The Music in Plain Speech and Writing

Contents

References

Article Licenses

CMU Pronouncing Dictionary

CMU Pronouncing Dictionary

Developer(s)	Carnegie Mellon University
Stable release	0.7a / February 18, 2008
Development status	Maintained
Available in	English
License	Public Domain
Website	Homepage [1]

The **CMU Pronouncing Dictionary** (also known as *cmudict*) is a public domain pronouncing dictionary created by Carnegie Mellon University (CMU). It defines a mapping from English words to their North American pronunciations, and is commonly used in speech processing applications such as the Festival Speech Synthesis System and the CMU Sphinx speech recognition system. The latest release is 0.7a, which contains 133,746 entries (from 123,442 baseforms).

Database Format

The database is distributed as a text file of the format *word <two spaces> pronunciation*. If there are multiple pronunciations available for a word, all subsequent entries are followed by an index in parentheses. The pronunciation is encoded using a modified form of the Arpabet system. The difference is stress marks on vowels with levels 0, 1, 2; not all entries have stress however.

History

Version	Release date [1]
0.1	16 September 1993
0.2	10 March 1994
0.3	28 September 1994
0.4	8 November 1995
0.5	No public release
0.6	11 August 1998
0.7a	19 February 2008 [2]

Applications

- The Unifon converter is based on the CMU Pronouncing Dictionary.
- The Natural Language Toolkit contains an interface to the CMU Pronouncing Dictionary.
- The Carnegie Mellon Logios[3] tool incorporates the CMU Pronouncing Dictionary.

References

[1] ftp://ftp.cs.cmu.edu/project/speech/dict/
[2] http://sourceforge.net/forum/forum.php?forum_id=787627
[3] https://cmusphinx.svn.sourceforge.net/svnroot/cmusphinx/trunk/logios/

External links

- The current version of the dictionary is maintained at SourceForge (https://cmusphinx.svn.sourceforge.net/svnroot/cmusphinx/trunk/cmudict/). dead link
- Homepage (http://www.speech.cs.cmu.edu/cgi-bin/cmudict) – includes database search
- RDF (http://sourceforge.net/project/showfiles.php?group_id=176781) converted to Resource Description Framework by the open source Texai project.

Arpabet

Arpabet is a phonetic transcription code developed by Advanced Research Projects Agency (ARPA) as a part of their Speech Understanding Project (1971–1976). It represents each phoneme of General American English with a distinct sequence of ASCII characters. Arpabet has been used in several speech synthesizers, including Computalker for the S-100 (Altair) system, SAM for the Commodore 64, SAY for the Amiga and TextAssist for the PC and Speakeasy from Intelligent Artefacts (see ST_Robotics) which used the Votrax SC01 speech synthesiser IC. It is also used in the CMU Pronouncing Dictionary.

Symbols

In Arpabet, every phoneme is represented by one or two capital letters. Digits are used as stress indicators and are placed at the end of the stressed syllabic vowel. Punctuation marks are used like in the written language, to represent intonation changes at the end of clauses and sentences. The stress values are:

Stress

Value	Description
0	No stress
1	Primary stress
2	Secondary stress

Vowels

Monophthongs

Arpabet	IPA	Word examples
AO	ɔ	off (AO1 F); fall (F AO1 L); frost (F R AO1 S T)
AA	ɑ	father (F AA1 DH ER), cot (K AA1 T)
IY	i	bee (B IY1); she (SH IY1)
UW	u	you (Y UW1); new (N UW1); food (F UW1 D)
EH	ɛ	red (R EH1 D); men (M EH1 N)
IH	ɪ	big (B IH1 G); win (W IH1 N)
UH	ʊ	should (SH UH1 D), could (K UH1 D)
AH	ʌ	but (B AH1 T), sun (S AH1 N)
	ə	sofa (S OW1 F AH0), alone (AH0 L OW1 N)
AX		discus (D IH1 S K AX0 S); note distinction from discuss (D IH0 S K AH1 S)
AE	æ	at (AE1 T); fast (F AE1 S T)

Diphthongs

Arpabet	IPA	Word Examples
EY	eɪ	say (S EY1); eight (EY1 T)
AY	aɪ	my (M AY1); why (W AY1); ride (R AY1 D)
OW	oʊ	show (SH OW1); coat (K OW1 T)
AW	aʊ	how (HH AW1); now (N AW1)
OY	ɔɪ	boy (B OY1); toy (T OY1)

R-colored vowels

Arpabet	IPA	Word Examples
ER	ɝ	her (HH ER0); bird (B ER1 D); hurt (HH ER1 T), nurse (N ER1 S)
AXR	ɚ	father (F AA1 DH ER); coward (K AW1 ER D)
EH R	ɛr	air (EH1 R); where (W EH1 R); hair (HH EH1 R)
UH R	ʊr	cure (K Y UH1 R); bureau (B Y UH1 R OW0), detour (D IH0 T UH1 R)
AO R	ɔr	more (M AO1 R); bored (B AO1 R D); chord (K AO1 R D)
AA R	ɑr	large (L AA1 R JH); hard (HH AA1 R D)
IH R *or* IY R	ɪr	ear (IY1 R); near (N IH1 R)
AW R	aʊr	*This seems to be a rarely used r-controlled vowel. In some dialects* flower (F L AW1 R; *in other dialects* F L AW1 ER0)

Consonants

Stops

Arpabet	IPA	Word Examples
P	p	pay (P EY1)
B	b	buy (B AY1)
T	t	take (T EY1 K)
D	d	day (D EY1)
K	k	key (K IY1)
G	ɡ	go (G OW1)

Affricates

Arpabet	IPA	Word Examples
CH	tʃ	chair (CH EH1 R)
JH	dʒ	just (JH AH1 S T); gym (JH IH1 M)

Fricatives

Arpabet	IPA	Word Examples
F	f	for (F AO1 R)
V	v	very (V EH1 R IY0)
TH	θ	thanks (TH AE1 NG K S); Thursday (TH ER1 Z D EY2)
DH	ð	that (DH AE1 T); the (DH AH0); them (DH EH1 M)
S	s	say (S EY1)
Z	z	zoo (Z UW1)
SH	ʃ	show (SH OW1)
ZH	ʒ	measure (M EH1 ZH ER0); pleasure (P L EH1 ZH ER)
HH	h	house (HH AW1 S)

Nasals

Arpabet	IPA	Word Examples
M	m	man (M AE1 N)
EM	m̩	keep 'em (K IY1 P EM)
N	n	no (N OW1)
EN	n̩	button (B AH1 T EN)
NG	ŋ	sing (S IH1 NG)
ENG	ŋ̍	Washington (W AO1 SH ENG T EN)

Liquids

Arpabet	IPA	Word Examples
L	ɬ	late (L EY1 T)
EL	ɬ̩	bottle (B AO1 DX EL)
R	ɹ *or* ɻ	run (R AH1 N)
DX	ɾ	wetter (W EH1 DX AXR)
NX	ɾ̃	wintergreen (W IY2 NX AXR G R IY1 N)

Semivowels

Arpabet	IPA	Word Examples
Y	j	yes (Y EH1 S)
W	w	way (W EY1)
Q	ʔ	glottal stop (uh-oh - ʔʌʔoʊ)
(missing)	hw *or* ʍ	"when" etc. in some dialects

References

- The CMU Pronouncing Dictionary [1]

International Phonetic Alphabet

International Phonetic Alphabet	
[aɪ pʰiː eɪ]	
Type	Alphabet, partially featural
Languages	Used for phonetic and phonemic transcription of any language
Time period	since 1888
Parent systems	Romic alphabet • Phonotypic alphabet • International Phonetic Alphabet

The **International Phonetic Alphabet** (**IPA**)[1] is an alphabetic system of phonetic notation based primarily on the Latin alphabet. It was devised by the International Phonetic Association as a standardized representation of the sounds of oral language.[2] The IPA is used by lexicographers, foreign language students and teachers, linguists, speech-language pathologists, singers, actors, constructed language creators, and translators.[][3]

The IPA is designed to represent only those qualities of speech that are distinctive in oral language: phonemes, intonation, and the separation of words and syllables.[2] To represent additional qualities of speech, such as tooth gnashing, lisping, and sounds made with a cleft palate, an extended set of symbols called the Extensions to the IPA may be used.[]

IPA symbols are composed of one or more elements of two basic types, letters and diacritics. For example, the sound of the English letter □t□ may be transcribed in IPA with a single letter, [t], or with a letter plus diacritics, [t̪ʰ], depending on how precise one wishes to be.[4] Often, slashes are used to signal broad or phonemic transcription;

thus, /t/ is less specific than, and could refer to, either [t̪ʰ] or [t] depending on the context and language.

Occasionally letters or diacritics are added, removed, or modified by the International Phonetic Association. As of the most recent change in 2005,[5] there are 107 letters, 52 diacritics, and four prosodic marks in the IPA. These are shown in the current IPA chart, posted below in this article and at the website of the IPA.[6]

History

In 1886, a group of French and British language teachers, led by the French linguist Paul Passy, formed what would come to be known from 1897 onwards as the International Phonetic Association (in French, *l'Association phonétique internationale*).[7] Their original alphabet was based on a spelling reform for English known as the Romic alphabet, but in order to make it usable for other languages, the values of the symbols were allowed to vary from language to language.[8] For example, the sound [ʃ] (the *sh* in *shoe*) was originally represented with the letter "c" in English, but with the letter "ch" in French.[7] However, in 1888, the alphabet was revised so as to be uniform across languages, thus providing the base for all future revisions.[7][9]

Since its creation, the IPA has undergone a number of revisions. After major revisions and expansions in 1900 and 1932, the IPA remained unchanged until the IPA Kiel Convention in 1989. A minor revision took place in 1993 with the addition of four letters for mid-central vowels[] and the removal of letters for voiceless implosives.[10] The alphabet was last revised in May 2005 with the addition of a letter for a labiodental flap.[11] Apart from the addition and removal of symbols, changes to the IPA have consisted largely in renaming symbols and categories and in modifying typefaces.[]

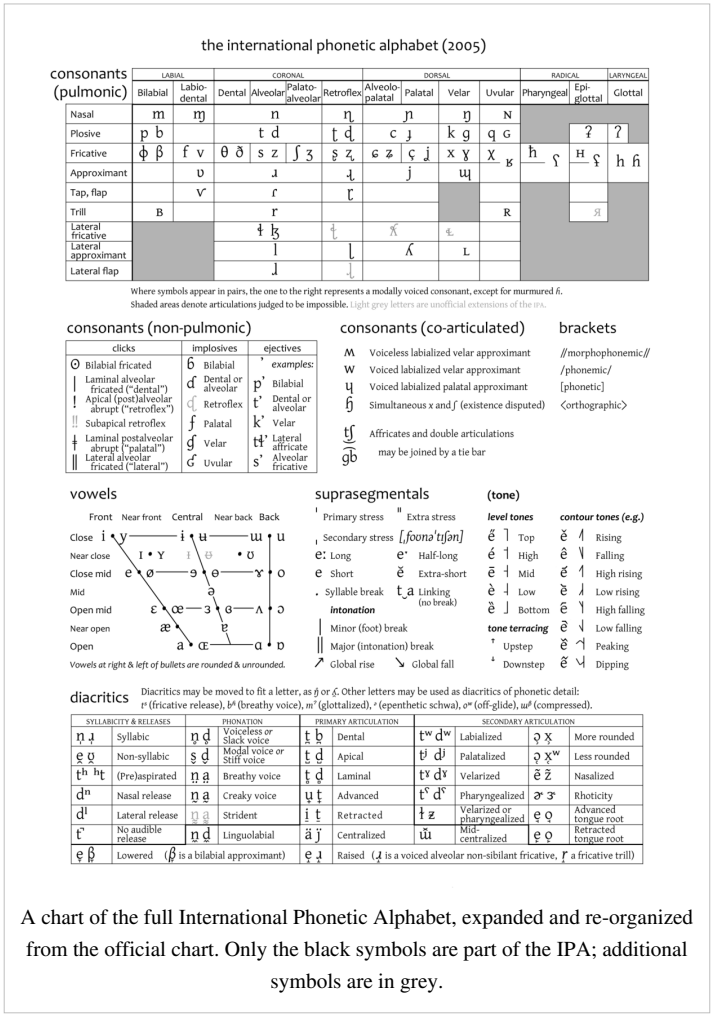
Extensions to the IPA for speech pathology were created in 1990 and officially adopted by the International Clinical Phonetics and Linguistics Association in 1994.[12]

Description

The general principle of the IPA is to provide one letter for each distinctive sound (speech segment) although this practice is not followed if the sound itself is complex.[13] This means that

- It does not normally use combinations of letters to represent single sounds, the way English does with □sh□, □th□ and □ng□, or single letters to represent multiple sounds the way □x□ represents /ks/ or /ɡz/ in English.
- There are no letters that have context-dependent sound values, as □c□ does in English and several other European languages.
- Finally, the IPA does not usually have separate letters for two sounds if no known language makes a distinction between them, a property known as "selectiveness".[][14]

Among the symbols of the IPA, 107 letters represent consonants and vowels, 31 diacritics are used to modify these, and 19 additional signs indicate suprasegmental qualities such as length, tone, stress, and intonation.[15] These are organized into a chart; the chart displayed here is an unofficial expansion and re-organization of the official chart [16] posted at the website of the IPA and below in this article.



A chart of the full International Phonetic Alphabet, expanded and re-organized from the official chart. Only the black symbols are part of the IPA; additional symbols are in grey.

Letterforms

The letters chosen for the IPA are meant to harmonize with the Latin alphabet.[16] For this reason, most letters are either Latin or Greek, or modifications thereof. Some letters are neither: for example, the letter denoting the glottal stop, □ʔ□, has the form of a dotless question mark, and derives originally from an apostrophe. A few letters, such as that of the voiced pharyngeal fricative, □ʕ□, were inspired by other writing systems (in this case, the Arabic letter ع *'ain*).[10]

Despite its preference for harmonizing with the Latin script, the International Phonetic Association has occasionally admitted other letters. For example, before 1989, the IPA letters for click consonants were □ʘ□, □ǂ□, □ᶜ□, and □ȸ□, all of which were derived either from existing IPA letters, or from Latin and Greek letters. However, except for □ʘ□, none of these letters were widely used among Khoisanists or Bantuists, and as a result they were replaced by the more widespread symbols □ʘ□, □ǀ□, □ǃ□, □ǂ□, and □ǁ□ at the IPA Kiel Convention in 1989.[17] Although the IPA diacritics are fully featural, there is little systemicity in the letter forms. A retroflex articulation is consistently indicated with a right-swinging tail, as in □ɖ ʂ ɳ□, and implosion by a top hook, □ɓ ɗ ɠ□, but other pseudo-featural elements are due to haphazard derivation and coincidence. For example, all nasal consonants but uvular □ɴ□ are based on the form □n□: □m ɱ n ɲ ɳ ŋ□. However, the similarity between □m□ and □n□ is a historical accident, □ɲ□ and □ŋ□ are derived from ligatures of *gn* and *ng,* and □ɱ□ is an *ad hoc* imitation of □ŋ□. In none of these is the form consistent with other letters that share these places of articulation.[*citation needed*]

Some of the new letters were ordinary Latin letters turned upside-down, such as ɐ ɔ ə ɟ ɥ ɯ ɹ ɻ ɾ ʌ ʍ ʎ (turned *a c e f h m r t v w y*). This was easily done with mechanical typesetting machines, and had the advantage of not requiring the casting of special type for IPA symbols.

Symbols and sounds

The International Phonetic Alphabet is based on the Latin alphabet, using as few non-Latin forms as possible.[] The Association created the IPA so that the sound values of most consonant letters taken from the Latin alphabet would correspond to "international usage".[] Hence, the letters ⟨b⟩, ⟨d⟩, ⟨f⟩, (hard) ⟨g⟩, (non-silent) ⟨h⟩, (unaspirated) ⟨k⟩, ⟨l⟩, ⟨m⟩, ⟨n⟩, (unaspirated) ⟨p⟩, (voiceless) ⟨s⟩, (unaspirated) ⟨t⟩, ⟨v⟩, ⟨w⟩, and ⟨z⟩ have the values used in English; and the vowel letters from the Latin alphabet (⟨a⟩, ⟨e⟩, ⟨i⟩, ⟨o⟩, ⟨u⟩) correspond to the (long) sound values of Latin: [i] is like the vowel in *machine*, [u] is as in *rule*, etc. Other letters may differ from English, but are used with these values in other European languages, such as ⟨j⟩, ⟨r⟩, and ⟨y⟩.

This inventory was extended by using capital or cursive forms, diacritics, and rotation. There are also several symbols derived or taken from the Greek alphabet, though the sound values may differ. For example, ⟨ʊ⟩ is a vowel in Greek, but an only indirectly related consonant in the IPA. For most of these subtly different glyph shapes have been devised for IPA, in particular ⟨ɑ⟩, ⟨ɣ⟩, ⟨ɛ⟩, ⟨ɸ⟩, and ⟨ʋ⟩ which are encoded in Unicode separately from their Greek "parent" letters, three of these (⟨β⟩, ⟨θ⟩ and ⟨χ⟩) are often used unmodified in form as they have not been encoded separately.

The sound values of modified Latin letters can often be derived from those of the original letters.[18] For example, letters with a rightward-facing hook at the bottom represent retroflex consonants; and small capital letters usually represent uvular consonants. Apart from the fact that certain kinds of modification to the shape of a letter generally correspond to certain kinds of modification to the sound represented, there is no way to deduce the sound represented by a symbol from its shape (unlike, for example, in Visible Speech).

Beyond the letters themselves, there are a variety of secondary symbols which aid in transcription. Diacritic marks can be combined with IPA letters to transcribe modified phonetic values or secondary articulations. There are also special symbols for suprasegmental features such as stress and tone that are often employed.

Brackets and phonemes

There are two principal types of brackets used to set off IPA transcriptions:

- [square brackets] are used for phonetic details of the pronunciation, possibly including details that may not be used for distinguishing words in the language being transcribed, but which the author nonetheless wishes to document.
- /slashes/ are used to mark off phonemes, all of which are distinctive in the language, without any extraneous detail.

For example, while the /p/ sounds of *pin* and *spin* are pronounced slightly differently in English (and this difference would be meaningful in some languages), the difference is not meaningful in English. Thus *phonemically* the words are /pɪn/ and /spɪn/, with the same /p/ phoneme. However, to capture the difference between them (the allophones of /p/), they can be transcribed phonetically as [pʰɪn] and [spɪn].

Other conventions are less commonly seen:

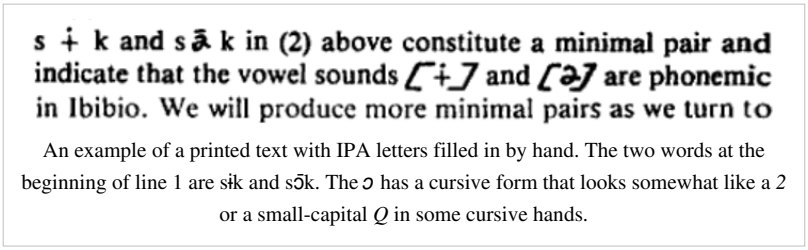
- Double slashes //...//, pipes |...|, double pipes ||...||, or braces {...} may be used around a word to denote its underlying structure, more abstract even than that of phonemes. See morphophonology for examples.
- Angle brackets are used to clarify that the letters represent the original orthography of the language, or sometimes an exact transliteration of a non-Latin script, not the IPA; or, within the IPA, that the letters themselves are indicated, not the sound values that they carry. For example, ⟨pin⟩ and ⟨spin⟩ would be seen for those words, which do not contain the *ee* sound [i] of the IPA letter ⟨i⟩. Italics are perhaps more commonly used for this

purpose when full words are being written (as *pin, spin* above), but may not be sufficiently clear for individual letters and digraphs. The true angle brackets ⟨...⟩ (U+27E8, U+27E9) are not supported by many non-mathematical fonts as of 2010. Therefore chevrons ‹...› (U+2039, U+203A) are sometimes used in substitution, as are the less-than and greater-than signs <...> (U+003C, U+003E).

- Braces} are used for prosodic notation. See Extensions to the International Phonetic Alphabet for examples in that system.
- (Parentheses) are used for indistinguishable utterances. They are also seen for silent articulation (mouthing), where the expected phonetic transcription is derived from lip-reading, and with periods to indicate silent pauses, for example (...).
- Double parentheses indicate obscured or unintelligible sound, as in ((2 syll.)), two audible but unidentifiable syllables.

Handwritten forms

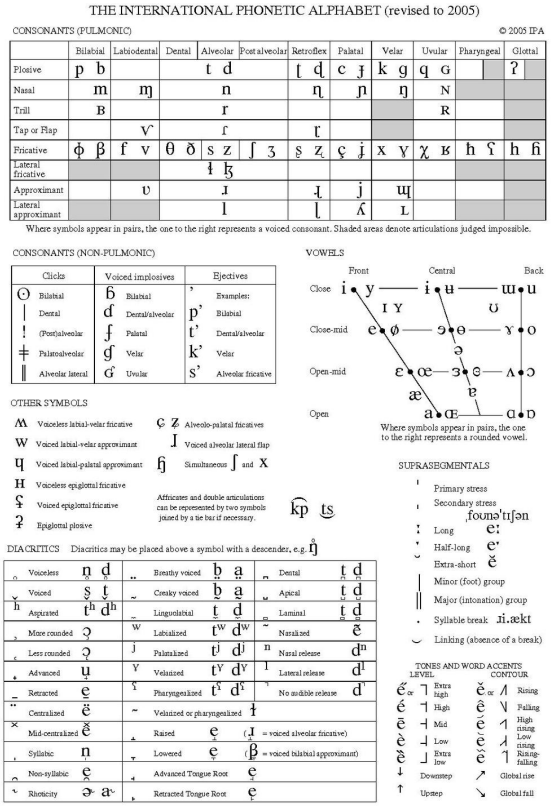
IPA letters have handwritten forms designed for use in manuscripts and when taking field notes; they are occasionally seen in publications when the printer did not have fonts that supported IPA, and the IPA was therefore filled in by hand.


s i̱ k and sa̱ k in (2) above constitute a minimal pair and indicate that the vowel sounds [i̱] and [a̱] are phonemic in Ibibio. We will produce more minimal pairs as we turn to

An example of a printed text with IPA letters filled in by hand. The two words at the beginning of line 1 are sɨk and sɔ̄k. The ɔ has a cursive form that looks somewhat like a *2* or a small-capital *Q* in some cursive hands.

Official chart

The International Phonetic Alphabet is occasionally modified by the Association. After each modification, the Association provides an updated simplified presentation of the alphabet in the form of a chart. (See History of the IPA.) The most recent official chart, from 2005, is presented at right.



The official chart of the IPA as of 2005, displaying the alphabet in simplified form. The proper symbols for upstep and downstep are not available in this font, and have been substituted.

The procedure for modifying the alphabet or the chart is to propose the change in the *Journal of the IPA* (see, for example, August 2008 on a low central vowel and August 2011 on central approximants[]). Reactions to the proposal may be published in the same or subsequent issues of the Journal (as in August 2009 on the low central vowel[19]). A formal proposal is then put to the Council of the IPA[20] (which is elected by the membership [21]) for further discussion and a formal vote.[22][23]

Only changes to the alphabet or chart that have been approved by the Council can be considered part of the official IPA. Nonetheless, many IPA users make personal changes in their own practice, either for convenience in working on a particular language (see, for example, "Illustrations of the IPA" for individual languages in the *Handbook*, which for example may use □c□ for [tʃ][24]), or because they object to some aspect of the official version. For example, the chart at the top of this article is reorganized in response to perceived shortcomings of the official version, and in places reflects the organization of the 1979 chart.

Usage

[eboʃ]

Ébauche is a French term meaning *outline* or *blank*.

Although the IPA offers over one hundred and sixty symbols for transcribing speech, only a relatively small subset of these will be used to transcribe any one language. It is possible to transcribe speech with various levels of precision. A precise phonetic transcription, in which sounds are described in a great deal of detail, is known as a *narrow transcription*. A coarser transcription which ignores some of this detail is called a *broad transcription.* Both are relative terms, and both are generally enclosed in square brackets.[] Broad phonetic transcriptions may restrict themselves to easily heard details, or only to details that are relevant to the discussion at hand, and may differ little if at all from phonemic transcriptions, but they make no theoretical claim that all the distinctions transcribed are necessarily meaningful in the language.

For example, the English word *little* may be transcribed broadly using the IPA as [ˈlɪtəl], and this broad (imprecise) transcription is a more or less accurate description of many pronunciations. A narrower transcription may focus on individual or dialectical details: [ˈɬɪɾɬ] in General American, [ˈlɪʔo] in Cockney, or [ˈɬɪːɬ] in Southern US English.

[ɪntəˈnæʃənəɬ]
[ɪr̃ɚˈnæʃɨnəɬ]

Phonetic transcriptions of the word *international* in two English dialects. The square brackets indicate that the differences between these dialects are not necessarily sufficient to distinguish different words in English.

It is customary to use simpler letters, without many diacritics, in phonemic transcriptions. The choice of IPA letters may reflect the theoretical claims of the author, or merely be a convenience for typesetting. For instance, in English, either the vowel of *pick* or the vowel of *peak* may be transcribed as /i/ (for the pairs /pik, piːk/ or /pɪk, pik/), and neither is identical to the vowel of the French word *pique* which is also generally transcribed /i/. That is, letters between slashes do not have absolute values, something true of broader phonetic approximations as well. A narrow transcription may, however, be used to distinguish them: [pʰɪk], [pʰiːk], [pik].

Linguists

Although IPA is popular for transcription by linguists, American linguists often alternate use of the IPA with Americanist phonetic notation or use the IPA together with some nonstandard symbols, for reasons including reducing the error rate on reading handwritten transcriptions or avoiding perceived awkwardness of IPA in some situations. The exact practice may vary somewhat between languages and even individual researchers, so authors are generally encouraged to include a chart or other explanation of their choices.[]

Language study

Some language study programs use the IPA to teach pronunciation. For example, in Russia (and earlier in the Soviet Union) and mainland China, textbooks for children[25] and adults[26] for studying English and French consistently use the IPA. English teachers and textbooks in Taiwan tend to use the Kenyon and Knott system instead.

Dictionaries

English

Many British dictionaries, including the Oxford English Dictionary and some learner's dictionaries such as the Oxford Advanced Learner's Dictionary and the Cambridge Advanced Learner's Dictionary, now use the International Phonetic Alphabet to represent the pronunciation of words.[27] However, most American (and some British) volumes use one of a variety of pronunciation respelling systems, intended to be more comfortable for readers of English. For example, the respelling systems in many American dictionaries (such as Merriam-Webster) use □y□ for IPA [j] and □sh□ for IPA [ʃ], reflecting common representations of those sounds in written English,[28] using only letters of the English Roman alphabet and variations of them. (In IPA, [y] represents the sound of the French □u□ (as in *tu*), and [sh] represents the pair of sounds in *gra**ssh**opper*.)

Other languages

The IPA is also not universal among dictionaries in languages other than English. Monolingual dictionaries of languages with generally phonemic orthographies generally do not bother with indicating the pronunciation of most words, and tend to use respelling systems for words with unexpected pronunciations. Dictionaries produced in Israel use the IPA rarely and sometimes use the Hebrew script for transcription of foreign words. Monolingual Hebrew dictionaries use pronunciation respelling for words with unusual spelling; for example, Even-Shoshan Dictionary respells תָּכְנִית as תוֹכְנִית because this word uses kamatz katan. Bilingual dictionaries that translate from foreign

languages into Russian usually employ the IPA, but monolingual Russian dictionaries occasionally use pronunciation respelling for foreign words; for example, Ozhegov's dictionary adds нэ́ in brackets for the French word пенсне (pince-nez) to indicate that the е does not iotate the н.

The IPA is more common in bilingual dictionaries, but there are exceptions here too. Mass-market bilingual Czech dictionaries, for instance, tend to use the IPA only for sounds not found in the Czech language.[29]

Standard orthographies and capital variants

IPA letters have been incorporated into the alphabets of various languages, notably via the Africa Alphabet in sub-Saharan Africa: Hausa, Fula, Akan, Gbe languages, Manding languages, Lingala, etc. This has created the need for capital variants. For example, Kabiyé of northern Togo has Ɔ ɔ, Ɛ ɛ, Ɖ ɖ, Ŋ ŋ, Ɣ ɣ, Ʃ ʃ, Ʊ ʊ (or ᵾ ᵾ):

MBƆ AJƐYA KIGBƐNDƆƆ ŊGBƐYƐ KEDIƔZAƔ SƆSƆƆ TƆM SE.

These, and others, are supported by Unicode, but appear in Latin ranges other than the IPA extensions.

In the IPA itself, only lower-case letters are used. The 1949 edition of the IPA handbook indicated that an asterisk □*□ may be prefixed to indicate that a word is a proper name,[30] but this convention has not been included in recent editions.

Classical singing

IPA has widespread use among classical singers for preparation, especially among English-speaking singers who are expected to sing in a variety of foreign languages. Opera librettos are authoritatively transcribed in IPA, such as Nico Castel's volumes[31] and Timothy Cheek's book *Singing in Czech*.[32] Opera singers' ability to read IPA was recently used by the Visual Thesaurus, which employed several opera singers "to make recordings for the 150,000 words and phrases in VT's lexical database. ...for their vocal stamina, attention to the details of enunciation, and most of all, knowledge of IPA."[33]

Letters

The International Phonetic Association organizes the letters of the IPA into three categories: pulmonic consonants, non-pulmonic consonants, and vowels.[34][35]

Pulmonic consonant letters are arranged singly or in pairs of voiceless (tenuis) and voiced sounds, with these then grouped in columns from front (labial) sounds on the left to back (glottal) sounds on the right. In official publications by the IPA,[36] two columns are omitted to save space, with the letters listed among 'other symbols',[37] and with the remaining consonants arranged in rows from full closure (occlusives: stops and nasals), to brief closure (vibrants: trills and taps), to partial closure (fricatives) and minimal closure (approximants), again with a row left out to save space. In the table below, a slightly different arrangement is made: All pulmonic consonants are included in the pulmonic-consonant table, and the vibrants and laterals are separated out so that the rows reflect the common lenition pathway of *stop → fricative → approximant,* as well as the fact that several letters pull double duty as both fricative and approximant; affricates may be created by joining stops and fricatives from adjacent cells. Shaded cells are judged to be implausible.

Vowel letters are also grouped in pairs—of unrounded and rounded vowel sounds—with these pairs also arranged from front on the left to back on the right, and from maximal closure at top to minimal closure at bottom. No vowel letters are omitted from the chart, though in the past some of the mid central vowels were listed among the 'other symbols'.

Each character is assigned a number, to prevent confusion between similar letters (such as ɵ and θ, ɤ and ɣ, or ʃ and ʄ) in such situations as the printing of manuscripts. The categories of sounds are assigned different ranges of numbers.[38]

Consonants

IPA pulmonic consonants chart image • audio

Place →	Labial				Coronal							Dorsal					Radical		Glottal
↓ Manner	Bilabial		Labio-dental		Dental		Alveolar	Postalveolar		Retroflex		Alveolo-palatal		Palatal		Velar		Uvular	Pharyngeal		Epiglottal		Glottal
Nasal	m̥	m		ɱ		n̪	n̥	n		ɳ̊	ɳ		ɲ̊	ɲ̊	ɲ	ŋ̊	ŋ	ɴ					
Stop	p	b	p̪	b̪	t̪	d̪	t	d		ʈ	ɖ			c	ɟ	k	ɡ	q	ɢ			ʡ	ʔ	
Sibilant fricative					s̪	z̪	s	z	ʃ	ʒ	ʂ	ʐ	ɕ	ʑ										
Non-sibilant fricative	ɸ	β	f	v	θ	ð	θ̪	ð̪						ç	ʝ	x	ɣ	χ	ʁ	ħ	ʕ	ʜ	ʢ	h	ɦ
Approximant				ʋ			ɹ			ɻ				j̊	j		ɰ							
Flap or tap		ⱱ̟		ⱱ			ɾ			ɽ								ɢ̆			ʡ̮			
Trill		ʙ					r̥	r		ɽ͡r								ʀ			ʡ*			
Lateral fricative							ɬ	ɮ		𝼈*				ɬ̊		ɮ̊	ɮ							
Lateral approximant							l̥	l			ɭ		ʎ̝		ʎ		ʟ							
Lateral flap							ɺ			𝼊*					ʎ̆		ʟ̆							

Non-pulmonic consonants

	ʘ	ǀ	ǃ	ǂ	ǁ			
Clicks	ʘ	ʘˀ	ʘq͡	ʘq̰͡	!!			
Implosives	ɓ	ɗ	ʄ	𝼅	ɠ	ʛ		
	pʼ	t̪ʼ	tʼ	cʼ	ʈʼ	kʼ	qʼ	
	fʼ	θʼ	sʼ	ɬʼ	ʃʼ	ʂʼ	ɕʼ	xʼ	χʼ
Ejectives	ts’	tɬ’	cʎ̝’	tʃ’	ʈʂ’	kx’	kʟ̝’	qχ’	

Affricates

p̪f	b̪v	ts	dz	t̪s̪	d̪z̪	tθ	dð	tʃ	dʒ
tɕ	dʑ	ʈʂ	ɖʐ	tɬ	dɮ	cç	ɟʝ	cʎ̝	
kx	ɡɣ	kʟ̝	ɡʟ	qχ	ɢʁ				

Co-articulated consonants

Continuants	ʍ w ɥ ɧ
Occlusives	k͡p g͡b ŋ͡m

— These tables contain phonetic symbols, which may not display correctly in some browsers. [Help]

— Where symbols appear in pairs, left–right represent the voiceless–voiced consonants.

— Shaded areas denote pulmonic articulations judged to be impossible.

— Symbols marked with an asterisk (*) are not defined in the IPA.

