SWRL EDUCATIONAL RESEARCH AND DEVELOPMENT

Spelling English As A Second Language

31 October 1975 Professional Paper 33

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ABSTRACT

The English spelling system and the teaching of English spelling are discussed in relation to students who are learning English as a second (or foreign) language. The systematic nature of English spelling is described and a brief summary is presented of sound-to-spelling correspondences and of other spelling rules. Specific difficulties which may cause problems for the learner of English are discussed, and teaching strategies are suggested; some sample spelling lessons are appended to the paper.

Contents

SPELLING ENGLISH AS A SECOND LANGUAGE*

Bruce Cronnell

Among the four skills that are the goals of ESL instruction--listening, speaking, reading, writing--writing is commonly last: last to be taught in the sequence of skills, and last to receive much emphasis.[1] Writing includes several sub-skills, one of which is spelling. Spelling is important for at least two reasons. First, a writer may not communicate well if he cannot spell; that is, a reader must be able to interpret marks on the page as meaningful words and he cannot do this easily when words are misspelled. Secondly, contemporary American society (and probably other educated English-speaking societies) considers misspelling a serious social error, marking a person as, at best, "illiterate," if not outright "ignorant." While a wide variation in speech is acceptable, variation in spelling is completely forbidden.[2]

ENGLISH SPELLING: ORDER OR CHAOS?

A common attitude, prevalent for several hundred years, is that English spelling is a chaotic mess and that it is a miracle anyone has learned to spell correctly. The claim is that English is "not phonetic;" that is, English words cannot be spelled on the basis of their pronunciation as can, for example, words in Spanish or Turkish. It is true that not all English words can be spelled on the basis of sound. The spellings of a few words cannot be (synchronically) related to speech at all, e.g., _of_, _who_. In a number of other words, certain parts cannot be related to speech, e.g., the _a_ in _was_, the _o_ in _to_ and _do_, the _oi_ in _choir_. However, words with such idiosyncratic spellings account for probably fewer than 10% of English words; thus many words can be spelled on the basis of sounds and of other principles of English orthography.

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*This paper will appear as a chapter in Celce-Murcia, M., and McIntosh, L. (eds.), _An introduction to the teaching of English as a second or foreign language_.

[1]Additional sub-skills of writing might be letter formation, punctuation and other mechanics, fluency, organization, style. These are not the domain of the present paper, which is about spelling: The process of moving from spoken words to written words.

[2]This was not always true; the development of printing seems to have given rise to standardization of spelling. Vallins (1965) provides an interesting description of past spelling practice.

Much recent linguistic research supports the view that English spelling is a rule-governed system based on speech. Hanna, Hanna, Hodges, and Rudorf (1966) analyzed the sound-to-spelling relations in over 17,000 words; while flawed (cf. Reed, 1967; Roberts, 1967), their work and its extension by Bergquist (1966) has formed the basis of contemporary views concerning the regularity of English spelling. Some major studies of spelling-to-sound relations (Venezky, 1967, 1970; Berdiansky, Cronnell, and Koehler, 1969; Cronnell, 1971a) further support this conclusion; while these studies concerned letter-sound relations for reading and while such relations are not completely applicable to spelling (Cronnell, 1971c), they provide additional, albeit indirect, evidence for the regularity of English spelling. A linguistic study of English phonology (Chomsky & Halle, 1968) has been interpreted as further evidence for the regularity of English sound-spelling relations (Brengelman, 1970b; Chomsky, 1970; Schane, 1970).

However, English spelling is not a simple, straightforward system (cf. Vachek, 1945-49, 1959; Venezky, 1969); rather there are at least four subsystems to consider:

1. In one-syllable, one-morpheme words, sound-to-spelling correspondences can be used, e.g., /sæt/ is spelled sat: /s/-s, /æ/-a, /t/-t. Some of these correspondences are predictable in a one-to-one fashion; e.g., /æ/ is spelled a except in a very few words. Others are predictable, but application depends on recognition of word environment, e.g., the spellings of /k/ (see Appendix A). Other sounds may have two or more common spellings, but which to use in a particular word cannot be determined from sound alone, e.g., /ey/ spelled a...e or ai (date, wait). These unpredictable spellings often produce homophones, words pronounced the same but spelled differently, e.g., made, maid. However, knowledge of the possible alternate spellings for the same sound can be used to limit the search for the correct spelling of words in a dictionary.

