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Phonetically Justified Spelling Strategies of Good and Poor Readers in the Third Grade

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This study describes an investigation of the spelling strategies of good and poor readers in the third grade. Thirty students defined as good or poor readers based on standardized reading achievement scores were presented with a 24 item synthetic word spelling test with sound segment slots filled with high and mid front vowels.

INTRODUCTION

Purpose

This study was designed to investigate the spelling strategies used by elementary school age children. Its specific purpose was to assess the extent to which third grade children employ phonetically based spelling strategies in representing synthetic words whose vowels are tense e̲ [i] as in beat and a̲ [e] as in bait and lax i̲ [I] as in bit and e̲ [ɛ] as in bet.

Background

The non-alphabetic nature of the English spelling system has been extensively researched and debated for some time [4; 5; 6]. Spelling reformers such as Shaw [cited in 8] have stated that there are too many irregular spellings in the writing system to assume that lexical items are spelled according to the way they sound.

Chomsky and Halle [3] in contrast, suggested that English spelling is nearly perfect for representing the sounds of oral language. After an extensive examination of English orthography, they concluded that two levels of structure exist for all words. The deep structure consists of an abstract lexical representation of sound while the surface structure represents its phonetic manifestation. The two structures are related by an abstract set of phonological rules that are not evident within the surface appearance of words but are implicitly known by all native speakers of the language.

Chomsky [2] has theorized that native speakers tacitly use these rules as a means of acquiring proficient reading and spelling skills. Research by Read [9; 10] tended to support the reality of these rules. He analyzed the invented spellings of pre-school children who had never received instruction in writing or reading. In words such as *TABLE* and *FEEL,* the children consistently represented the tense (long) vowels with their letter name as in *TABIL* and *FEL* because the letter-sound matches were so evident to them. The children had more difficulty with the lax (short) vowels however, because the letter sound correspondences weren't as obvious. Consequently, lax i̲ [I] was represented as i̲ 65% of the time while lax e̲ [ɛ] was represented as e̲ less than 37% of the time. The most frequent misspellings for lax i̲ and e̲ were e̲ (23%) and a̲ (49.7%) respectively. Read noted that spellings such as *FES* for *FISH* and *LAFT* for *LEFT* weren't coincidental but were the result of linguistic judgments the children intuitively made. In associating lax i̲ [I] with tense e̲ [I] and lax e̲ [ɛ] with tense a̲ [e] the children had tacitly categorized the vowels that were nearly similar in sound and production features. In point of fact, tense e̲ [i] is formed with the tongue in nearly the same position as lax i̲ [I] while tense a̲ [e] is usually made with the tongue beginning a little higher than lax e̲ [ɛ] and gliding forward and upwards toward the [I] of bit. By representing the unknown lax vowel sounds with the letter representation of their tense counterparts, the children demonstrated their perceptions of the phonetic relationships between sound and letter.

Read [10] and others [e.g., 1] also found that first graders, even while learning to read and write, used similar strategies to spell unknown words. This suggested to him that young children, at least through the first grade, devise a two-part strategy for spelling the vowel sounds: Use a letter to spell a vowel if the sound of the vowel corresponds to the name of the letter; otherwise find a letter name that is phonetically close to the sound of the vowel.

It appears then that young children systematically utilize phonetic relationships as their most basic source of spelling information. Although this strategy is ingenious, children need to switch to conventional letter-sound associations if they are to learn to spell correctly. As it turns out, some children make this shift quite easily while others have more difficulty. Research has shown during the past decade that children who begin to read and acquire more experience looking at printed words discover the standard spelling patterns on which standard

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TABLE 1

Distribution of Subjects by Sex and Reading Level

	Reading Grade Equivalent					
	Male			Female		
	N	Mean	*SD*	*N*	Mean	*SD*
Above	7	4.7	.1871	8	3.7	.5437
Below	11	2.4	.0650	7	2.4	.1286

English writing is based. These standard patterns begin to show up in short vowels, silent letters and consonant digraphs.

Conventional practice with reading and writing and also instruction that emphasizes spelling patterns helps them establish control over these generalizations. Children are also involved in memorizing hundreds of spellings that are extended to the spelling of unknown words. Thus, by the end of the primary grades children tend to go well beyond phonetic spelling strategies because they have discovered what words ought to look like.

Correct spelling, of course, varies with the difficulty of the word. Although it has not been fully established, it is believed that older good readers (third grade and above) revert to phonetic strategies when they are faced with a difficult word. It is not generally known whether older poor readers, who are also poor spellers, try to spell words the way they sound or whether they adapt alternative schemes. With all the emphasis given to phonics instruction in remedial programs, it is possible that some older poor readers rely on the strategy choosing letters that most closely resemble the sounds they want to represent. Others, however, may lose confidence in the alphabetic principle. Eventually they may stop trying to represent phonemes with letters and thus revert to omissions. Or, they may never discover the rules that govern spelling and so may never go beyond putting down random letters to spell words. Exploring the relationship between spelling strategies and reading ability in older students should lead to a better understanding of the logic of older, poor reader's spelling strategies.

In light of prior research, two hypotheses were evaluated:

1. Subjects will correctly represent tense mid and high vowels significantly more often than the lax counterparts since the tense vowel match-ups are more evident than the lax representations.

2. Subjects will represent lax i as e and lax e as a in unknown words significantly more times than any other representation on the assumption that children will systematically utilize phonetic relationships as their most basic source of spelling information, regardless of formal instruction in reading and spelling.

