

## **Spache Diagnostic Reading Scales**

*Grade 3 /Year 4*

### **Fast Track Project Technical Report**

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#### **Citation**

##### *Instrument*

Spache, G. D. (1963). *Diagnostic Reading Scales Examiner's Manual*. Monterey, CA: CTB/McGraw-Hill.

##### *Reports*

Maumary-Gremaud, A. & Miller-Johnson, S. (1996). *Spache Diagnostic Reading Scales* (Fast Track Project Technical Report). Durham, NC: Duke University.

Corrigan, A. (2003). *Spache Diagnostic Reading Scales, Grade 3 /Year 4* (Fast Track Project Technical Report). Available from the Fast Track Project Web site, <http://www.fasttrackproject.org>

#### **Data Sources**

*Unscored:* C4F

*Scored:* SPC4

#### **I. Scale Description**

The Spache Diagnostic Reading Scales (1981 version) evaluate a child's reading ability. Two subtests from the Spache Scales were administered in Year 4: Word Recognition and Stories. Word Recognition assesses the child's ability to recognize and read individual words. Stories assesses oral reading ability and reading comprehension of text.

Word Recognition contains lists of 40 words each. In Year 4, Word List 2 and Word List 3 were administered. Word List 2 includes generally less difficult words than Word List 3. For example, "fly," "skate," and "either" are included on Word List 2. "Difference," "photograph," and "argue" are on Word List 3. Words in each list are ordered starting with the easier words and progressing to the more difficult words.

The Stories subtest contains eight stories and comprehension questions for each story. The stories increase in difficulty, from Story 1, which contains four short, declarative sentences with simple vocabulary, to Story 8, which contains three paragraphs of compound and complex sentences with advanced vocabulary. The Spache Diagnostic Reading Scales are administered by an interviewer, one-on-one with a child.

#### **Administration**

*Word Lists* –The interviewer instructs the child to point to each word on a list and read it. The interviewer awards points for each word as "correctly read (1)" or "incorrect (0)." A word is correctly read if the child recognizes the word within approximately 5 seconds. If the child can read the word, but takes longer than 5 seconds, the score is "incorrect (0)" for

that word. If the child does not recognize the word, or partly recognizes the word, the word score is zero. When a child misreads the same sound repeatedly (e.g., *show* read as *sow*; *shame* read as *same*), a zero is coded for each misreading. The subtest ends when the child misses five words consecutively. If the child completes the first word list without five consecutive mistakes, the interviewer instructs the child to begin the second word list.

*Stories* – In Year 4, the interviewer skipped the first three stories and began with Story 4. If the child passed Story 4, the interviewer went forward to stories 5 through 8. If the child failed Story 4, the interviewer went backwards through Stories 3, 2, and 1 until the child passed a story.

- Oral Reading Ability

Interviewers recorded errors made by children in reading each of the eight stories aloud. The following criteria define errors:

- Omissions: words, parts of words, or groups of words that a child leaves out.
- Additions: words, word parts, or groups of words that a child adds to the text.
- Substitutions: a word or group of words substituted in the story text. For example, if the text says: “...would play,” the child reads: “...would *have played*.”
- Repetitions: two or more words repeated.
- Reversals: reversal of letters in a word or word sequence (e.g., reversing “hop up on” as “hop *on up*”).

Only one error is recorded for each mistake. Each error adds one point to the error tally for the story. If a child misreads a word several times, it counts as a single error. When a child spontaneously corrects a mistake (except for repetitions), the mistake is expunged. Hesitations by the child are not considered errors.

The interviewer is instructed to wait about five seconds while the child tries to read a word in a story, before telling the child to skip the word and continue. The interviewer may not correct the child, or pronounce any words. When the child is finished reading, the interviewer tallies the errors and records the number of errors on his/her copy of the story page. The reading time is also recorded.

- Reading Comprehension

Each story is followed by several reading comprehension questions. The interviewer reads each question and waits for the child’s answer. The answer must come from the story information, and not from the child’s prior knowledge (even if prior knowledge produces an accurate response). Correct answers receive one point; incorrect answers receive zero. In responding to a single question, a child may answer several other questions as well. In this case, the child gets credit for all the correct answers.