2. In one-morpheme words consisting of more than one syllable, the spelling of the stressed syllable can generally be determined as in one-syllable words. However, the spelling of the unstressed vowel is often unpredictable, but finding the correct spelling in a dictionary is generally not too difficult since there are only five options (a, e, i, o, u).

3. In polymorphemic words, the spellings are generally predictable (although sometimes complex) if each morpheme is spelled independently and then appropriate morpheme-combining rules are used.

4. Finally, there are the words with unpredictable spellings--the irregular words which have to be memorized. As noted above, they represent probably less than 10% of English words. While many of them are high-frequency words, their frequency--and thus familiarity--may make them less difficult to learn.

This outline suggests that English spelling is not a simple system; however, it is a system, and one that can be learned.

WHAT ARE THE RULES OF ENGLISH SPELLING?

One reason why English spelling is difficult to learn and to teach is that few people know explicitly what the rules are: what is regular and what is irregular, what is predictable and what is not. At present, descriptions of English spelling rarely take into account all the subsystems noted above. Russell (1975) is perhaps the best such description and provides the basis for Appendix A, which attempts to provide an overview--albeit simplified and condensed--which may help teachers and students to utilize the system more fully. While not all the details of English spelling are given and while irregularities are not noted, the summary in Appendix A can serve as a starting point for investigations into an understanding of English sound-to-spelling correspondences.

HOW CAN SPELLING BE DIFFICULT FOR ESL STUDENTS?

The description of English spelling in Appendix A is based on the phonological and morphological systems of standard English (the educated form of speech described, for example, in Prator & Robinett, 1972). Thus the use of these spelling rules should hold for speakers of standard English. Speakers of other dialects (even those standard dialects differing from the one used in this chapter) may have problems in spelling. Boiarsky (1969) found that the dialect of rural West Virginia tenth graders affected their spelling performance as opposed to that of comparable Philadelphians. Graham and Rudorf (1970) detected spelling differences related to dialect among sixth graders from Ohio, Massachusetts, and Georgia. Sullivan (1971) compared speech and spelling of Black and White second graders in Texas and found differences which could be attributed to dialect. In California, Kligman and Cronnell (1974) also studied Black and White second graders; they tested the spelling of features known to occur commonly in Black English but infrequently in standard English and concluded that dialect affected spelling performance.

Thus there is ample research evidence that differences in pronunciation can produce spelling errors related to these pronunciations. While the speech of ESL students is not generally considered a dialect of English, most ESL students do not speak standard English. Therefore,

we might expect their speech forms to affect their spelling. While /r/ and /l/ can be easily spelled in standard English, their spelling could be a problem for speakers who do not differentiate between these sounds. Students who do not differentiate between /ɪ/ and /iy/ could have problems spelling these sounds--in addition to the problems which may already exist because of the complexities of the spellings for /iy/. The ESL student's pronunciation may result in more homophonous spellings, i.e., more cases of multiple spellings for one sound (Cronnell, 1972). Since English already has many homophonous spellings, this is not a different but a more prevalent spelling problem for ESL students than for native speakers. However, variant pronunciations may not always result in misspellings. For example, Kligman and Cronnell (1974) found that Black English speakers often used /f/ in speech where standard English has final /θ/, but rarely misspelled th. Thus predictions of spelling difficulty based on speech need verification in actual spelling performance.

On the other hand, the spelling and combining of affixes and bases may be an especial problem for the ESL student. While the native speaker generally can use the morphology of English, the learner may not have this ability. Chomsky and Halle (1968), in discussing morphologically-based phonology, contend that "Orthography is a system designed for readers who know the language, who understand sentences and therefore know the surface structure of sentences." This assertion can reasonably be extended to the role of orthography for spellers. Kligman and Cronnell (1974) found that Black English speakers had their greatest difficulty in spelling inflectional suffixes, which are realized differently in Black English than in standard English. For example, the past tense marker -ed, which has three phonological variations in standard English (i.e., /d, t, ɪd/), is frequently realized with a zero morpheme in Black English (i.e., no phonological ending added) with the result that the child speaking standard English will tend to write "I walked to school yesterday" while the child speaking Black English will tend to write "I walk to school yesterday." Similarly ESL students who have incomplete command of English morphology and syntax might be expected to have particular difficulty in spelling words of more than one morpheme.

