



# Spelling: Assessment and Instructional Recommendations

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Our knowledge about writing and spelling research has lagged far behind our understanding of cognitive functions that mediate reading. There is a considerably larger number of research studies pertaining to how children learn to read than studies that have explored how writing and spelling skills are acquired. For instance, according to Social Sciences Citation Index, from 1995-2005, nearly 10,387 articles were published on 'reading', but only 1,053 articles on 'spelling'. This is in spite of the fact that spelling was given much importance during the colonial period, and the first books of instruction were called "spellers" rather than "readers".

Nonetheless, reading and spelling are closely related, and poor readers tend to be poor spellers (Ehri, 1997; Joshi, 1999; Joshi & Aaron, 1991; 2003). For this reason, a better understanding of the nature of spelling skills and its development could increase our knowledge about literacy in general and, perhaps, when spelling skills of children improve, their reading skills also might improve. Furthermore, because reading and spelling skills are closely interrelated (the coefficient of correlation between the two ranges from 0.66 to 0.90, Ehri, 1989) spelling error analyses could also provide useful insights into the nature of reading problems of school children. For instance, omission of phonemes such as nasals and schwas in spelling indicate similar deficits in spoken language.

Teachers, in general, select a list of words taught in the classroom and use the list as a spelling test (the traditional Friday test). Some school systems and school psychologists, however, use standardized published tests for this purpose. Two of the frequently used standardized spelling tests are: The Test of Written Language-3 (Hammill & Larson, 1996) and the Wide Range Achievement Test-3 (Wilkinson, 1995). After carefully reviewing the available standardized tests, Moats (1994) concluded that these tests lack a theoretical rationale for selecting the words used in the test and may not discriminate between good and poor spellers very well. One of the reasons for such poor discriminatory power of these tests is that many of the words in these lists may not be familiar to the test takers. Unfamiliar words, particularly irregular ones, are likely

to be spelled phonologically. Such misspellings arise out of lack of vocabulary knowledge rather than poor spelling skill. Further, these tests provide only quantitative measures of spelling skill and thus do not lead to instructional insights for the classroom teacher.

This paper will first discuss briefly acquisition of spelling skills and then take up the topic of assessment of spelling skills and instructional recommendations of spelling skills.

Research in spelling acquisition has shown that children acquire spelling in a gradual sequence and in a systematic way (Caffee, Venezky, & Chapman, 1969; Hanna, Hanna, Hodges, & Rudolf, 1966; Read, 1986; Treiman, 1998). For instance, hard "c" (as in cat) at the word-initial position is learned earlier than soft "c" (as in city); and the "g" sound (as in gun) is learned before its /j/ sound (as in gem). According to Gentry (1982), children go through the following phases on their way to become fluent spellers: precommunicative, semi-phonetic, phonetic, transitional, and correct spelling. Moats (this issue of *Perspectives*) uses terms such as "novice alphabetic stage", "late alphabetic stage", and so on to describe this developmental sequence. Henderson (1990) and Templeton and Bear (1992) have recognized five stages and labeled them prephonetic, letter-name, within-word pattern, syllable juncture, and derivational constancy. Even though these stages might have been called by different names, the general concept remains the same, that is, spelling skills are progressively acquired by children. Of course, there is considerable variation in the rate of acquisition of spelling skills by children.

Treiman and Cassar (1997), and Varnahagen, McCallum, and Burstow (1997), observe that children use a variety of strategies and utilize their knowledge of phonological, orthographic, and morphological principles to various degrees at each phase of development. Some of these strategies are used early on whereas others are utilized later thus giving rise to the apparent stages of spelling development. For example, phonetic principles are used by very young children, even as young as four years of age, whereas morphological principles are used later. For this reason, spelling skills of children and the nature of the spelling errors can serve as windows to

look into the linguistic and reading skills of children. Linguistic assessment (or qualitative assessment) of spelling performance is, therefore, a tool that can be helpful to teachers. In this context, it is worth reiterating that rote visual memorization may not be of great help in acquiring spelling skills. Current research has shown that acquiring spelling skills depends on phonological, orthographic, and morphological processes (Aaron & Joshi, 1992; Brown & Ellis, 1994; Perfetti, Rieben, Fayol, 1997; Sterling & Robson, 1992; Venezky, 1998) even though the role of visual memory cannot be dismissed out of hand.