If a child incorrectly reads a word or phrase in the story, and the word is also the answer to a comprehension question, the child gets credit for the correct answer. If a question requires two answers (with appropriate prompting from the interviewer) and the child only provides one answer, a half point is recorded.

## **II. Report Sample**

This report contains data collected on Cohort 1, Year 4. The data include a high-risk control sample (n=155) and a normative sample (n = 387) for a total N = 463, including overlap. Of the 463 subjects, 70 are missing all responses, including 50 from the normative group (9 from Durham, 16 from Washington, 12 from Pennsylvania, and 13 from Nashville), and 20 from the control group (5 from Durham, 3 from Nashville, 4 from Pennsylvania, and 8 from Washington), with overlap between the normative and control groups. None of these measures was used in the analyses.

### III. Scaling

Scales and subscores include:

- *Word List 2 Score*: Sum of points for correct words on Word List 2
- *Word List 3 Score*: Sum of points for correct words on Word List 3
- *Word List Total Sum Score*: Word List 2 score + Word List 3 score
- *Oral Reading Scaled Story Score*: For each story,  $Score = 1 - (\# \text{ of errors} / 25)$   
No respondent can receive a score less than 0 for any story. If the score on a story is “no pass”, scores for subsequent stories not used.
- *Oral Reading Scaled Sum Score*: Sum of Oral Reading Scaled Story Scores for the eight stories. For example, if a respondent reads two stories with 5 oral errors on Story 1 and 15 errors on Story 2, then the score is  $.8 + .4 = 1.2$ .
- *Reading Comprehension Sum Score*: Sum of the point for all stories on reading comprehension.
- *Composite Score*: Word List Combined standard score + Oral Reading Scaled Sum standard score + Reading Comprehension Sum standard score.

For each story, pass/fail standards for Oral Reading and Reading Comprehension are based on the “average number of errors made by pupils reading at this level” (Spache 1963). The cutoff scores are below:

**Pass/Fail Cutoffs for Stories**

	<b>Oral Reading</b>	<b>Reading Comprehension</b>
	Maximum Errors Allowed	Minimum Correct Answers Needed
Story 1	9	4
Story 2	12	4
Story 3	9	4
Story 4	10	4
Story 5	12	5
Story 6	9	5
Story 7	10	5
Story 8	14	5

Since the Year 4 Oral Reading test administration began with Story 4, missing data for stories 1 through 3 would exist for respondents who passed Story 4. Oral Reading and Reading Comprehension scores for Stories 1, 2 and 3 were thus estimated for these respondents as follows:

- Reading Comprehension and Oral Reading scores for stories 4 through 8 were computed within the group of respondents who passed Story 4.
- Oral Reading scores on Stories 4 through 8 were summed and standardized.
- Reading Comprehension scores on Stories 4 through 8 were summed and standardized.

- Based on each standard score, estimated scores for stories 1 through 3 were assigned by the scoring program as noted in the table below:

**Scoring oral reading and reading comprehension for Year 4, respondents who passed Story 4.**

<b>Standardized total scores Oral Reading and Comp</b>	<b>Story # 1 ORAL</b>	<b>Story # 1 COMPR</b>	<b>Story # 2 ORAL</b>	<b>Story # 2 COMPR</b>	<b>Story # 3 ORAL</b>	<b>Story # 3 COMPR</b>
Score > Mean + 2SD	9	6	12	7	9	7
Mean + SD < Score < Mean + 2SD	8	6	10	6	8	6
Mean < Score < Mean + SD	6	5	7	6	6	6
Mean - SD < Score < Mean	4	5	5	5	4	5
Mean - 2SD < Score < Mean - SD	2	4	2	4	2	4
Score < Mean - 2SD	0	4	0	4	0	4

Since children who failed Story 4 were given stories 3, 2 and 1 until a story was passed, some of these respondents are missing data for stories 2 and/or 1, depending on whether they passed Story 3. (A pass on a higher level story automatically passes lower level stories.) To estimate missing scores for these respondents, the following method was used:

- Mean scores for Stories 1 and 2 were computed by site for Year 3 data.
- In Year 4, the rounded value of each mean score from Year 3 was then imputed for Year 4 respondents, using the score corresponding to the site. One site (Nashville) was relevant. The values for this site are:

<b>Story #/ Score</b>	<b>Mean (rounded)</b>	<b>Std. Dev</b>
Story 1/Oral Reading Score	2	1.96
Story 1/Comprehension Score	5	.75
Story 2/Oral Reading Score	4	4.72
Story 2/Comprehension Score	6	1.25

The alpha coefficients of sum scores and additive scores for the normative sample and control samples are:

	<b>Normative Sample</b>	<b>Control Sample</b>
<b>Word List Total Sum Score</b>	0.87	0.92
<b>Oral Reading Scaled Sum Score</b>	0.71	0.71
<b>Reading Comprehension Sum Score</b>	0.65	0.55
<b>Composite Score</b>	0.60	0.65

#### IV. Differences Between Groups

T-tests of means on the subscores between the normative and control samples yielded the following results:

	Normative Sample		Control Sample		DF	t Value	Pr >  t
	Mean	SD	Mean	SD			
<b>Word List Total Sum Score</b>	52.05	24.21	42.09	26.90	401	-3.76	0.0002
<b>Oral Reading Scaled Story Score 1</b>	0.79	0.35	0.77	0.34	461	-0.77	0.4443
<b>Oral Reading Scaled Story Score 2</b>	0.72	0.38	0.65	0.39	461	-1.78	0.0758
<b>Oral Reading Scaled Story Score 3</b>	0.69	0.39	0.61	0.40	461	-2.16	0.0314
<b>Oral Reading Scaled Story Score 4</b>	0.69	0.41	0.59	0.43	461	-2.28	0.0232
<b>Oral Reading Scaled Story Score 5</b>	0.58	0.40	0.48	0.40	461	-2.60	0.0096
<b>Oral Reading Scaled Story Score 6</b>	0.50	0.44	0.37	0.43	461	-3.04	0.0025
<b>Oral Reading Scaled Story Score 7</b>	0.44	0.41	0.30	0.37	461	-3.48	0.0005
<b>Oral Reading Scaled Story Score 8</b>	0.28	0.35	0.16	0.29	461	-3.65	0.0003
<b>Oral Reading Scaled Sum Score</b>	4.70	2.74	3.94	2.61	461	-2.86	0.0044
<b>Reading Comprehension Sum Score</b>	38.82	16.30	32.73	17.39	400	-3.45	0.0006
<b>Composite Score</b>	0.20	0.80	-0.16	0.90	400	-4.13	<.0001

#### V. Recommendations for Use

T-tests of means show significant differences between the normative and control groups for the following: Word List Total Sum Score, Oral Reading Scaled Scores for Stories 3 through 8, Oral Reading Scaled Sum Score, Reading Comprehension Sum Score, and the Composite Score. For Year 4 respondents, alpha values for the Word List Total Sum Score are good and alpha values for the Oral Reading Scaled Sum Score are moderate. These scales should be useful, depending on the construct of interest.

#### VI. Item and Scale Means and SDs

**Means and Standard Deviations for Items  
Cohort 1, Year 4, Control Sample**

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
C4FOR1	Oral Reading & Comp. St1 Oral	132	2.51	2.91	0.00	12.00
C4FOR2	Oral Reading & Comp. St1 Comp	135	4.94	1.44	0.00	6.00
C4FOR3	Oral Reading & Comp. St2 Oral	118	3.57	3.86	0.00	15.00
C4FOR4	Oral Reading & Comp. St2 Comp	117	6.08	1.02	1.00	7.00
C4FOR5	Oral Reading & Comp. St3 Oral	110	3.50	2.89	0.00	13.00
C4FOR6	Oral Reading & Comp. St3 Comp	110	6.29	0.89	3.50	7.00
C4FOR7	Oral Reading & Comp. St4 Oral	105	3.05	3.43	0.00	17.00
C4FOR8	Oral Reading & Comp. St4 Comp	104	5.91	1.28	1.00	7.00
C4FOR9	Oral Reading & Comp. St5 Oral	97	5.86	4.65	0.00	20.00
C4FOR10	Oral Reading & Comp. St5 Comp	97	6.96	1.34	3.00	8.00
C4FOR11	Oral Reading & Comp. St6 Oral	68	3.85	2.81	0.00	9.00
C4FOR12	Oral Reading & Comp. St6 Comp	68	7.15	1.00	5.00	8.00
C4FOR13	Oral Reading & Comp. St7 Comp	67	7.37	4.78	0.00	17.00
C4FOR14	Oral Reading & Comp. St7 Comp	65	5.86	1.63	0.00	8.00
C4FOR15	Oral Reading & Comp. St8 Comp	43	10.86	6.81	0.00	28.00
C4FOR16	Oral Reading & Comp. St8 Comp	42	4.54	1.54	1.00	7.00