ESL students who can write their native language may have spelling problems because of this literacy.[3] If the native language uses a non-alphabetic writing system, then students must learn the notion that symbols (letters) represent sounds rather than syllables (as in Japanese) or words (as in Chinese). If the native language uses an alphabetic writing system, but not the Roman alphabet (such languages as Arabic, Hindi), a new alphabet must be learned, although the notion of sound-spelling relations would not be new. If the native language uses an

[3] Illiterate learners who must learn how to write may have needs closer to those of young, English-speaking children.

alphabet related to the Roman alphabet (such as Greek and Cyrillic), a number of new letters must be learned; in addition, some native-language sound-to-spelling correspondences must be unlearned; for example, in Greek P represents /r/ and in Russian H represents /n/.

While literate ESL students from all these orthographic backgrounds may have difficulties, there is some suggestion that the greatest spelling problems may exist for students whose native languages use the Roman alphabet. Oller and Ziahosseiny (1970) found that, at the college level, such students made significantly more spelling errors in English than students whose native languages do not use the Roman alphabet. The sources of this problem are often clear; for example, in German /y/ is spelled j (English: y); in Spanish /ay/ is spelled ay (never in English). Literate language learners, when writing a familiar alphabet, may continue using highly-learned native-language sound-to-spelling correspondences even when writing English. On the other hand, students who must learn a new alphabet or writing system for English may be much more aware of how English spelling differs from their native orthography.

There is little empirical evidence concerning the effects of native language on spelling in English. Two studies of the spelling performance of Hebrew speakers have turned up conflicting results. Bassan (1973) found that the misspellings of third graders could be more easily accounted for by analysis of the English spelling system than by interference from Hebrew, thus suggesting that native language is not a problem. Michelson (1974) found that the vowel misspellings of college students reflected the pronunciation of Hebrew speakers. Additional controlled studies are needed with speakers from a variety of language backgrounds and at different ages and language levels to determine more fully the effects of native language on spelling in English.

HOW SHOULD SPELLING BE TAUGHT?

As in all areas of language learning, there are no simple solutions to questions of how to teach; this section can only make some suggestions and provide some guidelines. We can begin with ten general features which can be valuable for students to learn.

1. English spelling is systematic.

2. Which spellings are predictable (e.g., /æ/ - a).

3. Which spellings are not predictable, but are common (e.g., /i y/ - ea, ee, e, ei, ie).

4. How frequent unpredictable spellings are (e.g., in one syllable words, /i y/ is most frequently spelled ea or ee).

5. How to use a dictionary to find the spelling of words with unpredictable spellings. Since, as noted above, ESL students may have more homophonous spellings than native speakers, this is probably a crucial skill.

6. How to spell useful but irregularly spelled words.

7. What bases and affixes are, and how to spell them individually.

8. How to combine bases and affixes.

9. How to use certain word-internal punctuation (e.g., apostrophes in contractions and possessives, capitalization of names, periods in abbreviations, hyphens in compounds[4]).

10. What is possible and what is impossible in English spelling (e.g., words do not end in vowel-cke, rather in vowel-ck, vowel-ke, or vowel-k).

Once students know all of the above, they should be well on their way to good spelling.

The approach to teaching depends on the learner's background (see Appendix B for some sample spelling lessons). For the illiterate learner, instruction might be similar to that used for English-speaking children (see Hanna, Hodges, and Hanna, 1971, for a detailed description of a graded organization for spelling instruction). For children learning English, a regular elementary school spelling series may be appropriate; however, a series should be selected which adequately reflects the nature of English spelling (Cronnell, 1971b).

For the literate beginning learner, many particular features of English will need to be mastered. However, the teacher may be able to take advantage of the student's native-language knowledge of the nature of spelling, particularly when the student can write a European language. For example, the German speaker who can spell Hand in German should have little difficulty spelling hand in English; the French speaker who can spell air and nation in French should be able to spell air and nation in English. Often the relations between spellings in two languages are less direct, but could be used in spelling instruction. For example, the Spanish speaker who can spell accidente and rapido in Spanish would need only learn not to include the final vowel when spelling accident and rapid in English. Being able to spell proporcion in Spanish would require learning only one letter to spell proportion in English.