Notes

- Asterisks (*) indicate unofficial IPA symbols for attested sounds. See the respective articles for *ad hoc* symbols found in the literature.
- In rows where some letters appear in pairs (the *obstruents*), the letter to the right represents a voiced consonant (except breathy-voiced [ɦ]). However, [ʔ] cannot be voiced, and the voicing of [ʔ] is ambiguous.[39] In the other rows (the *sonorants*), the single letter represents a voiced consonant.
- Although there is a single letter for the coronal places of articulation for all consonants but fricatives, when dealing with a particular language, the letters may be treated as specifically dental, alveolar, or post-alveolar, as appropriate for that language, without diacritics.
- Shaded areas indicate articulations judged to be impossible.
- The letters [ʁ, ʕ, ʢ] represent either voiced fricatives or approximants.
- In many languages, such as English, [h] and [ɦ] are not actually glottal, fricatives, or approximants. Rather, they are bare phonation.[40]
- It is primarily the shape of the tongue rather than its position that distinguishes the fricatives [ʃ ʒ], [ɕ ʑ], and [ʂ ʐ].
- The labiodental nasal [ɱ] is not known to exist as a phoneme in any language.[41]

Pulmonic consonants

A pulmonic consonant is a consonant made by obstructing the glottis (the space between the vocal cords) or oral cavity (the mouth) and either simultaneously or subsequently letting out air from the lungs. Pulmonic consonants make up the majority of consonants in the IPA, as well as in human language. All consonants in the English language fall into this category.[42]

The pulmonic consonant table, which includes most consonants, is arranged in rows that designate manner of articulation, meaning how the consonant is produced, and columns that designate place of articulation, meaning where in the vocal tract the consonant is produced. The main chart includes only consonants with a single place of articulation.

Co-articulated consonants

Co-articulated consonants are sounds that involve two simultaneous places of articulation (are pronounced using two parts of the vocal tract). In English, the [w] in "went" is a coarticulated consonant, because it is pronounced by rounding the lips and raising the back of the tongue. Other languages, such as French and Swedish, have different coarticulated consonants.

Note

- [ɧ] is described as a "simultaneous [ʃ] and [x]".[43] However, this analysis is disputed. (See voiceless palatal-velar fricative for discussion.)

Affricates and double articulated consonants

Affricates and doubly articulated stops are represented by two letters joined by a tie bar, either above or below the letters.[44] The six most common affricates are optionally represented by ligatures, though this is no longer official IPA usage,[] because a great number of ligatures would be required to represent all affricates this way. Alternatively, a superscript notation for a consonant release is sometimes used to transcribe affricates, for example t^s for t͡s, paralleling k^x ~ k͡x. The letters for the palatal plosives c and ɟ, are often used as a convenience for t͡ʃ and d͡ʒ or similar affricates, even in official IPA publications, so they must be interpreted with care.

View this table as an image.		
Tie bar	**Ligature**	**Description**
t͡s	ʦ	voiceless alveolar affricate
d͡z	ʣ	voiced alveolar affricate
t͡ʃ	ʧ	voiceless postalveolar affricate
d͡ʒ	ʤ	voiced postalveolar affricate
t͡ɕ	ʨ	voiceless alveolo-palatal affricate
d͡ʑ	ʥ	voiced alveolo-palatal affricate
t͡ɬ	–	voiceless alveolar lateral affricate
k͡p	–	voiceless labial-velar plosive
g͡b	–	voiced labial-velar plosive
ŋ͡m	–	labial-velar nasal stop
g͡ɣ	–	voiced velar affricate

Note

- On browsers that use *Arial Unicode MS* to display IPA characters, the following incorrectly formed sequences may look better due to a bug in that font: t͡s, t͡ʃ, t͡ɕ, d͡z, d͡ʒ, d͡ʑ, t͡ɬ, k͡p, g͡b, ŋ͡m.

Non-pulmonic consonants

Non-pulmonic consonants are sounds whose airflow is not dependent on the lungs. These include clicks (found in the Khoisan languages of Africa), implosives (found in languages such as Swahili or Vietnamese), and ejectives (found in many Amerindian and Caucasian languages).

View this table as an image					
Clicks		**Implosives**		**Ejectives**	
ʘ	Bilabial	ɓ	Bilabial	ʼ	*For example:*
ǀ	Laminal alveolar ("dental")	ɗ	Alveolar	pʼ	Bilabial
ǃ	Apical (post-) alveolar ("retroflex")	ʄ	Palatal	tʼ	Alveolar
ǂ	Laminal postalveolar ("palatal")	ɠ	Velar	kʼ	Velar
ǁ	Lateral coronal ("lateral")	ʛ	Uvular	sʼ	Alveolar fricative

Notes

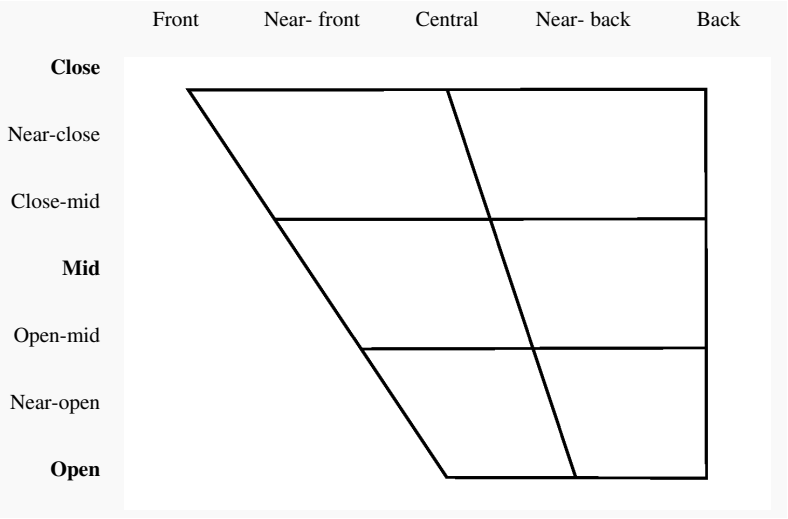
- Clicks are double articulated and have traditionally been described as having a forward 'release' and a rear 'accompaniment', with the click letters representing the release. Therefore all clicks would require two letters for proper notation: □͡k‡, ɡ͡‡, ŋ͡‡, q͡‡, ɢ͡‡, ɴ͡‡ *etc.*, or □‡͡k, ‡͡ɡ, ‡͡ŋ, ‡͡q, ‡͡ɢ, ‡͡ɴ□. When the dorsal articulation is omitted, a [k] may usually be assumed. However, recent research disputes the concept of 'accompaniment'.[45] In

these approaches, the click letter represents both articulations, with the different letters representing different click 'types', there is no velar-uvular distinction, and the accompanying letter represents the manner, phonation, or airstream contour of the click: □ǂ, □ǂ, □ǂ□ *etc.*

- Letters for the voiceless implosives □ɓ, ɗ, ʄ, ɠ, ʛ□ are no longer supported by the IPA, though they remain in Unicode. Instead, the IPA typically uses the voiced equivalent with a voiceless diacritic: □̥, ɡ̊□, *etc.*.
- Although not confirmed as contrastive in any language, and therefore not explicitly recognized by the IPA, a letter for the retroflex implosive, □□□, is supported in the Unicode Phonetic Extensions Supplement, added in version 4.1 of the Unicode Standard, or can be created as a composite □ɖ̩□.
- The ejective diacritic often stands in for a superscript glottal stop in glottalized but pulmonic sonorants, such as [mˀ], [lˀ], [wˀ], [aˀ]. These may also be transcribed as creaky [m̰], [l̰], [w̰], [a̰].

Vowels

IPA vowel chart



Paired vowels are: unrounded • rounded

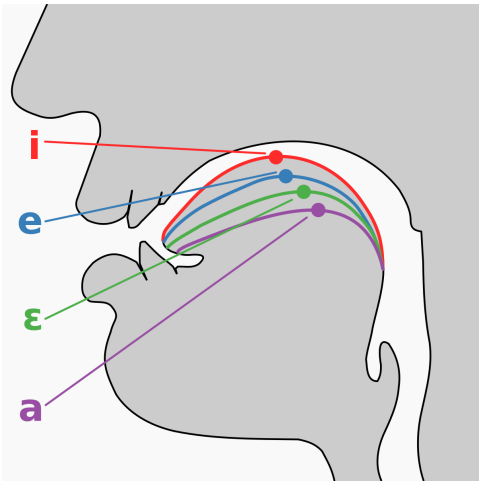
This table contains phonetic symbols, which may not display correctly in some browsers. [Help]

IPA help • IPA key • chart • chart with audio • view

The IPA defines a vowel as a sound which occurs at a syllable center.[46] Below is a chart depicting the vowels of the IPA. The IPA maps the vowels according to the position of the tongue.

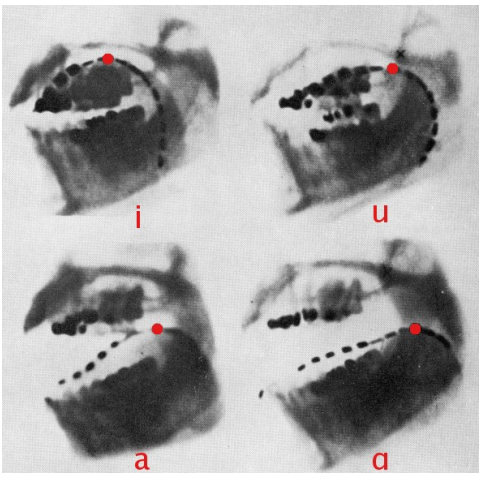
The vertical axis of the chart is mapped by vowel height. Vowels pronounced with the tongue lowered are at the bottom, and vowels pronounced with the tongue raised are at the top. For example, [ɑ] (the first vowel in *father*) is at the bottom because the tongue is lowered in this position. However, [i] (the vowel in "meet") is at the top because the sound is said with the tongue raised to the roof of the mouth.

In a similar fashion, the horizontal axis of the chart is determined by vowel backness. Vowels with the tongue moved towards the front of the mouth (such as [ɛ], the vowel in "met") are to the left in the chart, while those in which it is moved to the back (such as [ʌ], the vowel in "but") are placed to the right in the chart.



Tongue positions of cardinal front vowels with highest point indicated. The position of the highest point is used to determine vowel height and backness

In places where vowels are paired, the right represents a rounded vowel (in which the lips are rounded) while the left is its unrounded counterpart.



An X-ray film shows the sounds [i, u, a, ɑ]

Diphthongs

Diphthongs are typically specified with a non-syllabic diacritic, as in [aɪ̯]. However, sometimes a tie bar is used, especially if it is difficult to tell if the vowel is characterized by an on-glide or an off-glide: [a͡ɪ] or [o͡e].

Notes

- [a] officially represents a front vowel, but there is little distinction between front and central open vowels, and [a] is frequently used for an open central vowel.[] However, if disambiguation is required, the retraction diacritic or the centralized diacritic may be added to indicate an open central vowel, as in [a̠] or [ä].

Diacritics

Diacritics are small markings which are placed around the IPA letter in order to show a certain alteration or more specific description in the letter's pronunciation.[47] Sub-diacritics (markings normally placed below a letter) may be placed above a letter having a descender (informally called a tail), e.g. n̊, j̈.[47]

The dotless *i,* [ɪ], is used when the dot would interfere with the diacritic. Other IPA letters may appear as diacritic variants to represent phonetic detail: t^{s} (fricative release), $b^{ɦ}$ (breathy voice), ^{ʔ}a (glottal onset), [] (epenthetic schwa), o[] (diphthongization). Additional diacritics were introduced in the Extensions to the IPA, which were designed principally for speech pathology.

View the diacritic table as an image					
Syllabicity diacritics					
◌̩	ɻ̩ n̩	Syllabic	◌̯	e̯ o̯	Non-syllabic
Consonant-release diacritics					
◌ʰ	tʰ	Aspirated[a]	◌ⁿ	dⁿ	No audible release
◌ʰ	dʰ				
◌ⁿ	dⁿ	Nasal release	◌ˡ	dˡ	Lateral release
Phonation diacritics					
◌̥	n̥ d̥	Voiceless	◌̬	s̬ t̬	Voiced
◌̤	b̤ a̤	Breathy voiced[b]	◌̰	b̰ a̰	Creaky voiced
Articulation diacritics					
◌̪	t̪ d̪	Dental	◌̼	t̼ d̼	Linguolabial
◌̺	t̺ d̺	Apical	◌̻	t̻ d̻	Laminal
◌̟	u̟ t̟	Advanced	◌̠	i̠ t̠	Retracted
◌̈	ë ä	Centralized	◌̽	e̽ o̽	Mid-centralized
◌̝	e̝ ɻ̝	Raised (ɻ̝ = voiced alveolar nonsibilant fricative)			
◌̞	ɹ̞				
◌̞	e̞ β̞	Lowered (β̞ = bilabial approximant)			
◌̞	ɹ̞				
Co-articulation diacritics					
◌̹	c̹ x̹	More rounded	◌̜	c̜ x̜ʷ	Less rounded
◌ʷ	tʷ dʷ	Labialized or labio-velarized	◌ʲ	tʲ dʲ	Palatalized
◌ˠ	tˠ dˠ	Velarized	◌ˤ	tˤ aˤ	Pharyngealized
◌᷅	t᷅ d᷅	Labio-palatalized	◌̴	ɬ̴ z̴	Velarized *or* pharyngealized
◌̙	e̙ o̙	Advanced tongue root	◌̘	e̘ o̘	Retracted tongue root
◌̃	ẽ z̃	Nasalized	◌̴	ɚ̴ ɝ̴	Rhotacized

Notes

a^ With aspirated voiced consonants, the aspiration is also voiced. Many linguists prefer one of the diacritics dedicated to breathy voice.

b^ Some linguists restrict this breathy-voice diacritic to sonorants, and transcribe obstruents as $b^{ɦ}$.

The state of the glottis can be finely transcribed with diacritics. A series of alveolar plosives ranging from an open to a closed glottis phonation are:

Open glottis	[t]	voiceless
	[t̤]	breathy voice, also called *murmured*
	[t̰]	slack voice
Sweet spot	[t]	modal voice
	[t̪]	stiff voice
	[t̲]	creaky voice
Closed glottis	[ʔ͡t]	glottal closure

Suprasegmentals

These symbols describe the features of a language above the level of individual consonants and vowels, such as prosody, tone, length, and stress, which often operate on syllables, words, or phrases: that is, elements such as the intensity, pitch, and gemination of the sounds of a language, as well as the rhythm and intonation of speech.[48] Although most of these symbols indicate distinctions that are phonemic at the word level, symbols also exist for intonation on a level greater than that of the word.[48]

View this table as an image			
Length, stress, and rhythm			
ˈa	Primary stress (symbol goes before stressed syllable)	ˌa	Secondary stress (symbol goes before stressed syllable)
aː kː	Long (long vowel or geminate consonant)	aˑ	Half-long
		ă	Extra-short
a.a	Syllable break	s‿a	Linking (absence of a break)
Intonation			
ˈ	Minor (foot) break	‖	Major (intonation) break
↗ [49]	Global rise	↘ [49]	Global fall
Tone diacritics and tone letters			
ŋ̋ e̋ e˥	Extra high / top	ꜜke	Upstep
ŋ́ é e˦	High	ŋ̌ ě	Generic rise
ŋ̄ ē e˧	Mid		
ŋ̀ è e˨	Low	ŋ̂ ê	Generic fall
ŋ̏ ȅ e˩	Extra low / bottom	ꜛke	Downstep

Finer distinctions of tone may be indicated by combining the tone diacritics and letters shown here, though not many fonts support this. The primary examples are high (mid) rising ɔ◌́, ɔ˧˥; low rising ɔ◌̌, ɔ˩˧; high falling ɔ◌̂, ɔ˥˧; low (mid) falling ɔ◌̂, ɔ˧˩; peaking ɔ◌̌, ɔ˧˥˧ (etc.); and dipping ɔ◌̂, ɔ˧˩˧ (etc.). The correspondence between the diacritics and tone letters is only approximate; for example, diacritics only indicate generic peaking or dipping tones, while the tone letters can convey fine phonetic detail, with over a hundred peaking and hundred dipping tone contours that correspond to these two diacritics, or even approximately to the six rising and falling diacritics. Various combinations are used in the IPA *Handbook* despite not being found on the simplified official IPA chart. However, although it is theoretically possible to combine the three diacritics in any permutation, in practice only the six combinations given here are actually used.

A work-around for diacritics sometimes seen when a language has more than one rising or falling tone, and the author does not wish to completely abandon the IPA, is to restrict generic rising ◌ᷔ and falling ◌ᷓ for the higher-pitched of the rising and falling tones, ɔ◌᷈ and ɔ◌᷉, and to use the non-standard subscript diacritics ◌̗ and ◌̖ for the lower-pitched rising and falling tones, ɔ◌̗ and ɔ◌̖. When a language has four or six level tones, the two mid tones are sometimes transcribed as high-mid ◌̋ (non-standard) and low-mid ◌̄.

As with other IPA diacritics, such as length, aspiration, and rhoticity, the stress mark may be doubled to indicate an extra degree of stress.[50]

Obsolete and nonstandard symbols

The IPA inherited alternate symbols from various traditions, but eventually settled on one for each sound. The other symbols are now considered obsolete. An example is ◌ɷ◌ which has been standardized to ◌ʊ◌. Several letters indicating secondary articulation have been dropped altogether, with the idea that such things should be indicated with diacritics: ◌ɋ◌ for ◌zʷ◌ is one. In addition, the rare voiceless implosive series ◌ɓ ɗ ƈ ƙ ɠ◌ has been dropped; they are now written ◌ɓ̥ ɗ̥ ʄ̊ ɠ̊ ʛ̥◌ or ◌pˈ↓ tˈ↓ cˈ↓ kˈ↓ qˈ↓◌. A rejected competing proposal for transcribing clicks, ◌ǂ, ◌Ↄ, ◌ȸ◌, is still sometimes seen, as the official letters ◌ǀ, ǃ, ◌ǁ◌ may cause problems with legibility, especially when used with brackets ([ ] or / /), the letter ◌ǁ◌, or the prosodic marks ◌ǀ, ◌ǁ◌ (for this reason, some publications which use standard IPA click letters disallow IPA brackets).[51]

There are also unsupported or *ad hoc* letters from local traditions that find their way into publications that otherwise use the standard IPA. This is especially common with affricates such as the "barred lambda" ◌ƛ◌ for [t͡ɬ].

IPA extensions

The "Extensions to the IPA", often abbreviated as "extIPA", and sometimes called "Extended IPA", are symbols whose original purpose was to accurately transcribe disordered speech. At the IPA Kiel Convention in 1989, a group of linguists drew up the initial extensions,[52] which were based on the previous work of the PRDS (Phonetic Representation of Disordered Speech) Group in the early 1980s.[53] The extensions were first published in 1990, then modified, and published again in 1994 in the *Journal of the International Phonetic Association*, when they were officially adopted by the ICPLA.[54] While the original purpose was to transcribe disordered speech, linguists have used the extensions to designate a number of unique sounds within standard communication, such as hushing, gnashing teeth, and smacking lips. The extensions have also been used to record certain peculiarities in an individual's voice, such as nasalized voicing.[]

The Extensions to the IPA do not include symbols used for voice quality (VoQS), such as whispering.

Segments without letters

The remaining blank cells on the IPA chart can be filled without too much difficulty if the need arises. Some *ad hoc* letters have appeared in the literature for the retroflex lateral flap, the voiceless lateral fricatives, the epiglottal trill, and the labiodental plosives. (See the grey letters in the PDF chart.) Diacritics can supply much of the remainder, which would indeed be appropriate if the sounds were allophones.[55] If a sound cannot be transcribed, an asterisk ◌* may be used, either as a letter or as a diacritic (as in ◌k* sometimes seen for the Korean 'fortis' velar).

Consonants

Representations of consonant sounds outside of the core set are created by adding diacritics to letters with similar sound values. The Spanish bilabial and dental approximants are commonly written as lowered fricatives, [β̞] and [ð̞] respectively. Similarly, voiced lateral fricatives would be written as raised lateral approximants, [ɮ̝ ʎ̝ ʟ̝]. A few languages such as Banda have a bilabial flap as the preferred allophone of what is elsewhere a labiodental flap. It has been suggested that this be written with the labiodental flap letter and the advanced diacritic, [◌̟].[56]

Similarly, a labiodental trill would be written [ʙ̪] (bilabial trill and the dental sign), and labiodental stops [p̪ b̪] rather than with the *ad hoc* letters sometimes found in the literature. Other taps can be written as extra-short plosives or laterals, e.g. [ʃ̆ ɡ̆/ʁ̆ l̆], though in some cases the diacritic would need to be written below the letter. A retroflex trill can be written as a retracted [r̠], just as retroflex fricatives sometimes are. The remaining consonants, the uvular laterals (ʟ̠ *etc.*) and the palatal trill, while not strictly impossible, are very difficult to pronounce and are unlikely to occur even as allophones in the world's languages.

Vowels

The vowels are similarly manageable by using diacritics for raising, lowering, fronting, backing, centering, and mid-centering.[57] For example, the unrounded equivalent of [ʊ] can be transcribed as mid-centered [ɯ̽], and the rounded equivalent of [æ] as raised [ɶ̝]. True mid vowels are lowered [e̞ ø̞ ɘ̞ ɵ̞ ɤ̞ o̞], while centered [ɪ̈ ʊ̈] and [ä] are near-close and open central vowels, respectively. The only known vowels that cannot be represented in this scheme are vowels with unexpected roundedness, which would require a dedicated diacritic, such as [ʏ] and [u] (or [ɪ] and [ɯ]).

Symbol names

An IPA symbol is often distinguished from the sound it is intended to represent, since there is not necessarily a one-to-one correspondence between letter and sound in broad transcription, making articulatory descriptions such as 'mid front rounded vowel' or 'voiced velar stop' unreliable. While the *Handbook of the International Phonetic Association* states that no official names exist for its symbols, it admits the presence of one or two common names for each.[58] The symbols also have nonce names in the Unicode standard. In some cases, the Unicode names and the IPA names do not agree. For example, IPA calls ɛ "epsilon", but Unicode calls it "small letter open E".

The traditional names of the Latin and Greek letters are usually used for unmodified letters.[59] Letters which are not directly derived from these alphabets, such as [ʕ], may have a variety of names, sometimes based on the appearance of the symbol, and sometimes based on the sound that it represents. In Unicode, some of the letters of Greek origin have Latin forms for use in IPA; the others use the letters from the Greek section.

For diacritics, there are two methods of naming. For traditional diacritics, the IPA notes the name in a well known language; for example, **é** is *acute*, based on the name of the diacritic in English and French. Non-traditional diacritics are often named after objects they resemble, so **d̪** is called *bridge*.

Pullum and Ladusaw list a variety of names in use for IPA symbols, both current and retired, in addition to names of many other non-IPA phonetic symbols.[10] Their collection is extensive enough that the Unicode Consortium used it in the development of Unicode.

ASCII and keyboard transliterations

Several systems have been developed that map the IPA symbols to ASCII characters. Notable systems include Kirshenbaum, Arpabet, SAMPA, and X-SAMPA. The usage of mapping systems in on-line text has to some extent been adopted in the context input methods, allowing convenient keying of IPA characters that would be otherwise unavailable on standard keyboard layouts.

Notes

[1] "The acronym 'IPA' strictly refers [...] to the 'International Phonetic Association'. But it is now such a common practice to use the acronym also to refer to the alphabet itself (from the phrase 'International Phonetic Alphabet') that resistance seems pedantic. Context usually serves to disambiguate the two usages." (Laver 1994:561)

[2] International Phonetic Association (IPA), *Handbook*.

[4] The inverted bridge under the [t] specifies it as apical (pronounced with the tip of the tongue), and the superscript *h* shows that it is aspirated (breathy). Both these qualities cause the English to sound different from the French or Spanish , which is a laminal (pronounced with the blade

of the tongue) and unaspirated . □□ and □□ are thus two different IPA symbols for two different, though similar, sounds.

[7] International Phonetic Association, *Handbook*, pp. 194–196

[8] "Originally, the aim was to make available a set of phonetic symbols which would be given *different* articulatory values, if necessary, in different languages." (International Phonetic Association, *Handbook*, pp. 195–196)

[10] Pullum and Ladusaw, *Phonetic Symbol Guide*, pp. 152, 209

[12] International Phonetic Association, *Handbook*, p. 186

[13] "From its earliest days...the International Phonetic Association has aimed to provide 'a separate sign for each distinctive sound; that is, for each sound which, being used instead of another, in the same language, can change the meaning of a word'." (International Phonetic Association, *Handbook*, p. 27)

[14] For instance, flaps and taps are two different kinds of articulation, but since no language has (yet) been found to make a distinction between, say, an alveolar flap and an alveolar tap, the IPA does not provide such sounds with dedicated letters. Instead, it provides a single letter (in this case,) for both. Strictly speaking, this makes the IPA a partially phon*em*ic alphabet, not a purely phon*et*ic one.

[15] There are five basic tone diacritics and five basic tone letters, both sets of which are compounded for contour tones.

[16] "The non-roman letters of the International Phonetic Alphabet have been designed as far as possible to harmonize well with the roman letters. The Association does not recognize makeshift letters; It recognizes only letters which have been carefully cut so as to be in harmony with the other letters." (IPA 1949)

[17] Laver, *Principles of Phonetics*,pp. 174–175

[18] "The new letters should be suggestive of the sounds they represent, by their resemblance to the old ones." (International Phonetic Association, *Handbook*, p. 196)

[24] *IPA Handbook* (1999)

[25] For example, the English school textbooks by I. N. Vereshagina, K. A. Bondarenko and T. A. Pritykina.

[26] For example, "Le Français à la portée de tous" by K. K. Parchevsky and E. B. Roisenblit (1995) and "English Through Eye and Ear" by L.V. Bankevich (1975).

[28] *Pronunciation respelling for English* has detailed comparisons.

[30] *Principles of the International Phonetic Association,* 1949:17.

[34] "Segments can usefully be divided into two major categories, consonants and vowels." (International Phonetic Association, *Handbook*, p. 3)

[35] International Phonetic Association, *Handbook*, p. 6.

[36] Reproduced here (http://westonruter.github.com/ipa-chart/)

[37] "for presentational convenience [...] because of [their] rarity and the small number of types of sounds which are found there." (IPA *Handbook*, p 18)

[38] A chart of IPA numbers can be found on the IPA website. IPA number chart (http://www.langsci.ucl.ac.uk/ipa/IPA_Number_chart_(C)2005.pdf)

[39] Ladefoged and Maddieson, 1996, *Sounds of the World's Languages,* §2.1.

[40] Ladefoged and Maddieson, 1996, *Sounds of the World's Languages,* §9.3.

[41] p 18

[45] Amanda L. Miller *et al.*, "Differences in airstream and posterior place of articulation among Nluu lingual stops" (http://web.archive.org/web/20070609200226/http://ling.cornell.edu/plab/amanda/amiller_jipa.pdf). Submitted to the *Journal of the International Phonetic Association*. Retrieved 2007-05-27.

[46] International Phonetic Association, *Handbook*, p. 10.

[47] International Phonetic Association, *Handbook*, pp. 14–15.

[48] International Phonetic Association, *Handbook*, p. 13.

[49] The global rise and fall arrows come before the affected syllable or prosodic unit, like stress and upstep/downstep. This contrasts with the Chao tone letters, which come after.

[50] An example in French, with a single stress mark for normal prosodic stress at the end of each prosodic unit (marked as a minor prosodic break), and a double stress mark for contrastive/emphatic stress:

"" *Entrez monsieur, voilà madame.*

(Passy, 1958, *Conversation fraçaises en transcription phonétique.* 2nd ed.)

[52] "At the 1989 Kiel Convention of the IPA, a sub-group was established to draw up recommendations for the transcription of disordered speech." ("Extensions to the IPA: An ExtIPA Chart" *in* International Phonetic Association, *Handbook*, pp. 186.)

[54] "Extensions to the IPA: An ExtIPA Chart" *in* International Phonetic Association, *Handbook*, pp. 186–187.

[55] "Diacritics may also be employed to create symbols for phonemes, thus reducing the need to create new letter shapes." (International Phonetic Association, Handbook, p. 27)

[56] Olson, Kenneth S.; & Hajek, John. (1999). The phonetic status of the labial flap. *Journal of the International Phonetic Association*, *29* (2), pp. 101–114.

[57] "The diacrtics...can be used to modify the lip or tongue position implied by a vowel symbol." (International Phonetic Association, Handbook, p. 16)

[58] "...the International Phonetic Association has never officially approved a set of names..." (International Phonetic Association, *Handbook*, p. 31)

[59] For example, is called "Lower-case P" and is "Chi." (International Phonetic Association, *Handbook*, p. 171)

References

Further reading

- Ball, Martin J.; John H. Esling & B. Craig. Dickson (1995). "The VoQS system for the transcription of voice quality". *Journal of the International Phonetic Alphabet* **25** (2): 71–80. doi: 10.1017/S0025100300005181 (http://dx.doi.org/10.1017/S0025100300005181).
- Duckworth, M.; G. Allen, M.J. Ball (December 1990). "Extensions to the International Phonetic Alphabet for the transcription of atypical speech". *Clinical Linguistics and Phonetics* **4** (4): 273–280. doi: 10.3109/02699209008985489 (http://dx.doi.org/10.3109/02699209008985489).
- Hill, Kenneth C.; Pullum, Geoffrey K.; Ladusaw, William (March 1988). "Review of *Phonetic symbol guide* by G. K. Pullum & W. Ladusaw". *Language* **64** (1): 143–144. doi: 10.2307/414792 (http://dx.doi.org/10.2307/414792). JSTOR 414792 (http://www.jstor.org/stable/414792).
- International Phonetic Association (1989). "Report on the 1989 Kiel convention". *Journal of the International Phonetic Alphabet* **19** (2): 67–80.
- International Phonetic Association (1999). *Handbook of the International Phonetic Association: A guide to the use of the International Phonetic Alphabet*. Cambridge: Cambridge University Press. ISBN 0-521-65236-7 (hb); ISBN 0-521-63751-1 (pb) Check `|isbn=` value (help).
- Jones, Daniel (1988). *English pronouncing dictionary* (revised 14th ed.). London: Dent. ISBN 0-521-86230-2. OCLC 18415701 (http://www.worldcat.org/oclc/18415701).
- Ladefoged, Peter (September 1990). "The revised International Phonetic Alphabet". *Language* **66** (3): 550–552. doi: 10.2307/414611 (http://dx.doi.org/10.2307/414611). JSTOR 414611 (http://www.jstor.org/stable/414611).
- Ladefoged, Peter; Morris Hale (September 1988). "Some major features of the International Phonetic Alphabet". *Language* **64** (3): 577–582. doi: 10.2307/414533 (http://dx.doi.org/10.2307/414533). JSTOR 414533 (http://www.jstor.org/stable/414533).
- Laver, John (1994). *Principles of Phonetics*. New York: Cambridge University Press. ISBN 0-521-45031-4 (hb); ISBN 0-521-45655-X (pb) Check `|isbn=` value (help).
- Pullum, Geoffrey K.; William A. Laduslaw (1986). *Phonetic symbol guide*. Chicago: University of Chicago Press. ISBN 0-226-68532-2.
- Skinner, Edith; Timothy Monich, and Lilene Mansell (1990). *Speak with Distinction*. New York, NY: Applause Theatre Book Publishers. ISBN 1-55783-047-9.

External links

- The International Phonetic Association web site (http://www.langsci.ucl.ac.uk/ipa/)
- York University IPA Interactive Flash Charts (http://www.yorku.ca/earmstro/ipa/)
- Video recordings of the sounds of IPA (http://www.shef.ac.uk/ipa/index.php) by The University of Sheffield
- Information on IPA by Omniglot (http://www.omniglot.com/writing/ipa.htm)
- IPA Chart (http://weston.ruter.net/projects/ipa-chart/view/) in Unicode and XHTML/CSS
- IPA copy & paste charts, keyboards, etc (http://www.ipa.webstuff.org/) by IPA.Webstuff.org
- Learning the IPA for English (http://cla.calpoly.edu/~jrubba/phon/learnipa.html), (Standard American English)
- Various resources including a glossary (http://www.cambridge.org/elt/peterroach/resources.htm) by Peter Roach.

- The International Phonetic Alphabet (revised to 2005) (http://www.langsci.ucl.ac.uk/ipa/IPA_chart_(C)2005.pdf) Symbols for all languages are shown on this one-page chart
- Using IPA fonts with Mac OS X: The Comprehensive Guide (http://linguisticmystic.com/2007/03/08/using-ipa-fonts-with-mac-os-x-the-comprehensive-guide/), an article explaining how to install and use freeware fonts and keyboard layouts to type in the International Phonetic Alphabet on OS X
- Visual Thesaurus (http://www.visualthesaurus.com/howitworks/)
- IPA – Introduction (http://web.ku.edu/~cmed/ipafolder/index.html) This site was especially designed to act as an introduction to the International Phonetic Alphabet as used for English.

Education

- Interactive Saggital Section (http://www.chass.utoronto.ca/~danhall/phonetics/sammy.html)
- Phonetics: the Sounds of English and Spanish (http://www.uiowa.edu/~acadtech/phonetics/#) Note: requires Flash 7 or higher.
- IPA Charts with an interactive chart of all IPA letters with their sounds (Flash) (http://www.yorku.ca/earmstro/ipa/)

Transcription

- John Wells, 2004, "Phonetic transcription and analysis" (http://www.phon.ucl.ac.uk/home/wells/transcription-ELL.pdf), *Encyclopedia of Language and Linguistics*, 2nd ed. – types of IPA transcription, and how to choose appropriate conventions

IPA font downloads

- Charis SIL (http://scripts.sil.org/CharisSILfont), a very complete international font (Latin, Greek, Cyrillic) in roman, italic, and bold typefaces that includes tone letters and pre-composed tone diacritics on IPA vowels, the new labiodental flap, and many non-standard phonetic symbols. Based on Bitstream Charter, this font suffers from extremely bad hinting when rendered by FreeType on Linux.
- DejaVu fonts (at Sourceforge.net (http://dejavu.sourceforge.net/wiki/index.php/Download)) have full Unicode IPA support (http://dejavu.svn.sourceforge.net/viewvc/dejavu/trunk/dejavu-fonts/unicover.txt).
- Doulos SIL (http://scripts.sil.org/DoulosSILfont), a Times/Times New Roman style font. It contains the same characters as Charis SIL, but only in a single face, roman.
- Gentium (http://scripts.sil.org/FontDownloadsGentium), a professionally designed international font (Latin, Greek, Cyrillic) in roman and italic typefaces that includes the IPA, but not yet tone letters or the new labiodental flap. For bold typefaces but only the most basic IPA letters, Gentium Basic may be used.
- TIPA (http://tug.ctan.org/cgi-bin/ctanPackageInformation.py?id=tipa), a font and system for entering IPA phonetic transcriptions in LaTeX documents.

