

Supplementary materials

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What do spelling errors tell us? Classification and analysis of errors
made by Greek schoolchildren with and without dyslexia

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Brief description of testing battery

Pseudoword repetition. Twenty pseudowords 2–5 syllables long (from Maridaki-Kassotaki, 1998) were pronounced by the experimenter one by one for the child to repeat, noting the number of incorrectly repeated items (range 0–20; Cronbach's $\alpha = .72$ for Grades 3–4, $.64$ for Grade 7).

Pseudoword reading. Twenty pseudowords 2–5 syllables long (from Maridaki-Kassotaki, 1998, not used in the repetition task) were presented on a sheet of paper for the child to read aloud, noting the total reading time and number of incorrectly read items (range 0–20; $\alpha = .83/G34, .84/G7$).

Word reading. Children read aloud a list of 84 words, 1–7 syllables long (including high, medium, and low frequency items and a variety of parts of speech and declension types), presented in three columns on a sheet of paper. The total reading time and number of incorrectly read items were noted (range 0–84; $\alpha = .91/G34, .95/G7$).

Passage reading and comprehension. Three age-appropriate passages of increasing difficulty were read aloud by the children, noting their total reading time and number of reading errors. Following each passage, 2–4 open-ended comprehension questions were asked, and points were given for correct responses (partial points for approximations). For the second and third passage, one-minute silent study was provided after reading aloud and before the questions.

Passages were 40–76 and 72–90 words long, for Grades 3–4 and Grade 7, respectively. They differed in genre (including narrative and expository) and included increasingly longer and less frequent words as well as longer sentences and subordinate clauses. Comprehension questions probed information memorization, integration from disparate points in the passage, and reasoning on the basis of information (range 0–20, $\alpha = .44/G34, .43/G7$).

Word spelling. A list of 22 words were individually dictated at a pace determined by the child's writing. Words were chosen to be frequent and to provide opportunities for a variety of spelling errors. The number of spelling errors of each error type was noted (see error classification below), allowing the possibility of more than one error in each word (on the basis of number of words correct, range 0–21, $\alpha = .87$ for both groups).

Passage spelling. An age-appropriate passage from Zahos and Zahos (1998) was dictated at a pace determined by the child's writing. The passage contained well known words (33 words for

Grades 3–4 and 49 for Grade 7) and its meaning was easy for the target age. The words provided many opportunities for spelling errors. The number of spelling errors of each error type was noted.

Phoneme deletion. A set of 22 two-syllable and three-syllable pseudowords were constructed following Greek phonotactic structure, including a high proportion of consonant clusters. For each pseudoword, one phoneme was the designated deletion target, varying greatly in phoneme type, word position, and syllabic position. Each pseudoword was presented orally and, once repeated correctly, was presented again along with the phoneme to be deleted. The total number of incorrect responses was noted (range 0–22, $\alpha = .86/G34, .79/G7$).

Speech sound discrimination. This is a subscale from the “Athena” test for learning disabilities (Paraskevopoulos, Kalantzi-Azizi, & Giannitsas, 1999). It includes 32 pseudoword pairs, 8 of which are identical repetitions. The remaining 24 item pairs differ by a single phoneme modification, insertion, or translation. Each pair was presented orally to the student to be judged as “same” or “different.” The total number of incorrect responses was noted (range 0–32, $\alpha = .78/G34, .72/G7$).

Nonverbal ability. The full 60-item version of the Raven’s Standard Progressive Matrices (SPM) test (Raven, 1976) was used in Grade 7 (range 0–60, $\alpha = .92$), series A–D only in Grades 3–4 (range 0–48, $\alpha = .89$), noting the number of correct choices (raw score).

Digit span. The Digit Span subscale from the Greek standardized version of the Wechsler Intelligence Scale for Children, third edition (WISC-III; Georgas, Paraskevopoulos, Bezevegis, & Giannitsas, 1997), was used, including forward and backward span, following standard administration procedure and termination criterion. The total number of sequences reproduced correctly was noted (raw score).