[4]Other uses of punctuation operate at the phrase or sentence level and are thus not properly dealt with as part of spelling.

Most literate ESL students do not need instruction in the complete range of the English spelling system. For them, diagnostic testing may be most useful. One approach used effectively with English-speaking students beyond the early grades is the test-study method (Gates, 1931): a preliminary spelling test is given and those words misspelled are specifically studied. However, rather than simply testing and studying random lists of words, a better approach is testing words that illustrate various spellings. Then students performing poorly on specific spellings could receive instruction and practice on their problems. For advanced students (with specific or general spelling difficulties) a programmed text may provide more individualized learning without creating a heavy burden on the teacher (e.g., Ryan, 1973; Smith, 1966).

All students who have a basic knowledge of English spelling should learn to use a dictionary (1) to find the spellings of words in which there are sounds with two or more possible spellings and (2) to check words when they are unsure of the spellings. Literate students may be familiar with dictionary use from their native language, but they may need instruction in using an English dictionary to locate spellings of unknown words. Students without experience in dictionary use will need instruction; many dictionaries designed for elementary school children have extensive sections on how to use a dictionary, which may be helpful for ESL students.

Teaching spelling is not the same as teaching composition. When the emphasis is on getting the students to write, too much concern with the spelling of individual words may inhibit students' fluency and expression of ideas. Rather, spelling instruction may best be viewed as a separate "subject," in which individual words and rules are focused on. Correct spelling in composition should probably be a concern when editing written work; then students can carefully check their spelling. Since editing may not be an obvious process for students, practice might be of value, for instance, proofreading (and correcting) sentences with spelling errors.

CONCLUSION

ESL students' specific spelling needs depend on their language and educational background. However, all students should understand that English spelling is a system, and they should be able to apply the rules of this system. One of their most valuable spelling tools is the dictionary. Since teachers cannot always depend on reliable published resources for teaching spelling, they may need to become "experts" in English spelling in order to provide systematic and accurate instruction.

While this chapter has focused on spelling, spelling is only part of writing. Perfect spelling without ideas, knowledge, organization, and clarity is of little value; with these and other features of good writing, correct spelling is the finishing touch on all written communication.

APPENDIX A

A Brief Summary of English Spelling[1]

Vowel categories

There are two main categories of English vowels:

Category A	Category B
/ey/	/æ/
/iy/	/ɛ/
/ay/	/ɪ/
/ow/	/a/
/uw/ or /vuw/	/ə/ (stressed)
/ɔy/	
/aw/	
	/ɔ/
	/u/

The first five sounds in each category are frequently paired in English spelling because they use the same letters, e.g., /ey/ - /æ/, lady - lad. The sound /ɔ/ does not occur in many English dialects and is merged with /a/.

There are many labels in use for these two categories:

Category A	Category B	Source
diphthong	simple	Prator & Robinett, 19
glided (ends with a glide; i.e., is a diphthong)	unglided (does not end with a glide; i.e., is a diphthong)	
tense (muscle tenseness in articulation)	lax (lack of muscle tenseness in articulation)	Chomsky & Halle, 1968
free (can end a word; includes /ɔ/)	checked (cannot end a word)	Kurath, 1967

[1] This description is based to a large extent on Russell (1975). The pronunciation is that described in Prator and Robinett (1972).

name (the names of the vowel letters)	basic (most common pronunciation of the five vowel letters)	Allen, Allen, & Shute, 1966
long (does not mean length)	short (does not mean shortness)	traditional; Prator & Robinett, 1972

All of these sets of labels have problems. The first four are rather technical and may not be very meaningful to students without some background in phonology. The last two actually cover only the first five sounds in each category. Choice of a category label depends on at least three factors: (1) students' backgrounds (those familiar with linguistics should be able to handle the first four); (2) students' future needs (children in American schools will likely find "long" and "short" used in many texts); (3) the textbook being used.

In this chapter, "simple vowels" and "diphthongs" will be used, although not without recognition of the value of other terminology.

