

# Spelling Pronunciation: An Explanation in Terms of Exemplar Theory

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## Abstract

In mainstream linguistic theory, spelling is not regarded as part of a word's phonological representation. This raises the question how spelling pronunciations should be explained. This paper proposes that spelling pronunciations can be accounted for in a theory of linguistic representation in which different aspects of linguistic expressions, including their spelling, are simultaneously available in the mental representation of a word.

*Keywords:* spelling pronunciation, mental representation, Exemplar Theory, second language acquisition, English language, historical change

## 1. Introduction

Spelling pronunciation occurs when a word is pronounced according to (some aspect of) its spelling, in a way that differs from a longstanding standard or traditional pronunciation. It is therefore sometimes regarded as an error, such as pronouncing the *d* in *Wednesday* in English. However, sometimes a spelling pronunciation has become accepted, e.g. pronouncing the *t* in English *often*, where pronunciations with or without the medial *t* are both listed as acceptable variants by most dictionaries. Thus, spelling pronunciation may function as a source of potential errors (in first or second language acquisition), but also as an (incidental) catalyst

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of lexical change.

This phenomenon bears on different aspects of language in society, where written text increasingly dominates spoken language (which as such might predict an increase in spelling-driven pronunciation, in first-language but probably more prominently in second-language acquisition, see recently Bassetti 2023), and on the nature of mental representations of words in a language (where spelling has been mainly ignored in mainstream theories of linguistics). In this article I focus on the latter point and advocate for a more prominent role of spelling as part of linguistic knowledge, and therefore in linguistic theories. Exemplar Theory is a theory which makes this possible without much effort, and I will show how this theory captures the phenomenon of spelling pronunciation more insightfully than previous theories.

In section 2 I pay more attention to spelling pronunciation and present examples from different languages. In section 3 I provide a short introduction to the (meagre) role traditionally allotted to spelling (or orthography – the terms here are used interchangeably) in linguistic theories. Section 4 presents a way of understanding such effects in the context of Exemplar Theory and section 5 briefly sums up.

## **2. Spelling Pronunciation: Examples**

Spelling pronunciation is the realisation of some part of the spelling of a word where this is not traditionally realised. Of course, some languages are unwritten (i.e. have no spelling) and in such languages no such effect is expected. Written languages have a fascinating variety of writing systems (Coulmas, 1999; Sproat, 2020) and it would be interesting to investigate how different systems affect pronunciation. For instance, languages in which the relation

between spelling and pronunciation is more transparent are expected to have fewer spelling pronunciations. Here we focus on just two cases: English, which has an alphabetic writing system (§ 2.1), and Chinese, which has a logographic writing system (§ 2.2). Both show instances of spelling pronunciation.

## 2.1 Spelling Pronunciation in English

Spelling pronunciation in English, which of course has a notoriously opaque relation between spelling and pronunciation, can be discussed from two different perspectives: as a source of errors in first or second language speakers, and as the underlying cause for dialect variation and change. In the first case, the resulting pronunciation (e.g. *Wednesday* with a [d]) is not yet (or not usually, or not yet) accepted by mainstream English pronunciation (itself a diffuse concept), and in the latter case different dialects (including mainstream ones such as Standard British English or General American) are characterised by pronunciation habits that may be a little different from either sociolinguistically more prominent varieties or from earlier varieties of such dialects. The spread of such variants through dialects or across regions is an interesting issue; see e.g. Venezky (1999) for a history of American English orthography including the role of spelling pronunciation.

Wells (2008), in a pronouncing dictionary, provides examples of both types. First, he warns non-native speakers that spelling pronunciations for place names such as Gloucester, Worcester, Harwich and Southwark “sound absurd” (Wells, 2008, p.763), as well as the pronunciation of ‘Oxford’ with a full second vowel. However, there are also pronunciations, usually of less frequent words, where spelling pronunciations have become accepted. Different

such words are presented in Table 1; see also other examples (especially names) in Wells (2008) and discussion there.

**Table 1.** Words in English that have undergone pronunciation changes as a result of their spelling; some examples from Berube (1996). All pronunciations from LDOCE online

Item	Pronunciation (British English \$ American English)
alms	/ɑ:mz \$ ɑ:mz, ɑ:lmz/
boatswain	/'bəʊsən \$ 'boʊ-/
comptroller	/kən'trəʊlə, kəmp- \$ -'troʊlər/
forecastle	/'fəʊksəl \$ 'foʊk-/
leeward	/'li:wəd, 'lu:əd \$ -ərd/
often	/'ɒfən, 'ɒftən \$ 'ɒ:f-/
waistcoat	/'weɪskəʊt, 'weskət \$ 'weskət/

Different varieties of English also diverge from more prominent varieties in ways that suggest spelling may play a role (Algeo, 2010, pp. 46–47) for many examples and discussion, as well as Kachru & Smith (2008, p. 79), Mahboob & Huma Ahmar (2008), among others.