Arithmetic. The Arithmetic subscale from the Greek standardized version of the WISC-III (Georgas et al., 1997) was used, following the standard instructions and termination criterion. The number of correct responses was noted (raw score).

Spelling test materials

Grades 3-4 passage (from Zahos and Zahos, 1998)

Η πατρίδα μας είναι όμορφη χώρα. Όταν μπαίνει η άνοιξη, ανθίζουν οι κάμποι, και το πολύχρωμο, λουλουδένιο χαλί τους απλώνεται ως την άκρη της θάλασσας. Εδώ φαίνεται πόσο καλός τεχνίτης είναι η φύση.

Grade 7 passage (from Zahos and Zahos, 1998)

Αυτή την εποχή οι γεωργοί ασχολούνται με το ράντισμα των δέντρων. Συχνά, δανείζονται εργαλεία από άλλους. Κάποτε μαζεύουν τη σοδειά και τη συγκεντρώνουν σε ειδικές αποθήκες. Περιμένοντας την κατάλληλη στιγμή, πηγαίνουν και πουλάνε τα προϊόντα τους συνήθως στις πόλεις. Είναι ευχαριστημένοι όταν κερδίζουν μερικά χρήματα πουλώντας τον ιδρώτα τους.

Isolated word list

αρέσει, αρχίζω, φαίνομαι, τρέχει, διαθέτω, περιμένετε, παίζω, κοπάδι, αρνί, αντί, κάτω, πιάνο, ασχολούνται, πρέπει, φουγάρο, γυμναστική, πλένομαι, φύση, σταματάτε, αντέχουμε, φαράσι, ασχολείται

Table S1

Counts of units relevant for error opportunities, for each spelling material.

| | Passages | | Word list |
|--|----------|------------|-----------|
| | Grade 7 | Grades 3-4 | |
| Words | 49 | 33 | 22 |
| Punctuation marks | 7 | 6 | 0 |
| Syllables | 117 | 68 | 66 |
| Letters | 292 | 160 | 151 |
| Stressed syllables | 33 | 22 | 22 |
| Unstressed syllables in stressed words | 68 | 35 | 44 |
| Monosyllables (unstressed) | 16 | 11 | 0 |

References

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- Maridaki-Kassotaki, K. (1998). Ικανότητα βραχύχρονης συγκράτησης φωνολογικών πληροφοριών και επίδοση στην ανάγνωση: Μια προσπάθεια διερεύνησης της μεταξύ τους σχέσης [Evaluation of the relationship between phonological working memory and reading ability in Greek-speaking children]. *Psychologia*, 5, 44–52.
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- Raven, J. (1976). *Standard progressive matrices*. New York: Psychological Corp.
- Zahos, G. I., & Zahos, D. I. (1998). *Δυσλεξία: Αντιμετώπιση-Αποκατάσταση. Οδηγίες εφαρμογής προγράμματος* [Dyslexia: Guide to the application of an intervention-remediation program]. Athens: Author.

Table S2*Performance of each participant group and selected subgroups on the assessment battery.*