TABLE 2

Test Form of Synthetic Words

	[I] i	[i] ē	[ɛ] e	[e] ā
Voiceless/voiceless	piply	theet	skek	tātrim
Voiced/voiceless	bist	geiflem	zeff	jaistrim
Nasal/voiceless	nippit	kneech	metfiss	smake
Voiced/voiced	dib	veegen	jeg	thage
Voiceless/voiced	fith	cheve	eblen	sabe
Nasal/voiced	snid	meebech	amev	nāzep

PROCECURES

Sample Description

The study was conducted in a rural community in Wisconsin. A sample was drawn to fill the cells of a 2 × 2 sex by reading level matrix. Grade level was held constant; age and intelligence were not. Subjects were chosen from a pool of all third grade children attending a single elementary school. Fifty subjects with standardized reading scores ranging between 1.9 and 4.1 were randomly selected and invited to participate in the study. Permission was obtained from thirty-three parents. A summary of the sampling matrix is presented on Table 1.

Content Validity of the Test Instrument

Thirty subjects were assigned to one of two groups defined as good or poor readers based on standardized reading achievement scores. Subjects were presented with a 24 item synthetic word spelling test constructed to accommodate sound segment and supra-segmental features. The sound segment slots were filled by high and mid front vowels phonetically represented as [i] + [I] and [e] +

TABLE 3

Results of Analysis of Variance of Lax and Tense Vowels and Phonetically Justified Misspellings

Source of Variation	*df*	*MS*	*F*
Mean Differences Between Tense and Lax Vowels			
Correct Long Vowels	1	3.33	21.25**
Sex	1	.31	2.02
Reading Ability	1	.70	4.50*
Sex by Reading Ability	1	.16	1.07*
Error	29	.15	
Mean Differences Between Justified and Non-Justified Misspellings			
Misspellings	1	15.16	14.04*
Sex	1	1.60	1.49
Reading Ability	1	.00	.00
Sex by Reading Ability	1	1.25	1.16

**P = <.01
*O = <.05

[ɛ]. The environment surrounding each of the four vowel values was controlled by syllable stress and length of neighboring consonant patterns. Each of the vowels was tested in six different stressed segments followed by equal numbers of voiced and voiceless consonants.

The instrument was divided into thirteen single syllable and eleven two syllable words. None of the double syllable words consisted of unstressed syllables followed by nasal or voiceless consonants. Phonograms per syllable averaged three; consonant/vowel patterns varied between CVCC and CVC patterns for the lax values and CVCV and CV patterns for the tense ones. The order of the words was randomly assigned before administration of the test. A synthetic representation of the test instrument is found in Table 2.

RESULTS

The data were analyzed by a univariate analysis of variance with repeated measures design (see Table 3).

The differences between the mean number of correctly represented tense (5.38) vowels and lax vowels (4.27) was significant at the .01 level ($F=21.25$, df 1/29, $p<.0001$). S's reading level in relation to vowel representation was also significant at the .05 level ($F=4.50$, df 1/29, $p<.043$). Poor readers (7.26) had more difficulty than good readers (9.78) representing the lax vowels. There were no sex or interaction effects.

Predictions regarding the significant differences across lax vowel representations were upheld with the phonetic based misspellings the most frequent. The main effect was significant at the .01 level ($F=19.04$, df 1/29, $p<.0008$); no significance was attributed to sex, reading achievement level or interaction factors.

DISCUSSION AND IMPLICATIONS FOR PRACTICE

Good Readers

Older children in this study, across reading abilities, had one thing in common: they chose to hypothesize about vowel spellings in unfamiliar words on the basis of phonetic relationships. This finding is consistent with the invented spelling strategies of younger children reported elsewhere [e.g., 7] and substantiates the claim that letter-sound strategies, not alternative schemes such as wild guessing or omitting, continue to be a basic source of spelling information for children at least through the third grade. As Reid [Note 1] has said elsewhere, misspellings are generally rule-governed and derive from judgments about language and are not as random as they might appear.

Even normally correct spellers in this study made errors (reflecting attention to articulatory features) when they were faced with difficult words. It seems apparent that as spelling growth advances developmentally, children continue to attend closely to articulatory features as well as conventional patterns. Knowing this, it would appear to be a mistake for teachers to merely point out that these misspellings are wrong or to penalize such misspellings; instead it might be more productive to accept justified misspellings while sensitizing children to conventional letter-sound patterns and helping them remain curious about written language and enthusiastic to master the complicated matter of correct spelling.

Poor Readers

Instructional strategies for the poor readers/poor spellers should also be based on where they are in a developmental sequence. In this study, their difficulties with lax vowels serve as an indicator that they are less aware of the patterns of written language than the good readers/good spellers. Although the children in this group had begun to read they may not have developed a keen sense of the structure of words and thus were unable to form spelling generalizations. Part of the reason for their inability to spell lax vowels in words they did not know may be because they lacked exposure to written materials. Hence it would not be productive to have them memorize hundreds of spellings for words they cannot read or memorize dozens of phonic rules they cannot contend with. For now, it would be enough for teachers to help them spell the words they know how to read. As they acquire more experience with print they will be able to form generalizations to use with words they don't know. Thus, the instruction would proceed inductively, with teachers helping them analyze the words they want to spell while inducing them to read and write as best they can.

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