Keyboard input

- Extended IPA keyboard layout for Microsoft Windows (https://sites.google.com/site/themistocleous/ipa-keyboard-layout/): for Unicode IPA input
- Complete Guide (http://ipa4linguists.pbwiki.com/): Beginners' guide to using IPA on Windows, Mac OS and Linux, covering many office applications and browsers
- Downloadable IPA keyboard layout for Microsoft Windows (http://www.rejc2.co.uk/ipakeyboard/) for Unicode IPA input
- Downloadable IPA-SIL keyboard layout for Mac OS X (http://scripts.sil.org/cms/scripts/page.php?site_id=nrsi&item_id=ipa-sil_keyboard) for Unicode IPA input
- IPA Character Picker (http://rishida.net/scripts/pickers/ipa/) Web-based input method

- IPAPalette (https://github.com/K8TIY/IPAPalette) is the Mac OS X input method on which IPACharMap is based.
- IPACharMap (scroll down to see it) (http://www.davidmontero.net/Linguistics.php) is an on-screen keyboard for point and click character entry, which can then be copied and pasted into a Unicode-aware word processor. Based on IPA Palette.
- IPATotal keyboard (http://keymankeyboards.com/?id=454) – This free UNICODE based keyboard encodes the whole character and diacritics charts of the International Phonetic Alphabet (IPA), designed to represent all the sounds of speech in any language.
- IPA Writer (http://ipatrainer.com/user/ipawriter/): The IPA Writer. Online tool to write IPA.
- Microsoft Template (http://www.jamesabela.co.uk/beginner/IPA.htm) – Creates a Toolbar for Microsoft Word. (This uses macros)
- Online keyboard (http://www.linguiste.org/phonetics/ipa/chart/keyboard/)Wikipedia:Link rot
- IPAEdit (http://www.uni-marburg.de/fb09/dsa/mitarbeiter/lueders/applications) Unicode-compliant Transcription Editor for Linux, Mac OS X and Windows from the University of Marburg
- PhonPad (http://www.lfsag.unito.it/ipa/editor_en.html) online IPA editor.
- Lenz (http://ssadowsky.hostei.com/lenz.html) Windows program that allows typing IPA symbols directly into other programs.
- Online Smart IPA Keyboard (http://www.i2speak.com) quickly type IPA phonetics without memorizing symbol codes
- IPANow! - Automatic Foreign Language IPA Transcription (http://www.ipanow.com) : IPANow! is shareware that automatically creates phonetic transcriptions of texts in Latin, Italian, German, and French.
- PhoTransEdit - English Phonetic Transcription Editor (http://www.photransedit.com) : PhoTransEdit is an on-line and off-line application created to make typing phonetic transcriptions easier. It includes automatic phonemic transcription (in RP and General American) of English texts and an IPA phonetic keyboard to edit them. The transcription can be pasted into other editors (e.g. Microsoft Word) or exported to use it in HTML pages.

Sound files

- IPA Chart (http://www.phonetics.ucla.edu/course/chapter1/chapter1.html) with linked AIFF sound files for Peter Ladefoged's **Course in Phonetics**.
  - Supplementary material (http://www.phonetics.ucla.edu/course/contents.html) for **A Course in Phonetics (5th Edition)**. Includes IPA Chart with linked AIFF sound files, sample transcriptions with embedded Quicktime videos, and exercises.
  - Vowels and Consonants (http://www.phonetics.ucla.edu/vowels/contents.html). Supplementary material for **Course in Phonetics (2nd Edition)**, including IPA Chart and sample word lists, both with linked AIFF sound files.
- Complete IPA charts (http://www.yorku.ca/earmstro/ipa/) with sound samples for consonants and vowels, including English diphthongs (requires Adobe Flash).
- IPA chart (http://web.uvic.ca/ling/resources/ipa/ipa-lab.htm) with MP3 sound files for all IPA letters on the chart (limited version is available to anyone)

Unicode charts

- International Phonetic Alphabet in Unicode (http://www.phon.ucl.ac.uk/home/wells/ipa-unicode.htm)
- Unicode chart for main IPA letters (http://www.unicode.org/charts/PDF/U0250.pdf) PDF (246.8 KB)
- Unicode chart for IPA modifier letters (http://www.unicode.org/charts/PDF/U02B0.pdf) PDF (203 KB)
- Unicode chart including IPA diacritics (http://www.unicode.org/charts/PDF/U0300.pdf) PDF (231.2 KB)
- IPA with Unicode superimposed (http://www.staff.uni-marburg.de/~luedersb/IPA_CHART2005-UNICODE.pdf) PDF (1.6 MB) from the University of Marburg
- MySQL Unicode collation chart for IPA and other phonetic blocks (http://www.collation-charts.org/mysql60/mysql604.utf8_unicode_ci.phonetic.html)
- Unicode-HTML codes for IPA symbols: (http://tlt.its.psu.edu/suggestions/international/bylanguage/ipachart.html) Tables of symbol names, character entity references and/or numeric character references at Penn State.

Phonetic transcription

WARNING: Article could not be rendered - ouputting plain text.
Potential causes of the problem are: (a) a bug in the pdf-writer software (b) problematic Mediawiki markup (c) table is too wide

Phonetic transcription (or phonetic notation) is the visual representation of speech sounds (or Phone (phonetics)phones). The most common type of phonetic transcription uses a phonetic alphabet, e.g., the International Phonetic Alphabet.Phonetic transcription versus orthography The pronunciation of words in many languages, as distinct from their written form (orthography), has undergone significant change over time. Pronunciation can also vary greatly among dialects of a language. Traditional orthography in some languages, particularly French languageFrench and English languageEnglish, often differs from the pronunciation. For example, the words "bough" and "trough" do not rhyme in English, even though their spellings might suggest they do. As well, each contains a Silent lettersilent 'g', and "trough" contains an invisible 'f'. An example from French is the 's' at the end of words, which is usually silent ("militaire" is pronounced the same as "militaires") unless followed by a word beginning in a vowel. In the orthography of most European languages, the fact that many letters are pronounced or silent depending on contexts causes difficulties in determining the appropriate pronunciation, especially in the cases of English, Irish languageIrish, and French. However, in other languages, such as Spanish languageSpanish and Italian languageItalian, there is a more consistent—though still imperfect—relationship between orthography and pronunciation. Therefore, phonetic transcription can provide a function that orthography cannot. It displays a one-to-one relationship between symbols and phonemesounds, unlike traditional writing systems. Phonetic transcription allows us to step outside of orthography and examine differences in pronunciation between dialects within a given language, as well as to identify changes in pronunciation that may take place over time. Narrow versus broad transcription Phonetic transcription may aim to transcribe the phonology of a language, or it may wish to go further and specify the precise phonetic realisation. In all systems of transcription we may therefore distinguish between broad transcription and narrow transcription. Broad transcription indicates only the more noticeable phonetic features of an utterance, whereas narrow transcription encodes more information about the phonetic variations of the specific allophones in the utterance. The difference between broad and narrow is a continuum. One particular form of a broad transcription is a phonemic transcription, which disregards all allophonic difference, and, as the name implies, is not really a phonetic transcription at all, but a representation of phonemic structure.For example, one particular pronunciation of the English word little may be transcribed using the IPA as /ˈlɪtəl/ or [ˈlɪɾɬ];

the broad, phonemic transcription, placed between slashes, indicates merely that the word ends with phoneme /l/, but the narrow, allophonic transcription, placed between square brackets, indicates that this final /l/ ([ɬ]) is Velarized alveolar lateral approximantdark (velarized).The advantage of the narrow transcription is that it can help learners to get exactly the right sound, and allows linguists to make detailed analyses of language variation. The disadvantage is that a narrow transcription is rarely representative of all speakers of a language. Most Americans and Australians would pronounce the /t/ of little as a Flap consonanttap [ɾ]. Some people in southern England would say /t/ as [ʔ] (a glottal stop) and/or the second /l/ as [w] or something similar. A further disadvantage in less technical contexts is that narrow transcription involves a larger number of symbols that may be unfamiliar to non-specialists.The advantage of the broad transcription is that it usually allows statements to be made which apply across a more diverse language community. It is thus more appropriate for the pronunciation data in foreign language dictionaries, which may discuss phonetic details in the preface but rarely give them for each entry. A rule of thumb in many linguistics contexts is therefore to use a narrow transcription when it is necessary for the point being made, but a broad transcription whenever possible. Types of notational systems Most phonetic transcription is based on the assumption that linguistic sounds are segmentable into discrete units that can be represented by symbols. AlphabeticIPA The International Phonetic Alphabet (IPA) is one of the most popular and well-known phonetic alphabets. It was originally created by primarily British language teachers, with later efforts from European phoneticians and linguists. It has changed from its earlier intention as a tool of foreign language pedagogy to a practical alphabet of linguists. It is currently becoming the most often seen alphabet in the field of phonetics. Most American dictionaries for native English-speakers—American Heritage Dictionary of the English Language, Random House Dictionary of the English Language, Webster's Third New International Dictionary—employ respelling systems based on the English alphabet, with diacritical marks over the vowels and stress marks.Landau, Sidney (2001) Dictionaries: The Art and Craft of Lexicography, 2nd ed., p 118. Cambridge University Press. ISBN 0-521-78512-X. (See for a generic version.)Another commonly encountered alphabetic tradition was originally created for the transcription of Native American languagesNative American and European languages, and is still commonly used by linguists of Slavic languagesSlavic, Languages of IndiaIndic, Uralic languagesUralic, Semitic, and Caucasian languagesCaucasian languages. This is sometimes labeled the Americanist phonetic notationAmericanist phonetic alphabet, but this is misleading because it has always been widely used for languages outside the Americas. The difference between these alphabets and IPA is small, although often the specially created characters of the IPA are often abandoned in favour of already existing characters with diacritics (e.g. many characters are borrowed from Eastern European orthographies) or Digraph (orthography)digraphs. There are also extended versions of the IPA, for example: extIPA, VoQs, and Luciano Canepari's canIPA. Aspects of alphabetic transcription Other alphabets, such as Hangul, may have their own phonetic extensions. There also exist featural phonetic transcription systems, such as Alexander Melville Bell's Visible Speech and its derivatives. The International Phonetic Association recommends that a phoneticsphonetic transcription should be enclosed in bracketsquare brackets "[ ]". A transcription that specifically denotes only phonologyphonological contrasts may be enclosed in slash (punctuation)slashes "/ /" instead. If one is in doubt, it is best to use brackets, for by setting off a transcription with slashes one makes a theoretical claim that every symbol within is phonemephonemically contrastive for the language being transcribed. Phonetic transcriptions try to objectively capture the actual pronunciation of a word, whereas phonemic transcriptions are model-dependent. For example, in The Sound Pattern of English, Noam Chomsky and Morris Halle transcribed the English word night phonemically as /nixt/. In this model, the phoneme /x/ is never realized as [x], but shows its presence by "lengthening" the preceding vowel. The preceding vowel in this case is the phoneme /i/, which is pronounced [aɪ] when "long". So phonemic /nixt/ is equivalent to phonetic [naɪt], but underlying this analysis is the belief that historical sounds such as the gh in night may remain in a word long after they have ceased to be pronounced, or that a phoneme may exist in a language without ever being directly expressed. (This was later rejected by both Chomsky and Halle.)[citation needed]For phonetic transcriptions, there is flexibility in how closely sounds may be transcribed. A transcription that gives only a basic idea of the sounds of a language in the broadest terms is called a broad transcription; in some cases this may

be equivalent to a phonemic transcription (only without any theoretical claims). A close transcription, indicating precise details of the sounds, is called a narrow transcription. These are not binary choices, but the ends of a continuum, with many possibilities in between. All are enclosed in brackets.For example, in some dialects the English word pretzel in a narrow transcription would be [ˈpʰɻʷɛʔt.sɬ], which notes several phonetic features that may not be evident even to a native speaker. An example of a broad transcription is [ˈpʰɹɛt.sɬ], which only indicates some of the easier to hear features. A yet broader transcription would be [ˈpɹɛt.sl]. Here every symbol represents an unambiguous speech sound, but without going into any unnecessary detail. None of these transcriptions make any claims about the phonemic status of the sounds. Instead, they represent certain ways in which it is possible to produce the sounds that make up the word.There are also several possibilities in how to transcribe this word phonemically, but here the differences are generally not of precision, but of analysis. For example, pretzel could be /ˈprɛt.sl̩/ or /ˈpret.səl/. The special symbol for English r is not used, for it is not meaningful to distinguish it from a rolled r. The differences in the letter e reflect claims as to what the essential difference is between the vowels of pretzel and pray; there are half a dozen ideas in the literature as to what this may be. The second transcription claims that there are two vowels in the word, even if they can't both be heard, while the first claims there is only one.However, phonemic transcriptions may also be broad or narrow, or perhaps it would be better to say abstract vs. concrete. They may show a fair amount of phonetic detail, usually of a phoneme's most common allophone, but because they are abstract symbols they do not need to resemble any sound at all directly. Phonemic symbols will frequently be chosen to avoid diacritics as much as possible, under a 'one sound one symbol' policy, or may even be restricted to the ASCII symbols of a typical keyboard. For example, the English word church may be transcribed as /ʧɝːʧ/, a close approximation of its actual pronunciation, or more abstractly as /crc/, which is easier to type. Phonemic symbols should always be explained, especially when they are as divergent from actual pronunciation as /crc/.Occasionally a transcription will be enclosed in vertical barpipes ("| |"). This goes beyond phonology into morphology (linguistics)morphological analysis. For example, the words pets and beds could be transcribed phonetically as [pʰɛʔts] and [b̥ɛdz] (in a fairly narrow transcription), and phonemically as /pets/ and /bedz/. Because /s/ and /z/ are separate phonemes in English, they receive separate symbols in the phonemic analysis. However, you probably recognize that underneath this, they represent the same plural ending. This can be indicated with the pipe notation. If you believe the plural ending is essentially an s, as English spelling would suggest, the words can be transcribed |pets| and |beds|. If, as most linguists would probably suggest, it is essentially a z, these would be |petz| and |bedz|.To avoid confusion with IPA symbols, it may be desirable to specify when native orthography is being used, so that, for example, the English word jet is not read as "yet". This is done with Bracketangle brackets or chevrons: ⟨jet⟩. It is also common to italicize such words, but the chevrons indicate specifically that they are in the original language's orthography, and not in English transliteration.IconicVisible Speech In iconic phonetic notation, the shapes of the phonetic characters are designed so that they visually represent the position of articulators in the vocal tract. This is unlike alphabetic notation, where the correspondence between character shape and articulator position is arbitrary. This notation is potentially more flexible than alphabetic notation in showing more shades of pronunciation (MacMahon 1996:838–841). An example of iconic phonetic notation is the Visible Speech system, created by Scottish phonetician, Alexander Melville Bell (Ellis 1869:15).Analphabetic Another type of phonetic notation that is more precise than alphabetic notation is analphabetic phonetic notation. Instead of both the alphabetic and iconic notational types' general principle of using one symbol per sound, analphabetic notation uses long sequences of symbols to precisely describe the component features of an articulatory gesture (MacMahon 1996:842–844). This type of notation is reminiscent of the notation used in chemical formulas to denote the composition of chemical compounds. Although more descriptive than alphabetic notation, analphabetic notation is less practical for many purposes (e.g. for descriptive linguists doing fieldwork or for speech pathologists impressionistically transcribing speech disorders). As a result, this type of notation is uncommon.Two examples of this type were developed by the Danish Otto Jespersen (1889) and American Kenneth Pike (1943). Pike's system, which is part of a larger goal of scientific description of phonetics, is particularly interesting in its challenge against the descriptive method of the phoneticians who created alphabetic systems like the IPA. An example of Pike's

system can be demonstrated by the following. A syllablesyllabic voiced consonantvoiced alveolar nasal consonant (/ṇ/ in IPA) is notated as MaIlDeCVoeIpvnnAPpaatdtltnransnsfSpvavdtlvtnransssfTpgagdtlwvtitvransnsfSrpFSsIn Pike's notation there are 5 main components (which are indicated using the example above): M - manner of production (i.e., MaIlDe)C - manner of controlling (i.e., CVoeIpvnn) description of stricture (i.e., what APpaatdtltnransnsfSpvavdtlvtnransssfTpgagdtlwvtitvransnsf)S - segment type (i.e., Srp)F - phonetic function (i.e., FSs)The components of the notational hierarchy of this consonant are explained below: M = productive mechanism a = air-stream mechanism I = initiator l = for lung air D = direction of the air stream e = egressive C = controlling mechanism V = valvate stricture o = oral stricture e = subvalvate esophageal stricture I = degree of air-stream interruption p = partial (continuants) v = nonfrictional n = nasal n = resonant nasal (Rank of stricture) A = acme P = primary (Features of stricture)p = point of articulation a = alveolar a = articulator t = tongue tip d = degree of articulation t = in time l = long t = type of articulation n = normal r = relative strength a = of articulating movement n = normal s = of acoustic impression n = normal s = shape of articulator f = flat (Rank of stricture)S = segmental type r = real p = perceptual F = function phonetically S = of the segment in the syllable s = syllabic contoid S = secondary (Features of stricture)p = point of articulation v = velic a = articulator v = velic d = degree of articulation t = in time l = long v = with cavity friction t = type of articulation n = normal r = relative strength a = of articulating movement n = normal s = of acoustic impression s = soft s = shape of articulator f = flat (Rank of stricture) T = tertiary (Features of stricture)p = point of articulation g = glottal a = articulator g = vocal folds d = degree of articulation t = in time l = long w = wide v = with cavity friction t = type of articulation i = iterative t = trill v = vibratory trill r = relative strength a = of articulating movement n = normal s = of acoustic impression n = normal s = shape of articulator f = flat Bibliography Albright, Robert W. (1958). The International Phonetic Alphabet: Its Background and Development. International Journal of American Linguistics (Vol. 24, No. 1, Part 3); Indiana University Research Center in Anthropology, Folklore, and Linguistics, publ. 7. Baltimore. (Doctoral dissertation, Stanford University, 1953). Canepari, Luciano. (2005). A Handbook of Phonetics: ⟨Natural⟩ Phonetics. München: Lincom Europa, pp. 518. ISBN 3-89586-480-3 (hb). Ellis, Alexander J. (1869–1889). On Early English Pronunciation (Parts 1 & 5). London: Philological Society by Asher & Co.; London: Trübner & Co. International Phonetic Association. (1949). The Principles of the International Phonetic Association, Being a Description of the International Phonetic Alphabet and the Manner of Using It, Illustrated by Texts in 51 Languages. London: University College, Department of Phonetics. International Phonetic Association. (1999). Handbook of the International Phonetic Association: A Guide to the Use of the International Phonetic Alphabet. Cambridge: Cambridge University Press. ISBN 0-521-65236-7 (hb); ISBN 0-521-63751-1 (pb). Jespersen, Otto. (1889). The Articulations of Speech Sounds Represented by Means of Analphabetic Symbols. Marburg: Elwert. Kelly, John. (1981). The 1847 Alphabet: An Episode of Phonotypy. In R. E. Asher & E. J. A. Henderson (Eds.), Towards a History of Phonetics. Edinburgh: Edinburgh University Press. Kemp, J. Alan. (1994). Phonetic Transcription: History. In R. E. Asher & J. M. Y. Simpson (Eds.), The Encyclopedia of Language and Linguistics (Vol. 6, pp. 3040–3051). Oxford: Pergamon. MacMahon, Michael K. C. (1996). Phonetic Notation. In P. T. Daniels & W. Bright (Ed.), The World's Writing Systems (pp. 821–846). New York: Oxford University Press. ISBN 0-19-507993-0. Pike, Kenneth L. (1943). Phonetics: A Critical Analysis of Phonetic Theory and a Technique for the Practical Description of Sounds. Ann Arbor: University of Michigan Press. Pullum, Geoffrey K.; & Ladusaw, William A. (1986). Phonetic Symbol Guide. Chicago: University of Chicago Press. ISBN 0-226-68532-2. Sweet, Henry. (1880–1881). Sound Notation. Transactions of the Philological Society, 177-235. Sweet, Henry. (1971). The Indispensable Foundation: A Selection from the Writings of Henry Sweet. Henderson, Eugénie J. A. (Ed.). Language and Language Learning 28. London: Oxford University Press.ReferencesExternal links Official home page of the IPA canIPA Natural Phonetics : Luciano Canepari's extended version of IPA (500 basic, 300 complementary, and 200 supplementary symbols), with a lot of downloadable PDF's Roman Phonetic Transcription of English dead link PhoTransEdit - English Phonetic Transcription Editor : PhoTransEdit is a free tool created to make typing phonetic transcriptions easier. It includes automatic phonemic transcription (in RP and General American) of English texts and a phonetic keyboard to edit them. The transcription can be pasted into other editors (e.g. Microsoft Word) or exported to use it in HTML pages.

IPANow! - Automatic Foreign Language IPA Transcription : IPANow! is shareware that automatically creates phonetic transcriptions of texts in Latin, Italian, German, and French.

Phonemic orthography

A **phonemic orthography** is an orthography (system for writing a language) in which the graphemes (written symbols) correspond to the phonemes (significant spoken sounds) of the language. Languages rarely have perfectly phonemic orthographies; a high degree of grapheme-phoneme correspondence can be expected in orthographies based on alphabetic writing systems, but these orthographies differ in the degree to which they are in fact fully phonemic. English orthography, for example, though alphabetic, is highly non-phonemic.

In less formal terms, a language with a highly phonemic orthography may be described as having **regular spelling**. Another terminology is that of deep and shallow orthographies, where the depth of an orthography is the degree to which it diverges from being truly phonemic (this concept can also be applied to non-alphabetic writing systems like syllabaries).

Ideal phonemic orthography

In an ideal phonemic orthography, there would be a complete one-to-one correspondence (bijection) between the graphemes (letters) and the phonemes of the language, and each phoneme would invariably be represented by its corresponding grapheme. This would mean that the spelling of a word would unambiguously and transparently indicate its pronunciation; and conversely that a speaker knowing the pronunciation of a word would be able to infer its spelling without any doubt. This ideal situation is rarely if ever achieved in practice – it seems that nearly all alphabetic orthographies deviate from it to some degree or other.[1]

Note that there are effectively two different types of deviation from this phonemic ideal. In the first case, the exact one-to-one correspondence may be lost (for example, some phoneme may be represented by a digraph instead of a single letter), but the "regularity" is retained, in that there is still an algorithm (though a more complex one) for predicting the spelling from the pronunciation and vice versa. In the second case true irregularity is introduced, as certain words come to be spelled according to different rules than others, and prediction is no longer possible without knowledge about the orthography of individual words. Common cases of both of these types of deviation from the ideal are discussed in the following section.

Deviations from phonemic orthography

Some ways in which orthographies may deviate from the ideal of one-to-one grapheme-phoneme correspondence are listed below. The first list contains deviations that tend only to make the relation between spelling and pronunciation more complex, without affecting its predictability (see above paragraph).

- A phoneme may be represented by a sequence of letters – called a multigraph – rather than by a single letter (as in the case of the digraph *ch* in English and French, and the trigraph *sch* in German). (This only retains predictability if the multigraph cannot be broken down into smaller units, for example some languages require diacritics to distinguish between "sch" and "s" + "ch"; cf e.g. *fathead* in English.) This is often due to the use of an alphabet that was originally used for a different language (the Latin alphabet in these examples) and thus does not have single letters available for all phonemes in the language currently being written (although some orthographies use devices such as diacritics to increase the number of available letters).

- Sometimes, conversely, a single letter may represent a sequence of more than one phoneme (as *x* can represent the sequence /ks/ in English and other languages).
- Sometimes the rules of correspondence are more complex and depend on adjacent letters, often as a result of historical sound changes (as with the rules for the pronunciation of *c* and *ci* in Italian, and the silent *e* in English).

An orthography mainly affected only by the above types of deviation, with only minor instances of other types of deviation, may still be described as *phonemic*, or *regular*, since pronunciation and spelling still correspond in a predictable way. However the deviations listed below are more "serious", as they reduce this predictability (in at least one direction), thus introducing irregularity.

- Sometimes different letters correspond to the same phoneme (as *u* and *ó* in Polish are both pronounced as the phoneme /u/). This is often for historical reasons (these Polish letters originally stood for different phonemes, which merged later). This affects the predictability of spelling from pronunciation, though not necessarily vice versa. Another example is found in modern Greek, where the phoneme /i/ can be written in six different ways: ι, η, υ, ει, οι and υι.
- Conversely, a letter or group of letters can correspond to different phonemes in different contexts (as *th* does in English; originally this stood for a single phoneme, which then split).
- Spelling may otherwise represent a historical pronunciation; orthography does not necessarily keep up with sound changes in the spoken language.
- Spelling may represent the pronunciation of a different dialect from the one being considered. Orthographies tend to reflect a standard variety of the language; however for an international language with wide variations in its dialects, such as English, it would be impossible to represent even the major varieties of the language with a single phonemic orthography.
- Spellings of loanwords often adhere to, or are influenced by, the orthography of the source language (as with the English words *ballet* and *fajita*, from French and Spanish respectively, and with the Thai word เบียร์ "beer", which includes a letter for the final consonant "r" which appears in the English word it was borrowed from, even though this letter is not pronounced). With some loanwords, though, regularity is retained – either by nativizing the pronunciation to match the spelling (as with the Russian word шофёр, from French *chauffeur*, but pronounced [ʂɐˈfʲor] in accordance with the normal rules of Russian vowel reduction; see also spelling pronunciation), or by nativizing the spelling (for example, *football* is spelt *fútbol* in Spanish and *futebol* in Portuguese).
- Spelling may reflect false etymology (as in the English words *hiccough*, *island*, so spelt because of an imagined connection with the words *cough* and *isle*), or distant etymology (as in the English word *debt*, where the *b* was added under the influence of Latin).
- Spelling may reflect morphophonemic structure rather than the purely phonemic (see next section), although this is often also a reflection of historical pronunciation.

Most orthographies do not reflect the changes in pronunciation known as sandhi, where pronunciation is affected by adjacent sounds in neighboring words (however written Sanskrit and other Indian languages do reflect such changes). A language may also use different sets of symbols or different rules for distinct sets of vocabulary items, such as the Japanese hiragana and katakana syllabaries (and the different treatment in English orthography of words derived from Latin and Greek).

Morphophonemic features

Alphabetic orthographies often have features that are morphophonemic rather than purely phonemic. This means that the spelling reflects to some extent the underlying morphological structure of the words, not only their pronunciation. Hence different forms of a morpheme (minimum meaningful unit of language) are often spelt identically or similarly in spite of differences in their pronunciation. This is often for historical reasons; the morphophonemic spelling reflects a previous pronunciation from before historical sound changes that caused the variation in pronunciation of a given morpheme. Such spellings can assist in the recognition of words when reading.

Some examples of morphophonemic features in orthography are described below.

- The English plural morpheme is written *-s* regardless of whether it is pronounced as /s/ or /z/; it is *cat**s*** and *dog**s***, not *dog**z***. This is because the [s] and [z] sounds are forms of the same underlying morphophoneme, automatically pronounced differently depending on its environment. (However when this morpheme takes the form /ɪz/, the addition of the vowel *is* reflected in the spelling: *church**es***, *mass**es***.)
- Similarly the English past tense morpheme is written *-ed* regardless of whether it is pronounced as /d/, /t/ or /ɪd/.
- Many English words retain spellings that reflect their etymology and morphology rather than their present-day pronunciation. For example, *sign* and *signature* include the spelling <sign>, which means the same, but is pronounced differently, in the two words. Other examples are "***sci**ence* /saɪ/ vs. *uncon**sci**ous* /ʃ/, ***pre**judice* /prɛ/ vs. ***pre**quel* /priː/, ***na**tion* /neɪ/ vs. ***na**tionalism* /næ/, and ***spec**ial* /spɛ/ vs. ***spec**ies* /spiːs/.
- Phonological assimilation is often not reflected in spelling, even in otherwise phonemic orthographies such as Spanish, where *obtener* "obtain" and *optimista* "optimist" are written with *b* and *p* respectively, even though both are pronounced /p/ by assimilation with the following /t/. On the other hand, Serbo-Croatian (Serbian, Croatian and Bosnian) spelling reflects assimilation, thus one writes *Ср**б**ија/Sr**b**ija* "Serbia" but *ср**н**ски/sr**p**ski* "Serbian".
- The final-obstruent devoicing that occurs in many languages (such as German, Polish, Russian and Welsh) is not normally reflected in the spelling. For example, in German, *Bad* "bath" is spelt with a final *d*, even though it is pronounced /t/, thus corresponding to other morphologically related forms such as the verb *baden*, where the *d* is pronounced /d/. (Compare *Rat*, *raten*, where the *t* is pronounced /t/ in both positions.) Turkish orthography, however, is more strictly phonemic: for example, the imperative of *eder* "does" is spelled *et*, as it is pronounced (and the same as the word for "meat"), not **ed* as it would be if the German approach were followed.

Korean *hangul* has changed over the centuries from a highly phonemic to a largely morpho-phonemic orthography, and there are moves in Turkey to make that script more morphophonemic as well.[*citation needed*] Japanese kana are almost completely phonemic, but have a few morphophonemic aspects, notably in the use of ぢ *di* and づ *du* (rather than じ *ji* and ず *zu*, their pronunciation in standard Tokyo dialect), when the character is a voicing of an underlying ち or つ – see rendaku. The Russian orthography is also mostly morphophonemic (does not reflect vowel reduction, consonant assimilation, final-obstruent devoicing; some consonant coombinatioons have silent consonants).

Defective orthographies

A defective orthography is one that is not capable of representing all the phonemes or phonemic distinctions in a language. An example of such a deficiency in English orthography is the lack of distinction between the voiced and voiceless "th" phonemes, occurring in words like *then* and *thin* respectively (both have to be written *th*). More systematic deficiency is found in orthographies based on abjadic writing systems like the Arabic and Hebrew scripts, which do not normally represent the short vowels (although methods are available for doing so in special situations).

Comparison between languages

Orthographies with a high grapheme-to-phoneme correspondence (excluding exceptions due to loan words and assimilation) include those of Finnish, Albanian, Georgian, Turkish (apart from *ğ* and various palatal and vowel allophones), Serbo-Croatian (Serbian, Croatian and Bosnian), Bulgarian, Macedonian (if the apostrophe is counted, though slight inconsistencies may be found), Eastern Armenian (apart from *o, v*), Basque (apart from palatalized *l, n*), Haitian Creole, Castilian Spanish (apart from *h, x, b/v,* and sometimes *k, c, g, j, z*), Czech (apart from *ě, ů, y, ý*), Polish (apart from *ó, h, rz*), Romanian (apart from distinguishing semivowels from vowels), Ukrainian (mainly phonemic with some other historical/morphological rules, as well as palatalization), Belarusian (phonemic for vowels but morphophonemic for consonants except *ў* written phonetically), Swahili (missing aspirated consonants, which do not occur in all varieties and are sparsely used anyways), Mongolian (apart from letters representing multiple sounds depending on front or back vowels, the soft and hard sign, silent letters to indicate /ŋ/ from /n/ and

voiced versus voiceless consonants) Azerbaijani (apart from *k*), and Kazakh (apart from *u, y, x, щ, ю*).

Many languages of India written in Brahmic scripts, such as Hindi (apart from schwa and nasal vowels) and Marathi,[*citation needed*], but not Bengali and Gujarati, have phonemic orthographies.

Languages with highly phonemic orthographies often lack a word corresponding to the verb "to spell", or rarely use such a term, because the act of spelling out words is rarely needed (careful pronunciation of a word is generally sufficient to convey its spelling).

Some phonemic orthographies are slightly defective: Malay, Italian, Lithuanian, and Welsh do not fully distinguish their vowels, Serbian and Croatian do not distinguish tone and vowel length, Somali does not distinguish vowel phonation, etc.

French, with its silent letters and its heavy use of nasal vowels and elision, may seem to lack much correspondence between spelling and pronunciation, but its rules on pronunciation, though complex, are consistent and predictable with a fair degree of accuracy. The actual letter-to-phoneme correspondence, however, is often low and a sequence of sounds may have multiple ways of spelling it.

Orthographies such as those of German, Hungarian (mainly phonemic with "ly, j" representing the same sound, but consonant and vowel length are not always accurate and various spellings reflect etymology, not pronunciation), Portuguese, and that of the modern Greek language (written with the Greek alphabet), as well as Korean hangul, are sometimes considered to be of intermediate depth (for example they include many morphophonemic features, as described above).

English orthography is highly non-phonemic. It would in any case be hard to construct an orthography that reflected all of the main dialects of English, because of differences in phonological systems (such as between standard British and American English, and between these and Australian English with its bad–lad split). The irregularity of English spelling is partly because the Great Vowel Shift occurred after the orthography was established, and because English has acquired a large number of loanwords at different times, retaining their original spelling at varying levels. However even English has general, albeit complex, rules that predict pronunciation from spelling, and these rules are successful most of the time; rules to predict spelling from the pronunciation have a higher failure rate.

Most constructed languages such as Esperanto and Lojban have mostly phonemic orthographies.

The syllabary systems of Japanese (hiragana and katakana) are examples of almost perfectly shallow orthography – exceptions include the use ぢ and づ (discussed above) and the use of は, を, and へ to represent the sounds わ, お, and え, as relics of historical kana usage.

Realignment of orthography

With time, pronunciations change and spellings become out of date, as has happened to English and French. In order to maintain a phonemic orthography such a system would need periodic updating, as has been attempted by various language regulators and proposed by other spelling reformers.

Sometimes the pronunciation of a word changes to match its spelling; this is called a spelling pronunciation. This is most common with loanwords, but occasionally occurs in the case of established native words too. In some English personal names and place names, the relationship between the spelling of the name and the pronunciation is so distant that associations among phonemes and graphemes cannot be readily identified. Moreover, in many other words, the pronunciation has subsequently evolved from a fixed spelling, so that it has to be said that the phonemes represent the graphemes rather than vice versa. And in much technical jargon, the primary medium of communication is the written language rather than the spoken language, so the phonemes represent the graphemes, and it is unimportant how the word is pronounced. The sounds which literate people perceive being heard in a word are largely influenced by the actual spelling of the word.[2]

Sometimes, countries have the written language undergo a spelling reform to realign the writing with the contemporary spoken language. These can range from simple spelling changes and word forms to switching the

entire writing system itself, as when Turkey switched from the Arabic alphabet to a Turkish alphabet of Latin origin.

Phonetic transcription

Methods for phonetic transcription such as the International Phonetic Alphabet (IPA) aim to describe pronunciation in a standard form. They are often used to solve ambiguities in the spelling of written language. They may also be used to write languages with no previous written form. Systems like IPA can be used for phonemic representation or for showing more detailed phonetic information (see Narrow vs. broad transcription).