**Means and Standard Deviations for Items  
Cohort 1, Year 4, Normative Sample**

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
C4FOR1	Oral Reading & Comp. St1 Oral	326	1.71	2.30	0.00	14.00
C4FOR2	Oral Reading & Comp. St1 Comp	336	5.08	1.40	0.00	6.00
C4FOR3	Oral Reading & Comp. St2 Oral	307	2.90	3.56	0.00	21.00
C4FOR4	Oral Reading & Comp. St2 Comp	307	6.05	1.04	2.00	7.00
C4FOR5	Oral Reading & Comp. St3 Oral	290	2.62	2.68	0.00	14.00
C4FOR6	Oral Reading & Comp. St3 Comp	290	6.39	0.82	1.00	7.00
C4FOR7	Oral Reading & Comp. St4 Oral	281	2.20	2.71	0.00	19.00
C4FOR8	Oral Reading & Comp. St4 Comp	281	6.06	1.14	0.50	7.00
C4FOR9	Oral Reading & Comp. St5 Oral	266	4.85	4.32	0.00	22.00
C4FOR10	Oral Reading & Comp. St5 Comp	267	6.99	1.21	2.00	8.00
C4FOR11	Oral Reading & Comp. St6 Oral	209	3.09	2.56	0.00	9.00
C4FOR12	Oral Reading & Comp. St6 Comp	209	7.22	0.96	5.00	8.00
C4FOR13	Oral Reading & Comp. St7 Comp	208	5.92	4.51	0.00	27.00
C4FOR14	Oral Reading & Comp. St7 Comp	206	6.50	1.33	3.00	8.00
C4FOR15	Oral Reading & Comp. St8 Comp	160	10.09	7.00	0.00	32.00
C4FOR16	Oral Reading & Comp. St8 Comp	157	4.61	1.86	0.00	8.00

**Means and Standard Deviations for Subscales  
Cohort 1, Year 4, Control Sample**

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
C4Frcs	Spache Reading Comprehension sum score	135	32.73	17.39	0.00	57.00
C4Fso1	Oral Reading scaled score story 1	155	0.77	0.34	0.00	1.00
C4Fso2	Oral Reading scaled score story 2	155	0.65	0.39	0.00	1.00
C4Fso3	Oral Reading scaled score story 3	155	0.61	0.40	0.00	1.00
C4Fso4	Oral Reading scaled score story 4	155	0.59	0.43	0.00	1.00
C4Fso5	Oral Reading scaled score story 5	155	0.48	0.40	0.00	1.00
C4Fso6	Oral Reading scaled score story 6	155	0.37	0.43	0.00	1.00
C4Fso7	Oral Reading scaled score story 7	155	0.30	0.37	0.00	1.00
C4Fso8	Oral Reading scaled score story 8	155	0.16	0.29	0.00	1.00
C4Fsos	Spache Oral Reading scaled sum score	155	3.94	2.61	0.00	7.80
C4Fspc_com	Spache Composite Score (Wrd, Oral, Comp)	135	-0.16	0.90	-1.85	1.12
C4Fwls	Spache Word List Total sum score	135	42.09	26.90	0.00	80.00