The authors of this chapter have developed a spelling test based on known linguistic principles backed by current research. Teachers are encouraged to develop their own spelling lists following these principles. The corpus of words used in this test was collected by Rinsland (1947) from children's spontaneous writings of stories, personal notes, and compositions collected from a nationwide sample of 100,212 children from grades one through eight. The frequency tabulation was carried out on a total of 6,012,359 words. Taking into consideration developmental trends seen in the development of spelling skills, we prepared four lists of words. The four lists of the words can best be described as "regular", "exception", "unique", and "morphophonemic". There are 14 words in each category and words in the four lists were matched with each other closely for frequency.

**Regular words:** The pronunciation of these words is consistent with their spelling in the sense that the pronunciation of any given word conforms with that of more than two other words with similar spelling patterns. For example, pronunciation of the word cake is similar to bake, make, and rake and pronunciation of the word green is similar to reed and greet. Spelling of these words could be described as being dependent upon surfacelevel phonology.

**Exception words:** Criteria used for defining exception words are: (1) the pronunciation of these words should differ from the pronunciation of a majority of words with similar spelling patterns; (2) there should be at least two words with a similar spelling pattern but different pronunciation; and (3) phonetic spelling of the word should result in a spelling error.

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Examples of words included in this category are, "sew" and "prove".

**Unique words:** As the label indicates, "unique words" have a singular spelling pattern. No other word has either a spelling pattern or pronunciation similar to that of the unique word. It is, therefore, difficult to classify these words as "regular" or "exception" on the basis of their spelling-pronunciation relationship. The list of unique words include words such as, "picnic", "ghost", and "feud".

**Morphophonemic words:** The spelling of these words goes beyond the simple one-to-one relationship between spelling pattern and pronunciation. The spelling of these words is conditioned by certain phonological as well as morphemic features. Examples of spelling governed by morphemic constraints are words such as rehearsal and health in which the spelling of the root word hear and heal are preserved even though the pronunciation of the derived words is different from that of the root words. Consequently, lack of sensitivity to morphological principles as well as poor word knowledge can impede correct spelling of these words.

The validity coefficients determined by comparing the performance of children in the classroom tests with that of the proposed lists of words at grade levels 3, 4, 5, and 6 were 0.69, 0.72, 0.77, and 0.78 respectively, and the reliability coefficients for the same 4 grade levels were 0.95, 0.97, 0.97, and 0.98.

The practical implication is that the classroom spelling tests should include words from these four categories the child has come across in his/her textbooks.

## A new way of assessing spelling ability

As mentioned earlier, one of the drawbacks of the traditional way of measuring spelling in the classroom is that the test may include words with which children are not familiar with. Some irregular words may be misspelled because the child is not familiar with them; consequently, these misspellings cannot be considered genuine spelling errors. We examined the degree of the effect that word familiarity has on spelling by administering a spelling test and scoring the results in the traditional way (number of words spelled correctly) and by counting the number of words with which the child was familiar (by asking him/her to pronounce them) that were correctly

spelled. We found that five out of 39 children from Grade 3 classified as average spellers under the traditional method turned out to be above-average spellers under the revised method. This represents approximately 13% of the children being misclassified as "below-average" spellers. Similarly, three out of 40 children who were classified below-average spellers in grade 5 turned out to be average spellers under the revised format, which accounted for 8% of the children being misclassified in their spelling ability. Interestingly, no one classified as a normal speller under the

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traditional method turned out to be below-average in the revised format of scoring. Thus familiarity with words, indicated in terms of ability to pronounce them, plays an important role in children's ability to spell correctly (Joshi & Aaron, 2002).

## Qualitative analysis of spelling errors

As noted earlier, scoring the spelling performance as "right" or "wrong" may not give an accurate picture of children's spelling ability. For instance, a child who spells "cat" as KAT has a better knowledge of the letter-sound correspondence than a child who spells "cat" as 'TD' even though both spellings are incorrect. The first child can be expected to learn the correct spelling of the word with a little additional instruction, whereas the second child might need intense and prolonged instruction in learning to spell the word correctly.