Phonemic orthographies are different from phonetic transcription; whereas in a phonemic orthography, allophones will usually be represented by the same grapheme, a purely phonetic script would demand that phonetically distinct allophones be distinguished. To take an example from American English: the /t/ sound in the words "table" and "cat" would, in a phonemic orthography, be written with the same character; however, a strictly phonetic script would make a distinction between the aspirated "t" in "table", the flap in "butter", the unaspirated "t" in "stop" and the glottalized "t" in "cat" (not all these allophones exist in all English dialects). In other words, the sound that most English speakers think of as /t/ is really a group of sounds, all pronounced slightly differently depending on where they occur in a word. A perfect phonemic orthography has one letter per group of sounds (phoneme), with different letters only where the sounds distinguish words (so "bed" is spelled differently from "bet").

A narrow phonetic transcription represents phones, the atomic sounds humans are capable of producing, many of which will often be grouped together as a single phoneme in any given natural language, though the groupings vary across languages. English, for example, does not distinguish between aspirated and unaspirated consonants, but other languages, like Bengali and Hindi, do.

The sounds of speech of all languages of the world can be written by a rather small universal phonetic alphabet. A standard for this is the International Phonetic Alphabet.

References

[1] *The Graphical Basis of Phones and Phonemes* (https://www.cs.indiana.edu/~port/pap/TheGraphicalBasis.SGLSP.pdf), Robert F. Port, Indiana University, 2005

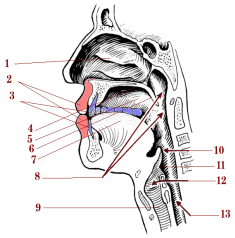
[2] The English Spelling Society (http://www.spellingsociety.org/journals/j3/pronunciation.php)

Pronunciation

Pronunciation refers to the ability to use the correct stress, rhythm, and intonation of a word in a spoken language. A word can be spoken in different ways by various individuals or groups, depending on many factors, such as: the area in which they grew up, the area in which they now live, if they have a speech or voice disorder,[1] their ethnic group, their social class, or their education.[2]

Linguistic terminology

Syllables are counted as units of sound (phones) that they use in their language. The branch of linguistics which studies these units of sound is phonetics. Phones which play the same role are grouped together into classes called phonemes; the study of these is phonemics or phonematics or phonology. Phones as components of articulation are usually described using the International Phonetic Alphabet (IPA).[3]



1. Nose; 2. Lips; 3. Teeth; 4. Palate; 5.

References

External links

- Forvo (http://forvo.com/) — All the words in the world pronounced by native speakers. See also Forvo.
- Inogolo (http://inogolo.com/) — American English audio pronunciation guide
- Sounds Familiar? (http://www.bl.uk/learning/langlit/sounds/) — Listen to examples of regional accents and dialects from across the UK on the British Library's 'Sounds Familiar' website
- Howjsay (http://www.howjsay.com) — Enter a word to hear it spoken. Over 146,133 words in British English with alternative pronunciations.

Syllable

A **syllable** is a unit of organization for a sequence of speech sounds. For example, the word *water* is composed of two syllables: *wa* and *ter*. A syllable is typically made up of a syllable nucleus (most often a vowel) with optional initial and final margins (typically, consonants).

Syllables are often considered the phonological "building blocks" of words. They can influence the rhythm of a language, its prosody, its poetic meter and its stress patterns.

Syllabic writing began several hundred years before the first letters. The earliest recorded syllables are on tablets written around 2800 BC in the Sumerian city of Ur. This shift from pictograms to syllables has been called "the most important advance in the history of writing".[1]

A word that consists of a single syllable (like English *dog*) is called a **monosyllable** (and is said to be *monosyllabic*). Similar terms include **disyllable** (and *disyllabic*) for a word of two syllables; **trisyllable** (and *trisyllabic*) for a word of three syllables; and **polysyllable** (and *polysyllabic*), which may refer either to a word of more than three syllables or to any word of more than one syllable.

Structure

In most theories of phonology, the general structure of a syllable (σ) consists of three segments:

Onset (ω)

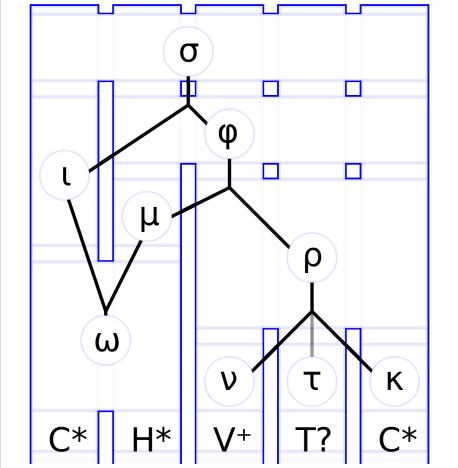
: consonant, obligatory in some languages, optional or even restricted in others

Nucleus (ν)

: sonorant, obligatory in most languages

Coda (κ)

: consonant, optional in some languages, highly restricted or prohibited in others



Tree representation of a syllable

The syllable is usually considered right-branching, i.e. nucleus and coda are grouped together as a "rime" and are only distinguished at the second level. However, in some traditional descriptions of certain languagesWikipedia:Citing sources, the syllable is considered left-branching, i.e. onset and nucleus group below a higher-level unit, called a "body" or "core":

Rime (ρ)

: right branch, contrasts with onset, splits into nucleus and coda

Body or core

: left branch, contrasts with coda, splits into onset and nucleus

In some theories the onset is strictly consonantal, thus necessitating another segment before the nucleus:

Initial (ι)

: often termed *onset*, but leaving out semi-vowels

Medial (μ)

: glide between initial, if any, and nucleus or rime

Final (φ)

: contrasts with initial, extended rime

Although every syllable has supra-segmental features, these are usually ignored if not semantically relevant, e.g. in tonal languages.

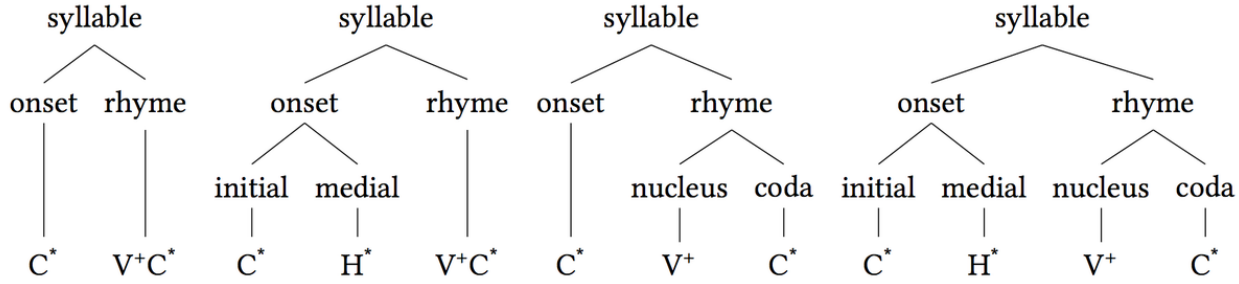
Tone (τ)

may be carried by the syllable as a whole or by the rime

In some theories of phonology, these syllable structures are displayed as tree diagrams (similar to the trees found in some types of syntax). Not all phonologists agree that syllables have internal structure; in fact, some phonologists doubt the existence of the syllable as a theoretical entity.[2]

The *nucleus* is usually the vowel in the middle of a syllable. The *onset* is the sound or sounds occurring before the nucleus, and the *coda* (literally 'tail') is the sound or sounds that follow the nucleus. They are sometimes collectively known as the *shell*. The term *rime* covers the nucleus plus coda. In the one-syllable English word *cat*, the nucleus is *a* (the sound that can be shouted or sung on its own), the onset *c*, the coda *t*, and the rime *at*. This syllable can be abstracted as a *consonant-vowel-consonant* syllable, abbreviated *CVC*. Languages vary greatly in the restrictions on the sounds making up the onset, nucleus and coda of a syllable, according to what is termed a language's phonotactics.

Onset



Most syllables have an onset. Some languages restrict onsets to be only a single consonant, while others allow multiconsonant onsets according to various rules. For example, in English, onsets such as *pr-*, *pl-* and *tr-* are possible but *tl-* is not, and *sk-* is possible but *ks-* is not. In Greek, however, both *ks-* and *tl-* are possible onsets, while contrarily in Classical Arabic no multiconsonant onsets are allowed at all.

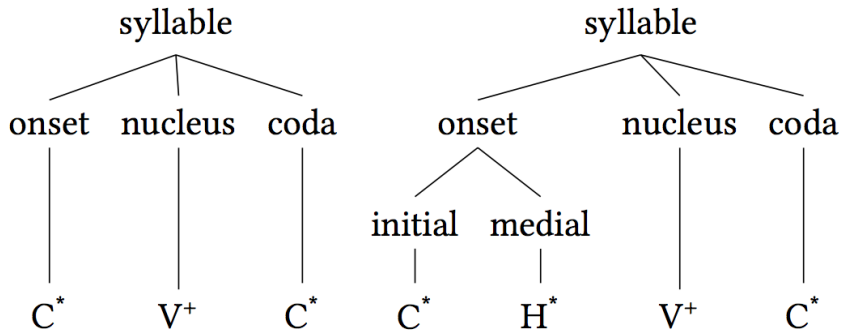
Some languages require all syllables to have an onset; in these languages a *null onset* such as in the English word "at" is not possible. This is less strange than it may appear at first, as most such languages allow syllables to begin with a phonemic glottal stop (the sound in the middle of English "uh-oh", represented in the IPA as /ʔ/). Furthermore, in English and most other languages, a word that begins with a vowel is automatically pronounced with an initial glottal stop when following a pause, whether or not a glottal stop occurs as a phoneme in the language. Consequently, few languages make a phonemic distinction between a word beginning with a vowel and a word beginning with a glottal stop followed by a vowel, since the distinction will generally only be audible following another word. (However, Hawaiian and a number of other Polynesian languages do make such a distinction; cf. Hawaiian /ahi/ "fire", /ʔahi/ "tuna".)

This means that the difference between a syllable with a null onset and one beginning with a glottal stop is often purely a difference of phonological analysis, rather than the actual pronunciation of the syllable. In some cases, the pronunciation of a (putatively) vowel-initial word when following another word – particularly, whether or not a glottal stop is inserted – indicates whether the word should be considered to have a null onset. For example, many Romance languages such as Spanish never insert such a glottal stop, while English does so only some of the time, depending on factors such as conversation speed; in both cases, this suggests that the words in question are truly vowel-initial. But there are exceptions here, too. For example, German and Arabic both require that a glottal stop be inserted between a word and a following, putatively vowel-initial word. Yet such words are said to begin with a vowel in German but a glottal stop in Arabic. The reason for this has to do with other properties of the two

languages. For example, a glottal stop does not occur in other situations in German, e.g. before a consonant or at the end of word. On the other hand, in Arabic, not only does a glottal stop occur in such situations (e.g. Classical /saʔala/ "he asked", /raʔj/ "opinion", /dˤawʔ/ "light"), but it occurs in alternations that are clearly indicative of its phonemic status (cf. Classical /kaːtib/ "writer" vs. /maktuːb/ "written", /ʔaːkil/ "eater" vs. /maʔkuːl/ "eaten").

The writing system of a language may not correspond with the phonological analysis of the language in terms of its handling of (potentially) null onsets. For example, in some languages written in the Latin alphabet, an initial glottal stop is left unwritten; on the other hand, some languages written using non-Latin alphabets such as abjads and abugidas have a special zero consonant to represent a null onset. As an example, in Hangul, the alphabet of the Korean language, a null onset is represented with ㅇ at the left or top section of a grapheme, as in 역 "station", pronounced *yeok*, where the diphthong *yeo* is the nucleus and *k* is the coda.

Nucleus

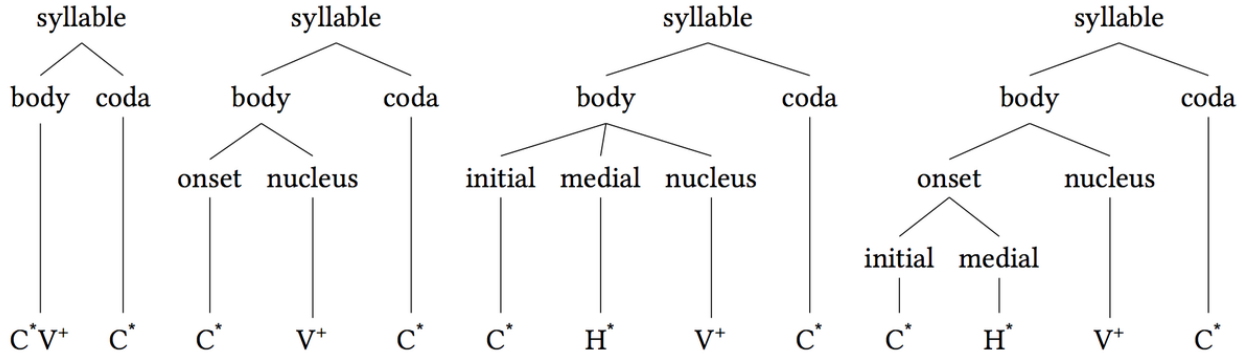


Word	Nucleus
c**a**t [kæt]	[æ]
b**e**d [bɛd]	[ɛ]
ode [oʊd]	[oʊ]
b**ee**t [bit]	[i]
b**i**te [baɪt]	[aɪ]
r**ai**n [reɪn]	[eɪ]
b**i**tt**e**n [ˈbɪt.ən] or [ˈbɪt.n]	[ɪ] [ə] or [n]

|+ Examples of syllable nuclei

Generally, every syllable requires a nucleus (sometimes called the *peak*), and the minimal syllable consists only of a nucleus, as in the English words "eye" or "owe". The syllable nucleus is usually a vowel, in the form of a monophthong, diphthong, or triphthong, but sometimes is a syllabic consonant. By far the most common syllabic consonants are sonorants like [l], [r], [m], [n] or [ŋ], but a few languages have so-called *syllabic fricatives*, also known as *fricative vowels*. (In the context of Chinese phonology, the related but non-synonymous term *apical vowel* is commonly used.) Mandarin Chinese is famous for having such sounds in at least some of its dialects, for example the pinyin syllables *sī shī rī*, sometimes pronounced [sɻ̩ ʂɻ̩ ʐɻ̩] respectively. A few languages, such as Nuxalk (Bella Coola), even allow stop consonants and voiceless fricatives as syllabic nuclei. However, linguists have analyzed this situation in various ways, some arguing that such syllables have no nucleus at all, and some arguing that the concept of "syllable" cannot clearly be applied at all to these languages. See the discussion below concerning syllable-less languages.

Coda



The **coda** comprises the consonant sounds of a syllable that follow the nucleus, which is usually a vowel. The combination of a nucleus and a coda is called a rime. Some syllables consist only of a nucleus with no coda. Some languages' phonotactics limit syllable codas to a small group of single consonants, whereas others allow any consonant phoneme or even clusters of consonants.

A coda-less syllable of the form V, CV, CCV, etc. is called an **open syllable** (or *free syllable*), while a syllable that has a coda (VC, CVC, CVCC, etc.) is called a **closed syllable** (or *checked syllable*). Note that they have nothing to do with open and close vowels. Almost all languages allow open syllables, but some, such as Hawaiian, do not have closed syllables.

Here are some English single-syllable words that have both a nucleus and a coda:

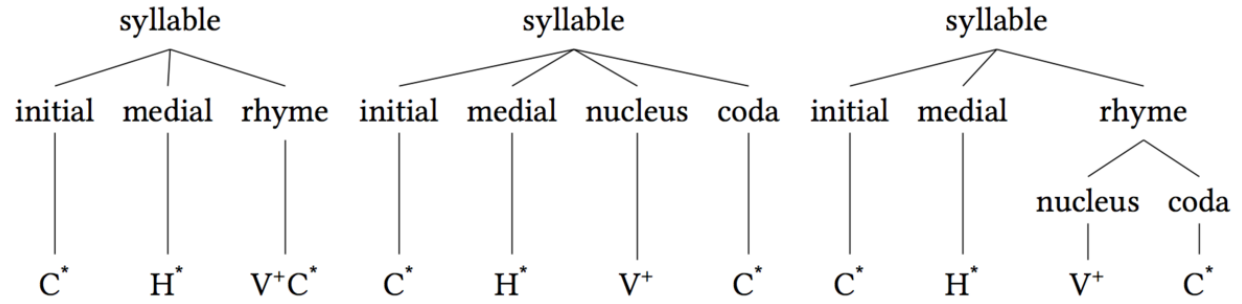
- a*n*: κ = /n/, ν = /æ/ (stressed) or /ə/ (unstressed)
- cu*p*: κ = /p/, ν = /ʌ/
- ta*ll*: κ = /l/, ν = /ɔː/ (or short)
- mi*lk*: κ = /lk/ or /ɬk/, ν = /ɪ/
- ti*nts*: κ = /nts/, ν = /ɪ/
- fi*fths*: κ = /fθs/, ν = /ɪ/
- si*xths*: κ = /ksθs/, ν = /ɪ/
- twe*lfths*: κ = /lfθs/, ν = /ɛ/
- stre*ngths*: κ = /ŋθs/, ν = /ɛ/

The following single-syllable words end in a nucleus and do not have a coda:

- glue, ν = /uː/
- pie, ν = /ʌɪ/ or /aɪ/
- though, ν = /əʊ/ (UK) or /oʊ/ (US)
- boy, ν = /ɔɪ/

A list of examples of syllable codas in English is found at English phonology: Coda.

Rhyme



The **rime** or **rhyme** of a syllable consists of a nucleus and an optional coda. It is the part of the syllable used in poetic rhyme, and the part that is lengthened or stressed when a person elongates or stresses a word in speech.

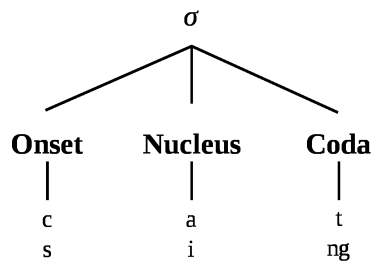
The rime is usually the portion of a syllable from the first vowel to the end. For example, /æt/ is the rime of all of the words *at*, *sat*, and *flat*. However, the nucleus does not necessarily need to be a vowel in some languages. For instance, the rime of the second syllables of the words *bottle* and *fiddle* is just /l/, a liquid consonant.

"Rime" and "rhyme" are variants of the same word, but the rarer form "rime" is sometimes used to mean specifically "syllable rime" to differentiate it from the concept of poetic rhyme. This distinction is not made by some linguists and does not appear in most dictionaries.

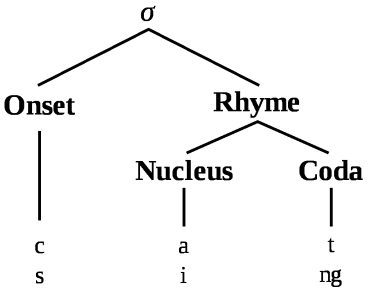
Structure

The simplest model of syllable structure divides each syllable into an optional onset, an obligatory nucleus and an optional coda.

There exist, however, many arguments for a hierarchical relationship, rather than a linear one, between the syllable constituents. This hierarchical model groups the syllable nucleus and coda into an intermediate level, the *rime*. The hierarchical model accounts for the role that the *nucleus+coda* constituent plays in verse (i.e., rhyming words such as *cat* and *bat* are formed by matching both the nucleus and coda, or the entire rhyme), and for the distinction between heavy and light syllables, which plays a role in phonological processes such as, for example, sound change in Old English *scipu* and *wordu*.[3]

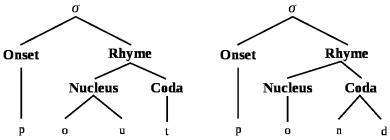


Segmental model for *cat* and *sing*



Hierarchical model for *cat* and *sing*

Just as the rime branches into the nucleus and coda, the nucleus and coda may each branch into multiple phonemes.[4]



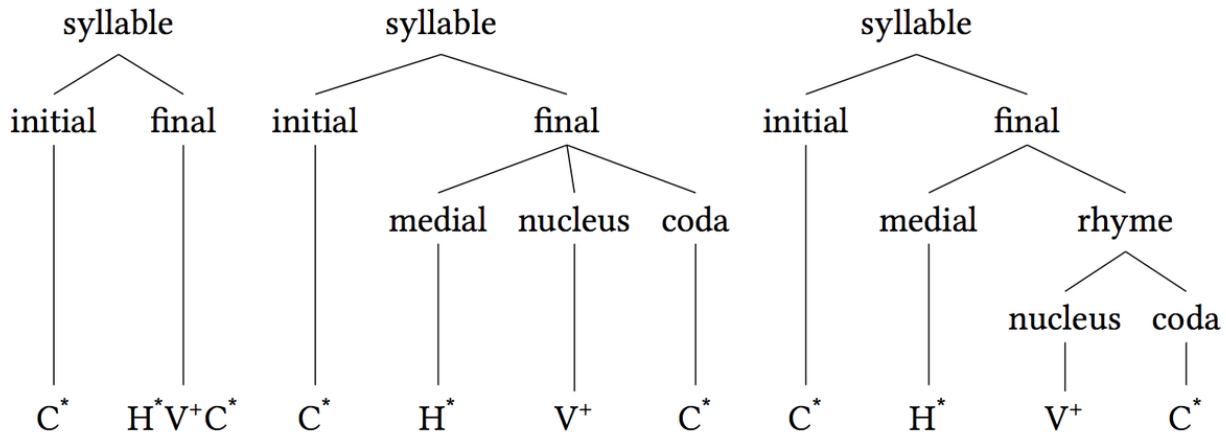
Branching nucleus for *pout* and branching coda for *pond*

Examples

C = consonant, V = vowel, optional components are in parentheses.

structure:	syllable =	onset	+ rhyme
$C^+V^+C^*$:	$C_1(C_2)V_1(V_2)(C_3)(C_4)$ =	$C_1(C_2)$	+ $V_1(V_2)(C_3)(C_4)$
V^+C^*:	$V_1(V_2)(C_3)(C_4)$ =	∅	+ $V_1(V_2)(C_3)(C_4)$

Medial and final



In the phonology of some East Asian languages, especially Chinese, the syllable structure is expanded to include an additional, optional segment known as a **medial**, which is located between the onset (often termed the *initial* in this context) and the rime. The medial is normally a glide consonant, but reconstructions of Old Chinese generally include liquid medials (/r/ in modern reconstructions, /l/ in older versions), and many reconstructions of Middle Chinese include a medial contrast between /i/ and /j/, where the /i/ functions phonologically as a glide rather than as part of the nucleus. In addition, many reconstructions of both Old and Middle Chinese include complex medials such as /rj/, /ji/, /jw/ and /jwi/. The medial groups phonologically with the rime rather than the onset, and the combination of medial and rime is collectively known as the **final**.

Some linguists, especially when discussing the modern Chinese varieties, use the terms "final" and "rime/rhyme" interchangeably. In historical Chinese phonology, however, the distinction between "final" (including the medial) and "rime" (not including the medial) is important in understanding the rime dictionaries and rime tables that form the primary sources for Middle Chinese, and as a result most authors distinguish the two according to the above definition.

Tone

In most languages, the pitch or pitch contour in which a syllable is pronounced conveys shades of meaning such as emphasis or surprise, or distinguishes a statement from a question. In tonal languages, however, the pitch of a word affects the basic lexical meaning (e.g. "cat" vs. "dog") or grammatical meaning (e.g. past vs. present). In some languages, only the pitch itself (e.g. high vs. low) has this effect, while in others, especially East Asian languages such as Chinese, Thai or Vietnamese, the shape or contour (e.g. level vs. rising vs. falling) also needs to be distinguished.

Weight

A **heavy syllable** is one with a *branching rime*, i.e. it is a *closed syllable* that ends in a consonant, or with a *branching nucleus*, i.e. a long vowel or diphthong. Generally, this means that either the nucleus is followed by two consonants or by a single, final consonant. The name is a metaphor, based on the nucleus or coda having lines that branch in a tree diagram.

In some languages, heavy syllables include both VV (branching nucleus) and VC (branching rime) syllables, contrasted with V, which is a **light syllable**. In other languages, only VV syllables are considered heavy, while both VC and V syllables are light. Some languages distinguish a third type of **superheavy syllable**, which consists of VVC syllables (with both a branching nucleus and rime) or VCC syllables (with a coda consisting of two or more consonants) or both.

In moraic theory, heavy syllables are said to have two moras, while light syllables are said to have one and superheavy syllables are said to have three. Japanese phonology is generally described this way.

Many languages forbid superheavy syllables, while a significant number forbid any heavy syllable. Some languages strive for consonant syllable weight; for example, in stressed, non-final syllables in Italian, short vowels co-occur with closed syllables while long vowels co-occur with open syllables, so that all such syllables are heavy (not light or superheavy).

The difference between heavy and light frequently determines which syllables receive stress – this is the case in Latin and Arabic, for example. The system of poetic meter in many classical languages, such as Classical Greek, Classical Latin and Sanskrit, is based on syllable weight rather than stress (so-called *quantitative rhythm* or *quantitative meter*).

A classical definition

Guilhem Molinier, a member of the Consistori del Gay Saber, which was the first literary academy in the world and held the Floral Games to award the best troubadour with the *violeta d'aur* top prize, gave a definition of the syllable in his *Leys d'amor* (1328–1337), a book aimed at regulating the then flourishing Occitan poetry:

Sillaba votz es literals.	A syllable is the sound of several letters,
Segon los ditz .	According to those called grammarians,
En un accen pronunciada.	Pronounced in one accent
Et en un trag: d'una alenada.	And uninterruptedly: in one breath.

Suprasegmentals

The domain of suprasegmental features is the syllable and not a specific sound, that is to say, they affect all the segments of a syllable:

- Stress
- Tone
- Stød

Sometimes syllable length is also counted as a suprasegmental feature; for example, in some Germanic languages, long vowels may only exist with short consonants and vice versa. However, syllables can be analyzed as compositions of long and short phonemes, as in Finnish and Japanese, where consonant gemination and vowel length are independent.

Phonotactic constraints

Phonotactic rules determine which sounds are allowed or disallowed in each part of the syllable. English allows very complicated syllables; syllables may begin with up to three consonants (as in *string* or *splash*), and occasionally end with as many as four (as in *prompts*). Many other languages are much more restricted; Japanese, for example, only allows /ɴ/ and a chroneme in a coda, and theoretically has no consonant clusters at all, as the onset is composed of at most one consonant.[5]

There are languages that forbid empty onsets, such as Hebrew and Arabic (the names transliterated as "Israel", "Abraham", "Omar", "Ali" and "Abdullah", among many others, actually begin with semiconsonantic glides or with glottal or pharyngeal consonants). Conversely, some analyses of the Arrernte language of central Australia posit that no onsets are permitted at all in that language, all syllables being underlyingly of the shape VC(C).[6]

Notation

The International Phonetic Alphabet provides the period as the symbol for marking syllable breaks. In practice, however, IPA transcription is typically divided into words by spaces, and often these spaces are also understood to be syllable breaks. When a word space comes in the middle of a syllable (that is, when a syllable spans words), a tie bar can be used for liaison.[7]

Syllabification

Syllabification is the separation of a word into syllables, whether spoken or written. In most languages, the actually spoken syllables are the basis of syllabification in writing too. Due to the very weak correspondence between sounds and letters in the spelling of modern English, for example, written syllabification in English has to be based mostly on etymological i.e. morphological instead of phonetic principles. English "written" syllables therefore do not correspond to the actually spoken syllables of the living language.

Syllabification may also refer to the process of a consonant becoming a syllable nucleus.

Syllable division and ambisyllabicity

Most commonly, a single consonant between vowels is grouped with the following syllable (i.e. /CV.CV/), while two consonants between vowels are split between syllables (i.e. /CVC.CV/). In some languages, however, such as Old Church Slavonic, any group of consonants that can occur at the beginning of a word is grouped with the following syllable; hence, a word such as *pazdva* would be syllabified /pa.zdva/. (This allows the phonotactics of the language to be defined as requiring open syllables.) Contrarily, in some languages, any group of consonants that can occur at the end of a word is grouped with the following syllable.

In English, it has been disputed whether certain consonants occurring between vowels (especially following a stressed syllable and preceding an unstressed syllable) should be grouped with the preceding or following syllable. For example, a word such as *better* is sometimes analyzed as /ˈbɛt.ər/ and sometimes /ˈbɛ.tər/. Some linguists have in fact asserted that such words are "ambisyllabic", with the consonant shared between the preceding and following syllables. However, Wells (2002)[8] argues that this is not a useful analysis, and that English syllabification is simply /ˈCVC(C).V/.

In English, consonants have been analyzed as acting simultaneously as the coda of one syllable and the onset of the following syllable, as in 'bellow' *bel-low*, a phenomenon known as **ambisyllabicity**. It is argued that words such as *arrow* /ˈæroʊ/ can't be divided into separately pronounceable syllables: neither /æ/ nor /ær/ is a possible independent syllable, and likewise with the other short vowels /ɛHelp:IPA for English#KeyɪHelp:IPA for English#KeyɒHelp:IPA for English#KeyʌHelp:IPA for English#Keyʊ/. However, Wells (1990) argues against ambisyllabicity in English, positing that consonants and consonant clusters are codas when after a stressed syllable followed by an unstressed

syllable, or after a full vowel and followed by a reduced syllable, and are onsets in other contexts. (See English phonology#Phonotactics.)

Stress

Syllable structure often interacts with stress. In Latin, for example, stress is regularly determined by syllable weight, a syllable counting as heavy if it has at least one of the following:

- a long vowel in its nucleus
- a diphthong in its nucleus
- one or more coda(e)

In each case the syllable is considered to have two moras.

Vowel tenseness

In most Germanic languages, lax vowels can occur only in closed syllables. Therefore, these vowels are also called checked vowels, as opposed to the tense vowels that are called *free vowels* because they can occur even in open syllables.

Nucleus-less syllables

The notion of syllable is challenged by languages that allow long strings of consonants without any intervening vowel or sonorant. Even in English there are a few para-verbal utterances that have no vowels; for example, *shh* (meaning "be quiet") and *psst* (a sound used to attract attention).

Languages of the Northwest coast of North America, including Salishan and Wakashan languages, are famous for this.

Nuxálk (Bella Coola)

> [ɬχʷtɬtsxʷ] 'you spat on me'
>
> [ts’ktskʷts’] 'he arrived'
>
> [xɬp’χʷɬtɬpɬɬs] 'he had in his possession a bunchberry plant'[9]
>
> [sxs] 'seal blubber'

In Bagemihl's survey of previous analyses, he finds that the word [ts’ktskʷts’] would have been parsed into 0, 2, 3, 5, or 6 syllables depending which analysis is used. One analysis would consider all vowel and consonants segments as syllable nuclei, another would consider only a small subset (fricatives or sibilants) as nuclei candidates, and another would simply deny the existence of syllables completely.

This type of phenomenon has also been reported in Berber languages (such as Indlawn Tashlhiyt Berber), Moroccan Arabic (apparently under Berber influence), Mon–Khmer languages (such as Semai, Temiar, Kammu) and Ōgami (a Miyako Ryukyuan language).[10]

Indlawn Tashlhiyt Berber

> [tftktst tfktstt] 'you sprained it and then gave it'
>
> [rkkm] 'rot' (imperf.)[11]

Semai

> [kckmrʔɛːc] 'short, fat arms'[12]

References

[1] Geoffrey Blainey, *A Short History of the World*, p.87, citing J.T. Hooker et al., *Reading the Past: Ancient Writing from Cuneiform to the Alphabet*, British Museum, 1993, Ch. 2

[2] See CUNY Conference on the Syllable (http://www.cunyphonologyforum.net/syllable.php) for discussion of the theoretical existence of the syllable.

[4] The limit for the number of phonemes which may be contained in each varies by language. For example, Japanese and most Sino-Tibetan languages do not have consonant clusters at the beginning or end of syllables, whereas many Eastern European languages can have more than two consonants at the beginning or end of the syllable. In English, the onset, nucleus, and coda may all have two phonemes, as in the word *flouts*: [fl] in the onset, the diphthong [aʊ] in the nucleus, and [ts] in the coda.

[6] Arrernte: a language with no syllable onsets (http://www.jstor.org/stable/4179048). Gavan Breen and Rob Pensalfini. *Linguistic Inquiry*. Vol. 30, No. 1 (1999), pp. 1-25. Massachusetts Institute of Technology.

[7] The liaison tie is also used to join lexical words into phonological words, for example in the Croatian illustration in the IPA *Handbook*

[8] http://www.phon.ucl.ac.uk/home/wells/syllabif.htm

[9] (Bagemihl 1991:589, 593, 627)

[10] http://halshs.archives-ouvertes.fr/docs/00/52/95/98/PDF/irl-ogami.pdf

[11] (Dell & Elmedlaoui 1985, 1988)

[12] (Sloan 1988)

Sources and recommended reading

- Bagemihl, Bruce (1991). "Syllable structure in Bella Coola". *Linguistic Inquiry* **22**: 589–646.
- Clements, George N.; Keyser, Samuel J.. (1983). *CV phonology: A generative theory of the syllable*. Linguistic inquiry monographs (No. 9). Cambridge, MA: MIT Press. ISBN 0-262-53047-3 (pbk); ISBN 0-262-03098-5 (hb)
- Dell, François; Elmedlaoui, Mohamed (1985). "Syllabic consonants and syllabification in Imdlawn Tashlhiyt Berber". *Journal of African Languages and Linguistics* **7** (2): 105–130. doi: 10.1515/jall.1985.7.2.105 (http://dx.doi.org/10.1515/jall.1985.7.2.105).
- Dell, François; Elmedlaoui, Mohamed (1988). "Syllabic consonants in Berber: Some new evidence". *Journal of African Languages and Linguistics* **10**: 1–17. doi: 10.1515/jall.1988.10.1.1 (http://dx.doi.org/10.1515/jall.1988.10.1.1).
- Ladefoged, Peter (2001). *A course in phonetics* (4th ed.). Fort Worth: Harcourt College Publishers. ISBN 0-15-507319-2.