**Means and Standard Deviations for Subscales  
Cohort 1, Year 4, Normative Sample**

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
C4Frcs	Spache Reading Comprehension sum score	336	37.37	16.95	0.00	59.00
C4Fso1	Oral Reading scaled score story 1	387	0.78	0.35	0.00	1.00
C4Fso2	Oral Reading scaled score story 2	387	0.70	0.38	0.00	1.00
C4Fso3	Oral Reading scaled score story 3	387	0.67	0.40	0.00	1.00
C4Fso4	Oral Reading scaled score story 4	387	0.66	0.42	0.00	1.00
C4Fso5	Oral Reading scaled score story 5	387	0.55	0.40	0.00	1.00
C4Fso6	Oral Reading scaled score story 6	387	0.47	0.44	0.00	1.00
C4Fso7	Oral Reading scaled score story 7	387	0.41	0.40	0.00	1.00
C4Fso8	Oral Reading scaled score story 8	387	0.25	0.34	0.00	1.00
C4Fsos	Spache Oral Reading scaled sum score	387	4.51	2.73	0.00	8.00
C4Fspc_com	Spache Composite Score (Wrd, Oral, Comp)	336	0.11	0.85	-1.85	1.22
C4Fwls	Spache Word List Total sum score	337	49.43	25.55	0.00	80.00

## VII. Item and Subscale Correlations

### Subscale Correlations Combined Normative and Control Samples

	C4Fwls	C4Frcs	C4Fsos	C4Fspc_com
<b>C4Fwls WL Total Sum score</b>	1.000	0.198 0.001	0.276 0.000	0.565 0.000
<b>C4Frcs Reading Comprehension Sum score</b>	0.198 0.001	1.000	0.914 0.000	0.906 0.000
<b>C4Fsos Oral Reading Scaled Sum score</b>	0.276 0.000	0.914 0.000	1.000	0.928 0.000
<b>C4Fspc_com Composite Score (Wrd, Oral, Comp)</b>	0.565 0.000	0.906 0.000	0.928 0.000	1.000