| | School sample | | Nondyslexic | | Clinical sample | | Dyslexic profile | | Reading match | |
|-------------------------------|---------------|-----------|-------------|-----------|-----------------|-----------|------------------|-----------|---------------|-----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| <i>Grades 3-4</i> | | | | | | | | | | |
| Age (months) | 109.04 | 7.16 | 108.22 | 7.21 | 106.74 | 7.06 | 106.50 | 6.64 | 109.32 | 7.25 |
| Pseudoword repetition errors | 4.04 | 3.03 | 4.82 | 3.21 | 6.80 | 3.41 | 8.73 | 2.22 | 3.55 | 2.32 |
| Pseudoword reading errors | 6.79 | 4.30 | 7.02 | 4.46 | 9.07 | 3.99 | 11.40 | 3.02 | 7.17 | 3.97 |
| Pseudoword reading time (s) | 70.14 | 54.16 | 70.58 | 32.25 | 96.20 | 78.06 | 100.73 | 66.11 | 67.07 | 25.92 |
| Word reading errors | 10.93 | 8.86 | 11.13 | 8.75 | 16.27 | 7.47 | 26.00 | 10.09 | 10.38 | 7.48 |
| Word reading time (s) | 157.87 | 77.54 | 160.12 | 73.12 | 236.07 | 86.18 | 249.27 | 143.59 | 162.90 | 77.45 |
| Passage reading errors | 3.98 | 6.25 | 4.33 | 5.52 | 8.33 | 6.44 | 14.33 | 15.36 | 2.83 | 3.36 |
| Passage reading time (s) | 130.46 | 88.31 | 130.02 | 81.28 | 216.60 | 80.35 | 266.60 | 214.37 | 125.72 | 51.52 |
| Passage comprehension score | 10.78 | 3.08 | 10.57 | 3.39 | 10.53 | 3.31 | 7.27 | 3.60 | 11.24 | 2.90 |
| Phoneme deletion errors | 9.85 | 5.19 | 10.83 | 5.18 | 13.13 | 4.24 | 17.80 | 2.81 | 8.31 | 4.47 |
| Speech discrimination errors | 6.23 | 4.22 | 7.70 | 4.38 | 8.80 | 3.57 | 10.07 | 4.71 | 5.52 | 3.15 |
| Raven's SPM raw score | 23.46 | 7.69 | 22.06 | 7.71 | 23.73 | 7.34 | 19.33 | 4.97 | 23.76 | 6.37 |
| WISC-III digit span raw score | 11.19 | 2.21 | 10.76 | 2.13 | 9.47 | 2.13 | 9.33 | 2.19 | 11.97 | 2.01 |
| WISC-III arithmetic raw score | 14.81 | 2.55 | 14.38 | 2.44 | 14.07 | 1.39 | 11.87 | 3.18 | 15.66 | 2.68 |
| <i>Grade 7</i> | | | | | | | | | | |
| Age (months) | 151.08 | 6.26 | 149.60 | 4.97 | 148.41 | 6.69 | 151.29 | 7.33 | | |
| Pseudoword repetition errors | 4.59 | 2.76 | 4.33 | 2.33 | 5.03 | 3.63 | 4.81 | 2.90 | | |
| Pseudoword reading errors | 4.38 | 3.59 | 3.22 | 2.65 | 8.45 | 4.11 | 8.38 | 3.76 | | |
| Pseudoword reading time (s) | 45.32 | 17.27 | 40.57 | 12.03 | 74.97 | 31.50 | 77.38 | 28.09 | | |
| Word reading errors | 3.50 | 7.37 | 1.24 | 1.68 | 10.10 | 7.45 | 9.62 | 5.48 | | |
| Word reading time (s) | 100.45 | 48.52 | 85.84 | 17.33 | 165.72 | 76.55 | 179.56 | 60.55 | | |

ANALYSIS OF GREEK SPELLING ERRORS

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|-------------------------------|--------|-------|-------|-------|--------|-------|--------|--------|
| Passage reading errors | 5.66 | 6.32 | 3.56 | 2.65 | 9.45 | 6.38 | 14.31 | 9.26 |
| Passage reading time (s) | 131.53 | 67.68 | 98.79 | 15.26 | 209.17 | 83.11 | 280.12 | 141.25 |
| Passage comprehension score | 11.88 | 4.29 | 11.13 | 3.30 | 8.55 | 2.89 | 11.81 | 3.85 |
| Phoneme deletion errors | 5.97 | 4.04 | 4.71 | 3.29 | 8.07 | 4.40 | 10.25 | 5.04 |
| Speech discrimination errors | 5.39 | 3.46 | 4.73 | 2.83 | 6.34 | 3.65 | 5.69 | 3.83 |
| Raven's SPM raw score | 36.47 | 9.84 | 38.79 | 8.97 | 32.29 | 13.40 | 35.88 | 9.69 |
| WISC-III digit span raw score | 13.22 | 2.88 | 13.85 | 2.71 | 10.79 | 2.74 | 11.06 | 2.72 |
| WISC-III arithmetic raw score | 17.60 | 2.93 | 18.11 | 2.86 | 16.11 | 2.15 | 16.69 | 2.09 |