Cognitive psychologists have devised different procedures to assess spelling qualitatively. One approach is to score the spelling on a scale of 0 to 6, with a 0 score given to random symbols with no alphabetic representation while a score of 6 is given to the correct spelling (Tangel & Blachman, 1995). The scores of 1 through 5 are assigned to spellings depending

upon the degree of their phonological and morphophonemic accuracy. Other techniques that are used in scoring misspelled words are: phonetically legal or illegal; or as 'dysphonetic' (e.g., gla for girl), 'dyseidetic' (e.g., bloo for blue), or 'mixed' (Boder, 1973) or through a detailed phonological analysis based on substitution of consonant phonemes, omission of consonants in blends, omission of unaccented (schwa) vowels or syllables, and omission or confusion of inflections such as "ed" and "s". (Moats, 1995; and Treiman, 1993).

## Case Studies

In the following section, some cases are presented to demonstrate qualitative analysis of spelling.

### Case 1. Justin

Justin was entering third grade at the time of testing. His listening comprehension as measured by Woodcock Language Proficiency Battery - Revised (WLPB-R, Woodcock, 1991) was within the normal range. His naming of pseudowords from WLPB-R as well as the words on the spelling test was rather slow and laborious which indicates that he has decoding problems. He could not read most of the words on the spelling test. Justin was administered the spelling test and a sample of his spelling errors are shown below.

cents	SES	cage	KAG
cellar	SALN	distance	DISOLES
young	YUG	valley	VIE
piece	PES	address	ADRS
chief	GEF	health	HELLS

As can be seen from his spelling patterns, Justin seems to be at the beginning of semiphonetic stage. He has decoding problems specifically with converting phonemes to graphemes. He has omitted or substituted vowels and vowel digraphs as in KAG for "cage" (omission of finale 'e'); YUG for young (omission of vowel digraph 'ou'). Justin is a poor speller and a poor reader. His spelling may be improved by drawing his attention to the sound sequence of letters in target words.

### Case II. Quentin

Quentin was also in third grade at the time of testing and his listening comprehension as measured by WLPB-R (Woodcock, 1991) was within the normal range. His naming of nonwords from WLPB-R as well

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as reading of the word lists was rather slow and laborious, particularly the exception, unique, and morphophonemic words. From the word list shown below, he could not correctly read aloud words such as "wool", "height", "moth", "yell" and "grown". This indicates that he has not developed good decoding skills. This was also reflected in his spelling. Below is a sample of his spelling errors.

jail	GLLE	yell	YELLE
tend	TEN	foot	FAT
beak	BELAK	grown	GROW
wool	WOLE	sew	SOWS
height	HITE	wound	WONE
moth	MOTHE	cough	COFE
tomb	TOWNE	bomb	BOME

An examination of his spelling errors indicates that Quentin's decoding skill is better than that of Justin's decoding skills. Even though Quentin may have the basic knowledge of the alphabetic principle, he still has difficulty with some of the words, especially the ones containing the vowel pair. Quentin could be helped with instruction in phonemic awareness and syllable patterns such as VCE, and vowel pair.

### Case III. Chris

Chris was a fourth grader with average listening comprehension score. He read regular words, exception words, and unique words correctly, but made errors in reading multisyllabic, morphophonemic words. His spelling pattern shows that he is at the advanced level of phonetic phase. His spelling errors were:

gender	GENGER	cellar	SLIER
tomb	TIEM	tour	TOOR
valley	VILEY	doubt	DET
thorough	TRO	feud	FOUND
separate	SIPET	grammar	GAMER
suggestible	SUEJUSTABE	negative	NEATEV
rehearsal	REHISE	conferred	CONFED

Chris lacks the knowledge of semantic properties of words. He could benefit from instruction in syllable division, structural analysis (prefixes and suffixes), and morphemic patterns (the root words in compound words).

### Case IV. Natasha

Natasha was a fourth grader and her performance in listening comprehension, naming of nonwords, as well as her reading of words on the spelling list were above average. Her spelling pattern shows that Natasha is at the advanced stage of

transitional spelling. Here are her spelling errors:

gender	CHENDER	cellar	SELLER
tomb	TUME	tour	TORE
valley	VALLY	doubt	DOUGHT
thorough	THURO	feud	FUDE
separate	SEPERATE	grammar	GRAMAR
suggestible	SUGGESTABLE	negative	NEGATIVE
rehearsal	REHURCLE	conferred	CONFURED

Natasha could be helped by drawing her attention to word origins and by stressing the semantic properties of spelling such as "separate", is derived from 'apart', hence spelled with 'a' and not 'e' after p; "negative" from 'negation'; and "rehearsal" from 'hear'.