External links

- HowManySyllables.com (http://www.HowManySyllables.com) – Syllable Dictionary lets you look up the number of syllables in any English word
- Online Lyric Hyphenator (http://www.juiciobrennan.com/hyphenator/) – Separates English text into syllables
- Do syllables have internal structure? What is their status in phonology? CUNY Phonology Forum (http://www.cunyphonologyforum.net/syllable.php)

Allophone

In phonology, an **allophone** (pron.: /ˈæləfoʊn/; from the Greek: ἄλλος, *állos*, "other" and φωνή, *phōnē*, "voice, sound") is one of a set of multiple possible spoken sounds (or *phones*) used to pronounce a single phoneme.[] For example, [pʰ] (as in *pin*) and [p] (as in *spin*) are allophones for the phoneme /p/ in the English language. Although a phoneme's allophones are all alternative pronunciations for a phoneme, the specific allophone selected in a given situation is often predictable. Changing the allophone used by native speakers for a given phoneme in a specific context usually will not change the meaning of a word but the result may sound non-native or unintelligible. Native speakers of a given language usually perceive one phoneme in their language as a single distinctive sound in that language and are "*both unaware of and even shocked by*" the allophone variations used to pronounce single phonemes.[][]

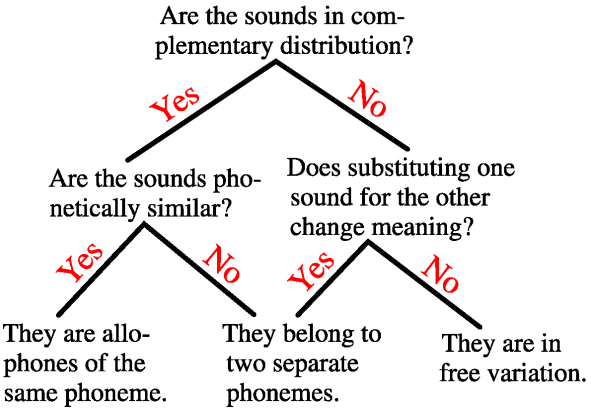


Diagram of basic procedure to determine whether two sounds are allophones

History of concept

The term "allophone" was coined by Benjamin Lee Whorf in the 1940s. In doing so, he placed a cornerstone in consolidating early phoneme theory.[1] The term was popularized by G. L. Trager and Bernard Bloch in a 1941 paper on English phonology[2] and went on to become part of standard usage within the American structuralist tradition.[3]

Complementary and free-variant allophones

Every time a speech sound is produced for a given phoneme, it will be slightly different from other utterances, even for the same speaker. This has led to some debate over how real, and how universal, phonemes really are (see phoneme for details). Only some of the variation is significant (i.e., detectable or perceivable) to speakers. There are two types of allophones, based on whether a phoneme must be pronounced using a specific allophone in a specific situation, or whether the speaker has freedom to (unconsciously) choose which allophone he or she will use.

When a specific allophone (from a set of allophones that correspond to a phoneme) *must* be selected in a given context (i.e. using a different allophone for a phoneme will cause confusion or make the speaker sound non-native), the allophones are said to be **complementary** (i.e. the allophones complement each other, and one is not used in a situation where the usage of another is standard). In the case of complementary allophones, each allophone is used in a specific phonetic context and may be involved in a phonological process.[]

In other cases, the speaker is able to select freely from **free variant** allophones, based on personal habit or preference.

Allotone

A tonic allophone is sometimes called an **allotone**, for example in the neutral tone of Mandarin.

Examples in English vs. other languages

For example, [pʰ] as in *pin* and [p] as in *spin* are allophones for the phoneme /p/ in the English language because they cannot distinguish words (in fact, they occur in complementary distribution). English speakers treat them as the same sound, but they are different: the first is aspirated and the second is unaspirated (plain). Plain [p] also occurs as the **p** in *cap* [kʰæp], or the second **p** in *paper* [pʰeɪ.pəɹ]. Chinese languages treat these two phones differently; for example in Mandarin, [p] (written **b** in Pinyin) and [pʰ] (written **p**) contrast phonemically. Many Indo-Aryan languages, such as Hindustani, also write the two phones differently and treat them as completely distinct phonemes: [p] is written as 'प' (or 'پ'), while [pʰ] is written 'फ' (or 'پھ') and so on.[]

There are many other allophonic processes in English, like lack of plosion, nasal plosion, partial devoicing of sonorants, complete devoicing of sonorants, partial devoicing of obstruents, lengthening and shortening vowels, and retraction.

- Aspiration – strong explosion of breath. In English a voiceless plosive that is p, t or k is aspirated whenever it stands as the only consonant at the beginning of the stressed syllable or of the first, stressed or unstressed, syllable in a word.
- Nasal plosion – In English a plosive (/p, t, k, b, d, ɡ/) has nasal plosion when it is followed by a nasal, inside a word or across word boundary.
- Partial devoicing of sonorants – In English sonorants (/j, w, l, r, m, n, ŋ/) are partially devoiced when they follow a voiceless sound within the same syllable.
- Complete devoicing of sonorants – In English a sonorant is completely devoiced when it follows an aspirated plosive (/p, t, k/).
- Partial devoicing of obstruents – In English, a voiced obstruent is partially devoiced next to a pause or next to a voiceless sound, inside a word or across its boundary.
- Retraction – in English /t, d, n, l/ are retracted before /ɹ/.

Because the choice of allophone is seldom under conscious control, people may not realize they exist. English speakers may be unaware of the differences among six allophones of the phoneme /t/, namely unreleased [t̚] as in *cat*, aspirated [tʰ] as in *top*, glottalized [ʔ] as in *button*, flapped [ɾ] as in American English *water*, nasalized flapped as in *winter*, and none of the above [t] as in *stop*. However, they may become aware of the differences if, for example, they contrast the pronunciations of the following words:

- *Night rate*: unreleased [ˈnʌɪt̚.ɹʷeɪt̚] (without word space between . and ɹ)
- *Nitrate*: aspirated [ˈnaɪ.tʰˌɹeɪt̚] or retracted [ˈnaɪ.tʃɹʷeɪt̚]

If a flame is held before the lips while these words are spoken, it flickers more during aspirated *nitrate* than during unaspirated *night rate*. The difference can also be felt by holding the hand in front of the lips. For a Mandarin speaker, to whom /t/ and /tʰ/ are separate phonemes, the English distinction is much more obvious than it is to the English speaker who has learned since childhood to ignore it.

Allophones of English /l/ may be noticed if the 'light' [l] of *leaf* [ˈliːf] is contrasted with the 'dark' [ɬ] of *feel* [ˈfiːɬ]. Again, this difference is much more obvious to a Turkish speaker, for whom /l/ and /ɬ/ are separate phonemes, than to an English speaker, for whom they are allophones of a single phoneme.

Allophony of "v-w" in Hindustani

A reverse example is that of [v] versus [w] in Hindustani. These are distinct phonemes in English, but both allophones of the phoneme /व/ (or /ৱ/) in Hindustani. Native Hindi speakers pronounce /व/ as [v] in *vrat* ('व्रत', *fast*) but [w] in *pakwan* ('पकवान', *food dish*), treating them as a single phoneme and without being aware of the allophone distinctions they are subconsciously making, though these are apparent to native English speakers. However, the allophone phenomenon becomes obvious when speakers switch languages. When non-native speakers speak Hindustani, they might pronounce /व/ in 'व्रत' as [w], i.e. as *wrat* instead of the correct *vrat*. This results in an intelligibility problem because *wrat* can easily be confused for *aurat*, which means *woman* instead of *fast* in Hindustani. Similarly, Hindustani speakers might unconsciously apply their native 'v-w' allophony rules to English words, pronouncing *war* as *var* or *advance* as *adwance*, which can result in intelligibility problems with native English speakers.[]

Representing a phoneme with an allophone

Since phonemes are abstractions of speech sounds, not the sounds themselves, they have no direct phonetic transcription. When they are realized without much allophonic variation, a simple (i.e. 'broad') transcription is used. However, when there are complementary allophones of a phoneme, so that the allophony is significant, things become more complicated. Often, if only one of the allophones is simple to transcribe, in the sense of not requiring diacritics, then that representation is chosen for the phoneme.

However, there may be several such allophones, or the linguist may prefer greater precision than this allows. In such cases a common convention is to use the "elsewhere condition" to decide which allophone will stand for the phoneme. The "elsewhere" allophone is the one that remains once the conditions for the others are described by phonological rules. For example, English has both oral and nasal allophones of its vowels. The pattern is that vowels are nasal only when preceding a nasal consonant within the same syllable; elsewhere they're oral. Therefore, by the "elsewhere" convention, the oral allophones are considered basic; nasal vowels in English are considered to be allophones of oral phonemes.

In other cases, an allophone may be chosen to represent its phoneme because it is more common in the world's languages than the other allophones, because it reflects the historical origin of the phoneme, or because it gives a more balanced look to a chart of the phonemic inventory. In rare cases a linguist may represent phonemes with abstract symbols, such as dingbats, so as not to privilege any one allophone.

References

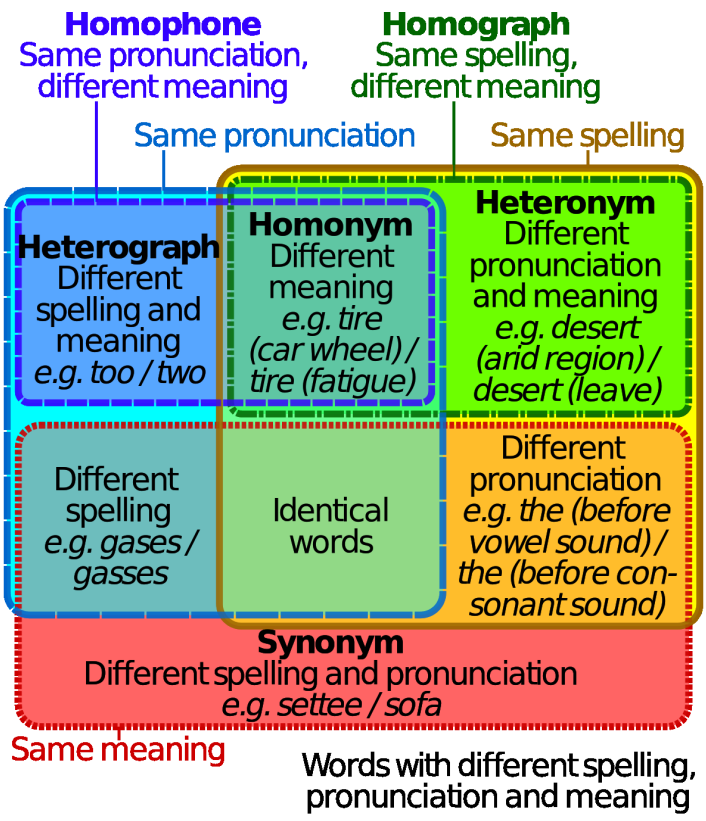
External links

- Phonemes and allophones (http://www.elloandfriends.uni-osnabrueck.de/wikis/1/show?n=PhoneticsandPhonology.PhonemesAndAllophones)

Homophone

A **homophone** is a word that is pronounced the same as another word but differs in meaning. The words may be spelled the same, such as *rose* (flower) and *rose* (past tense of "rise"), or differently, such as *carat*, *caret*, and *carrot*, or *to*, *two*, and *too*. Homophones that are spelled the same are also both homographs and homonyms.[1] Homophones that are spelled differently are also called **heterographs**. The term "homophone" may also apply to units longer or shorter than words, such as phrases, letters or groups of letters that are pronounced the same as another phrase, letter or group of letters.

The word derives from the Greek *homo-* (ὁμο-), "same", and *phōnḗ* (φωνή), "voice, utterance".



Euler diagram showing the relationships between homophones (purple) and related linguistic concepts.

In wordplay and games

Homophones are often used to create puns and to deceive the reader (as in crossword puzzles) or to suggest multiple meanings. The last usage is common in poetry and creative literature. An example of this is seen in Dylan Thomas's radio play *Under Milk Wood*: "The shops in mourning" where *mourning* can be heard as *mourning* or *morning*. Another vivid example is Thomas Hood's use of "birth" and "berth" and "told" and "toll'd" (tolled) in his poem "Faithless Sally Brown":

> His death, which happen'd in his berth,
>
> At forty-odd befell:
>
> They went and told the sexton, and
>
> The sexton toll'd the bell.

In some accents, various sounds have merged in that they are no longer distinctive, and thus words that differ only by those sounds in an accent that maintains the distinction (a minimal pair) are homophonous in the accent with the merger. Some examples from English are:

> *pin* and *pen* in many southern American accents.
>
> *merry*, *marry*, and *Mary* in most American accents.
>
> The pairs *do*, *due* and *forward*, *foreword* are homophonous in most American accents but not in most British accents.
>
> The pairs *talk*, *torque*, and *court*, *caught* are distinguished in rhotic accents such as Scottish English and most dialects of American English, but are homophones in many non-rhotic accents such as British Received Pronunciation.

Wordplay is particularly common in English because the multiplicity of linguistic influences offers considerable complication in spelling and meaning and pronunciation compared with other languages.

Homophones of multiple words or phrases (as sometimes seen in word games) are also known as "oronyms". This term was coined by Gyles Brandreth and first published in his book *The Joy of Lex* (1980), and it was used in the BBC programme *Never Mind the Full Stops*, which also featured Brandreth as a guest.

Examples of "oronyms" (which may only be true homophones in certain dialects of English) include:

"ice cream" vs. "I scream" (as in the popular song "I scream. You scream. We all scream for ice cream.")

"euthanasia" vs. "Youth in Asia"

"depend" vs. "deep end"

"Gemini" vs. "Jim and I" and also vs. "Jem in eye"

"the sky" vs. "this guy" (most notably as a mondegreen in Purple Haze by Jimi Hendrix)

"four candles" vs. "fork handles"

"sand which is there" vs. "sandwiches there"

"example" vs. "egg sample"

"foxhole" vs. "Vauxhall" vs. "Vauxhall"

"big hand" vs. "began" vs. "Mégane" vs. "Meg's hand"

"some others" vs. "some mothers" and also vs. "smothers"

"minute" vs. "my newt"

"Ruth" vs. "roof"

"Cougar" vs. "Kuga"

"real eyes" vs. "realize" vs. "real lies"

"Honda" vs. "Hyundai"

"a dressed male" vs. "addressed mail"

"them all" vs. "the mall"

"see" vs. "sea"

In his Appalachian comedy routine, American comedian Jeff Foxworthy frequently uses oronyms which play on exaggerated "country" accents. Notable examples include:

Initiate: "My wife ate two sandwiches, *initiate* [and then she ate] a bag o' tater chips."
Mayonnaise: "*Mayonnaise* [Man, there is] a lot of people here tonight."
Innuendo: "Hey dude I saw a bird fly *innuendo* [in your window]."
Moustache: "I *Moustache* [must ask] you a question."

Malapropisms, which often create a similar comic effect, are usually near-homophones. See also Eggcorn.

How many homonyms are there?

There are sites, for example, http://people.sc.fsu.edu/~jburkardt/fun/wordplay/multinyms.html which have lists of homonyms or rather homophones and even 'multinyms' which have as many as seven spellings. There are differences in such lists due to dialect pronunciations and usage of old words. In English, there are approximately 88 triples; 24 quadruples; 2 quintuples; 1 sextet and 1 septet. The septet is:

Raise, rays, rase, raze, rehs, réis, res

Other than the three common words (raise, rays and raze), there is:

- rase - a verb meaning "to erase";
- rehs - the plural of reh, a mixture of sodium salts found as an efflorescence in India;
- réis - the plural of real, a currency unit of Portugal and Brazil;
- res - the plural of re, a name for one step of the musical scale;

Use in psychological research

Pseudo-homophones

Pseudo-homophones are pseudowords that are phonetically identical to a word. For example, groan/grone and crane/crain are pseudo-homophone pairs, whereas plane/plain is a homophone pair since both letter strings are recognised words. Both types of pairs are used in lexical decision tasks to investigate word recognition.[2]

Use as ambiguous information

Homophones where one spelling is of a threatening nature and one is not (*e.g.* slay/sleigh, war/wore) have been used in studies of anxiety as a test of cognitive models that those with high anxiety tend to interpret ambiguous information in a threatening manner.[3]

References

[1] According to the strict sense of homonyms as words with the same spelling *and* pronunciation; however, homonyms according to the loose sense common in nontechnical contexts are words with the same spelling *or* pronunciation, in which case all homophones are also homonyms. Random House Unabridged Dictionary entry for "homonym" (http://dictionary.reference.com/browse/homonym?r=66) at Dictionary.com

[2] Martin, R. C. (1982). The pseudohomophone effect: The role of visual similarity in nonword decisions. Quarterly Journal of Experimental Psychology, 34A, 395-409.

[3] Mogg K, Bradley BP, Miller T, Potts H, Glenwright J, Kentish J (1994). Interpretation of homophones related to threat: Anxiety or response bias effects? *Cognitive Therapy and Research*, **18**(5), 461-77

External links

- Homophone.com (http://www.homophone.com); Complete List of American homophones with a searchable database.
- (http://www.pisgahpress.com/authors/a-d-reed/); Reed's Homophones: a comprehensive book of sound-alike words, reference work published in 2012.
- Homophone Machine (http://www.all-about-homophones.com/homophone-machine.php); Swaps homophones in any sentence
- Between The Lions (http://pbskids.org/lions/videos/homophones.html); Song about homophones

Rhyme

A **rhyme** is a repetition of similar sounds in two or more words, most often at the end of lines in poems and songs.[1] The word "rhyme" may also be used as a *pars pro toto* to refer to a short poem, such as a rhyming couplet or other brief rhyming poem such as nursery rhymes.

Function of rhyme

Rhyme partly seems to be enjoyed simply as a repeating pattern that is pleasant to hear. It also serves as a powerful mnemonic device, facilitating memorization. The regular use of tail rhyme helps to mark off the ends of lines, thus clarifying the metrical structure for the listener. As with other poetic techniques, poets use it to suit their own purposes; for example William Shakespeare often used a rhyming couplet to mark off the end of a scene in a play.

Evolutionary psychologist Geoffrey Miller hypothesizes that rhyme is a form of sexually selected handicap imposed on communication making poetry harder and more reliable as a signal of verbal intelligence and overall fitness.[2]

Types of rhyme

The word *rhyme* can be used in a specific and a general sense. ; two lines of poetry rhyme if their final strong positions are filled with rhyming words. A rhyme in the strict sense is also called a perfect rhyme. Examples are *sight* and *flight*, *deign* and *gain*, *madness* and *sadness*.

Perfect rhymes

Perfect rhymes can be classified according to the number of syllables included in the rhyme, which is dictated by the location of the final stressed syllable.

- **masculine:** a rhyme in which the stress is on the final syllable of the words (*rhyme*, *sublime*)
- **feminine:** a rhyme in which the stress is on the penultimate (second from last) syllable of the words (*picky*, *tricky*)
- **dactylic:** a rhyme in which the stress is on the antepenultimate (third from last) syllable (*cacophonies*, *Aristophanes*)

General rhymes

In the general sense, *general rhyme* can refer to various kinds of phonetic similarity between words, and to the use of such similar-sounding words in organizing verse. Rhymes in this general sense are classified according to the degree and manner of the phonetic similarity:

- **syllabic:** a rhyme in which the last syllable of each word sounds the same but does not necessarily contain stressed vowels. (*cleaver*, *silver*, or *pitter*, *patter*; the final syllable of the words *bottle* and *fiddle* are /l/, a liquid consonant.)
- **imperfect (or near):** a rhyme between a stressed and an unstressed syllable. (*wing*, *caring*)
- **weak (or unaccented):** a rhyme between two sets of one or more unstressed syllables. (*hammer*, *carpenter*)
- **semirhyme:** a rhyme with an extra syllable on one word. (*bend*, *ending*)
- **forced (or oblique):** a rhyme with an imperfect match in sound. (*green*, *fiend*; *one*, *thumb*)
- **assonance:** matching vowels. (*sh**a**ke*, *h**a**te*) Assonance is sometimes referred to as slant rhymes, along with consonance.
- **consonance:** matching consonants. (***r**a**b**ie**s**, **r**o**bb**er**s***)
- **half rhyme** (or **slant rhyme**): matching final consonants. (*be**nt***, *a**nt***)
- **pararhyme:** all consonants match. (*tell*, *tall*)
- **alliteration** (or **head rhyme**): matching initial consonants. (***sh**ort*, ***sh**ip*)

Identical rhymes

Identical rhymes are considered less than perfect in English poetry; but are valued more highly in other literatures such as, for example, *rime riche* in French poetry.

Though homophones and homonyms satisfy the first condition for rhyming — that is, that the stressed vowel sound is the same—they do not satisfy the second: that the preceding consonant be different. As stated above, in a perfect rhyme the last stressed vowel and all following sounds are identical in both words.

If the sound preceding the stressed vowel is also identical, the rhyme is sometimes considered to be inferior and not a perfect rhyme after all.[3][4] An example of such a "super-rhyme" or "more than perfect rhyme" is the "identical rhyme", in which not only the vowels but also the onsets of the rhyming syllables are identical, as in *gun* and *begun*. Punning rhymes such are "bare" and "bear" are also identical rhymes. The rhyme may of course extend even farther back than the last stressed vowel. If it extends all the way to the beginning of the line, so that there are two lines that sound identical, then it is called a "holorhyme" ("For I scream/For ice cream").

In poetics these would be considered *identity*, rather than rhyme.

Eye rhyme

Eye rhymes or sight rhymes or spelling rhymes refer to similarity in spelling but not in sound where the final sounds are spelled identically by pronounced differently.[] Examples in English are *cough*, *bough*, and *love*, *move*.

Some early written poetry appears to contain these, but in many cases the words used rhymed at the time of writing, and subsequent changes in pronunciation have meant that the rhyme is now lost.

Mind rhyme

Mind rhyme is a kind of substitution rhyme similar to rhyming slang, but it is less generally codified and is “heard” only when generated by a specific verse context. For instance, “this sugar is neat / and tastes so sour.” If a reader or listener thinks of the word “sweet” instead of “sour”, then a mind rhyme has occurred.

Classification by position

Rhymes may be classified according to their position in the verse:

- **tail rhyme** (also called **end rhyme** or **rime couée**): a rhyme in the final syllable(s) of a verse (the most common kind)
- When a word at the end of the line rhymes with a word in the interior of the line, it is called an **internal rhyme**.
- **Holorhyme** has already been mentioned, by which not just two individual words, but two entire lines rhyme.
- **Off-centered rhyme** is a type of internal rhyme occurring in unexpected places in a given line. This is sometimes called a misplaced-rhyme scheme, or a Spoken Word rhyme style
- **Broken rhyme** is a type of enjambement producing a rhyme by dividing a word at the line break of a poem to make a rhyme with the end word of another line.
- **Cross rhyme** matches a sound or sounds at the end of a line with the same sound or sounds in the middle of the following (or preceding) line.[]

A rhyme scheme is the pattern of rhyming lines in a poem.

History

In many languages, including modern European languages and Arabic, poets use rhyme in set patterns as a structural element for specific poetic forms, such as ballads, sonnets and rhyming couplets. Some rhyming schemes have become associated with a specific language, culture or period, while other rhyming schemes have achieved use across languages, cultures or time periods. However, the use of structural rhyme is not universal even within the European tradition. Much modern poetry avoids traditional rhyme schemes.

The earliest surviving evidence of rhyming is the Chinese Shi Jing (ca. 10th century BC). Rhyme is used occasionally in the poems of classical antiquity. For instance, Catullus wrote a poem that rhymed, given here.[5] The ancient Greeks knew rhyme, and rhymes in The Wasps by Aristophanes are noted by a translator.[6] Classical Greek and Latin poetry did not use rhyme.[7] Rhyme is also occasionally used in the Bible.[8]

According to some archaic sources, Irish literature introduced the rhyme to Early Medieval Europe, though this is a disputed claim;[9] in the 7th century we find the Irish had brought the art of rhyming verses to a high pitch of perfection. Also in the 7th Century, rhyme was used in the Qur'an. The leonine verse is notable for introducing rhyme into High Medieval literature in the 12th century.

Rhyme entered European poetry in the High Middle Ages, in part under the influence of the Arabic language in Al Andalus (modern Spain).[10] Arabic language poets used rhyme extensively from the first development of literary Arabic in the sixth century, as in their long, rhyming qasidas.[11]

Since languages change over time, lines which rhymed in the past may no longer rhyme in today's language and it may not be clear how one would pronounce the words so that they rhyme. For example:

> Rejoice, O Judah, and in songs divine
>
> With cherubim and seraphim harmonious join.
>
> from Handel's *Judas Maccabaeus* (libretto by Thomas Morell)

"Should we really sing 'harmonious jine' [or 'songs divoin']?"[12]

Etymology

The word is derived from Old French *rime* or *ryme*, which may be derived from Old Frankish **rīm*, a Germanic term meaning "series, sequence" attested in Old English (Old English *rīm* meaning "enumeration, series, numeral") and Old High German *rīm*, ultimately cognate to Old Irish *rím*, Greek *ἀριθμός arithmos* "number". Alternatively, the Old French words may derive from Latin *rhythmus*, from Greek *ῥυθμός* (*rhythmos*, rhythm).[][13]

The spelling *rhyme* (from original *rime*) was introduced at the beginning of the Modern English period, due to a learned (but perhaps etymologically incorrect) association with Latin *rhythmus*.[] The older spelling *rime* survives in Modern English as a rare alternative spelling. A distinction between the spellings is also sometimes made in the study of linguistics and phonology, where *rime/rhyme* is used to refer to the nucleus and coda of a syllable. In this context, some prefer to spell this *rime* to separate it from the poetic rhyme covered by this article (see syllable rime).

Rhyme in various languages

Arabic

The Qurʾan is written in *saj'*, a prosaic genre that uses end rhymes. This particular style was widespread in the Arabic peninsula during the time of the Qurʾan's appearance.

Celtic languages

For Welsh, see cynghanedd

Rhyming in the Celtic Languages takes a drastically different course from most other Western rhyming schemes despite strong contact with the Romance and English patterns. Even today, despite extensive interaction with English and French culture, Celtic rhyme continues to demonstrate native characteristics. Brian Ó Cuív sets out the rules of rhyme in Irish poetry of the classical period: the last stressed vowel and any subsequent long vowels must be identical in order for two words to rhyme. Consonants are grouped into six classes for the purpose of rhyme: they need not be identical, but must belong to the same class. Thus 'b' and 'd' can rhyme (both being 'voiced plosives'), as can 'bh' and 'l' (which are both 'voiced continuants') but 'l', a 'voiced continuant', cannot rhyme with 'ph', a 'voiceless continuant'. Furthermore, "for perfect rhyme a palatalized consonant may be balanced only by a palatalized consonant and a velarized consonant by a velarized one."[14] In the post-Classical period, these rules fell into desuetude, and in popular verse simple assonance often suffices, as can be seen in an example of Irish Gaelic rhyme from the traditional song *Bríd Óg Ní Mháille*:

Is a Bhríd Óg Ní Mháille / 'S tú d'fhág mo chroí cráite

[is ə vrʲiːdʲ oːg nʲiː wɒːlʲə / stuː dɒːg mə xriː krɒːtʲə]

Translation: *Oh young Bridget O'Malley / You have left my heart breaking*

Here the vowels are the same, but the consonants, although both palatalized, do not fall into the same class in the bardic rhyming scheme.

Chinese

Besides the vowel/consonant aspect of rhyming, Chinese language rhymes often include tone quality (that is, tonal contour) as an integral linguistic factor in determining rhyme.

Use of rhyme in Classical Chinese poetry typically but not always appears in the form of paired couplets, with end-rhyming in the final syllable of each couplet.

Another important aspect of rhyme in regard to Chinese language studies is the study or reconstruction of past varieties of Chinese, such as Middle Chinese.

English

See English poetry

Old English poetry is mostly alliterative verse. One of the earliest rhyming poems in English is The Rhyming Poem.

As English is a language in which stress is important, lexical stress is one of the factors affecting the similarity of sounds for the perception of rhyme. Perfect rhyme can be defined as the case when two words rhyme if their final stressed vowel and all following sounds are identical.[]

Some words in English, such as "orange", are commonly regarded as having no rhyme. Although a clever writer can get around this (for example, by obliquely rhyming "orange" with combinations of words like "door hinge" or with lesser-known words like "Blorenge", a hill in Wales), it is generally easier to move the word out of rhyming position or replace it with a synonym ("orange" could become "amber").

One view of rhyme in English is from John Milton's preface to *Paradise Lost*:

> The Measure is *English* Heroic Verse without Rime, as that of *Homer* in *Greek*, and of *Virgil* in *Latin*; Rime being no necessary Adjunct or true Ornament of Poem or good Verse, in longer Works especially, but the Invention of a barbarous Age, to set off wretched matter and lame Meeter; grac't indeed since by the use of some famous modern Poets, carried away by Custom...

A more tempered view is taken by W. H. Auden in The Dyer's Hand:

> Rhymes, meters, stanza forms, etc., are like servants. If the master is fair enough to win their affection and firm enough to command their respect, the result is an orderly happy household. If he is too tyrannical, they give notice; if he lacks authority, they become slovenly, impertinent, drunk and dishonest.

Forced or clumsy rhyme is often a key ingredient of doggerel.

French

In French poetry, unlike in English, it is common to have "identical rhymes", in which not only the vowels of the final syllables of the lines rhyme, but their onset consonants ("consonnes d'appui") as well. To the ear of someone accustomed to English verse, this often sounds like a very weak rhyme. For example, an English perfect rhyme of homophones, *flour* and *flower*, would seem weak, whereas a French rhyme of homophones *doigt* and *doit* is not only acceptable but quite common.

Rhymes are sometimes classified into the categories "rime pauvre" ("poor rhyme"), "rime suffisante" ("sufficient rhyme"), "rime riche" ("rich rhyme") and "rime richissime" ("very rich rhyme"), according to the number of rhyming sounds in the two words or in the parts of the two verses. For example to rhyme "parla" with "sauta" would be a poor rhyme (the words have only the vowel in common), to rhyme "pas" with "bras" a sufficient rhyme (with the vowel and the silent consonant in common), and "tante" with "attente" a rich rhyme (with the vowel, the onset consonant, and the coda consonant with its mute "e" in common). Authorities disagree, however, on exactly where to place the boundaries between the categories.

Holorime is an extreme example of *rime richissime* spanning an entire verse. Alphonse Allais was a notable exponent of holorime. Here is an example of a holorime couplet from Marc Monnier:

> *Gall, amant de la Reine, alla (tour magnanime)*
>
> *Galamment de l'Arène à la Tour Magne, à Nîmes.*
>
> Gallus, the Queen's lover, went (a magnanimous gesture)
>
> Gallantly from the Arena to the Great Tower, at Nîmes.

Classical French rhyme not only differs from English rhyme in its different treatment of onset consonants. It also treats coda consonants in a distinctive way.

French spelling includes several final letters that are no longer pronounced, and that in many cases have never been pronounced. Such final unpronounced letters continue to affect rhyme according to the rules of Classical French versification. They are encountered in almost all of the pre-20th-century French verse texts, but these rhyming rules are almost never taken into account from the 20th century.

The most important "silent" letter is the "mute e". In spoken French today, final "e" is, in some regional accents (in Paris for example), omitted after consonants; but in Classical French prosody, it was considered an integral part of the rhyme even when following the vowel. "Joue" could rhyme with "boue", but not with "trou". Rhyming words ending with this silent "e" were said to make up a "feminine rhyme", while words not ending with this silent "e" made up a "masculine rhyme". It was a principle of stanza-formation that masculine and feminine rhymes had to alternate in the stanza. All 17th-century French plays in verse alternate masculine and feminine alexandrine couplets.

The "silent" final consonants present a more complex case. They, too, were considered an integral part of the rhyme, so that "pont" could rhyme only with "vont" and not with "long"; but this cannot be reduced to a simple rule about the spelling, since "pont" would also rhyme with "rond" even though one word ends in "t" and the other in "d". This

is because the correctness of the rhyme depends not on the spelling on the final consonant, but on how it would have been pronounced. There are a few simple rules that govern word-final consonants in French prosody:

- The consonants must "rhyme" *give or take their voicing*. So "d" and "t" rhyme because they differ only in voicing. So too with "g" and "c", and "p" and "b", and also "s" and "z" (and "x"). (Rhyming words ending with a silent "s" "x" or "z" are called "plural rhymes".)
- Nasal vowels rhyme no matter what their spelling. ("Essaim" can rhyme with "sain", but not with "saint" because the final "t" counts in "saint".)
- If the word ends in a consonant cluster, only the final consonant counts. ("Temps" rhymes with "lents" because both end in "s".)

In fact, only the "silent" final consonants which would be able to be pronounced the same way, if they were followed by a vowel, are able to rhyme together.

Greek

See Homoioteleuton rhyme

Hebrew

Ancient Hebrew verse generally did not employ rhyme. However, many Jewish liturgical poems rhyme today, because they were written in medieval Europe, where rhymes were in vogue.

Latin

In Latin rhetoric and poetry homeoteleuton and alliteration were frequently used devices.

Tail rhyme was occasionally used, as in this piece of poetry by Cicero:

*O Fortu**natam natam** me consule **Romam**.*

(O fortunate Rome, to be born with me consul)

But tail rhyme was not used as a prominent structural feature of Latin poetry until it was introduced under the influence of local vernacular traditions in the early Middle Ages. This is the Latin hymn *Dies Irae*:

Dies irae, dies illa

Solvet saeclum in favilla

Teste David cum Sybilla

(The day of wrath, that day

which will reduce the world to ashes,

as foretold by David and the Sybil.)

Medieval poetry may mix Latin and vernacular languages. Mixing languages in verse or rhyming words in different languages is termed macaronic.

Portuguese

Portuguese classifies rhymes in the following manner:

- **rima pobre** (poor rhyme): rhyme between words of the same grammatical category (e.g. noun with noun) or between very common endings (*-ão*, *-ar*);
- **rima rica** (rich rhyme): rhyme between words of different grammatical classes or with uncommon endings;
- **rima preciosa** (precious rhyme): rhyme between words with a different morphology, for example *estrela* (star) with *vê-la* (to see her);
- **rima esdrúxula** (odd rhyme): rhyme between proparoxitonic words (example: *última*, "last", and *vítima*, "victim").

Russian

Rhyme was introduced into Russian poetry in the 18th century. Folk poetry had generally been unrhymed, relying more on dactylic line endings for effect. Rhyme depends on a vowel and adjacent consonant (which may include the semivowel *Short I*). Vowel pairs rhyme - even though non-Russian speakers may not perceive them as the same sound. Consonant pairs rhyme if both are devoiced. Early 18th century poetry demanded perfect rhymes which were also grammatical rhymes, namely that noun endings rhymed with noun endings, verb endings with verb endings, and so on. Such rhymes relying on morphological endings become much rarer in modern Russian poetry, and greater use is made of approximate rhymes.[15]

Sanskrit

Patterns of rich rhyme (*prāsa*) play a role in modern Sanskrit poetry, but only to a minor extent in historical Sanskrit texts. They are classified according to their position within the *pada* (metrical foot): *ādiprāsa* (first syllable), *dvitīyākṣara prāsa* (second syllable), *antyaprāsa* (final syllable) etc.

Tamil

There are some unique rhyming schemes in Dravidian languages like Tamil. Specifically, the rhyme called *etukai* (anaphora) occurs on the second consonant of each line.