Table S3

Nonparametric comparison (Mann-Whitney Z and associated two-tailed asymptotic significance) between the clinical sample in each age group and selected subgroups of the school sample on the reading and cognitive measures of the testing battery.

| | Nondyslexic vs. clinical sample | | | | Dyslexic profile vs. clinical sample | | | | Reading match | |
|-------------------------------|---------------------------------|------|---------|------|--------------------------------------|------|---------|------|----------------------------------|------|
| | Grades 3-4 | | Grade 7 | | Grades 3-4 | | Grade 7 | | vs. clinical sample ^a | |
| | Z | p | Z | p | Z | p | Z | p | Z | p |
| Age | .728 | .467 | .924 | .356 | .166 | .868 | .924 | .356 | 6.423 | .000 |
| Pseudoword repetition errors | 2.371 | .018 | .533 | .594 | 1.740 | .082 | .012 | .990 | 1.498 | .134 |
| Pseudoword reading errors | 1.602 | .109 | 6.079 | .000 | 1.690 | .091 | .024 | .981 | 1.171 | .242 |
| Pseudoword reading time (s) | 1.684 | .092 | 6.681 | .000 | .290 | .772 | .652 | .514 | .918 | .359 |
| Word reading errors | 2.500 | .012 | 7.130 | .000 | 3.011 | .003 | .107 | .915 | .117 | .907 |
| Word reading time (s) | 4.022 | .000 | 6.866 | .000 | .788 | .430 | 1.008 | .314 | .226 | .822 |
| Passage reading errors | 3.229 | .001 | 5.138 | .000 | 1.540 | .124 | 1.896 | .058 | 4.478 ^b | .000 |
| Passage reading time (s) | 4.219 | .000 | 7.804 | .000 | .062 | .950 | 1.790 | .073 | 4.425 ^b | .000 |
| Passage comprehension score | .188 | .851 | 3.623 | .000 | 2.193 | .028 | 2.860 | .004 | 3.130 ^b | .002 |
| Phoneme deletion errors | 1.561 | .118 | 3.818 | .000 | 2.670 | .008 | 1.653 | .098 | .437 | .662 |
| Speech discrimination errors | 1.413 | .158 | 2.398 | .016 | .584 | .559 | .596 | .551 | .727 | .467 |
| Raven's SPM raw score | .878 | .380 | 2.575 | .010 | 1.644 | .100 | .574 | .566 | 3.827 | .000 |
| WISC-III digit span raw score | 2.430 | .015 | 4.944 | .000 | .126 | .900 | .272 | .786 | 1.753 | .080 |
| WISC-III arithmetic raw score | .929 | .353 | 3.804 | .000 | 1.838 | .066 | 1.111 | .266 | .354 | .723 |

^a Reading match comparison between Grade 7 clinical sample and selected children from Grades 3-4 school sample.

^b Comparison involving different passages due to grade difference (see *Materials*).

Table S4

Mean number of spelling errors (and corresponding standard deviation) in the passage and word list spelling tasks for each subgroup of children and each error type (major categories shown in boldface).