In New Zealand English, for instance, words like *botanical* and *placate* tend to be pronounced with a full vowel in the first syllable (Bauer & Warren, 2007, p. 601; Bell & Kuiper, 1999, p. 149). Similarly, this occurs in Ghanaian English (Huber, 2007, p. 855), whereas Fiji English has past tenses with [ɛd] in words like *robbed*, *asked*, *learned* (Tent & Mugler, 2007, p. 767). Some Caribbean varieties of English pronounce consonants that are silent in British English, as in *bomb* [bɒmb], *plumber* [plɒmbə], *sing* [sɪŋg], *hang* [haŋg] and *debt* [dɛbt], similarly in Nigerian English (Gut, 2007, p. 823) and other varieties.

## 2.2 Spelling Pronunciation in Chinese

Sinitic languages famously use logographs, here referred to as Chinese characters, to represent words or morphemes. Here we will focus on Standard Chinese, which uses simplified characters (it would be interesting to compare other varieties such as Hong Kong or Taiwan Chinese, which use traditional characters, with respect to spelling pronunciation). Many Chinese characters consist of semantic and phonetic components, which give clues to meaning and pronunciation, respectively (making them a kind of compounds, but not in the traditional sense). An example is given in (1):

(1) 河 [hé] ‘river’

In this character, the meaning radical is the three water drops on the left, which indicate that this word is associated with water or liquid. Other words that have the same radical are 海 hǎi ‘ocean’ (as in 上海 ‘Shanghai’), 流 liú ‘flow’, 深 shēn ‘deep’ (as in 深圳 ‘Shenzhen’), 江 jiāng ‘large river’, 油 yóu ‘oil’ or 游泳 yóuyǒng ‘swim’. It is not always the case that this radical indicates water or a liquid, e.g. 没 méi ‘not have’ also has it.

The phonetic component in the word in (1), which appears on the right-hand side, also appears in many other words, which have the same or similar pronunciations, such as 何 hé, ‘surname He’, 荷 hé ‘lotus’ (as in 荷兰 ‘Holland’), 苛 kē / hé ‘harsh’, and 呵 hē / hā ‘to scold or exhale’. Again, as the examples show, the radical-pronunciation correspondence is not perfect.

In some words, the pronunciation radical does not or no longer reflect the contemporary pronunciation, in which case pronunciation errors, driven by the spelling, i.e.

spelling pronunciations in the sense understood here, are expected and attested. One example comes from the radical (and as an independent character) 只, which almost always is associated with a historical [zhi]-type pronunciation, as in 识 shí / zhì ‘recognise, knowledge’, 职 zhí ‘duty, profession’, 织 zhī ‘weave’, 枳 zhǐ ‘orange tree’, 咫 zhǐ ‘a short measure (8 inches)’, 帜 zhì ‘flag, banner’. All of these words have 只 and have comparable pronunciations (although tones may differ). However, the words in (2) below are sometimes mispronounced by learners and occasionally by native speakers encountering unfamiliar characters (The data come from spelling primers for primary school children and have been confirmed by consultation with native speakers):

- |        |        |             |
|--------|--------|-------------|
| (2) 炽热 | chì rè | ‘hot’       |
| 面积     | miànjī | ‘area’      |
| 积极     | jījí   | ‘energetic’ |

Here the pinyin transcriptions indicate that the character with 只 is not pronounced with [zhi], but with [chi] or [ji], although learners might (and sometimes do) incorrectly assume a pronunciation with zh- (e.g. zhì) based on the phonetic component 只.

The examples from English and Chinese indicate that spelling can have an effect on pronunciation. In other languages, too, variation in pronunciation can be understood in its relation to spelling. In Dutch, for instance, there is variation between [mɛlk] and [ˈmɛlək] ‘milk’, which has variously been regarded as dialect-determined or age-related. Perhaps spelling is playing a role in the (ongoing) promotion of the first variant. This is not surprising because literate speakers use spelling all the time to access word pronunciation. Sometimes

this use reflects the standard norms of a language variety; when it does not such pronunciations will be recognised as a spelling pronunciation.

The same is expected for languages that have quite different writing systems, such as abjads, syllabaries or have quite mixed systems like Japanese. There is solid evidence that spelling (and even the differences between spelling systems in one and the same language) play a role in psycholinguistic processing. The specific way in which different writing systems affect processing is a matter of ongoing research (Daniels & Share, 2018) for a recent overview.