Vowel spellings in single morphemes

1. Simple vowels (generally spelled with one letter)

   /æ/ - a: pass

   /ɛ/ - e, less frequently ea: bed, head

   /ɪ/ - i: slip (infrequent, y*: myth)

   /ɑ/ - o: pot

   /ə/ - u, less frequently o or o...e (generally before /m, n, ŋ, or ð/) and ou: but, son, come, young

*This is a foreign spelling; the words it occurs in are frequently marked semantically as technical, academic, or luxurious.

/ɔ/ - o, a before /l/, au, aw finally: long, ball, sauce, saw
(infrequent: augh, ough: caught, thought)

/ʊ/ - oo (particularly before /d/ or /k/) or u (particularly after a labial): look, pull

2. Diphthongs (commonly spelled with two letters[2]; spellings are listed approximately in order of descending frequency)

/ey/ - a...e or ai, ay finally, a in polysyllabic words:
date, rain, day, table
(infrequent: ei, and eigh, ey, et* finally:
veil, weigh, they, ballet)

/iy/ - ea or ee, y finally in polysyllabic words: heat, tree, silly
(infrequent: e...e, ie, ei, i...e*, e, i*, and e, ey finally:
scene, thief, deceive, machine, meter, museum, stadium,
he, valley)

/ay/ - i...e, i before consonant clusters and in polysyllabic words, y finally, less frequently igh finally or before t:
mine, mind, tiger, cry, light
(infrequent: y...e*, y*, and ie, ye finally:
type, cycle, pie, dye)

/ow/ - o...e or oa, o before consonant clusters and in polysyllabic words, ow finally: hope, boat, most, open, yellow
(infrequent: ou*, and o, oe finally: mould, go, hoe)

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[2]The two letters are commonly the letter with the name corresponding to the vowel sound, plus e at the end of the morpheme. (Note that "final silent e" is usually part of a vowel spelling or a consonant spelling.) When the two vowels in the spelling are contiguous, the second is often y, i, w, or u: y or w, when morpheme final, before a vowel, or before final l or n; i or u elsewhere.

*These are foreign spellings; the words they occur in are frequently marked semantically as technical, academic, or luxurious.

/uw/ or /yuw/ - oo (for /uw/ only), u...e, u in polysyllabic words:

boot, cute, super

(infrequent: ui*, eu, ou*, and ew, ue finally:

fruit, feud, group, new, blue)

/oy/ - oi, oy finally: boil, boy

/aw/ - ou, ow finally: found, allow

3. Vowels plus /r/

Vowel-r combinations are sometimes spelled by applying the appropriate vowel correspondences before /r/ - r, e.g., hire (cf. hike), our (cf. out). For some simple vowels, the spelling before /r/ corresponds to a diphthong spelling:

/ɛər/ - cf. /ey/: stare, air. (In many dialects /ey/, /ɛ/, and /æ/ have merged before /r/, so the spelling for each of these vowels is found: vary, berry, marry.)

/ɪər/ - cf. /iy/: deer, fear

/ɔr/ - cf. /ow/: more, board, torn. (After /w/, /ɔr/ is spelled ar: warm, quart.)

/ʊr/ - cf. /(y)uw/: pure, poor

Two vowel-r spellings are not related to other spellings:

/ar/ - ar: star

/ər/ - er, ur, ir, or after w: her, hurt, bird, word (infrequent: ear: earn).

*These are foreign spellings; the words they occur in are frequently marked semantically as technical, academic, or luxurious.

4. The unstressed vowel /ə/ (or /ɪ/ or /ɨ/) may be spelled with any single vowel letter: lapel, wallet, April, gallop, circus. Initial /ə/ (when not part of a prefix) and final /ə/ are generally spelled a: about, comma. Syllabic consonants are best treated for spelling purposes as a vowel plus the consonant (e.g., button, metal); for syllabic /l/, the spelling le is most common, but el and al are also found: battle, shovel, oval. Unstressed /ər/ is most commonly spelled er, but is sometimes spelled with other vowel letters: butter, collar, doctor, sulphur.

Consonant spellings in single morphemes

1. Consonant sounds with one primary spelling (in addition to the doubling described in 3)

The sounds /p, t, b, d, g, f, v, m, n, l, r, w, y, h/ are spelled with the corresponding letters: p, t, b, d, g, f, v, m, n, l, r, w, y, h.