| Grades 3-4 | Passage | | | | | | | | | | Word list | | | | | | | | | |
|---------------------|---------------|-------------|-------------|-------------|-----------------|-------------|------------------|-------------|---------------|-------------|---------------|-------------|-------------|-------------|-----------------|-------------|------------------|-------------|---------------|-------------|
| | School sample | | Nondyslexic | | Clinical sample | | Dyslexic profile | | Reading match | | School sample | | Nondyslexic | | Clinical sample | | Dyslexic profile | | Reading match | |
| | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Phonological | .73 | 1.49 | .77 | 1.55 | 1.87 | 2.53 | 2.47 | 2.33 | .59 | 1.21 | .68 | 1.28 | .77 | 1.37 | 1.47 | 1.96 | 1.93 | 2.31 | .34 | .94 |
| Graph subst | .21 | .62 | .22 | .65 | .67 | 1.29 | .67 | 1.29 | .17 | .47 | .38 | .79 | .43 | .88 | .80 | 1.21 | 1.07 | 1.10 | .21 | .68 |
| Graph omit | .27 | .65 | .29 | .65 | .67 | .90 | .67 | .90 | .28 | .46 | .06 | .31 | .07 | .28 | .07 | .26 | .27 | .59 | .03 | .19 |
| Graph insert | .14 | .42 | .14 | .42 | .33 | .62 | .60 | .63 | .07 | .37 | .08 | .29 | .09 | .28 | .33 | .62 | .13 | .35 | .00 | .00 |
| Graph transp | .01 | .11 | .02 | .15 | .00 | .00 | .13 | .35 | .03 | .19 | .02 | .14 | .01 | .12 | .07 | .26 | .13 | .35 | .03 | .19 |
| ConsDigr inv | .01 | .14 | .01 | .17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| ConsDigr drop | .02 | .12 | .01 | .12 | .07 | .26 | .07 | .26 | .03 | .19 | .03 | .18 | .03 | .21 | .00 | .00 | .07 | .26 | .03 | .19 |
| VowlDigr inv | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .06 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 |
| VowlDigr drop | .06 | .25 | .05 | .22 | .13 | .35 | .27 | .59 | .00 | .00 | .06 | .28 | .08 | .27 | .07 | .26 | .27 | .80 | .03 | .19 |
| Syllable omit | .01 | .11 | .02 | .15 | .00 | .00 | .07 | .26 | .00 | .00 | .05 | .23 | .06 | .24 | .07 | .26 | .00 | .00 | .00 | .00 |
| Diaeresis omit | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Grammatical | 1.98 | 2.55 | 2.20 | 2.72 | 5.40 | 3.52 | 6.20 | 3.59 | 1.28 | 1.51 | 3.92 | 3.06 | 4.10 | 3.21 | 7.27 | 3.15 | 8.53 | 3.56 | 3.03 | 1.90 |
| Inflected suf | 1.94 | 2.51 | 2.14 | 2.68 | 5.20 | 3.49 | 6.00 | 3.61 | 1.24 | 1.53 | 3.92 | 3.06 | 4.10 | 3.21 | 7.27 | 3.15 | 8.53 | 3.56 | 3.03 | 1.90 |
| Uninflect suf | .05 | .21 | .06 | .24 | .20 | .41 | .20 | .41 | .03 | .19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Orthographic | 3.22 | 3.05 | 3.50 | 3.23 | 7.27 | 2.82 | 7.60 | 2.38 | 2.45 | 2.44 | 1.50 | 1.61 | 1.66 | 1.80 | 3.53 | 1.69 | 3.93 | 1.87 | 1.17 | 1.17 |
| Vowel subst | 1.07 | 1.56 | 1.20 | 1.72 | 3.20 | 2.08 | 3.33 | 1.95 | .69 | 1.04 | .71 | 1.14 | .89 | 1.31 | 2.27 | 1.53 | 2.40 | 1.55 | .41 | .63 |
| Conson subst | .10 | .36 | .14 | .42 | .20 | .41 | .07 | .26 | .10 | .31 | .01 | .11 | .01 | .12 | .00 | .00 | .00 | .00 | .00 | .00 |
| Palatal cons | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .06 | .01 | .09 | .00 | .00 | .07 | .26 | .00 | .00 |
| Deriv rule | 2.05 | 1.69 | 2.16 | 1.65 | 3.87 | .99 | 4.20 | 1.01 | 1.66 | 1.52 | .73 | .73 | .71 | .76 | 1.13 | .64 | 1.40 | .51 | .76 | .87 |
| Deriv except | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .05 | .23 | .04 | .19 | .13 | .35 | .07 | .26 | .00 | .00 |
| Stress | 2.57 | 4.65 | 2.25 | 4.07 | 8.53 | 7.30 | 8.13 | 6.76 | 1.72 | 4.15 | 1.82 | 4.62 | 1.72 | 4.61 | 8.87 | 8.49 | 6.93 | 8.13 | .41 | .91 |
| Stress omit | 2.28 | 4.40 | 1.97 | 3.83 | 8.33 | 7.33 | 6.40 | 6.27 | 1.72 | 4.15 | 1.67 | 4.55 | 1.58 | 4.52 | 8.80 | 8.44 | 5.73 | 8.14 | .38 | .82 |
| Stress misplace | .23 | 1.02 | .22 | .89 | .20 | .56 | 1.47 | 2.90 | .00 | .00 | .14 | .71 | .14 | .75 | .07 | .26 | 1.07 | 2.31 | .03 | .19 |
| Stress extra | .06 | .29 | .06 | .26 | .00 | .00 | .27 | .80 | .00 | .00 | .01 | .14 | .00 | .00 | .00 | .00 | .13 | .52 | .00 | .00 |
| SecStress omit | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Punctuation | .27 | .63 | .30 | .65 | 1.33 | 1.35 | .40 | .91 | .17 | .38 | .00 | .06 | .01 | .09 | .00 | .00 | .00 | .00 | .00 | .00 |
| MainPunct omit | .22 | .57 | .22 | .57 | 1.20 | 1.27 | .20 | .56 | .17 | .38 | .00 | .06 | .01 | .09 | .00 | .00 | .00 | .00 | .00 | .00 |