The other rhyme and related patterns are called *mōn̲ai* (alliteration), *toṭai* (epiphora) and *iraṭṭai kiḷavi* (parallelism).

Some classical Tamil poetry forms, such as *veṇpā*, have rigid grammars for rhyme to the point that they could be expressed as a context-free grammar.

Notes

[2] Miller G (2000) *The mating mind: how sexual choice shaped the evolution of human nature*, London, Heineman, ISBN 0-434-00741-2 (also Doubleday. ISBN 0-385-49516-1)

[3] (http://myclasses.net/smiser/cwp/rhyme.html), which cites *Whitfield's University Rhyming Dictionary*, 1951

[4] (http://www.michael-thomas.com/music/songwriting/rhyming.htm)

[5] http://www.prosentient.com.au/balnaves/johnbalnaves/dissch6c.asp

[6] http://books.google.com/books?id=WHmfT2s4mLgC&pg=PA4&lpg=PA4&dq=Aristophanes+wasps+rhyme&source=bl&ots=Re1e6MnWTd&sig=mczUaaeZwyOoemTUREZBuMHBemA&hl=en#v=onepage&q=Aristophanes%20wasps%20rhyme&f=false

[8] " Old Testament survey: the message, form, and background of the Old Testament pg. 236 (http://books.google.ca/books?id=6wSWpZmmlAoC&pg=PA236&lpg=PA236&dq=ugaritic+poetry+rhyme&source=bl&ots=8i7tZjxiF6&sig=F918VtPZEKIZ7r4ffu7lDRbrH6k&hl=en&ei=37ReTdeKLJKs8QOespxa&sa=X&oi=book_result&ct=result&resnum=2&ved=0CBwQ6AEwAQ#v=onepage&q=rhyme&f=false)"

[9] " Article about early Irish literature by prof. Douglas Hyde in The Catholic Encyclopedia (http://www.newadvent.org/cathen/08116a.htm)"

[12] Kelly, Thomas Forest (2011). *Early Music: A Very Short Introduction*, p.83. ISBN 978-0-19-973076-6.

[14] Ó Cuív, Brian (1967). 'The Phonetic Basis of Classical Modern Irish Rhyme'. *Ériu 20, pp. 96-97*

External links

- Directory of rhyming dictionaries at the Open Directory Project (http://www.dmoz.org/Reference/Dictionaries/Rhyming/)

Half rhyme

Half-rhyme or **slant-rhyme**, sometimes called **near-rhyme** or **imperfect rhyme**,[1] is consonance on the final letters of the words involved (e.g. *ill* with *shell*).[*citation needed*]

The following example uses alternating half-rhymes (*on*/*moon*, *bodies*/*ladies*):

> When have I last looked **on**
>
> The round green eyes and the long wavering **bodies**
>
> Of the dark leopards of the **moon**?
>
> All the wild witches, those most noble **ladies**

(Yeats, "Lines written in Dejection")

American poet Emily Dickinson also used half rhyme frequently in her works.[2] In her poem "Hope is the thing with feathers" the half rhyme appears in the second and fourth lines. In the following example the rhyme is *soul*/*all*.

> Hope is the thing with feathers
>
> That perches in the **soul**,
>
> And sings the tune without the words,
>
> And never stops at **all**.

Moses ibn Ezra, 12th century Hebrew poet and poetry theoretician, terms the practice of poets to use half-rhyme "cow-rhyming."[*citation needed*]

References

[1] http://web.cn.edu/kwheeler/lit_terms_S.html

Internal rhyme

In poetry, **internal rhyme,** or middle rhyme, is rhyme that occurs within a single line of verse.[1]

Examples

Internal rhyme schemes were extremely common in popular song of the Swing Era. One familiar example is the bridge from "Don't Fence Me In," written by Cole Porter for the film "Hollywood Canteen" in 1944

> Just turn me **loose** let me **straddle** my old **saddle**,
>
> Underneath the western skies,
>
> On my **cayuse** let me **wander** over **yonder**,
>
> 'Til I see the mountains rise.

Internal rhyme is used extensively in rap/hip hop music. The usage of internal rhyme in rap has increased over time, but can be found even in the earliest rap songs, such as the Sugarhill Gang's 1979 single, Rapper's Delight:[2]

> I'm six-foot-**one** and I'm **tons** of **fun** and I dress to a **T**
>
> You **see**, I got more clothes than Muhammad **Ali** and I dress so **viciously**
>
> I got body **guards**, I got two big **cars**, I definitely ain't the whack
>
> I got a Lincoln Continental and a sun-roofed Cadillac
>
> So after **school**, I take a dip in the **pool**, which is really on the wall
>
> I got a color **TV**, so I can **see** the Knicks play basketball

Internal rhyme is used frequently by many different hip hop artists, including Kool Moe Dee, Big Daddy Kane, and Rakim, as demonstrated in Eric B. and Rakim's 1987 piece, "My Melody" from their debut album *Paid In Full*:

> My **unusual style** will **confuse you a while**
>
> If I were water, I'd flow in the **Nile**
>
> So many **rhymes** you won't have **time** to go for **yours**
>
> Just **because** of **applause** I have to **pause**
>
> **Right** after **tonight** is when I **prepare**
>
> To catch another sucker-duck MC out **there**
>
> My **strategy** has to be **tragedy, catastrophe**
>
> And after this you'll call me your **majesty...**

[3][4]

Another prominent hip hop artist who uses internal rhymes is AZ, as shown in "The Format":

> 1 **Young and gifted**, my **tongue's prolific**
>
> 2 In the **beach bungalow** is how I **brung in Christmas**
>
> 3 To the **streets imma flow** from the **hungriest districts**
>
> 4 **Swiss kicks** crisp when I come to them **picnics**
>
> 5 **Play slow**, paper chase **stack and lay low**
>
> 6 **Range rove** tinted all **black the same old**
>
> 7 **Psychic mind**, **writes rhymes** that **turned a new leaf from a life of crime**
>
> 8 No **concerns with new beef, who's as nice as I'm**
>
> 9 It's **confirmed, from few feet I'm still a sniper blind**

10 **Built my fame**, **spilt my pain**

11 Politicking daily, still trying to **milk the game**

12 It's obvious I'm real, rap **skills remain**

13 Took some **change** and I'm **still the same**

It is important to note the complexity of the internal rhyme patterns as the verse progresses. Starting with simple compounds, line-for-line: "Young and Gifted", "tongue's prolific"; the artist blends in another AB multi: "beach bungalow", "streets imma flow" while capping the line with the original AB pattern: "hungriest districts".

Rhyme table: Simple AB Multi

sound / line #	built (10)	fame (10)
10	spilt	pain
11	milk	game
12	skills	remain
13	still	same

Rhyme table: Nested AB Multi

sound / line #	young (1)	gifted (1)	beach (2)	bungalow (2)
1	tongue	lific (prolific)	--	--
2	brung	christmas	--	--
3	hung (hungriest)	districts	streets	flow
4	--	swiss kicks, picnics	--	--

Rhyme table: Full Line Multi

sound / line #	play (5)	slow (5)	stack (5)	lay (5)	low (5)
6	range	rov	black	same	old

AZ then adds to the depth of his internal rhymes, nearly rhyming word-for-word, one entire line to another:

Rhyme table: Lines 7-9

sound / line #	turned (7)	new (7)	leaf (7)	life (7)	crime (7)
8	concerns	new	beef	nice	I'm
9	confirmed	few	feet	snipe (sniper)	blind

References

[1] Strachan, John; Terry, Richard (2000). *Poetry*, p. 63. Edinburgh University Press, ISBN 0-7486-1045-6.
[2] http://rapgenius.com/Sugar-hill-gang-rappers-delight-lyrics
[3] Salaam, Mtume ya (June 22, 1995). "The Aesthetics ". *African American Review*.
[4] [allmusic (((Rakim > Biography)))]. Allmusic. Accessed May 22, 2008.

Assonance

Assonance is the repetition of vowel sounds to create internal rhyming within phrases or sentences, and together with alliteration and consonance[1] serves as one of the building blocks of verse. For example, in the phrase "D**o** y**ou** like bl**ue**?", the /uː/ ("o"/"ou"/"ue" sound) is repeated within the sentence and is assonant.

Assonance is found more often in come torta than in prose. It is used in (mainly modern) English-language poetry, and is particularly important in Old French, Spanish and the Celtic languages.

Examples

the silken sad unc**er**tain rustling of each p**ur**ple c**ur**tain	— Edgar Allan Poe, "The Raven"
And m**ur**m**ur**ing of innum**er**able bees	— Alfred Lord Tennyson, *The Princess* VII.203
Windows tinted on m**y** r**i**de when **I** dr**i**ve in it, so when **I** rob a bank run out and just d**i**ve in it, so **I**'ll be disgu**i**sed in it. And if anybody **i**dentif**i**es the gu**y** in it, **I** h**i**de for f**i**ve minutes. Come back, shoot the **eye** witness. F**i**re at the pr**i**vate **eye** h**i**red to pr**y** in m**y** business.	— Eminem, *Criminal*
That solit**u**de which s**ui**ts abstr**u**ser m**u**sings	— Samuel Taylor Coleridge, "Frost at Midnight"
I must conf**e**ss that in my qu**e**st I f**e**lt dep**re**ssed and **re**stless	— Thin Lizzy, "With Love"
Known n**ar**cissists, sipping on **ar**senic, C**ar**ved c**ar**casses in the g**ar**age, don't p**ar**k in it, H**ar**d as finding ret**ar**ded kids at H**ar**vard, It's Wolf Gang b**ar**king keep you up like c**ar** al**ar**ms and shit	— Earl Sweatshirt, from Tyler, The Creator's "AssMilk"
This b**ur**l**a**p s**a**ck **i**s f**i**lled w**i**th sn**a**ck for **a**fter cl**a**ss for the whole cl**a**ss to sn**a**ck on	— Earl Sweatshirt, from "Pigions"
The cr**u**mbling th**u**nder of seas	— Robert Louis Stevenson
Dead **i**n the m**i**ddle of l**i**ttle **I**taly, l**i**ttle d**i**d we know that we r**i**ddled some m**i**ddleman who d**i**dn't do d**i**ddily.	— Big Pun, "Twinz"
H**e**s **e**vil, and I'm bad like St**eve** S**ea**gal. Above the law cause I don't agr**ee** with pol**ice** **ei**ther. (Shit me n**ei**ther.) We ain't **ea**ger to b**e** l**e**gal, so pl**ease**, l**eave**, m**e**, with the k**eys** to your J**ee**p-**Ea**gle. I br**eathe** **e**ther in thr**ee** l**e**thal amounts, while I stab myself in the kn**ee** with a dis**ea**sed n**ee**dle.	— Eminem, "Bad Meets Evil"
Close your eyes for what you c**a**n't im**a**gine; we are the x**a**ny gn**a**shing C**a**ddy sm**a**shing, br**a**tty **a**ss; he m**a**d, he sn**a**tched his d**a**ddy's J**a**g; And used the shit for b**a**tting pr**a**ctice, **a**d**a**m**a**nt **a**nd he thr**a**shing Purchasing cr**a**ppy gr**a**ms with h**a**lf the h**a**nd of c**a**sh you h**a**nded P**a**nicking, p**a**tch me up; P**a**ppy done l**a**tch keyed us Toying with R**a**ggy **A**nns **a**nd m**a**mmy done h**a**d enough Br**a**sh **a**s fuck, breaching all these **a**queducts; don't believe us Treat us like we c**a**n't erupt, yup	— Earl Sweatshirt, from Frank Ocean's "Super Rich Kids"
t**u**ndit**ur** **u**nda	— Catullus 11
on a pr**ou**d r**ou**nd cl**ou**d in wh**i**te h**i**gh n**i**ght	— E.E. Cummings, *if a cheerfulest Elephantangelchild should sit*
I've never seen so many Dom**i**nican w**o**men with c**i**nnamon tans	— Will Smith, "Miami"

I **bo**mb at**o**mical**ly**—**So**crat**e**s' phil**o**s**o**ph**ie**s and hyp**o**thes**e**s can't define how I b**e** dr**o**ppin' th**e**se m**o**cker**ie**s.	— Inspectah Deck, from the Wu-Tang Clan's "Triumph."
Up in the arroy**o** a rare **ow**l's nest I did spy, s**o** I l**oa**ded up my shotgun and watched **ow**l feathers fly	— Jon Wayne, Texas Assonance
Some kids who played games about N**a**rn**ia** got gradually b**a**lm**ie**r and b**a**lm**ie**r	— C.S. Lewis The Voyage of the Dawn Treader
And the moon r**o**se **o**ver an **o**pen field	— Paul Simon, America
Gonna g**e**t a s**e**t of b**e**tter clubs, gonna f**i**nd the k**i**nd with t**i**ny nubs, just so m**y** **i**rons aren't always fl**y**ing off the backswing	— Barenaked Ladies, One Week
Ps**y**chic sp**i**es from Ch**i**na tr**y** to steal your m**i**nd's elation	— Red Hot Chili Peppers, Californication

J. R. R. Tolkien's *Errantry* is a poem whose meter contains three sets of trisyllabic assonances in every set of four lines.

Assonance can also be used in forming proverbs, often a form of short poetry. In the Oromo language of Ethiopia, note the use of a single vowel throughout the following proverb, an extreme form of assonance:

- *kan mana baala, aʔlaa gaala* (“A leaf at home, but a camel elsewhere"; somebody who has a big reputation among those who do not know him well.)

In more modern verse, stressed assonance is frequently used as a rhythmic device in modern rap. An example is Public Enemy's 'Don't Believe The Hype': *"Their pens and pads I snatch 'cause I've **had it** / I'm not an **addict**, fiending for **static** / I see their tape recorder and I **grab it** / No, you can't **have it** back, silly **rabbit**".*

Sources

- Assonance [2], American Rhetoric: Rhetorical Figures in Sound
- Assonance [3], Modern & Contemporary American Poetry, University of Pennsylvania
- Definition of Assonance [4], Elements of Poetry, VirtuaLit

External links

- Examples of assonance in poetry. [5]

References

[1] Khurana, Ajeet "Assonance and Consonance" Outstanding Writing. (http://outstandingwriting.com/assonance-and-consonance/)

Literary consonance

Consonance is a poetic device characterized by the repetition of the same consonant two or more times in short succession, as in "**p**i**tt**er **p**a**tt**er" or in "all **m**a**mm**als na**m**ed Sa**m** are cla**mm**y".[1]

Consonance should not be confused with assonance, which is the repetition of vowel sounds. Alliteration is a special case of consonance where the repeated consonant sound is at the stressed syllable[2], as in "**f**ew **f**locked to the **f**ight" or "a**r**ound the **r**ock the **r**agged **r**ascal **r**an". Alliteration is usually distinguished from other types of consonance in poetic analysis, and has different uses and effects.

Another special case of consonance is sibilance, the use of several sibilant sounds such as /s/ and /sh/. An example is the verse from Edgar Allan Poe's *The Raven*: "And the **s**ilken **s**ad un**c**ertain ru**st**ling of each purple curtain." (This example also contains assonance around the "ur" sound.) Another example of consonance is the word "**s**ibilan**c**e" itself.

Consonance is an element of half-rhyme poetic format, sometimes called "slant rhyme." It is common in hip-hop music, as for example in the song *Zealots* by the Fugees: "Rap **rejects** my tape deck, **ejects** pro**jectile/**Whether **Je**w or **gentile** I rank top per**centile**." (This is also an example of internal rhyme.)

Traditionally, consonance has been used to emphasize or imitate a sound in formal poetry but is often used in modern days to create a tongue-twister effect.

References

[1] http://books.google.se/books?id=mp0s9GgrafUC&pg=PA130&dq=Consonance+%22figure+of+speech%22&hl=en&sa=X&ei=s4ZuUafWNsW74AS6uYCoDw&redir_esc=y#v=onepage&q=Consonance%20%22figure%20of%20speech%22&f=false

[2] http://www.thefreedictionary.com/alliteration

External links

- Examples of consonance in poetry. (http://www.poetandknowit.com/english-definitions/consonance-examples.aspx)

Alliteration

Manners of articulation
• Obstruent Stop Affricate Fricative Sibilant • Sonorant Nasal Flap/Tap Approximant Liquid Vowel Semivowel • Lateral • Trill
Airstreams
• Pulmonic • Ejective • Implosive • Lingual (clicks) • Linguo-pulmonic • Linguo-ejective
• Alliteration • Assonance • Consonance • See also: Place of articulation
This page contains phonetic information in IPA, which may not display correctly in some browsers. [Help]

In language, **alliteration** is the repetition of a particular sound in the *prominent lifts* (or stressed syllables) of a series of words or phrases. Alliteration has developed largely through poetry, in which it more narrowly refers to the repetition of a consonant in any syllables that, according to the poem's meter, are stressed[*citation needed*], as in James Thomson's verse "Come…dragging the **l**azy **l**anguid **L**ine a**l**ong". Another example is Peter Piper Picked a Peck of Pickled Peppers.[1]

In alliterative verse, the alliteration that is relevant to the metre is the *lift* of the half-line (a lift being a *stressed syllable*); the ironic example often given to illustrate this is that the word *a**ll**iteration* itself alliterates on the consonant **l**, not **a** (the *a* of alliteration being marked as a *dip* or unstressed syllable, hence non-alliterating) - thus, *bold beauty* is an alliterative formula, *between beauties* is not, etc.

Consonance (ex: As the wi**nd** will be**nd**) is another 'phonetic agreement' akin to alliteration. *Assonance* is also often in said category (ex: she l**o**ves the th**u**nder), though is more akin to true-rhyme than alliteration (assonance-rhyme being a main feature of Old Celtic verseforms). Alliteration may also include the use of different consonants with similar properties[2] such as alliterating *z* with *s*, as does Tolkien in Sir Gawain and the Green Knight, or as Anglo-Saxon (Old English) poets would alliterate hard/fricative *g* with soft *g* (the latter exemplified in some courses as the letter yogh - ȝ - pronounced like the *y* in yarrow or the *j* in Jotunheim); this is known as *license*. The concept is that the sounds are formed orally with exceptional similarity (which can be exampled simply by pronouncing the

difference between *z* and *s*, or *f* and *v* likewise being acceptable as license in alliterative verse).

Alliteration is commonly used in many languages, especially in poetry. Alliterative verse was an important ingredient of poetry in "Sanskrit Shlokas",[3][4] *Old English*, *Old Norse* and *Old Irish* especially - as well as other old Germanic languages like Old High German, and Old Saxon. This custom extended to personal name giving, such as in Old English given names.[5] This is evidenced by the unbroken series of 9th century kings of Wessex named Æthelwulf, Æthelbald, Æthelberht, and Æthelred. These were followed in the 10th century by their direct descendants Æthelstan and Æthelred II, who ruled as kings of England.[6] The Anglo-Saxon saints Tancred, Torhtred and Tova provide a similar example, among siblings.[7]

Alliteration in poetry and literature

- The Raven by Edgar Allan Poe has many examples of alliteration including the following line : "And the silken sad uncertain rustling of each purple curtain."
- Samuel Taylor Coleridge's Rime of the Ancient Mariner has the following lines of alliteration : "For the sky and the sea, and the sea and the sky." and "the furrow followed free...".
- Robert Frost's poem *Acquainted with the Night* has the following line of alliteration : "I have stood still and stopped the sound of feet."
- Dr Tapan Kumar Pradhan's poem *"I, She and the Sea"* [8] has many alliterative word strings such as : *"as the surf surged up the sun swept shore..."*.
- The poem *Dancing Dolphins* by Paul McCann has the following brilliant example : "Those tidal thoroughbreds that tango through the torqouise tide/ Their taut tails thrashing, they twist in tribute to the Titans/ The twirl through the trek/ Tumbling towards the tide/ Throwing themselves towards those theatrical thespians."

Examples in nursery rhymes

- In the nursery rhyme *Three Grey Geese* by Mother Goose, use of alliteration can be found in the following lines : *"the Three grey geese in a green field grazing. Grey were the geese and green was the grazing."*
- The tongue-twister rhyme *Betty Botter* by Carolyn Wells is a brilliant example of alliterative composition : "Betty Botter bought some butter, but she said, this butter's bitter; if I put it in my batter, it will make my batter bitter, but a bit of better butter will make my batter better..."

Pop culture

Alliteration is most commonly used in modern music but is also seen in magazine article titles, advertisements, business names, comic strip and cartoon characters. :[8]

Examples

- Barnacle Boy
- Big Boss
- Bugs Bunny
- Daffy Duck
- Double Dash
- Family Feud
- Final Fantasy
- Froggy Fresh
- Horrid Henry
- Krispy Kreme
- Mega Man

- Mermaid Man
- Moaning Myrtle
- Morning Musume
- Mortar Mayhem
- Peter Parker
- Puyo Puyo
- Rayman Raving Rabbids
- Solid Snake
- sufferin' succotash (derived from suffering savior)
- Super Sonic Songs

References

[3] http://www.jstor.org/stable/599756

[4] K.N. Jha, Figurative Poetry In Sanskrit Literature, 1975, ISBN 978-8120826694

[5] Gelling, M., *Signposts to the Past* (2nd edition), Phillimore, 1988, pp. 163–4.

[6] Old English "Æthel" translates to modern English "noble". For further examples of alliterative Anglo-Saxon royal names, including the use of only alliterative first letters, see e.g. Yorke, B., *Kings and Kingdoms of Early Anglo-Saxon England*, Seaby, 1990, Table 13 (p. 104; Mercia, names beginning with "C", "M", and "P"), and pp. 142–3 (Wessex, names beginning with "C"). For discussion of the origins and purposes of Anglo-Saxon "king lists" (or "regnal lists"), see e.g. Dumville, D.N., 'Kingship, Genealogies and Regnal Lists', in Sawyer, P.H. & Wood, I.N. (eds.), *Early Medieval Kingship*, University of Leeds, 1977.

[7] Rollason, D.W., 'Lists of Saints' resting-places in Anglo-Saxon England', in *Anglo-Saxon England 7*, 1978, p. 91.

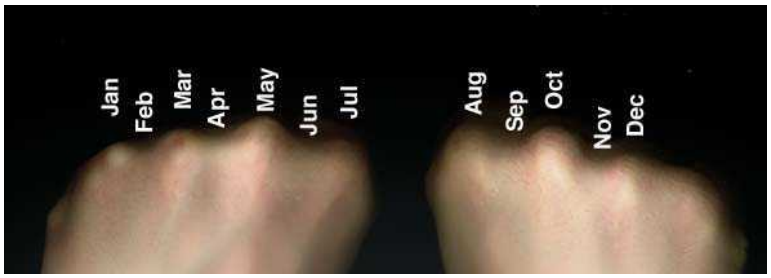
[8] Coard, Robert L. *Wide-Ranging Alliteration.* Peabody Journal of Education, Vol. 37, No. 1. (July 1959) pp. 30–32.

External links

- A collection of Dutch alliterations and related material (http://www.heardutchhere.net/BeautyOfDutch.html) (with sound files)
- Examples of alliteration in poetry (http://www.poetandknowit.com/english-definitions/alliteration-examples.aspx)

Mnemonic

A **mnemonic** (pron.: /nəˈmɒnɨk/,[1] with a silent "m"), or **mnemonic device**, is any learning technique that aids information retention. Mnemonics aim to translate information into a form that the human brain can retain better than its original form. Even the process of applying this conversion might already aid the transfer of information to long-term memory. Commonly encountered mnemonics are often for lists and in auditory form, such as short poems, acronyms, or memorable phrases, but mnemonics can also be for other types of information and in visual or kinesthetic forms. Their use is based on the observation that the human mind more easily remembers spatial, personal, surprising, physical, sexual, humorous, or otherwise 'relatable' information, rather than more abstract or impersonal forms of information.



Knuckle mnemonic for the number of days in each month of the Gregorian Calendar. Each projecting knuckle represents a 31-day month.

The word *mnemonic* is derived from the Ancient Greek word μνημονικός (*mnēmonikos*), meaning "of memory"[2] and is related to Mnemosyne ("remembrance"), the name of the goddess of memory in Greek mythology. Both of these words are derived from μνήμη (*mnēmē*), "remembrance, memory".[3] Mnemonics in antiquity were most often considered in the context of what is today known as the Art of memory.

Ancient Greeks and Romans distinguished between two types of memory: the 'natural' memory and the 'artificial' memory. The former is inborn, and is the one that everyone uses automatically and without thinking. The artificial memory in contrast has to be trained and developed through the learning and practicing of a variety of mnemonic techniques.

Mnemonic systems are special techniques or strategies consciously used to improve memory, it helps employ information already stored in long-term memory to make memorization an easier task.[4]

History

The general name of **mnemonics**, or *memoria technica*, was the name applied to devices for aiding the memory, enabling the mind to reproduce a relatively unfamiliar idea, and especially a series of dissociated ideas, by connecting it, or them, in some artificial whole, the parts of which are mutually suggestive.[5] Mnemonic devices were much cultivated by Greek sophists and philosophers and are repeatedly referred to by Plato and Aristotle. In later times the invention was ascribed to the poet Simonides, perhaps for no other reason than that the strength of his memory was famous. Cicero, who attaches considerable importance to the art, but more to the principle of order as the best help to memory, speaks of Carneades (or perhaps Charmades) of Athens and Metrodorus of Scepsis as distinguished examples of the use of well-ordered images to aid the memory. The Romans valued such helps as giving facility in public speaking.[6]

The Greek and the Roman system of mmnemonics was founded on the use of mental places and signs or pictures, known as "topical" mnemonics. The most usual method was to choose a large house, of which the apartments, walls, windows, statues, furniture, etc., were severally associated with certain names, phrases, events or ideas, by means of symbolic pictures; and to recall these it was only necessary to search over the apartments of the house till the particular place was discovered where they had been deposited by the imagination.

In accordance with said system, if it were desired to fix an historic date in memory, it was localised in an imaginary town divided into a certain number of districts, each of with ten houses, each house with ten rooms, and each room with a hundred quadrates or memory-places, partly on the floor, partly on the four walls, partly on the roof. Therefore, if it were desired to fix in the memory the date of the invention of printing (1436), an imaginary book, or some other symbol of printing, would be placed in the thirty-sixth quadrate or memory-place of the fourth room of the first house of the historic district of the town. Except that the rules of mnemonics are referred to by Martianus Capella, nothing further is known regarding the practice until the 13th century.[5]

Detail of Giordano Bruno's statue in Rome. Bruno was famous for his mnemonics, some of which he included in his treatises *De umbris idearum* and *Ars Memoriae*.

Among the voluminous writings of Roger Bacon is a tractate *De arte memorativa*. Ramon Llull devoted special attention to mnemonics in connection with his *ars generalis*. The first important modification of the method of the Romans was that invented by the German poet Konrad Celtes, who, in his *Epitoma in utramque Ciceronis rhetoricam cum arte memorativa nova* (1492), instead of places made use of the letters of the alphabet. About the end of the 15th century Petrus de Ravenna (b. 1448) created such an astonishment in Italy by his mnemonic feats that he was believed by many to be a necromancer. His *Phoenix artis memoriae* (Venice, 1491, 4 vols.) went through as many as nine editions, the seventh appearing at Cologne in 1608.

An impression equally great was produced about the end of the 16th century by Lambert Schenkel (*Gazophylacium*, 1610), who taught mnemonics in France, Italy and Germany, and, although he was denounced as a sorcerer by the University of Louvain, published in 1593 his tractate *De memoria* at Douai with the sanction of that celebrated theological faculty. The most complete account of his system is given in two works by his pupil Martin Sommer, published in Venice in 1619. In 1618 John Willis (d. 1628?) published *Mnemonica; sive ars reminiscendi*,[7] containing a clear statement of the principles of topical or local mnemonics. Giordano Bruno, in connection with his exposition of the *ars generalis* of Llull, included a *memoria technica* in his treatise *De umbris idearum*. Other writers of this period are the Florentine Publicius (1482); Johannes Romberch (1533); Hieronimo Morafiot, *Ars memoriae* (1602); B. Porta, *Ars reminiscendi* (1602).[5]

In 1648 Stanislaus Mink von Wennsshein made known what he called the "most fertile secret" in mnemonics — namely the use of consonants for figures, so as to express numbers by words (vowels being added as required); and the philosopher Leibnitz adopted an alphabet very similar to that of Wennsshein in connection with his scheme for a form of writing common to all languages. Wennsshein's method, which in fact is adopted with slight changes by the majority of subsequent "original" systems, was modified and supplemented in regard to many details by Richard Grey (1694-1771), who published a *Memoria technica* in 1730. The principal part of Grey's method (which may be compared with the Jewish system by which letters also stand for numerals, and therefore words for dates) is briefly this:

> To remember anything in history, chronology, geography, etc., a word is formed, the beginning whereof, being the first syllable or syllables of the thing sought, does, by frequent repetition, of course draw after it the latter part, which is so contrived as to give the answer. Thus, in history, the Deluge happened in the year before Christ two thousand three hundred forty-eight; this is signified by the word Del-*etok*, Del standing for Deluge and *etok* for 2348.[5]

To assist in retaining the mnemonical words in the memory, they were formed into memorial lines, which, however, being composed of strange words in difficult hexameter scansion, are by no means easy to memorise. The vowel or consonant, which Grey connected with a particular figure, was chosen arbitrarily; but in 1806 Gregor von Feinaigle, a German monk from Salem near Constance, began in Paris to expound a system of mnemonics, one feature (based on Wennsshein's system) of which was to represent the numerical figures by letters chosen on account of some

similarity to the figure to be represented or some accidental connection with it. This alphabet was supplemented by a complicated system of localities and signs. Feinaigle, who apparently published nothing himself, came to England in 1811, and in the following year one of his pupils published *The New Art of Memory*, which, beside giving Feinaigle's system, contains valuable historical material about previous systems.

Simplified forms were published later by other mnemonists, as the more complicated ones fell almost into complete disuse; but methods founded chiefly on the so-called laws of association (cf. Mental association) were taught with some success in Germany.[8]

Applications

A wide range of mnemonics are used for an even wider range of different purposes. The most commonly used mnemonics are those for lists, numerical sequences, and foreign-language acquisition.

For lists

A common mnemonic for remembering lists is to create an easily remembered acronym, or, taking each of the initial letters of the list members, create a memorable phrase in which the words with the same acronym as the material. Anyone can create their own mnemonics to aid the memorisation of novel material.

Some common examples for first letter mnemonics:

- To memorise the colours of the rainbow: the phrase "Richard Of York Gave Battle In Vain" - each of the initial letters matches the colours of the rainbow in order (Red, Orange, Yellow, Green, Blue, Indigo, Violet). Other examples are the phrase "Run over your granny because it's violent" or the imaginary name "Roy G. Biv".
- To memorise the North American Great Lakes: the acronym HOMES - matching the letters of the five lakes (Huron, Ontario, Michigan, Erie, and Superior) [9]
- To memorise color codes as they are used in electronics: the phrase "Bill Brown Realized Only Yesterday Good Boys Value Good Work" represents in order the 10 colours and their numerical order (black (0), brown (1), red (2), orange (3), yellow (4), green (5), blue (6), violet or purple (7), gray (8), and white (9)).[10]
- To memorise chemical reactions, such as redox reactions, where it is common to mix up oxidation and reduction, the short phrase "LEO (Lose Electron Oxidation) the lion says GER (Gain Electron Reduction)" or "Oil Rig" can be used - which is an acronym for "Oxidation is losing, Reduction is gaining".[]

For numerical sequences

Mnemonic phrases or poems can be used to encode numeric sequences by various methods, one common one is to create a new phrase in which the number of letters in each word represents the according digit of pi. For example, the first 15 digits of the mathematical constant pi (3.14159265358979) can be encoded as "Now I need a drink, alcoholic of course, after the heavy lectures involving quantum mechanics"; "Now", having 3 letters, represents the first number, 3. Piphilology is the practice dedicated to creating mnemonics for pi.

For foreign-language acquisition

Mnemonics may be helpful in learning foreign languages, for example by transposing difficult foreign words with words in a language the learner knows already. A useful such technique is to find linkwords, words that have the same pronunciation in a known language as the target word, and associate them visually or auditorially with the target word.

For example, in trying to assist the learner to remember **ohel**, the Hebrew word for *tent*, the memorable sentence "**Oh hell**, there's a raccoon in my *tent*" can be used. Also in Hebrew, a way to remember the word, bayit (bahy- it), meaning house, one can use the sentence "that's a lovely house, I'd like to bayit." The linguist Michel Thomas taught students to remember that *estar* is the Spanish word for *to be* by using the phrase "to be a star".

Another technique is for learners of gendered languages to associate their mental images of words with a colour that matches the gender in the target language. An example here is to remember the Spanish word for "foot", *pie*, with the image of a foot stepping on a pie which then spills blue filling (blue representing the male gender of the noun in this example).

Effectiveness

Academic study of the use of mnemonics has shown their effectiveness. In one such experiment, subjects of different ages who applied mnemonic techniques to learn novel vocabulary outperformed control groups that applied contextual learning and free-learning styles.[]

Mnemonics vary in effectiveness for several groups ranging from young children to the elderly. Mnemonic learning strategies require time and resources by educators to develop creative and effective devices. The most simple and creative mnemonic devices usually are the most effective for teaching. In the classroom, mnemonic devices must be used at the appropriate time in the instructional sequence to achieve their maximum effectiveness.[11]

Mnemonics were seen to be more effective for groups of people who struggled with or had weak long-term memory, like the elderly. Five years after a mnemonic training study, a research team followed-up 112 community-dwelling older adults, 60 years of age and over. Delayed recall of a word list was assessed prior to, and immediately following mnemonic training, and at the 5-year follow-up. Overall, there was no significant difference between word recall prior to training and that exhibited at follow-up. However, pre-training performance gains scores in performance immediately post-training and use of the mnemonic predicted performance at follow-up. Individuals who self-reported using the mnemonic exhibited the highest performance overall, with scores significantly higher than at pre-training. The findings suggest that mnemonic training has long-term benefits for some older adults, particularly those who continue to employ the mnemonic. [12] This greatly contrasts with a study where the results showed from surveys of medical students that approximately only 20% frequently used mnemonic acronyms.[13] Although the majority of a certain age group can benefit from the use of mnemonics, not everyone can learn best using them.Wikipedia:Please clarify

Studies (notably "The Magical Number Seven, Plus or Minus Two") have suggested that the short-term memory of adult humans can hold only a limited number of items; grouping items into larger chunks such as in a mnemonic might be part of what permits the brain to hold a larger total amount of information in short-term memory, which in turn can aid the creation of long-term memories.