Several consonant sounds are spelled with digraphs (two-letter spellings):

/θ/ and /ð/ - th: thigh, thy, with

/š/ - sh: shoot, bush

/hw/ - wh: when (for speakers who do not use /hw/, there are two spellings of /w/: w and wh.)

/tš/ - ch: chin

The final cluster /ks/ is spelled x: box, six.

2. Consonant sounds with variant spellings (in addition to the doubling described in 3)

/k/ - c before a, o, u or a consonant:

cat, cold, cute, cream, act

k before e, i or y: keep, kiss, sky

k at the end of a word after a diphthong:

seek, strike, make

k at the end of a word after a consonant:

milk, bark, honk

/kw/ - is always spelled qu

/s/ - s at the beginning of a word:

see, sit, sat, said

c(e) or s(e) at the end of a word:

ice, dance, base, else

/z/ - z at the beginning of a word: zone, zero

s before or after a consonant: wisdom, pansy

s(e) or z(e) at the end of a word:

wise, please, haze, breeze

/dž/ - j at the beginning of a word: jewel, jam

g (sometimes) if followed by e, i, y:

gem, giant, gym

g(e) at the end of a word: huge, large

/ŋ/ - ng at the end of a word: ring

n elsewhere: thank

3. Doubled consonants

Note: Consonants are not doubled after diphthongs, nor after two-letter vowel spellings.

(a) Consonants (except v and x) are doubled when following a single letter spelling of a simple vowel and preceding another vowel or a syllabic consonant:

happy, follow, merry, paddle, bottom, butter

The doubled forms of c (or k), ch, and j are ck, tch, and dg, respectively:

pickle, hatchet, midget

Note: This rule has numerous exceptions, e.g., copy, wagon.

(b) /k, f, s, z, č, ǰ, l/ occurring at the end of a morpheme following a single letter spelling of a simple vowel are spelled with a doubled consonant:

lick, puff, mess, buzz, match, edge (dge is the doubled form finally), tall.

4. Some foreign consonant spellings (cf. Brengelman, 1971):

/k/ - ch: chlorine, chorus

/f/ - ph: phone, graph

/š/ - ch: chef, chauffeur

Words with foreign spellings are often semantically marked as unusual - e.g., technical, academic, musical, connotating luxury.

5. Some infrequent consonant spellings:

/g/ - gu(e):	guest, league	/m/ - mb:	limb
/s/ - sc:	scene	/m/ - mn:	autumn
/s/ - st:	castle	/n/ - kn:	knee, know
/ž/ - ge:	rouge	/r/ - wr:	writer
		/y/ - i:	onion

Word final /v/ is spelled ve: give, twelve.

Word final /ô/ is spelled the: breathe.

Spelling compounds

Graphic compounds are generally spelled by writing the individual words with no space or with a hyphen between them: shortstop, short-term. Some semantic compounds are written as two words: White House. Only by using a dictionary--and different dictionaries may give conflicting information--can one determine how a compound is written.

Spelling prefixes

While the pronunciation of a vowel in a prefix may vary, the spelling remains the same, e.g., pronoun, prospect, promote.[3] However, recognition of the prefix (and/or the base) is often crucial to spelling it; in this, meaning is sometimes a clue, e.g., /prə/ meaning "before" spelled pre (e.g., predict), but /prə/ meaning "forward" spelled pro (e.g., promote). The final consonant in some prefixes

[3]Note that prefixes (and suffixes) are spelled according to the same principles, whether added to free bases or bound bases.

assimilates to the initial consonant in the base; e.g., in is assimilated in immature, impolite, illegal, irregular; while this reflects pronunciation, it is relevant to determining consonant doubling, e.g., doubling in assign (ad + sign) vs. not doubling in asleep (a + sleep).

Spelling suffixes

1. Inflectional suffixes (often described well in dictionaries)

The plural, verbal, and possessive suffix /s/, /z/, /ɪz/ is generally spelled s (with appropriate apostrophe use for possessives). When following s, z, sh, ch, x, the plural and verbal suffix is spelled es; when following o, it is spelled s or es. When reflected in the pronunciation, base f(e) becomes suffixed ves.

The past tense and past participle suffix /t/, /d/, /ɪd/ is spelled ed. Other inflectional suffixes are spelled with one spelling: ing, en, er, est.