### **3. The Relation Between Spelling and Pronunciation**

The relation between spelling and pronunciation has had a long history in linguistic theory, spelling being ostracised at first and later becoming more seriously investigated especially in the context of psycholinguistic experiments (does spelling become activated when a word is accessed in the mental lexicon?). In theoretical models of linguistics (and phonology in particular), orthography is treated as external to the grammar.

Saussure (1916) does not regard spelling (or ‘writing’) as part of language: “Language and writing are two distinct systems of signs” (Ch. 6) and famously refers to the “tyranny of writing” [*la tyrannie de l’écriture*] as an impediment to understanding the true nature of language. Of course it is correct, as observed above, that not all languages have writing systems and that these systems diverge considerably, shaped by history, culture and aesthetics. Moreover, in the context of early theory formation about language it was methodically justified to set aside spelling – for a while. In the present day it is acceptable to visit this relation again.

Bloomfield (1933) echoes Saussure: “Writing is not language, but merely a way of

recording language by means of visible marks” (Ch. 2). In Chomsky’s later terms (Chomsky, 1965), spoken language might reflect “competence” and written language might be part of a performance factor. As a result, spelling and writing systems were ignored in such mainstream theories of linguistics, or treated separately, as interesting systems in their own right (Vachek, 1989; Vachek, 1973).

In current discussions of phonetics and phonology (the fields in linguistics most closely connected to pronunciation), the disjunction between spelling and the mental language system is also emphasised: spelling is often said to be irrelevant to the operation of phonology/phonetics: see Brown (2015, p. 90) in the context of syllable structure, Välimaa-Blum (2005, p. 95) in a discussion of phonemic status, and Ashby (2011, p. 185) observes that spelling is “irrelevant” to pronunciation.

However, if orthography is not represented in the mental lexicon, spelling pronunciations are difficult to explain. They would require a secondary mechanism translating written forms into phonological structure and making these available for pronunciation. If orthography is stored together with other aspects of lexical knowledge, however, spelling pronunciations follow naturally. This is the kind of approach that is pursued here, very much in line with a paper published fifty years ago (Kerek, 1976).

In the past few decades, a more integrated, comprehensive theory of linguistic competence has gained ground, and ways have been sought to combine different aspects of language in a more unified model. This has been promoted by results in fields such as sociolinguistics, dialect geography, studies of historical change and psycholinguistics.

Although the role of spelling in pronunciation has been disputed in psycholinguistic research (Alario et al., 2007), there is generally little doubt that spelling plays an obvious role in language processing (Dijkstra, Roelofs & Fieuws, 1995; Charoy & Samuel, 2020) among many others, as witnessed in the reading acquisition, and psycholinguistically-based problems with reading such as dyslexia. Spelling has also been shown to play a role in language change (De Schryver et al., 2008). We'll come back to these two factors below.

One relevant finding from psycholinguistic research is that children who read extensively may be more susceptible to spelling pronunciation in their first language, since they are only exposed to the written words – especially if these are infrequent, they will just guess the pronunciation, and the spelling is the only thing to go by. The same holds for L2-speakers, who will often learn a language primarily on the basis of spelling (especially in cases where authentic audio is not available or scarce). New ways of acquiring a second language that rely more on multimodal input are being developed in response to exactly this. In this connection, it is interesting to look at one general, psychological theory where such insights could be fruitfully incorporated.

#### **4. Exemplar Theory**

Exemplar Theory (henceforth: ET) was first conceived as a general psychological theory (Komatsu, 1992; Nosofsky, 1988). Eysenck & Keane (2000, p. 320) describe its current status in psychology, and offer a comparison with other theories (such as Prototype Theory). They give four defining characteristics of exemplar-based theories (van de Weijer, 2024) and references cited there, for a fuller introduction to this theory and its role in a deeper

understanding of the phonological process of vowel harmony:

- a. Categories are made up of a collection of instances or exemplars rather than any abstract description of these instances.
- b. Instances are grouped relative to one another by some similarity metric.
- c. Categorization and other phenomena are explained by a mechanism that retrieves instances from memory given a particular cue.
- d. When exact matches are not found in memory, the nearest neighbour to the cue is usually retrieved.

One crucial aspect of this theory which is relevant here is that its representations are *rich*, and not economical or parsimonious as in earlier theories of language, particularly phonology. ET as a whole deals with cognition (what do we know? how do we know?) and ET as applied to language deals with knowledge of language (“what do we know if we know a language? how do we know it/how is this knowledge best captured?”) and therefore aligns remarkably well with the stated goal of (generative) grammar to capture the knowledge of a native speaker of their language (Cook, 1999, p. 190) “Competence is a neutral term in linguistics for the native speaker’s knowledge of language”.