ANALYSIS OF GREEK SPELLING ERRORS

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|-----------------------|------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|-------------|------------|------------|------------|------------|
| MainPunct insert | .02 | .21 | .04 | .29 | .00 | .00 | .20 | .78 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MainPunct subst | .01 | .09 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct omit | .00 | .06 | .01 | .09 | .07 | .26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct insert | .02 | .12 | .03 | .17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct subst | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Other | .82 | 1.41 | .71 | 1.08 | 1.80 | 2.24 | 3.20 | 3.53 | .45 | .83 | .04 | .22 | .05 | .22 | .47 | 1.06 | .00 | .00 | .03 | .19 |
| Word omit | .09 | .36 | .09 | .38 | .00 | .00 | .47 | .74 | .03 | .19 | .00 | .06 | .01 | .09 | .13 | .52 | .00 | .00 | .00 | .00 |
| Word insert | .03 | .20 | .04 | .21 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 |
| Word subst | .05 | .23 | .04 | .24 | .00 | .00 | .07 | .26 | .07 | .26 | .02 | .17 | .01 | .12 | .00 | .00 | .00 | .00 | .00 | .00 |
| Phrase omit | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Words runin | .23 | .72 | .17 | .55 | .73 | 1.03 | 1.47 | 2.03 | .10 | .41 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Syllables apart | .03 | .25 | .03 | .21 | .47 | .92 | .40 | .91 | .00 | .00 | .00 | .06 | .01 | .09 | .20 | .78 | .00 | .00 | .00 | .00 |
| Word break | .02 | .16 | .00 | .00 | .13 | .35 | .07 | .26 | .00 | .00 | .00 | .00 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 |
| UpperLower | .35 | .62 | .30 | .57 | .40 | .51 | .53 | .74 | .21 | .41 | .00 | .06 | .01 | .09 | .00 | .00 | .00 | .00 | .00 | .00 |
| Word split | .02 | .15 | .03 | .17 | .07 | .26 | .13 | .35 | .03 | .19 | .01 | .09 | .01 | .12 | .00 | .00 | .00 | .00 | .03 | .19 |
| Unclassifiable | .08 | .30 | .11 | .36 | .07 | .26 | .20 | .41 | .07 | .26 | .02 | .12 | .02 | .15 | .00 | .00 | .07 | .26 | .00 | .00 |
| Miscellaneous | .08 | .30 | .11 | .36 | .07 | .26 | .20 | .41 | .07 | .26 | .02 | .12 | .02 | .15 | .00 | .00 | .07 | .26 | .00 | .00 |