2. Derivational suffixes

There are many derivational suffixes. Some have homophonous spellings, which can frequently be distinguished on the basis of function or meaning; e.g., /ɪst/ is spelled est when a superative adjective (e.g., fastest), ist when referring to a person (e.g., artist).

Some suffixes, beginning with i or u, palatalize the final consonant in the base. Thus the following spellings result:

/š/ - ci, ti, ss(i), si: official, election, pressure expansion, permission

/tš/ - t(i): architecture, Christian

/ž/ - s(i): pleasure, explosion

/dž/ - d: graduate

Affixed-aided spelling

In general, the spellings of bases do not change (except for regular suffixation rules listed below) when affixes are added, even if the pronunciation changes. A variety of examples of affix-aided spellings are listed below to suggest the possibilities.

secret-secretary	athlete-athletic	Christ-Christian-Christmas
differ-difference	atom-atomic	magic-magician
study-studious	colony-colonial	please-pleasure
photograph-photography	invite-invitation	grade-graduate
office-official	relate-relative	human-humanity
elect-election	sign-signal	moral-morality
press-pressure	bomb-bombard	architect-architecture

This feature of English can help in determining the spelling of unstressed vowels. For example, in metal (/métəl/) the spelling of the first vowel is predictable (/ɛ/) but that of the second is not (/əl/ - le, el, al); in metallic (/mətælɪk/) the opposite is true (/ə/ - a, e, i, o, u; /æ/ - a); using the predictable e in metal and the predictable a in

metallic, the vowels in both words can be correctly spelled. Thus the spelling of unstressed vowels can be determined on the basis of the stressed pronunciation in related words.

Suffixation rules

Suffixes are commonly added directly to the ends of bases (e.g., trying, played, soften), but there are a few special rules. Many dictionaries provide good descriptions of these rules. The following is a summary of some major points.

1. When the base ends in a consonant and e and the suffix begins with a vowel, the e is dropped, e.g., hoped, driving.
2. When the last syllable is stressed and is spelled with a single vowel letter plus a single consonant letter, the final consonant is doubled, e.g., hopped, occurring.
3. When the base ends in a consonant plus y and the suffix does not begin with i, the y changes to i, e.g., happiness, tried.

APPENDIX B*

Sample Lessons

I. Purpose: To teach the spelling a...e ("a and then e at the end of the word") for /ey/.

Student level: Young (about second grade), two-three years of ESL instruction.

Spelling prerequisites: Ability to spell simple vowels and consonants spelled with one letter.

A. Write mad and made on the board. Say the words and note the differences in the vowel sounds. Explain that the vowel sound in made is called a "long vowel sound;"[1] it is the same as the name of the letter a. Explain that it is spelled with a and then e at the end of the word. Explain that the vowel sound in hat is called a "short vowel sound; Explain that it is spelled with a single vowel letter.

Have students tell whether words have a long or a short vowel sound; e.g., fate, fat, name, made, mad, sat, wave, map.

Have students tell whether words have the same or different vowel sounds; e.g., made-came, hat-name, sat-red, sad-lap, wave-let.

Written: Provide a list of words with e, a, and a...e, and have students circle the words that have a long vowel sound.

*These sample lessons are based, in part, on instruction used in the SWRL Communication Skills Programs for the Elementary Schools: Spelling. Lexington, MA: Ginn and Company. Copyright, 1975, by Southwest Regional Laboratory for Educational Research and Development.

[1]Students are assumed to be in United States schools, where this terminology is used.

B. Explain that when the sound /ey/ is heard, it is frequently spelled with a and then e at the end of the word. Using one-syllable words spelled with e, a, and a...e, have students spell the vowel sound. (These words can also be used for reviewing the spelling of first and last sounds.)

Written: Use pictures of words spelled with e, a, and a...e. Have students (1) circle the correct vowel spelling (2) write the correct vowel spelling.

Using only unambiguous strings, have students fill in either a or a...e. E.g., n m , s d , sl p , g m .

C. Have students spell whole words with e, a, and a...e. If students have difficulty, have them spell the individual sounds first:

Spell the first sound in name.

(n - write on board)

Spell the vowel sound in name.

(a...e - write on board with n: na e)

Spell the last sound in name.