References

[2] μνημονικός (http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0057:entry=mnhmoniko/s), Henry George Liddell, Robert Scott, *A Greek-English Lexicon*, on Perseus

[3] μνήμη (http://www.perseus.tufts.edu/hopper/text?doc=Perseus:text:1999.04.0057:entry=mnh/mh), Henry George Liddell, Robert Scott, *A Greek-English Lexicon*, on Perseus

[4] Carlson, Neil and et al. "Psychology the Science of Bahaviour", p. 245. Pearson Canada, United States of America. ISBN 978-0-205-64524-4.

[5] - and respective bibliography for this specific section.

[6] The method used is described by the author of *Rhet ad Heren.* iii. 16-24; see also Quintilian (*Inst. Or.* xi. 2), whose account is, however, obscure. In his time the art had almost ceased to be practiced.

[7] English version by Leonard Sowersby, 1661; extracts in Gregor von Feinaigle's *New Art of Memory*, 3rd ed., 1813.

[8] A simplified form of Feinaigle's method was published by Aimé Paris (*Principes et applications diverses de la mnémonique*, 7th ed., Paris, 1834), and the use of symbolic pictures was revived in connection with the latter by a Pole, Antoni Jaźwińsky, of whose system an account was published by the Polish general J. Bem, under the title *Exposé général de la méthode mnémonique polonaise, perfectionnée à Paris* (Paris, 1839). Various other modifications of the systems were advocated by subsequent mnemonists right through the 19th century. More complicated systems were proposed in the 20th century, such as the *Keesing Memory System*, the *System of Memory and Mental Training*, and the Pelman memory system.

[9] Great Lakes Mnemonic (http://www.happychild.org.uk/acc/tpr/mne/1199gtlk.htm)

[11] McAlum, Harry G., and Sharon S. Seay., "The use/application of mnemonics as a pedagogical tool in auditing" (http://go.galegroup.com.myaccess.library.utoronto.ca/ps/i.do?id=GALE|A235631629&v=2.1&u=utoronto_main&it=r&p=ITOF&sw=w,)"Academy of Educational Leadership Journal", May 2010

[12] O'Hara, Ruth et al, "Long-term effects of mnemonic training in community-dwelling older adults" (http://search.proquest.com.myaccess.library.utoronto.ca/psycinfo/docview/621661024/13A83EC33E93A96835/6?accountid=14771,)"Journal of Psychiatric Research", October 2007

[13] Brotle, D.Charles "The role of mnemonic acronyms in clinical emergency medicine: A grounded theory study" (http://search.proquest.com.myaccess.library.utoronto.ca/psycinfo/docview/884684185/13A83EC33E93A96835/1?accountid=14771), 2011

External links

- Font 99 mnemonics wiki (http://www.font99.com)
- Mind Tools: Introduction to Memory Techniques (http://www.mindtools.com/pages/article/newTIM_00.htm)
- Collection of Mnemonic Devices (http://www.mnemonic-device.com)

Phonetic algorithm

A **phonetic algorithm** is an algorithm for indexing of words by their pronunciation. Most phonetic algorithms were developed for use with the English language; consequently, applying the rules to words in other languages might not give a meaningful result.

They are necessarily complex algorithms with many rules and exceptions, because English spelling and pronunciation is complicated by historical changes in pronunciation and words borrowed from many languages.

Among the best-known phonetic algorithms are:

- Soundex, which was developed to encode surnames for use in censuses. Soundex codes are four-character strings composed of a single letter followed by three numbers.
- Daitch–Mokotoff Soundex, which is a refinement of Soundex designed to better match surnames of Slavic and Germanic origin. Daitch–Mokotoff Soundex codes are strings composed of six numeric digits.
- **(German)** Kölner Phonetik: This is similar to Soundex, but more suitable for German words.
- Metaphone and Double Metaphone, which is suitable for use with most English words, not just names. Metaphone algorithms are the basis for many popular spell checkers.
- New York State Identification and Intelligence System (NYSIIS), which maps similar phonemes to the same letter. The result is a string that can be pronounced by the reader without decoding.
- Match Rating Approach developed by Western Airlines in 1977 - this algorithm has an encoding and range comparison technique.
- Caverphone, created to assist in data matching between late 19th century and early 20th century electoral rolls, optimized for accents present in parts of New Zealand.

Common Uses

- Spell checkers can often contain phonetic algorithms. The Metaphone algorithm, for example, can take an incorrectly spelt word and create a code. The code is then looked up in directory for words with the same or similar Metaphone. Words that have the same or similar Metaphone become possible alternative spellings.
- Search functionality will often use phonetic algorithms to find results that don't match exactly the term(s) used in the search. Searching for names can be difficult as there are often multiple alternative spellings for names. An example is the name Claire. It has two alternatives, Clare/Clair,[1] which are both pronounced the same. Searching for one spelling wouldn't show results for the two others. Using Soundex all three variations produce the same Soundex code, C460. By searching names based on the Soundex code all three variations will be returned.

References

External links

- Algorithm for converting words to phonemes (http://shape-of-code.coding-guidelines.com/2012/03/16/generating-sounds-like-and-accented-words/) and back.
- StringMetric project (http://rockymadden.com/stringmetric/) a Scala library of phonetic algorithms.

Metaphone

Lawrence Philips redirects here. For the football player, see Lawrence Phillips.

Metaphone is a phonetic algorithm, published by Lawrence Philips in 1990, for indexing words by their English pronunciation.[1] It fundamentally improves on the Soundex algorithm by using information about variations and inconsistencies in English spelling and pronunciation to produce a more accurate encoding, which does a better job of matching words and names which sound similar. As with Soundex, similar sounding words should share the same keys. Metaphone is available as a built-in operator in a number of systems, including later versions of PHP.

The original author later produced a new version of the algorithm, which he named Double Metaphone. Contrary to the original algorithm whose application is limited to English only, this version takes into account spelling peculiarities of a number of other languages. In 2009 Lawrence Philips released a third version, called Metaphone 3, which achieves an accuracy of approximately 99% for English words, non-English words familiar to Americans, and first names and family names commonly found in the United States, having been developed according to modern engineering standards against a test harness of prepared correct encodings.

Procedure

Original Metaphone codes use the 16 consonant symbols 0BFHJKLMNPRSTWXY.[2] The '0' represents "th" (as an ASCII approximation of Θ), 'X' represents "sh" or "ch", and the others represent their usual English pronunciations. The vowels AEIOU are also used, but only at the beginning of the code.[3] This table summarizes most of the rules in the original implementation:

1. Drop duplicate adjacent letters, except for C.
2. If the word begins with 'KN', 'GN', 'PN', 'AE', 'WR', drop the first letter.
3. Drop 'B' if after 'M' at the end of the word.
4. 'C' transforms to 'X' if followed by 'IA' or 'H' (unless in latter case, it is part of '-SCH-', in which case it transforms to 'K'). 'C' transforms to 'S' if followed by 'I', 'E', or 'Y'. Otherwise, 'C' transforms to 'K'.
5. 'D' transforms to 'J' if followed by 'GE', 'GY', or 'GI'. Otherwise, 'D' transforms to 'T'.
6. Drop 'G' if followed by 'H' and 'H' is not at the end or before a vowel. Drop 'G' if followed by 'N' or 'NED' and is at the end.
7. 'G' transforms to 'J' if before 'I', 'E', or 'Y', and it is not in 'GG'. Otherwise, 'G' transforms to 'K'.
8. Drop 'H' if after vowel and not before a vowel.
9. 'CK' transforms to 'K'.
10. 'PH' transforms to 'F'.
11. 'Q' transforms to 'K'.
12. 'S' transforms to 'X' if followed by 'H', 'IO', or 'IA'.
13. 'T' transforms to 'X' if followed by 'IA' or 'IO'. 'TH' transforms to '0'. Drop 'T' if followed by 'CH'.
14. 'V' transforms to 'F'.
15. 'WH' transforms to 'W' if at the beginning. Drop 'W' if not followed by a vowel.
16. 'X' transforms to 'S' if at the beginning. Otherwise, 'X' transforms to 'KS'.
17. Drop 'Y' if not followed by a vowel.
18. 'Z' transforms to 'S'.
19. Drop all vowels unless it is the beginning.

It should be noted, however, that this table does not constitute a complete description of the original Metaphone algorithm, and the algorithm cannot be coded correctly from it. Original Metaphone contained many errors and was superseded by Double Metaphone, and in turn Double Metaphone and original Metaphone were superseded by Metaphone 3, which corrects thousands of miscodings that will be produced by the first two versions.

To implement Metaphone without purchasing an open source copy of Metaphone 3, the best guide would be the reference implementation of Double Metaphone, which may be found here [4].

Double Metaphone

The **Double Metaphone** phonetic encoding algorithm is the second generation of this algorithm. Its implementation was described in the June 2000 issue of *C/C++ Users Journal*. It makes a number of fundamental design improvements over the original Metaphone algorithm.

It is called "Double" because it can return both a primary and a secondary code for a string; this accounts for some ambiguous cases as well as for multiple variants of surnames with common ancestry. For example, encoding the name "Smith" yields a primary code of *SM0* and a secondary code of *XMT*, while the name "Schmidt" yields a primary code of *XMT* and a secondary code of *SMT*—both have *XMT* in common.

Double Metaphone tries to account for myriad irregularities in English of Slavic, Germanic, Celtic, Greek, French, Italian, Spanish, Chinese, and other origin. Thus it uses a much more complex ruleset for coding than its predecessor; for example, it tests for approximately 100 different contexts of the use of the letter C alone.

Metaphone 3

A professional version was released in October 2009, developed by the same author, Lawrence Philips. It is a commercial product but is sold as source code. Metaphone 3 further improves phonetic encoding of words in the English language, non-English words familiar to Americans, and first names and family names commonly found in the United States.[4] It improves encoding for proper names in particular to a considerable extent.[5] The author claims that in general it improves accuracy for all words from the approximately 89% of Double Metaphone to over 99%. Developers can also now set switches in to code to cause the algorithm to encode Metaphone keys 1) taking non-initial vowels into account, as well as 2) encoding voiced and unvoiced consonants differently. This allows the result set to be more closely focused if the developer finds that the search results include too many words that don't resemble the search term closely enough.[6] Metaphone 3 is sold as C++, Java, C#, PHP, and PL/SQL source, as well as Metaphone 3 for Spanish and German available as Java source.[7]

Common misconceptions

There are a couple of misconceptions about the Metaphone algorithms that should be addressed:

1. All of them are designed to address regular, "dictionary" words, not just names, and
2. Metaphone algorithms do **not** produce phonetic representations of the input words and names; rather, the output is an intentionally **approximate** phonetic representation, according to this standard:
    - words that start with a vowel sound will have an 'A', representing any vowel, as the first character of the encoding (in Double Metaphone and Metaphone 3 - original Metaphone just preserves the actual vowel),
    - vowels after an initial vowel sound will be disregarded and not encoded, and
    - voiced/unvoiced consonant pairs will be mapped to the same encoding. (Examples of voiced/unvoiced consonant pairs are D/T, B/P, Z/S, G/K, etc.).

This approximate encoding is necessary to account for the way English speakers vary their pronunciations and misspell or otherwise vary words and names they are trying to spell. Vowels, of course, are notoriously highly variable. British speakers often complain that Americans seem to pronounce 'T's the same as 'D'. Consider, also, that all English speakers often pronounce 'Z' where 'S' is spelled, almost always when a noun ending in a voiced consonant or a liquid is pluralized, for example "seasons", "beams", "examples", etc. Not encoding vowels after an initial vowel sound will help to group words where a vowel and a consonant may be transposed in the misspelling or alternate pronunciation.

External links

- Open Source Spell Checker [9]
- Another explanation of the algorithm [10]
- Project to write a formal definition of the algorithm [11]
- "The Double Metaphone Search Algorithm" [12], *C/C++ Users Journal*, June 2000 (full-text access requires registration)
- The Double Metaphone Search Algorithm [13], By Lawrence Phillips, June 1, 2000, Dr Dobb's, *Original article*
- Code project article on double metaphone: http://www.codeproject.com/string/dmetaphone1.asp

Metaphone Implementations

- Metaphone implementation [14] in T-SQL
- Soundex, Metaphone, and Double Metaphone implementation [15] in Java
- Soundex, Metaphone, Caverphone implementation [16] in Python
- Text::Metaphone [17] Perl module from CPAN
- Text::DoubleMetaphone [18] Perl module from CPAN
- OCaml implementation of Double Metaphone [19]
- PHP implementation by Stephen Woodbridge [20]
- PHP implementation [21]
- Ruby implementation included in http://english.rubyforge.org
- Ruby implementation included in http://rubyforge.org/projects/text/
- 4GL implementation by Robert Minter [22]
- CodeProject's article about double metaphone implementations [23]
- FileMaker Pro custom function [24], requiring FileMaker Pro Advanced to implement
- Spanish Metaphone in PHP [25] (First post), from a comment in the PHP Metaphone Manual Page [26]
- Brazilian Portuguese in C [27] Metaphone for Brazilian Portuguese, in C with PHP and PostgreSQL port.
- natural [28] - JavaScript (nodejs) natural language toolkit
- Spanish Metaphone in Python [29]
- Scala algorithm [30] and metric [31] implementations as part of the larger stringmetric [32] project

Double Metaphone Implementations

- C++ see: http://web.archive.org/web/20080101012741/http://www.cuj.com/documents/s=8038/cuj0006philips/
- C# see: http://www.codeproject.com/KB/recipes/dmetaphone5.aspx
- Perl see: http://search.cpan.org/dist/Text-DoubleMetaphone/
- PHP see: http://swoodbridge.com/DoubleMetaPhone/and native, in C: http://pecl.php.net/package/doublemetaphone
- JavaScript see: https://www.dropbox.com/s/2e33y9iykz9o6fn/DoubleMetaphone.zip view the HTML file for usage
- Java see: http://commons.apache.org/codec/userguide.html
- Ruby
  - https://github.com/anjlab/rubyfish
  - http://english.rubyforge.org/
  - http://rubyforge.org/projects/text/
- SQL:
  - MySQL see: see: http://www.atomodo.com/code/double-metaphone
  - PostgreSQL see: http://www.postgresql.org/docs/current/static/fuzzystrmatch.html

- Transact-SQL see: http://www.sqlmag.com/Articles/ArticleID/26094/pg/1/1.html (full-text access requires subscription)
- Python see: http://www.atomodo.com/code/double-metaphone
- Smalltalk, Squeak, also with SoundEx, see: http://www.squeaksource.com/SoundsLike.html
- Visual Basic see: http://www.snakelegs.org/2008/01/18/double-metaphone-visual-basic-implementation/
  - Visual Basic for Applications see: http://bytes.com/topic/access/answers/192513-metaphone-source-code/

References

[1] Hanging on the Metaphone, Lawrence Philips. Computer Language, Vol. 7, No. 12 (December), 1990.

[2] http://www.sound-ex.com/alternative_zu_soundex

[3] http://www.morfoedro.it/doc.php?n=222&lang=en

[4] B P Pande and Prof. H S Dhami. Article: Application of Natural Language Processing Tools in Stemming. International Journal of Computer Applications 27(6):14-19, August 2011. Published by Foundation of Computer Science, New York, USA.

[5] Best Faces Forward: A Large-scale Study of People Search in the Enterprise I Guy, S Ur, I Ronen, S Weber… - 2012 - http://www.research.ibm.com/haifa/dept/imt/papers/guyCHI12.pdf

[6] http://aspell.net/metaphone/

[7] http://www.amorphics.com/

Soundex

Soundex is a phonetic algorithm for indexing names by sound, as pronounced in English. The goal is for homophones to be encoded to the same representation so that they can be matched despite minor differences in spelling.[] The algorithm mainly encodes consonants; a vowel will not be encoded unless it is the first letter. Soundex is the most widely known of all phonetic algorithms (in part because it is a standard feature of popular database software such as PostgreSQL,[1] MySQL,[2] MS SQL Server[3] and Oracle[4]) and is often used (incorrectly) as a synonym for "phonetic algorithm".[*citation needed*] Improvements to Soundex are the basis for many modern phonetic algorithms.[5]

History

Soundex was developed by Robert C. Russell and Margaret K. Odell and patented in 1918[6] and 1922.[7] A variation called **American Soundex** was used in the 1930s for a retrospective analysis of the US censuses from 1890 through 1920. The Soundex code came to prominence in the 1960s when it was the subject of several articles in the *Communications* and *Journal of the Association for Computing Machinery*, and especially when described in Donald Knuth's *The Art of Computer Programming*.[8]

The National Archives and Records Administration (NARA) maintains the current rule set for the official implementation of Soundex used by the U.S. Government.[] These encoding rules are available from NARA, upon request, in the form of General Information Leaflet 55, "Using the Census Soundex".

American Soundex

The Soundex code for a name consists of a letter followed by three numerical digits: the letter is the first letter of the name, and the digits encode the remaining consonants. Similar sounding consonants share the same digit so, for example, the labial consonants B, F, P, and V are each encoded as the number 1.

The correct value can be found as follows:

1. Retain the first letter of the name and drop all other occurrences of a, e, i, o, u, y, h, w.
2. Replace consonants with digits as follows (after the first letter):
   - b, f, p, v => 1
   - c, g, j, k, q, s, x, z => 2
   - d, t => 3
   - l => 4
   - m, n => 5
   - r => 6
3. If two or more letters with the same number are adjacent in the original name (before step 1), only retain the first letter; also two letters with the same number separated by 'h' or 'w' are coded as a single number, whereas such letters separated by a vowel are coded twice. This rule also applies to the first letter.
4. Iterate the previous step until you have one letter and three numbers. If you have too few letters in your word that you can't assign three numbers, append with zeros until there are three numbers. If you have more than 3 letters, just retain the first 3 numbers.

Using this algorithm, both "Robert" and "Rupert" return the same string "R163" while "Rubin" yields "R150". "Ashcraft" and "Ashcroft" both yield "A261" and not "A226" (the chars 's' and 'c' in the name would receive a single number of 2 and not 22 since an 'h' lies in between them). "Tymczak" yields "T522" not "T520" (the chars 'z' and 'k' in the name are coded as 2 twice since a vowel lies in between them). "Pfister" yields "P236" not "P123" (the first two letters have the same number and are coded once as 'P').

Variants

A similar algorithm called "Reverse Soundex" prefixes the last letter of the name instead of the first.

The NYSIIS algorithm was introduced by the New York State Identification and Intelligence System in 1970 as an improvement to the Soundex algorithm. NYSIIS handles some multi-character n-grams and maintains relative vowel positioning, whereas Soundex does not.

Daitch–Mokotoff Soundex (D–M Soundex) was developed in 1985 by genealogist Gary Mokotoff and later improved by genealogist Randy Daitch because of problems they encountered while trying to apply the Russell Soundex to Jews with Germanic or Slavic surnames (such as Moskowitz vs. Moskovitz or Levine vs. Lewin). D–M Soundex is sometimes referred to as "Jewish Soundex" or "Eastern European Soundex",[9] although the authors discourage the use of these nicknames. The D–M Soundex algorithm can return as many as 32 individual phonetic encodings for a single name. Results of D-M Soundex are returned in an all-numeric format between 100000 and 999999. This algorithm is much more complex than Russell Soundex.

As a response to deficiencies in the Soundex algorithm, Lawrence Philips developed the Metaphone algorithm in 1990 for the same purpose. Philips developed an improvement to Metaphone in 2000, which he called Double Metaphone. Double Metaphone includes a much larger encoding rule set than its predecessor, handles a subset of non-Latin characters, and returns a primary and a secondary encoding to account for different pronunciations of a single word in English. Philips created Metaphone 3 as a further revision in 2009 to provide more exact consonant and internal vowel matching along with some configuration settings to allow for even better matches.

References

[6] (Archived (http://www.google.com/patents?vid=1261167))
[7] (Archived (http://www.google.com/patents?vid=1435663))

Rhyme Genie

Rhyme Genie

Developer(s)	Idolumic
Initial release	September 9, 2009
Stable release	5.0 / February 2, 2013
Operating system	Mac OS X, iOS, Microsoft Windows
Size	250MB download
Available in	English
Type	Music Software
License	Proprietary
Website	http://www.rhymegenie.com

Rhyme Genie is a rhyming dictionary software developed by Idolumic for the Mac OS X, iOS and Microsoft Windows platforms. Initially released in 2009 it was introduced as the world's first dynamic rhyming dictionary with 30 different rhyme types, 300,000 entries and more than 9 million phonetic references. One of the software's main features is an intelligent rhyme algorithm that enables users to find near rhymes,[1] also referred to as half or slant rhymes, by adjusting the similarity in sound between the search word and prospective rhyme mates.[2]

Rhyme types

Rhyme Genie can find 26 traditional types of rhymes, 2 phonetic algorithms (Metaphone, Soundex) and 2 proprietary rhyme algorithms (Related Rhyme, Intelligent Rhyme) to offer a total of 30 different rhyme types:

Additive Rhyme, Alliteration, Amphisbaenic Rhyme, Apocopated Rhyme, Assonance, Broken Rhyme, Consonance, Diminished Rhyme, Double Assonance, Double Consonance, Elided Rhyme, Family Rhyme, Feminine Pararhyme, Final Syllable Rhyme, First Syllable Rhyme, Full Assonance, Full Consonance, Half Double Rhyme, Homophone, Intelligent Rhyme, Light Rhyme, Metaphone, Pararhyme, Perfect Rhyme, Related Rhyme, Reverse Rhyme, Rich Rhyme, Soundex, Trailing Rhyme, Weakened Rhyme

Development history

Rhyme Genie 1.0 was released in September 2009 to introduce the first generation of the intelligent rhyme and an integrated thesaurus with 2.5 million synonyms. Further incremental updates have added support for heteronyms, a wordfilter with over 100,000 parts of speech and a redesigned multi-syllabic option that allows the intelligent rhyme to automatically switch to monosyllabic rhymes whenever a search word does not produce rhyme mates that match two or more syllables.[3]

Rhyme Genie 2.0 was released in May 2010 to introduce a selectable songwriter dictionary compiled from more than 100 million words in over 600,000 song lyrics.[4] An updated intelligent rhyme algorithm now distinguishes between primary and secondary stress in words to find more near rhymes with greater accuracy.

Rhyme Genie 3.0 was released in January 2011 to introduce a thesaurus that not only matches the meaning but also the number of syllables of words.

Rhyme Genie 4.0 was released in January 2012 to introduce a new accompanying songwriting software named TuneSmith that is able to run the Mac version of the rhyming dictionary as a plug-in. Developed by Idolumic, TuneSmith includes an advanced lyrics editor, a copyright tracker and a pitch journal to assist songwriters in the creation and administration of their songs.[] TuneSmith's copyright tracker enables users to track the writer and publisher portions of copyright splits and oversee copyright registrations of added songs. An integrated audio recorder can capture melodies or maintain commercially released studio recordings in AIFF, WAVE or MP3. In addition, a pitch journal allows songwriters to track hold periods, release dates and chart positions of pitched songs.[]

References

External links

- Rhyme Genie (official website) (http://www.rhymegenie.com/)

Article Sources and Contributors

CMU Pronouncing Dictionary *Source*: http://en.wikipedia.org/w/index.php?oldid=553140694 *Contributors*: Aeusoes1, Angr, Arudnicky, Icairns, Jnestorius, Jonsafari, Kwamikagami, LilHelpa, Mr pand, Nemti, Pigman, Senarvi, Stbett, StephenReed, Zhoroscop, 8 anonymous edits

Arpabet *Source*: http://en.wikipedia.org/w/index.php?oldid=519961625 *Contributors*: Angr, Babbage, Devil Master, Jnestorius, Kwamikagami, Manushand, Mzajac, Nemti, Ohms law, Rich Farmbrough, Soshial, Yerihyo, 14 anonymous edits

International Phonetic Alphabet *Source*: http://en.wikipedia.org/w/index.php?oldid=555149120 *Contributors*: 100110100, 16@r, 9abdulla, A. Parrot, A12n, ALE!, AVM, Abacavich, Acepectif, Actam, AdiJapan, Aesopos, Aeusoes1, Agent X, Ahoerstemeier, Ajblue98, AjitPD, Akamad, Alison, Allister MacLeod, Allolex, Amire80, Amxitsa, Analyticalizer, Anarkisto, Anas Salloum, Anchjo, Andonic, Andrew Dalby, Andyluciano, Angr, Anonymous Dissident, Ansumang, Antandrus, Anthony Appleyard, Antiedman, Antonio Prates, Aonicc, Apeiron242, Appraiser, Arashi, Arcadian, Ardric47, Arthurian Legend, Astronautics, Athen, AugPi, AxSkov, Az1568, Babbage, Bando26, Beao, Bellenion, Betterusername, Bigwhiteyeti, Bobblewik, Bobo192, Bodigami, Bogobor, Borgx, Borys Lysak, Bouncingmolar, Brainy J, Branddobbe, Brendaly, Brion VIBBER, Bryan Derksen, BullRangifer, Burschik, CJGB, Cafzal, Cakejaron1, Caltas, Cameron Nedland, Camilohoyos9, Can't sleep, clown will eat me, CapitalR, Capricorn42, Carsrac, Cassowary, Causa sui, Ccacsmss, Cgs, Chameleon, Charlesdrakew, Chavash, Chengdi, Chodorkovskiy, Choster, Chris 73, ChrisGualtieri, Chun-hian, Chuunen Baka, Ciacchi, Circeus, Closedmouth, Conversion script, Coroboy, Cotoco, CovenantD, Cryptic, CryptoDerk, Cthuljew, Cutefidgety, Czech is Cyrillized, DARTH SIDIOUS 2, DRosenbach, DabMachine, DaeX, Dalf, Damian Yerrick, Dan Pelleg, Danenberg, Danlover, Darth Panda, Dato deutschland, Dave Fried, David Latapie, David Marjanović, Dbachmann, Dbenbenn, Dcsohl, DePiep, Denelson83, Denn, DerBorg, DerHexer, Derek R Bullamore, Dforest, Diego UFCG, DocWatson42, DopefishJustin, Download, DragonHawk, Drilnoth, Droll, Edward, El aprendelenguas, El estremeñu, Emanuele Saiu, EmilJ, Epitome83, ErWenn, Erebus555, Eric.dane, Erwin, Eslweb, Evertype, Everything Else Is Taken, Evice, Extransit, Filemon, FilipeS, Firefox-dm, Flapdragon, Flipping Mackerel, Fluoronaut, Fresheneesz, Fsotrain09, Funandtrvl, Furrykef, Fvasconcellos, Galoubet, Galzigler, Garik, Gauravjuvekar, GauteHK, Gee Eight, Georgia guy, Gerbrant, Gfl87, Gilgamesh, Gilliam, Gioto, Glenn, Godfrey Daniel, GoingBatty, Gracefool, GraemeL, Graham87, Grammatical error, Grapelli, Greatgavini, Grendelkhan, Grouse, Grover cleveland, Guaka, Gudeldar, Gyopi, Haham hanuka, Hairy Dude, Hakeem.gadi, Haldraper, Haldrik, Hannes Hirzel, Harryboyles, Haza-w, Henry Flower, HexaChord, Hfastedge, Hippophaë, Hlnodovic, Homunq, Hu, Huhsunqu, Hyacinth, Hypnosnake, Ian Pitchford, IanMaddieson, Igoldste, Ikiroid, Imz, Interchangeable, Ish ishwar, J'88, J. 'mach' wust, JMyrleFuller, JPaestpreornJeolhlna, JackLumber, Jacobolus, Jacquerie27, James Crippen, Jasper Zanjani, Jdavidb, JeLuF, Jengod, Jennavecia, Jggouvea, Jim10701, Jimp, Jkbjkb, Jnestorius, Jo3sampl, Joeswork83, John Allsup, John Mark Williams, John Quincy Adding Machine, Johnsobe, Jonsafari, Jonverve, JorisvS, Jose77, Jotomicron, Jpgordon, Jrockley, Jtir, Juancahoyos, Juicycat, Justified Wikipedian, Kahusi, Kaihsu, Karmosin, Kdammers, Kesac, KevinTR, Killenheladagen, Kingdon, Kinston eagle, Kintetsubuffalo, Kiwibird, Kjoonlee, Knulclunk, Koavf, Krash, Kwamikagami, Kwekubo, LLarson, La goutte de pluie, Lacrimosus, Lambiam, Lampman, Landroving Linguist, Largoplazo, Laurinavicius, Lbs6380, Leandrod, LedgendGamer, Lethe, Lfh, Lightmouse, Lincher, Lingspert11, Livajo, LjL, Lobbuss, Loew Galitz, Lordmanwe, Lotje, Lowellian, LpztheHVY, LukasPietsch, Lumos3, Luna Santin, Lundgren8, Mac, Macrakis, Mahmudmasri, Malafaya, Marco Polo, Mark Arsten, Mark Dingemanse, MarkJJones, Master Conjurer, Matt Gies, Maunus, Mbc362, Mboverload, Mdd, Menchi, Michael Devore, Michael Hardy, Michael Shulman, Mik01aj, Mikhaela Mittson, Mild Bill Hiccup, Mindmatrix, Minesweeper, Miskwito, Mkouklis, Mlwgsgis1487, Modulatum, Morwen, Mossman fmcb, Moyogo, MuchForgottenLore, Musical Linguist, Musiphil, Mustafaa, Mvjs, Mwalcoff, Mxn, Mzajac, N-true, Ndsg, Neil916, Netrapt, Neutrality, Nickshanks, Nikki, Nneonneo, Nohat, NotWith, Nposs, Ntsimp, Numbo3, O.Koslowski, Offenbach, Oghmoir, OldakQuill, Olivier, Oncenawhile, One half 3544, Ootachi, Oracle of Truth, Ordinary Person, Ourboldhero, OwenBlacker, Pajast, Paolo Baggia, PatriciaKeatingIPA, Paul G, Pauli133, Pconstable, Pcyrus, PenguiN42, Peter Delmonte, Peter Isotalo, Pgan002, Pharaoh of the Wizards, Philip Trueman, PhnomPencil, PhoneticsPhonology, Phoneticsoft, Pi zero, Pigman, Piolinfax, Piotr Gasiorowski, Pipifax, PizzaMargherita, Pjrm, Plankton5005, Pne, Poccil, Pokajanje, Potters house, Pt, Ptcamn, Pérez, Quiddity, Qwwqw, R2D2Art2005, R3m0t, RW Marloe, Rabiznaz, Radiant chains, Ran, RandomXYZb, Ravedave, Rayizmi, RekishiEJ, Repku, Rex Germanus, Rich Farmbrough, Rishida, RitKill, RiverDeepMountainHigh, Riwnodennyk, Rjanag, Rjwilmsi, RoachPeter, Robert Will, RockMFR, Rodasmith, Rogerd, Ronhjones, RoseParks, Ross Burgess, Royote, Rushbugled13, Ruud Koot, Sam Hocevar, SameerKhan, Sanmartin, Sannse, Sardanaphalus, Saseigel, Sbrools, SchfiftyThree, Seb az86556, SebastianHelm, Seberle, Sebesta, Sesamevoila, Shimmin, SilverFox183, Simetrical, Singingkatiebug, Sintonak.X, Sion8, Skal, Slashname, Sligocki, Slp1, Sonjaaa, SopranoAscends, Spacevezon, Spencer195, Stalik, Stephan Leeds, Stevertigo, Stripey, Strongbow1800, Succha, Sunray, SuperElephant, Suruena, Sw258, TGilmour, TNAWrestlingForeverBaby, TOR, Takuzinis, Tarikash, TarmoK, Tarquin, Tarret, Tassedethe, Taxman, Tdslk, TedPavlic, Tesseran, Tezuni, Thane, The Man in Question, The Nut, The Thing That Should Not Be, The Vandal Warrior, The wub, Thegryseone, Thincat, Thnidu, Thrax, Tim Q. Wells, Timpo, Timwi, Tkinias, Tobi aa, Tobias Conradi, Tpbradbury, Trevor MacInnis, Trlkly, Tropylium, Trovatore, Turm, Ultratomio, Umofomia, Untifler, Uriyan, User6854, Vafa Hamidi, Vanished user, Velvetron, Vhorvat, Victor Yus, VoldermortSmerf, Vostok 129, Vrenator, Vystrix Nexoth, Wakuran, Walkie, Washburnmav, WeijiBaikeBianji, WereSpielChequers, WhatamIdoing, Wickey-nl, Wikievil666, Wikky Horse, Williamchacha, Winston Chuen-Shih Yang, Winston365, Wizardist, Wizardman, Womtelo, Woodstone, Woohookitty, Wrad, Wtmitchell, XJaM, Xcentaur, Xinit, Yes0song, Yupik, Zanaq, Zeimusu, Zhoroscop, Ziiv, Zuky79, Zuloo37, ZxxZxxZ, ^demon, ÀrdRuadh21, Ævar Arnfjörð Bjarmason, Милан Јелисавчић, לערי ריינהארט, 虞海, 534 anonymous edits

Phonetic transcription *Source*: http://en.wikipedia.org/w/index.php?oldid=552966718 *Contributors*: 16@r, 28421u2232nfenfcenc, 4pq1injbok, Aeusoes1, Alipir, Amire80, Andonic, Angr, Apcbg, Arraes.daniel, Barry Fruitman, Blainster, BrainMagMo, Burschik, Calabe1992, CapitalR, Cassowary, Coren, Denelson83, DerHexer, Dinoceras, Dissident, Doric Loon, Droll, Dvavasour, Dzzl, Edgar181, Eitch, Emanuele Saiu, Everchanging02, Falafal, Fano Ksenaki, FilipeS, Flyer22, Garik, Gcm, Gsp, Ikiroid, Ilana, Imiraven, Inyourtatos, Iopq, Ish ishwar, Jersey Devil, Kagredon, Kahusi, Konvalj, Kwamikagami, Linguistatlunch, Magicalsaumy, Man vyi, Marco79, Martin.Budden, Michael Hardy, Mjkhfg, Mordka, Muro de Aguas, Mzajac, Naerii, Nbarth, Noahpoah, Nohat, Notheruser, Ntsimp, Nychriss11, Ossi, Pearle, Phoneticsoft, Piractus, Pietrow, Reporter Nielsen, Rich Farmbrough, Rygelski, STGM, Sam Hocevar, SamEV, Seaphoto, Sereiche, SilverFox183, Skal, Sky Attacker, Sl, Sobolewski, Sonjaaa, SpLoT, Strabismus, Tcherser, The Man in Question, Tkynerd, Tomaxer, Trickstar, UncleMartin, Vertium, Wahrmund, Widr, Wikinger, Williamchacha, Zack wadghiri, Zawersh, Zenomax, Zerida, 虞海, 81 anonymous edits