| Grade 7 | Passage | | | | | | | | Word list | | | | | | | |
|---------------------|---------------|-------------|-------------|-------------|-----------------|-------------|------------------|-------------|---------------|-------------|-------------|-------------|-----------------|-------------|------------------|-------------|
| | School sample | | Nondyslexic | | Clinical sample | | Dyslexic profile | | School sample | | Nondyslexic | | Clinical sample | | Dyslexic profile | |
| | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Phonological | 1.86 | 3.72 | .84 | 1.07 | 2.69 | 2.62 | 4.69 | 9.14 | .50 | 1.21 | .21 | .53 | .48 | .87 | 1.50 | 2.22 |
| Graph subst | .34 | 1.38 | .15 | .38 | .41 | .68 | 1.00 | 2.76 | .27 | .82 | .10 | .34 | .21 | .77 | .56 | 1.09 |
| Graph omit | .39 | 1.55 | .09 | .29 | .45 | 1.02 | 1.75 | 4.88 | .03 | .18 | .03 | .17 | .00 | .00 | .13 | .34 |
| Graph insert | .76 | 1.14 | .41 | .78 | 1.21 | .98 | 1.31 | 1.62 | .08 | .31 | .04 | .19 | .17 | .47 | .37 | .72 |
| Graph transp | .01 | .15 | .00 | .00 | .07 | .26 | .12 | .50 | .00 | .06 | .00 | .00 | .00 | .00 | .06 | .25 |
| ConsDigr inv | .00 | .06 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| ConsDigr drop | .10 | .35 | .02 | .14 | .24 | .64 | .25 | .45 | .02 | .13 | .00 | .00 | .00 | .00 | .13 | .34 |
| VowlDigr inv | .00 | .06 | .00 | .00 | .03 | .19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| VowlDigr drop | .03 | .19 | .01 | .10 | .14 | .44 | .00 | .00 | .06 | .25 | .04 | .19 | .10 | .31 | .13 | .34 |
| Syllable omit | .04 | .26 | .01 | .10 | .00 | .00 | .06 | .25 | .03 | .23 | .00 | .00 | .00 | .00 | .13 | .50 |
| Diaeresis omit | .18 | .38 | .15 | .36 | .14 | .35 | .19 | .40 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Grammatical | 1.72 | 2.60 | .71 | 1.05 | 4.69 | 3.23 | 5.81 | 4.43 | 1.88 | 2.60 | .92 | 1.10 | 4.59 | 3.65 | 5.19 | 4.29 |
| Inflected suf | 1.18 | 2.17 | .39 | .81 | 3.52 | 2.75 | 4.31 | 3.86 | 1.89 | 2.60 | .92 | 1.10 | 4.59 | 3.65 | 5.19 | 4.29 |
| Uninflect suf | .54 | .70 | .32 | .53 | 1.17 | .93 | 1.50 | .82 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Orthographic | 3.38 | 4.59 | 1.68 | 1.87 | 10.55 | 5.61 | 11.19 | 7.61 | .59 | 1.23 | .19 | .50 | 2.07 | 1.85 | 2.50 | 2.42 |
| Vowel subst | 1.48 | 2.64 | .49 | .87 | 5.14 | 3.46 | 5.87 | 4.46 | .26 | .77 | .05 | .21 | .97 | 1.30 | 1.38 | 2.00 |