(m - write on board with previous: name)

Spell the word name.

Dictate words for students to write.

Written: Have students spell pictured words.

Have students complete sentences; the missing words are spelled with a or a...e:

I am not happy; I am s_____.

Her n_____ is Maria.

II. Purpose: To teach alternate spellings for /ey/ in monosyllables.

S ent level: Older students; literate; large vocabularies, but poor spelling skills.

Spelling prerequisites: General familiarity with English spelling; knowledge of pronunciation symbols; ability to use dictionary.

A. Write the following words on the board; explain that the underlined letters are spellings of /ey/ and note the constraints on these spellings. Point out that the spellings with a are more frequent than those with e.

name: with single final consonants and with st and ng (paste, strange)

rain: especially frequent before n and l; medial

gay: final

vein: medial

weign, weight: final or before final t

they: final

Be sure students can name the six spellings for /ey/ and can verbalize the constraints.

Written: Fill in correct letters (see I. B); use the following choices: ai/ay; ei/ey; ei/eigh. Encourage dictionary use for checking spellings with these choices: a...e/ai; a...e/ei; ai/ei; ay/eigh/ey.

Provide the pronunciation of nonsense syllables and have students circle all possible spellings. E.g.,

/bley/: blai, blay, blae, bleigh, blei, bley

/cleyn/: clain, clayn, clane, cleighn, clein, cleyn

B. Teach students several /ey/ words which they commonly misspell; e.g., strange, weight.

Written: Complete sentences (see I. C).

C. Teach homophones with /ey/, e.g., main-mane, pray-prey, way-weigh, wait-weight, waste-waist. Be sure students understand the meaning of each word. Use the words in sentences and have students choose the correct spelling.

Written: Using sentence context, have students circle the correct word. E.g.,

I know the weigh/way to school.

He weighs/ways 70 kilos.

Complete sentences (see I. C).

D. Say unfamiliar words and have students give possible spellings; e.g., /hwey/: whay, whey, wheigh. Have students check in a dictionary for the correct spelling.

Written: Provide the pronunciation of words and have students spell them, checking their spellings in a dictionary; e.g., /geyn/, /fley/.

III. Purpose: To use affixed words to determine the correct spelling of unstressed vowels.

Student level: Advanced; good spelling skills.

[This is an outline of some teaching possibilities; it is not developed as a full lesson.]

Have students identify unstressed syllables in words (e.g., first, last).

Have students identify bases in suffixed words (e.g., human is the base in humanity).

Have students provide suffixed forms which change stress in base (e.g., atomic is a suffixed form of atom where the second syllable is stressed).

Write a pair of vowel-less words on the board, e.g.,

h_m_n h_m_nity _t_m _t_mic

Have students spell the stressed vowel in the base and write it in both the base and the suffixed word, e.g.,

hum_n hum_nity at_m at_mic

Then have students spell the stressed vowel in the suffixed word and write it in both the base and suffixed words, e.g.,

human humanity atom atomic

Written: Have students identify bases and/or suffixes in suffixed words.

Have students write the bases for suffixed words.

Have students fill in the correct letter in pairs of vowel-less words (see above).

In sentences, have students write the correct form of a provided word, e.g.,

Concern for humans is also concern for all _____.

Another name for the atom bomb is the _____ bomb.

SUGGESTIONS FOR FURTHER READING

The best book available on spelling is Hanna, Hodges, and Hanna (1971). The first part discusses writing systems, the development of English (language and spelling), spelling as a school subject, and the psychology of spelling. The second part describes a fully sequenced spelling program. The best description of the English spelling system, with emphasis on sound-spelling features, is Russell (1975).

To obtain an understanding of spelling-sound relations, Hanna, Hanna, Hodges, and Rudorf (1966) should be consulted, although critically. (The Hanna, Hodges, and Hanna book summarizes this larger study.) Venezky (1970) and Cronnell (1971a) can also be helpful; Venezky (1967) is shorter but contains a description of crucial features of English orthography. Another useful and accurate description of English spelling is found in chapters 7 and 8 of Brengelman (1970a).

The spelling applications of recent research into generative phonology are clearly developed in Chomsky (1970).

Vallins (1965) provides a readable and interesting treatment of the history of English spelling, including many examples of previous spelling practices.

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