The question “what do we know if we know a language?” was brilliantly addressed at the word level (“what do we know if we know a word?”) by Lakoff (2004, p. 46), who answers this question (“Plenty”) for a culturally rich term like *marriage*. Terms, feelings, situations, and other words are associated with this word, which fit well within the Exemplar-style representation of words as a network. And, obviously, spelling is also a part of a native

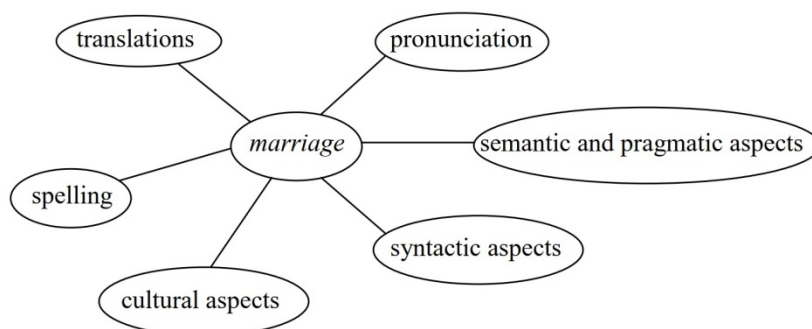
speaker's knowledge of a word. Here I try to list some aspects of word knowledge:

- its pronunciation, and variants of its pronunciation
- its meaning, including shades of different meaning
- its syntactic status (word class, subcategorization frames)
- its pragmatic, cultural, age-related or other social connotations
- translations (for multilingual speakers)
- its spelling (including orthographic variants, if any)

Synonyms would also be included, as well as other words that are in the same semantic field (*bride, bridegroom, wedding, etc.*). Words that are related will also be in the same network, such as its plural *weddings*, and the verb *to wed*. Of course, what goes for the word *marriage* in English goes for all words, in all languages.

One thing that such representations capture is that language is not uniform, but will differ from speaker to speaker, giving rise to variation and inducing change. Nobody's word knowledge exactly equals another person's word knowledge.

The following figure captures this view on the representation of word knowledge:



**Figure 1.** The word *marriage* as part of a richly structured lexicon

Word frequency is not reflected in this figure, but this plays a role too: spelling pronunciations are more common for less frequent words, since the correct pronunciation of such words will be less firmly entrenched. The role of frequency has also been strongly advocated for in recent usage-based approaches to language (Bybee 2006) among many others.

Such ET representations match well with psycholinguistic activation models and priming effects (hearing a word like *marriage* will automatically render words like *bride*, *groom* more likely to be activated), which are well supported. Thus, when the meaning (or another aspect) of a word becomes activated, other aspects of the same word (such as spelling, syntactic properties, and pragmatics) will also become activated and may interfere with each other, in precisely the same way as in the classical Stroop task (Stroop, 1935), where content and meaning may interfere with each other to create confusion.

In this kind of theory, interactions between different aspects of a word's representation (such as spelling and pronunciation) are *expected*, not exceptional. Other aspects of a word's representation (if that term is appropriate for the example in Figure 1) also interact, such as syntactic and semantic knowledge, and others. The word is a unit, albeit with fuzzy boundaries.

Ultimately, the question is why should we assume “phonological competence” (in the Chomskyan sense, see above), blind to spelling, and “phonological performance”, in which spelling is allowed to play a role? It is more straightforward to assume a single model, in which *general* cognitive processes take place, not limited to language.

## 5. Conclusion

We have explored the phenomenon of spelling pronunciation, where part of the written

language affects the pronunciation of a word. Sometimes this happens by mistakes, but some mistakes become entrenched in the “standard” language, a particular dialect or a sociolinguistic variety. Spelling pronunciation plays a role in second language acquisition, which normally involves more written sources than in first language acquisition.

Effects of spelling on pronunciation are not expected in models where spelling is treated as an afterthought or “not really part of language”. On the other hand, in more contemporary models such as ET, interaction between different dimensions of a word is expected and can be modelled. It remains to be seen how spelling pronunciation works in other languages, and how testable predictions can be derived from the line of analysis pursued here. Thus, future work could explore spelling pronunciation in other writing systems (e.g., abjads, syllabaries, or highly complex combined systems like that of Japanese) and test predictions of Exemplar Theory experimentally, for instance by examining how frequency and orthographic transparency interact in real-time word recognition.

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