ANALYSIS OF GREEK SPELLING ERRORS

| | | | | | | | | | | | | | | | | |
|-----------------------|-------------|-------------|------------|-------------|--------------|--------------|--------------|--------------|-------------|-------------|------------|------------|-------------|-------------|-------------|-------------|
| Conson subst | .63 | .74 | .53 | .62 | 1.72 | .84 | 1.50 | 1.10 | .01 | .12 | .00 | .00 | .00 | .00 | .00 | .00 |
| Palatal cons | .00 | .06 | .00 | .00 | .00 | .00 | .06 | .25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Deriv rule | 1.05 | 1.35 | .55 | .78 | 3.03 | 1.68 | 3.12 | 1.93 | .28 | .57 | .10 | .34 | .93 | .80 | 1.00 | .82 |
| Deriv except | .22 | .41 | .11 | .32 | .66 | .48 | .62 | .50 | .05 | .21 | .04 | .19 | .17 | .38 | .13 | .34 |
| Stress | 3.56 | 7.90 | .92 | 1.80 | 13.03 | 11.62 | 10.87 | 15.47 | 1.63 | 4.79 | .24 | .82 | 6.83 | 8.40 | 5.56 | 9.08 |
| Stress omit | 2.79 | 6.84 | .80 | 1.79 | 11.97 | 11.86 | 5.50 | 10.28 | 1.32 | 4.35 | .20 | .81 | 6.41 | 8.33 | 3.50 | 7.55 |
| Stress misplace | .45 | 1.62 | .05 | .21 | .79 | 1.47 | 1.75 | 3.07 | .20 | 1.31 | .04 | .19 | .34 | 1.08 | .56 | 1.55 |
| Stress extra | .32 | 2.44 | .07 | .28 | .28 | .80 | 3.63 | 9.63 | .10 | 1.03 | .01 | .10 | .07 | .26 | 1.50 | 4.12 |
| SecStress omit | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Punctuation | .42 | .86 | .27 | .72 | .52 | .69 | .62 | 1.31 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MainPunct omit | .29 | .61 | .21 | .58 | .38 | .62 | .25 | .45 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MainPunct insert | .07 | .40 | .04 | .31 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| MainPunct subst | .04 | .33 | .02 | .14 | .00 | .00 | .31 | 1.25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct omit | .03 | .16 | .01 | .10 | .14 | .44 | .06 | .25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct insert | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| SecPunct subst | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Other | .89 | 2.70 | .22 | .52 | 1.45 | 1.72 | 1.81 | 2.76 | .07 | .31 | .03 | .17 | .24 | 1.12 | .13 | .34 |
| Word omit | .09 | .41 | .03 | .17 | .07 | .26 | .06 | .25 | .03 | .18 | .00 | .00 | .24 | 1.12 | .00 | .00 |
| Word insert | .06 | .37 | .01 | .10 | .00 | .00 | .13 | .34 | .01 | .12 | .01 | .10 | .00 | .00 | .00 | .00 |
| Word subst | .04 | .19 | .02 | .14 | .00 | .00 | .00 | .00 | .00 | .06 | .01 | .10 | .00 | .00 | .00 | .00 |
| Phrase omit | .02 | .17 | .02 | .14 | .03 | .19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Words runin | .22 | .69 | .07 | .28 | .48 | .83 | .44 | .81 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Syllables apart | .11 | .58 | .02 | .14 | .24 | .58 | .25 | .68 | .01 | .10 | .01 | .10 | .00 | .00 | .13 | .34 |
| Word break | .03 | .16 | .01 | .10 | .24 | .51 | .13 | .34 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| UpperLower | .30 | 1.82 | .06 | .23 | .31 | .54 | .81 | 1.47 | .04 | .67 | .00 | .00 | .00 | .00 | .00 | .00 |
| Word split | .02 | .13 | .00 | .00 | .07 | .26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| Unclassifiable | .07 | .35 | .04 | .27 | .17 | .60 | .25 | .68 | .00 | .06 | .00 | .00 | .00 | .00 | .00 | .00 |
| Miscellaneous | .07 | .35 | .04 | .27 | .17 | .60 | .25 | .68 | .00 | .06 | .00 | .00 | .00 | .00 | .00 | .00 |

Note: See Appendix A for error type abbreviations.