These four cases illustrate that perhaps children's acquisition of spelling skills could be viewed more as a continuum rather than developing as distinct stages. The implications for classroom teachers are: (a.) spelling errors can be scored on a continuous scale of 1 through 6 rather than right or wrong (0 or 1); and (b.) based on the nature of the spelling errors, classroom teachers can use different techniques in teaching spelling through activities that stress phonological awareness, structural analysis, etymology, and morphology. For detailed information on sequential instruction on spelling, see Bear, Invernizzi, Templeton, & Johnston, 2005; Carreker, 2005; Henry, 1999, 2003, and Moats, 2000.

### The role of dialect in spelling

In the U.S., many dialects are spoken but the variety spoken by some African American individuals is the one well known. This dialect is also known as Black English, African-American Vernacular English, Ebonics, or simply as African-American English. It has to be remembered that African-American English dialect also shows variation from one area of the country to another. Furthermore, many African American children and young people can switch from African-American English to Standard English and vice versa, as the situation demands.

Studies that assessed the speech responses of young African-American Head Start children show that the African-American children were not delayed in language acquisition but that these children have learned the linguistic structures of the non-standard dialectal form of African-American English. These and similar studies show that even though expressions seen in African-American English may differ from

those seen in Standard English, they are not random productions but follow a consistent pattern. The syntax and phonology of African-American English, therefore, is structured and rule-governed as much as Standard English. For this reason, African-American English is considered by many linguists as a legitimate linguistic system. African-American English, even though different from Standard English, is not a deficient linguistic system.

Several patterns of speech common in African-American English are listed below with accompanying examples.

- 1). Phonological variations. Examples: "the disappearing /r/" (guard → god; sore → saw; court → caught; Paris → pass) "the disappearing /l/" (toll → toe; tool → too; fault → fough) "consonant cluster reduction" (past → pass; meant → men; mend → men; hold → hole)
- 2). Morphological variations  
Omission of suffixes. Example: This is my friend's books \* > (This be my friend book)
- 3). Syntactical variations  
Use of undifferentiated pronouns.  
Example: He kicked the ball. \* > (Him kicked the ball).  
Omission of verb forms of "be" in certain sentence patterns.  
Examples: He is old \* > (He old); They are running \* > (Dey runnin);

### What are the implications for instruction?

Teachers can readily understand the difficulties experienced by many ESL (English as a second language) children in learning to read, but may be baffled by the difficulties encountered by a child who speaks African-American English. However, the African-American English speaker has difficulties of his own. While the boundaries of a foreign language (e.g., Spanish) and English are usually clear cut, the many similarities between African-American English dialect and Standard English make it difficult to tell exactly where one leaves off and the other begins, making it difficult for the child to know what is acceptable and what is not acceptable.

Our speech and written language patterns are the templates which function as perceptual filters so that we perceive what fits our templates and fail to notice what is different. For instance, many African-American English-speaking child-

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ren may not notice the "ed" as a past tense signal because it is not in their spoken language. It will, therefore, be helpful for the teacher or the parent to draw the attention of the child to phonological and grammatical differences between Standard English and African-American English. In addition, special attention to spelling can make children sensitive to phonemes they tend to omit.

When this notion is applied to spelling, it is obvious that dialect can have an influence on spelling. In one study, it was found that American children from Oklahoma commit spelling errors that reflect the nature of the local dialect. Children from India who learn English as a second language do not commit spelling mistakes similar to the ones committed by the children from Oklahoma, but commit errors that reflect the articulatory features of their own native language (for more details, see Joshi & Aaron, 2005). The spelling errors committed on a spelling test (e.g., the Friday test), by an African American child may be due to dialectal differences rather than due to a weakness in spelling skill. Teachers of minority children can be sensitive to the influence of dialect on spelling and draw the attention of the child as to the reason and origins of such spelling errors.

## Conclusions

Compared to reading, spelling assessment and instruction have been neglected areas of study even though Noah Webster, as early as 1807, said that spelling is the foundation of reading and the greatest ornament of writing. The study conducted by us showed that the validity of spelling tests could be improved by administering only those words that the child could read aloud correctly. It was also noted in this paper that qualitative analysis of misspellings could provide guidance for spelling instruction. Further, the role of dialect in spelling is briefly discussed.

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