**Item Correlations – Raw Scores<sup>2</sup>**  
**Combined Normative and Control Samples**

Pearson Correlation Coefficients, N = 176 Prob >  r  under H0: Rho=0																
	C4FOR2	C4FOR4	C4FOR6	C4FOR8	C4FOR10	C4FOR12	C4FOR14	C4FOR16	C4FOR1	C4FOR3	C4FOR5	C4FOR7	C4FOR9	C4FOR11	C4FOR13	C4FOR15
<b>C4FOR2</b> Read & Comp. St1 Comp	1.000	0.263 0.000	0.325 0.000	0.212 0.005	0.169 0.025	0.126 0.096	0.157 0.037	0.218 0.004	-0.273 0.000	-0.210 0.005	-0.191 0.011	0.042 0.580	-0.100 0.187	-0.014 0.857	0.061 0.422	-0.012 0.870
<b>C4FOR4</b> Read & Comp. St2 Comp	0.263 0.000	1.000	0.326 0.000	0.251 0.001	0.032 0.676	0.306 0.000	0.151 0.045	0.206 0.006	-0.272 0.000	-0.239 0.001	-0.165 0.029	0.104 0.170	0.086 0.257	0.016 0.835	0.161 0.033	0.101 0.181
<b>C4FOR6</b> Read & Comp. St3 Comp	0.325 0.000	0.326 0.000	1.000	0.135 0.073	0.136 0.071	0.169 0.025	0.066 0.381	0.028 0.708	-0.358 0.000	-0.332 0.000	-0.294 0.000	0.086 0.259	0.198 0.009	0.129 0.088	0.150 0.047	0.164 0.029
<b>C4FOR8</b> Read & Comp. St4 Comp	0.212 0.005	0.251 0.001	0.135 0.073	1.000	0.116 0.124	0.288 0.000	0.147 0.052	0.265 0.000	0.126 0.096	0.146 0.052	0.189 0.012	0.035 0.647	0.046 0.548	0.132 0.080	0.164 0.030	0.046 0.546
<b>C4FOR10</b> Read & Comp. St5 Comp	0.169 0.025	0.032 0.676	0.136 0.071	0.116 0.124	1.000	0.163 0.030	0.083 0.271	0.207 0.006	0.083 0.272	0.087 0.249	0.105 0.167	0.053 0.485	0.130 0.086	0.064 0.395	0.064 0.402	0.002 0.978
<b>C4FOR12</b> Read & Comp. St6 Comp	0.126 0.096	0.306 0.000	0.169 0.025	0.288 0.000	0.163 0.030	1.000	0.418 0.000	0.319 0.000	0.196 0.009	0.153 0.043	0.207 0.006	0.030 0.692	-0.031 0.682	0.037 0.625	0.062 0.412	-0.031 0.685
<b>C4FOR14</b> Read & Comp. St7 Comp	0.157 0.037	0.151 0.045	0.066 0.381	0.147 0.052	0.083 0.271	0.418 0.000	1.000	0.379 0.000	0.124 0.101	0.056 0.462	0.071 0.346	-0.055 0.466	-0.204 0.006	-0.043 0.569	-0.142 0.059	-0.168 0.026
<b>C4FOR16</b> Read & Comp. St8 Comp	0.218 0.004	0.206 0.006	0.028 0.708	0.265 0.000	0.207 0.006	0.319 0.000	0.379 0.000	1.000	0.158 0.037	0.148 0.050	0.182 0.016	0.028 0.714	-0.036 0.632	-0.058 0.442	0.028 0.709	-0.239 0.001
<b>C4FOR1</b> Read & Comp. St1 Oral <sup>1</sup>	-0.273 0.000	-0.272 0.000	-0.358 0.000	0.126 0.096	0.083 0.272	0.196 0.009	0.124 0.101	0.158 0.037	1.000	0.893 0.000	0.806 0.000	0.211 0.005	0.093 0.218	0.132 0.082	0.135 0.074	0.019 0.799
<b>C4FOR3</b> Read & Comp. St2 Oral	-0.210 0.005	-0.239 0.001	-0.332 0.000	0.146 0.052	0.087 0.249	0.153 0.043	0.056 0.462	0.148 0.050	0.893 0.000	1.000	0.811 0.000	0.230 0.002	0.188 0.013	0.213 0.004	0.196 0.009	0.090 0.237
<b>C4FOR5</b> Read & Comp. St3 Oral	-0.191 0.011	-0.165 0.029	-0.294 0.000	0.189 0.012	0.105 0.167	0.207 0.006	0.071 0.346	0.182 0.016	0.806 0.000	0.811 0.000	1.000	0.296 0.000	0.255 0.001	0.289 0.000	0.308 0.000	0.064 0.398
<b>C4FOR7</b> Read & Comp. St4 Oral	0.042 0.580	0.104 0.170	0.086 0.259	0.035 0.647	0.053 0.485	0.030 0.692	-0.055 0.466	0.028 0.714	0.211 0.005	0.230 0.002	0.296 0.000	1.000	0.373 0.000	0.316 0.000	0.368 0.000	0.333 0.000
<b>C4FOR9</b> Read & Comp. St5 Oral	-0.100 0.187	0.086 0.257	0.198 0.009	0.046 0.548	0.130 0.086	-0.031 0.682	-0.204 0.006	-0.036 0.632	0.093 0.218	0.188 0.013	0.255 0.001	0.373 0.000	1.000	0.517 0.000	0.551 0.000	0.529 0.000
<b>C4FOR11</b> Read & Comp. St6 Oral	-0.014 0.857	0.016 0.835	0.129 0.088	0.132 0.080	0.064 0.395	0.037 0.625	-0.043 0.569	-0.058 0.442	0.132 0.082	0.213 0.004	0.289 0.000	0.316 0.000	0.517 0.000	1.000	0.593 0.000	0.564 0.000
<b>C4FOR13</b> Read & Comp. St7 Comp	0.061 0.422	0.161 0.033	0.150 0.047	0.164 0.030	0.064 0.402	0.062 0.412	-0.142 0.059	0.028 0.709	0.135 0.074	0.196 0.009	0.308 0.000	0.368 0.000	0.551 0.000	0.593 0.000	1.000	0.598 0.000
<b>C4FOR15</b> Read & Comp. St8 Comp	-0.012 0.870	0.101 0.181	0.164 0.029	0.046 0.546	0.002 0.978	-0.031 0.685	-0.168 0.026	-0.239 0.001	0.019 0.799	0.090 0.237	0.064 0.398	0.333 0.000	0.529 0.000	0.564 0.000	0.598 0.000	1.000

<sup>1</sup> Matrix contains correlations for raw Oral Reading story scores. (A scaled story score for Oral Reading is also calculated. See **III. Scaling** in this report.)