Phonemic orthography *Source*: http://en.wikipedia.org/w/index.php?oldid=546354218 *Contributors*: 334a, Aeusoes1, Andycjp, Arcandam, BRPXQZME, Bforte, Bjankuloski06en, Burzuchius, CJ Withers, Cameron Nedland, Carnby, Caspian blue, Cassowary, Chris Q, CrZTgR, Crossmr, Cypoet, Dissident, Dolphinn, Dqeswn, Dzenanz, Edward, Ehrenkater, Emil Kastberg, Espoo, Estrellador*, FilipeS, FlyHigh, Garik, Grover cleveland, Indiana State, Irakliy81, J04n, Jj137, Jnestorius, John of Reading, Joshua, Junipersgrao, Karada, Kjoonlee, Kwamikagami, Lawfulreasoning, Lockesdonkey, LordSimonofShropshire, Lupo Azzurro, Magioladitis, Mahmudmasri, Mais oui!, Man vyi, Marawe, Martiniiglesias, Mithridates, Morwen, Nanshu, Nbarth, Nposs, Pictureuploader, Pne, Q Chris, R'n'B, R.O.C, Ranveig, Rekk, Rogerb67, Ruakh, SamEV, Shepard, SkaTroma, Steven Zhang, Studerby, TUF-KAT, TalkChat, Trex279, Tripledot, Victor Yus, Woohookitty, Xommana, Zack wadghiri, Zaheen, Zorro CX, 虞海, 66 anonymous edits

Pronunciation *Source*: http://en.wikipedia.org/w/index.php?oldid=546698638 *Contributors*: 16@r, 4Russeteer, Ahoerstemeier, Aldaron, Alejotheo, AndreasJS, Andycjp, Angel caboodle, Apparition11, Arteyu, Astral, Bachrach44, Basketball110, BiT, Bjankuloski06en, Burntsauce, Burschik, Cab88, Chihuong bk, Clarityfiend, Correogsk, Crystal7k, DMacks, Dave3457, David Shay, Deor, Diamondland, Edcolins, El C, Eukesh, Garzo, Gilderien, Graham87, Guaka, Guy Peters, HaeB, Imasleepviking, Interlingua, Israelrs, Janweh64, Johndburger, Kku, KuboF, Kwamikagami, L33thax1994, Laura S, Ledmonkey, Levent, Lightsup55, Lukobe, Mac, Mandarax, Manu bcn, MarsRover, Martial75, MaxB123, Meno25, Michael Hardy, Mygerardromance, Mzajac, NathanHawking, Nogwa, Octahedron80, OldakQuill, Oleg Kikta, Oliver Pereira, Patrick, Pbahramian, Pipep, Quandaryus, RJHall, Richard Arthur Norton (1958-), Rogerb67, Ross Burgess, Rothorpe, SMC, Sanya3, ShaneCavanaugh, SimonP, Sintonak.X, TakuyaMurata, The Joker, Thehelpfulone, Thorncrag, Timothybowyer, Tolly4bolly, Tomasooie, Trlkly, Tweedledum and Tweedledee, VMS Mosaic, Wars, West Brom 4ever, Ynhockey, 126 anonymous edits

Syllable *Source*: http://en.wikipedia.org/w/index.php?oldid=555156599 *Contributors*: 2004-12-29T22:45Z, AdiJapan, Aeusoes1, Alijsh, AlimanRuna, Allstarecho, Angelica K, Angr, Aphaia, Aristolaos, Army1987, Bahman3d, Beckiesammers, Bekus, BenFrantzDale, Benwing, Blt400, Branko, Brion VIBBER, Burschik, Can't sleep, clown will eat me, CanisRufus, Capsot, Cecairns, Cessator, Chamaeleon, Christopher Parham, Cnilep, Contactharpreets, Cost, Cotoco, Coughinink, Coyne025, Crana, Crissov, Crusadeonilliteracy, Cuaxdon, Damoon4all, Dan.tsafrir, Danish47, Danny, Dbolton, Deflective, Den fjättrade ankan, Denisarona, Discospinster, Dissident, DivineAlpha, DopefishJustin, Doradus, Doric Loon, Dr Oldekop, Drundia, Duncan MacCall, Duoduoduo, Dysprosia, Ejoty, Ellywa, Eras-mus, Erutuon, FAeR, Fanatix, Fryed-peach, Gandalf1491, Gnominonwiki, GoingBatty, Gradelevel, Grover cleveland, Grégoire Détrez, Gurch, Haham hanuka, Hard Sin, Heron, Himatsu Bushi, Hippietrail, Imz, Ish ishwar, IvanLanin, J. 'mach' wust, J04n, Jasy jatere, Jauhienij, Javier Carro, Jefflayman, Jimp, Jimp jougler, Jmrowland, Jnestorius, JorisvS, Joseph Solis in Australia, Jsteph, Kewp, Kjoonlee, Kokoshneta, Kotniski, Kwamikagami, Kyorosuke, Le Anh-Huy, Lee Daniel Crocker, Litefantastic, Little Mountain 5, Magnus Bakken, Marc Venot, Mark Foskey, Masseman, Mayooranathan, McGeddon, Michael Hardy, Montgolfière, Moretime4game, Muke, N5iln, Natesgate, NawlinWiki, Nbarth, Neurolinguist, Nohat, Octahedron80, Ohconfucius, Pablo-flores, Pajast, Pcyrus, Phil Boswell, Philip Trueman, Piano non troppo, Piractus, Piccolapixxie, Piotrus, Poccil, Quangbao, Quantophonology, RandomP, Ranveig, Rdnewman, Redaktor, Reedy, ResearchRave, Rubin16, Sardanaphalus, Secretlondon, Sgravn, Shanes, Shikoten, Shushruth, Sintonak.X, Snap Davies, Storkk, Stuartyeates, Summer Song, Sun Creator, TAKASUGI Shinji, TakuyaMurata, Tamariki, Tarquin, That Guy, From That Show!, ThierryVignaud, Thingg, This, that and the other, Tide rolls, TowerDragon, TreyHarris, Trilobitealive, Triskaideka, TruthIsStrangerThanFiction, Umofomia, Unyoyega, Urgos, Vbs, Vipinhari, Vuo, Wikipeditor40, Willking1979, Woodstone, Xyzzyva, YuryT, Yy.yogesh007, Zerida, Ziggurat, 虞海, 198 anonymous edits

Allophone *Source*: http://en.wikipedia.org/w/index.php?oldid=539115620 *Contributors*: 192.218.140.xxx, 2004-12-29T22:45Z, 24ip, 65.68.87.xxx, AdamDobay, Aeusoes1, Angela, Angr, AnonMoos, Avjoska, Bcorr, Bertrand Bellet, Bgwhite, Boobland, Branddobbe, Burschik, Caesar, Canadiano, Canderson7, CharlotteWebb, Conversion script, D'Agosta, David spector, Deflective, Doric Loon, Dreadstar, Duoduoduo, El C, FilipeS, Fitzwilliam, Freelance Intellectual, Fritz Saalfeld, GauteHK, Ghewgill, Girdi, Grafen, Graham87, GrahamN, Gritchka, Hairy Dude, Hede2000, Heron, Hunnjazal, Indefatigable, Iopq, Ish ishwar, Jeepday, Karl-Henner, Kielbasa1, Kwaku, Kwamikagami, La Pianista, La goutte de pluie, Lenthe, Liberlogos, LokiClock, Looxix, Malhonen, Martin Růžička, MasterMan, Maunus, Michael Hardy, Montrealais, Munci, Musicalantonio, Nafpaktiakos, Nimic86, Nohat, Oghmoir, Olivier, Orbis 3, OwenBlacker, P.T. Aufrette, Pablo X, Pajast, Perverse incentive, Pgan002, PierreAbbat, Quadalpha, Quistnix, Raymond Meredith, Revan ltrl, Rogerb67, SebastianHelm, Stevertigo, Tabledhote, Tarquin, Thurble, Timschmi, Tinkuxlnc, Tremblay, Uanfala, Umofomia, Uncle G, Varlaam, Welsh, WigginsShadow, Wolfdog, Yortas, Zocky, KEKPΩΨ, 53 ,בוקי סרי"ק anonymous edits

Homophone *Source*: http://en.wikipedia.org/w/index.php?oldid=555650955 *Contributors*: 16@r, ADReed, AVand, Aaron Brenneman, Abbasgadhia, Acather96, Alansohn, Allens, Allstarecho, AmericanLeMans, Amls15flva, Anna Lincoln, AnonGuy, Aquayoshi156, Arakunem, Avono, Az1568, Bassbonerocks, BigDunc, BigPimpinBrah, Blackdiamondbay, Bobo192, Bondegezou, Brianfedirko, Brideshead, Capmo, Captain Zyrain, CardinalDan, ChrisCork, Christopher Pritchard, Cielomobile, CityOfSilver, Clayhalliwell, Closedmouth, Cmglee, Cmichael, Cnilep, Coroboy, Courcelles, Cépey, DARTH SIDIOUS 2, DVD R W, Dacomposa, Daf, Dashburd, David Shay, Davidfreesefan23, Dbachmann, Delldot, Denorris, Dhighman, DineshAdv, Discospinster, Dolfrog, Drenaline, Drmies, Dro Kulix, Drummer070, EEPROM Eagle, Edderso, Ehrenkater, El C, Elfinsheep, Enviroboy, Epbr123, Erik9, Erud, Espoo, Evil Monkey, Favonian, FordPrefect42, Furrykef, Fusionmix, Gilliam, Graxthal, Gurch, HeckXX, Henry W. Schmitt, Hertz1888, Hodgdon's secret garden, Hopiakuta, IRP, Ian Dalziel, Igoldste, Iridescent, IvanLanin, J.delanoy, JBHemlock, JForget, Jarble, Jarich, Jauhienij, Java13690, Jebus989, Jerome Charles Potts, Jesse Bass, Jim1138, Jimp, Jjknowles, Jmundo, John Riemann Soong, Jomasecu, Jonas Kölker, Jonathanfu, Kantletters, Khazar2, Killhi12, Kinaro, King Pickle, KingKane, Koavf, Krazygamerhead, Kwamikagami, LAX, LOL, Lalaland750, Laogeodritt, LeaveSleaves, Leifisme, Lights, Limegreen&tangerine, Loren.wilton, Lorikeet, MC10, MER-C, Maltrass, Mark272, Materialscientist, MattOates, Mikael Häggström, Mike Rosoft, Mle2512, Mostlymuppet, MovementLessRestricted, Mrguyguy226, Mustangcorey17, Nagrath.varun, Naleh, Nasnema, NawlinWiki, Neon white, Nestify, NewEnglandYankee, Ninope, Nucleusboy, Oneiros, Opelio, Ortolan88, Paul Barlow, Pdeq, Peejaydee, Peruvianllama, Phil Boswell, Philip Trueman, Physchim62, Pinkadelica, Poromenos, QueenCake, Radon210, Rawling, Reach Out to the Truth, Rick 50000, RoyBoy, Rrburke, Sanfranman59, Sango123, Scray, Seaphoto, Sentielvor, SexyBern, ShadowRangerRIT, Shadowjams, Shadowlynk, Shantavira, Sheeana, Slawekb, Solomonfromfinland, Stefanomione, Stephenchou0722, Stwalkerster, Tangent747, Technopat, The Thing That Should Not Be, TicketMan, Tiptoety, Tomhubbard, Tterrag, Uhlerz, Ulmanor, Vary, Vbdrummer0, West Brom 4ever, Wimt, Windchaser, Winties.inc, X201, Xyzzyplugh, Yworo, ZX81, Zahn, Zaxius, KEKPΩΨ, 519 anonymous edits

Rhyme *Source*: http://en.wikipedia.org/w/index.php?oldid=555586118 *Contributors*: -- April, 0, 16@r, 1966batfan, 28bytes, 30, A Musing, Aannath, Adamrce, Adrian nye, Adrian.benko, Aitias, AlanaRozKuw, Alansohn, Aldaron, Alex43223, Allens, Alma Pater, Altenmann, Amikeco, Ammubhave, Ap, Asarlaí, Ashot Gabrielyan, AuburnPilot, Az1568, Baboo1, Babul.paul, Backpackadam, Baffclan, Barek, BazookaJoe, Bibinj, BigHairRef, Billinghurst, Bluap, Bobo192, Bongwarrior, Bosoxfan5077, Boxstaa, Branddobbe, Brianga, Brion VIBBER, Bsadowski1, Burntsauce, Cameron Nedland, Camulogene, Camyoung54, CanisRufus, Capricorn42, Captain-tucker, Caramelldansener, Cbustapeck, Chamaeleon, Chameleon, Chick Bowen, Chirp Cricket, CodeCruncher, Comme le Lapin, Courcelles, Crana, Cremepuff222, CyborgTosser, DVD R W, Dacxjo, Dalstadt, Darktangent, Darobsta, David Chavanel, DavidBrooks, Davidhoskins, Davidiad, Dawn Bard, Dbachmann, Dcattell, DennisDaniels, Diberri, Diegusjaimes, Donarreiskoffer, Dosh Gillio, Ds13, EamonnPKeane, Eddie.willers, Eiad77, Eje211, Eley, Elzoog, EoGuy, Epbr123, Evaunit666, Excirial, Farosdaughter, Farshad83, Fedir, Filiocht, Foljiny, Folkdawg, Footballismything, Frankishy, Freiberg, FunnyMan3595, Fuzzypeg, Gareth Griffith-Jones, Garyh84, Gheuf, Giftlite, Gilgamesh, Goffrie, Gogo Dodo, Gonzonoir, Graham87, GreatWhiteNortherner, Greatgavini, Gurch, Haeleth, Hajor, Hughcharlesparker, Huw Powell, Hveziris, Hyacinth, IRP, Iamcuriousblue, Iammad666, Immunize, Ish ishwar, Ixfd64, JMBZ-12, James599, Jarble, Jasy jatere, Jclemens, Jeandré du Toit, Jeff G., Jeff Silvers, Jenright, JeremyA, JerryFriedman, Jfp2006, Jimp, Jimp jougler, JinJian, Joachimheck, Johanna-Hypatia, John Riemann Soong, John254, Jorge Stolfi, Joti, Jt68, Juisu, Julesd, Just say no to drugs, Jyril, Jóna Þórunn, KJS77, Kansas Sam, Karl-Henner, Keilana, KelvinAFK, Kimse, Kostisl, Kubigula, Kungfuadam, Kuru, Kwamikagami, L Kensington, Lanov, LuigiManiac, Luna Santin, MER-C, Macgreco, Maeglin Lómion, MagicBear, Magister Mathematicae, Man vyi, Manning Bartlett, Marcika, Marek69, Marish Glides, Materialscientist, Mathwhiz 29, Maxschmelling, Mediran, Meh222, Mendaliv, Miaow Miaow, Michael Hardy, Minesweeper, Miquai, Mr. Billion, Mr.Nobody, Mushroom Man, Mygerardromance, NCurse, NYArtsnWords, Narcisse, Naught101, NawlinWiki, Neelix, Neznanec, Nicknick43989, Nikola Smolenski, Noctibus, Nono64, NuclearWarfare, Octahedron80, OlEnglish, Omicronpersei8, PSE teh 1nf0, Pajz, Patstuart, Paul G, Pediaindia, PeruAlonso, Pewwer42, Pharaoh of the Wizards, Piano non troppo, Pinethicket, Pixeltoo, Prodego, Prof Wrong, Project2501a, Puffin, Redheylin, RexNL, Rfl, Riley Huntley, Rivertorch, Robheart, Robina Fox, Robmnl, Rossami, Rror, Ruakh, Sango123, Sanjat312, SebastianHelm, Selket, Sergivs-en, Shanes, Shelhabiron, Shreevatsa, Simetrical, Skarebo, Skizzik, Skomorokh, Slupianek, SoLando, SolidGun, Someguy1221, Spliffy, Stefanomione, Stumps, Suffusion of Yellow, Summer Song, Sycthos, Symane, TAKASUGI Shinji, Tarquin, Tcsetattr, Techman224, TedE, Teles, Telfordbuck, TexasAndroid, Tfine80, The Evil IP address, The Merciful, TheArguer, TheKoG, Thecheesykid, Thomas Mills Hinkle, Tide rolls, TimMony, TomS TDotO, Tomchiukc, Tretr2002, Triskaideka, UberScienceNerd, Uhai, Umofomia, Uncle G, Username314, V111P, Vansluva11, Vikramkr, Vinsfan368, Vinty, Vishnava, Vivio Testarossa, VolatileChemical, Wafaashohdy, Wastrel Way, Wavelength, Wayne Slam, Wereon, Wetman, Whitepaw, Widr, Wiki alf, Wikieditor26, Wikiwayne, William Avery, Wimt, Wolfdog, Wolfkeeper, XTCamus, Xulat, Yamamoto Ichiro, Yebop, Yidisheryid, 577 anonymous edits

Half rhyme *Source*: http://en.wikipedia.org/w/index.php?oldid=554561986 *Contributors*: 5 albert square, Amaury, Anamexis, Ananimus, Angela, Angr, Art LaPella, Atemperman, Barek, Binyamin Goldstein, Bonadea, Brianhe, Capricorn42, Chaim1221, Chrishepner, CodeCruncher, Cor Ferrum, Ebelular, EricEnfermero, Filiocht, Folkdawg, FrankMJohnson, Gecian, HOrdover, Hamamelis, Iridescent, It Is Me Here, Jason Quinn, JavaJake, Jfetteroll, Kzollman, Man vyi, Matturn, Maxis ftw, NTDOY Fanboy, NewEnglandYankee, Oxymoron83, Peter Delmonte, Peter James, RadioFan, Raoulharris, Redheylin, Rellis1067, Res2216firestar, RetnoWidyanti, Safety Cap, SciberDoc, Slupianek, Spannerjam, Stumps, Tamfang, TgreatALL, The Red, The Thing That Should Not Be, Thethethethe5555, Twinxor, Tyw7, Warlach, 108 anonymous edits

Internal rhyme *Source*: http://en.wikipedia.org/w/index.php?oldid=554566073 *Contributors*: 3213212a, AARES, Aajkaa, BOne, Bluemoose, Bobo192, Bongwarrior, BonsaiViking, BrokenSegue, Can't sleep, clown will eat me, ChrisGualtieri, Chubdub, Chuunen Baka, DanBealeCocks, Dartox007, Deor, Doktor Quack, Dromioofephesus, Ds13, Dysprosia, Epbr123, Fee, Frymaster, HJ Mitchell, Happysailor, Hydrogen Iodide, I.M. Rich, JamesBWatson, Jaysscholar, JohnChrysostom, JustAGal, Jwoodger, Letmedoitfirst, Lhw1, Mathwhiz 29, Meters, Michaelzeng7, Midnightdreary, Nahallac Silverwinds, PCP MC, Peteds, Philip Trueman, Pmrobert49, Publicgoods, RandomCritic, Razorflame, Redheylin, Restre419, Rocket000, Samfarhi, Spacemann Spiff, Spannerjam, Spellcast, Stefanomione, SteinbDJ, Stumps, Summer Song, SuperHamster, THEN WHO WAS PHONE?, Tresiden, Weirdy, Wikipedian2, Zalgo, Zreeon, 160 anonymous edits

Assonance *Source*: http://en.wikipedia.org/w/index.php?oldid=554224101 *Contributors*: 2602:304:5962:8CC9:F047:7E0:BB90:AD66, AXRL, AdjustShift, Adjwilley, AgentPeppermint, Agolib, Ahalterman, Alansohn, Alsandro, Angr, Ant1238, Aramgar, Arvindn, Atemperman, Auddie, Bahar101, Bashen, Beano, Benandorsqueaks, Berkut, BevRowe, Bigmantonyd, Blackicehorizon, Blah3, Bongwarrior, Brighterorange, Bro(sv), Buxbaum666, Captain-tucker, Christopher denman, Chuck Sirloin, Citicat, CleckleysProof, CodeCruncher, Conscious, Coolazice, Dasani, David.Mestel, Delldot, Deor, Dexter111344, Disavian, Discospinster, Doxology, Dpaking, Dr.K., Dude1818, Edgesused999, Elonka, Emperorbma, Enviroboy, Eric TF Bat, Erutuon, Feezo, Filiocht, Fluffernutter, Flyguy649, Fumitol, Gareth Griffith-Jones, Geoffrey.landis, Guoguo12, Gurubrahma, Hoozywatsit, Hyacinth, Hydrogen Iodide, Indiebum, InvisibleSun, Ironholds, Ixfd64, J.delanoy, JForget, JHCC, JJman69, JaGa, Jayunderscorezero, Jimp, Jivecat, Jlittlet, Kahlores, Kingpin13, Kjhf, Krantzstone, Kwamikagami, Kyrmyzy gul, LedgendGamer, Leslie Mateus, Lhw1, Lolink2, Lowellian, Macy, McGeddon, McSly, Mediran, Mentaka, Metodicar, Molerat, Molybdenumblue, Monkeymox, Moonriddengirl, Mormegil, Nachosnachos, Nagy, Nate3awesome, NewEnglandYankee, Nick Wilson, Ninly, Noah Salzman, NortyNort, NoychoH, OpenInfoForAll, Paxsimius, Peko, Pete unseth, Philip Trueman, Pinkadelica, R'n'B, R.E. Freak, Raven in Orbit, Realg187, Res2216firestar, RichardMarcJ, Robofish, Roland2, Rpyle731, Samuel J. Howard, Shanes, ShelfSkewed, Shii, Sietse, Silence, Skamecrazy123, SkyMachine, SlimVirgin, Soap, Sporti, Stefanomione, SteinbDJ, Stephen, Stephenb, Storm Rider, Stumps, Sue Rangell, Surv1v4l1st, Symane, Synchronism, Syp, TPIRFanSteve, Tangotango, The Blade of the Northern Lights, The Thing That Should Not Be, Tide rolls, Tiggerjay, Tlusťa, Toby Bartels, Tommy2010, Tyler, Typhoonchaser, Ubardak, UriBudnik, Urthogie, Vrenator, Wakuran, WalksOnDirt, Wavehunter, Wayne Slam, Weetoddid, Whatever404, Wintonian, Wknight94, World go boom, Wzrds3, Yamamoto Ichiro, Yougomedia, Zepheus, ^zer0dyer$, 574 anonymous edits

Literary consonance *Source*: http://en.wikipedia.org/w/index.php?oldid=554437305 *Contributors*: 7, AXRL, Ado, Ariconte, AugPi, BenFrantzDale, Benster310, Bobo192, Bourega, Camembert, Cathy1818, Cawhee, Celuici, Ceoil, Chasingsol, Chinasaur, Chrisdolan, Cymbalta, DARTH SIDIOUS 2, Daniar, Drake Redcrest, Emperorbma, Epbr123, EvanKroske, Filiocht, Fox Wilson, Freebullets, Freshacconci, Gareth Griffith-Jones, Gilliam, Graham87, Hyacinth, JHCC, Jauhienij, Jeffq, JigPu, Jmpangelo, Jorge Stolfi, Karada, Kathar, Kjhf, Kyraeu, LemonTwinkle, Lmcelhiney, Lockesdonkey, Malcolma, Marechal Ney, Masterofpsi, Materialscientist, Michaeltobin, Midnightdreary, Minna Sora no Shita, Mrquizzical, Narcie, Nerdherd67, Noetica, Notheruser, Nrbelex, Orphan Wiki, Owen&rob, PDanger, Philip Trueman, Rahulkudva, RaiderRobert, Sam Hocevar, Seattle Skier, Sharkface217, Spannerjam, Special-T, Stefanomione, Stickee, TUF-KAT, Thebestofall007, Theinnocentgirl, Uncle Dick, Vain777, Wdchk, Widr, Wytukaze, Xezbeth, Yb2, Yoyooyoo, Zack wadghiri, דוד, 安康土霸, 212 anonymous edits

Alliteration *Source*: http://en.wikipedia.org/w/index.php?oldid=555289368 *Contributors*: "alyosha", 16@r, 2008saints44, 22dragon22burn, 2602:30B:8259:46A9:44C8:94DF:D67F:50A1, 2D, 5 albert square, 7&6=thirteen, 90 Auto, A8UDI, ABF, Abdullais4u, AbigailAbernathy, Abog, Addshore, After Midnight, AgentPeppermint, Aitias, Alansohn, Alessadri, AlexJarrell82899, Allens, Amaury, Amazins490, Anakin101, Andycjp, Angelastic, Angr, Anil1956, Anilocra, Anonymi, Antandrus, Anthony Appleyard, Antsam, Aquila9, Archambe, Ashershow1, Avjoska, B. Jennings Perry, Baa, BigThunderMtn, Bilal mazhar 88, Bishonen, Bissinger, Bloodofox, BlueAmethyst, Bobo192, Bongwarrior, Brianboru, Brighterorange, BrokenSphere, Bsadowski1, Bumblekapera, Burnedthru, Bushido Brown, CSZero, CWii, Caltas, Camw, Can't sleep, clown will eat me, Candid145, Canjth, Capricorn42, Caractecus, Carvedstars, CattleGirl, Caudron, Ccrazymann, Cflm001, Chango369w, Charles Matthews, Chasingsol, Choubaka, Chris the Paleontologist, ChyranandChloe, Ckatz, Clownboat, Cmcfarland, Comme le Lapin, Computer Guru, Cootiequits, Courcelles, CraigNKeys, Crculver, Cst17, DARTH SIDIOUS 2, DBigXray, DR4G0NM4N, DVD R W, Daltonls, Damirgraffiti, Dancermansi, Dangerman200k, Darkspots, Darth Panda, Daven200520, Davitf, Dear Reader, Deconstructhis, DerHexer, Derekwashere, Dgw, Diabelli23, Discospinster, Doriethurston, Doug kwan, Dpaking, DrSlony, Draeco, Dthurston, Dude1818, Duggy 1138, E20Ci, EEMIV, ERcheck, EamonnPKeane, Efabrication, Eixo, El C, Elefant132, Elipongo, Elockid, Elzb, Emperorbma, EnglishPatterns, Epbr123, Erik9, Etjean0905, EvanSeeds, Exceedingly Rare, Excirial, Experty of experties, Extransit, FCivish, Faradayplank, Farmors111, Fatedbreath, Feedmecereal, Finalius, Finbarr Saunders, Flapdragon, Flyguy649, Freedom usually cares, kindly, Freyr, Friginator, Frozenport, Fusionmix, Fæ, Gangsterls, Gareth Griffith-Jones, GarudaZuke, GerryPerry01, Gggh, Glacialfox, Gogo Dodo, Gohst, Gongshow, Goodnightmush, Gracenotes, Graeme Hefner, Green caterpillar, Greendot1, Griot, GrogMcGee, Gromlakh, Guoguo12, Gurch, Guymontague, H Hog, Hackwrth, Hadal, Hangingonastar, HellAlex, Hennessey, Patrick, Henry Flower, Heron, HieronymousCrowley, Holothurion, Hyphen5, ISTB351, Iainsona, Ice-Soft-Eng, Igoldste, Ihcoyc, Insanity Incarnate, InvertRect, Ivashchuk303, Ixfd64, J. Spencer, J.delanoy, JAF1970, JForget, JHCC, JPMcGrath, Jab843, JackofOz, Jaddi27, Jan eissfeldt, Japanese Searobin, Jauhienij, JavaJake, Jaxl, JayC, JayJasper, Jc4p, Jhinman, Jim Raynor, Jimp, Jizz, Jkneel, Joclown, Joemommasllama, John, John P Hartley, John Price, John254, JohnElizabethGray, Johndburger, Johndrinkwater, JohnsonL623, JordeeBec, Jorge Stolfi, Josemanimala, Joshua.ewer, Jossi, Joti, Julian Mendez, Jumbuck, Jusdafax, Jusjih, K. Annoyomous, Kazfernandes, Kchishol1970, Kcowolf, Keepsleeping, Keilana, Kingpin13, KitsuneCybe, Kjhf, Kjoonlee, Klichka, Klilidiplomus, Korg, Kozka, Kristof vt, Kummi, Kungming2, Kunzite, Kuronue, Kwiki, Kyrmyzy gul, Landon1980, LarryJeff, Lazylizards8, Ldo, LeaveSleaves, LedgendGamer, Lfdder, Life of Riley, Little Mountain 5, Logan, Lugia2453, Luna Santin, Lysdexia, M@RIX, MD87, MER-C, MJS1996, Maddie!, Marciano guerrero, MarcoSchuffelen, Marknutley, Marvel164131, Materialscientist, Mav, Maximus Rex, MeadOfPoetry, Mendaliv, Mentifisto, Metodicar, Meursault2004, Michael Hardy, Michaelschmatz, Mihir26, Mike Rosoft, Mikhail Dvorkin, Mini-Geek, Mogism, Monz, Morning277, Mr. Lefty, MrChupon, Mrathel, Mschel, Mtelewicz, Musiclover, Mynameisntbob1, NERVUN, Narlee, Natalie Erin, Naveenrox, Nburden, NeilN, NellieBly,

Nevershoutnever36, NewEnglandYankee, Nibblus, Nickbeland, NithinBekal, Nk, Nkayesmith, Nmg20, Noctibus, Northamerica1000, Nortonius, Nwwaew, Oddbodz, Orange Suede Sofa, Orioane, OrlandoMatthews, Orphan Wiki, Ortolan88, Oxymoron83, Ozgod, PGWG, Pajz, Pampas Cat, Paranomia, Pavel Vozenilek, Pgk, Philip Trueman, PhnomPencil, PiRSquared17, Piano non troppo, Pictureuploader, Poiwaterwater, Prashanthns, PratzStrike, PrescitedEntity, Project2501a, Pseudomonas, Psmith, Pundit, PÆon, Quantpole, Quintote, Qxz, R. fiend, RainbowOfLight, RandomStringOfCharacters, Ranveig, Ranze, Raquel Baranow, Razorflame, RedRollerskate, Regal Atrocity, Res2216firestar, RexNL, Rhopkins8, RicardoFachada, Robert Foley, RobinHoudt, Rocastelo, Rocket71048576, Rror, Rsrikanth05, Rushbugled13, Ryulong, SD5, SDS, Saebjorn, Sam Korn, Sarah Joy Jones, Satdeep gill, Science4sail, Scraimer, Serene150, Sgtlemonpepper, Sharpie5982, ShelfSkewed, Shultz, Shultz III, SimonP, Simonmckenzie, Sjc, Skarebo, Skizzik, Sluzzelin, Soliloquial, Solitude, Some jerk on the Internet, Soulbust, SpaceFlight89, Splash, Spliffy, Spurius Furius Fusus, StAnselm, Stefanomione, SteinbDJ, Stupid Corn, Stwalkerster, Styrofoam1994, Symane, SyntaxError55, Syp, Tara969, Tarquin, Tas96, Teachingarcher, Tesi1700, Texture, The Man in Question, The Thing That Should Not Be, TheIsland'sEye, TheOldJacobite, TheRanger, Theda, Thingg, Thorwald, Tide rolls, Tigeron, Tim1357, Tiptoety, Tkynerd, Toddst1, Tom Ketchum, TomasBat, Tommy2010, Transcendence, Tricolor Truce, Troy 07, Txmy, Ty580, Udubjoe, Ugadeee, Uncle Dick, Uncle Milty, Unyoyega, Valenciano, Vanos13, VasilievVV, Vekron, Versus22, Vinnyzz, Volunteer Marek, Vrenator, Vsion, WadeSimMiser, Wahkeenah, Wakuran, Water14, Wavelength, Weedwhacker128, Weiteck, Wereon, West.andrew.g, Wikipedian Penguin, Wilstar53, Wjejskenewr, Wolfdog, Xanchester, Xiahou, Yamamoto Ichiro, Yenemus, Yintan, Ysaimanoj, Yurik, Zacefron52, Zack wadghiri, Zahid Abdassabur, ZydecoRogue, Zythe, 1370 anonymous edits

Mnemonic *Source*: http://en.wikipedia.org/w/index.php?oldid=553551431 *Contributors*: 2602:306:CFD9:E410:7049:D4E8:3314:C940, 83d40m, 88888, A520, A930913, Abbyroxx224, Abdull, Abdulpshyc, Abhishek89, Abigail-II, AbsolutDan, Abtract, Acdx, Achowat, Adamantios, Adammathias, Adwb, Ahmed Sammy, Ahoerstemeier, AirdishStraus, Alan Pascoe, Alansohn, Alex dubas, Allicat07, Alterego, Amalgamator, AmyBeth, Ancatdubh43, Andre Engels, Andrejj, AndrewN, Andrewpmk, Andycjp, Angus Lepper, Arcadian, ArnoldReinhold, Aronk, Art LaPella, Arthena, Ashesdhakal, Auntof6, B00P, Bagatelle, Balthamos, Bando26, Basicsharingwatuknow!, Bdmccray, Bearfoot, BenC7, BenFrantzDale, BenKovitz, Benny 919, Berrinam, Bgwhite, Big Paradox, Bigbluefish, BjKa, Bjoram11@yahoo.co.in, Blaukraut, Blotwell, BlueNovember, Blunto, Bob2, Bonojohn, Buster7, Butterflyteddy, C colorado, CDF280, CMYuill, CNichols, Cacycle, Calicore, CambridgeBayWeather, Camw, Can't sleep, clown will eat me, Canadian-Bacon, Candleflame, CapitalSasha, Capricorn42, CardinalDan, Carolfrog, Cbuckley, Cd3894, Ceinturion, Celithemis, Ceranthor, Ceyockey, Chinasaur, Chopin-Ate-Liszt!, Chowbok, Chridd, Chris the speller, Chuck SMITH, Comme le Lapin, Como, Congee1, Constructive editor, Coppertwig, Cordlox, Cornflake pirate, Cowman109, Cryptic C62, Css, Cuiusquemodi, Curps, Cybercobra, Cyberjean, Cyde, DMacks, Daiv, Dan Pangburn, DanBishop, Daniel2424, Darksun, Daveydweeb, David Shay, DavidCWG, Dbrodbeck, Deltabeignet, Demiurge, Dennis Valeev, Derek farn, Design, Discospinster, Dmbrown00, Doctormatt, Domino42, DonSiano, Doodledoo, Dpbsmith, Dreftymac, Drhfk, DropDeadGorgias, Ds13, EEPROM Eagle, EVula, Ebertek, Eclecticology, EdC, Ee79, Eequor, ElderKorean, Elf, Ellmist, Eludlow, Emjaybee, Enchanter, Eng101, Equal, Ericobnn, Everyking, Fafans, Fafans2k, Fainaent, Faradayplank, Fibonacci, Figaro, Flcelloguy, FleetCommand, Flex Flint, Forlane, Founder2k, Fraggle81, Fulleraaron, Fæ, G Rose, GPHemsley, Gaius Cornelius, Garion96, Garth5689, Gc9580, George100, Gerbrant, Gershwinrb, Ghosthunter1990, Glst2, Goochelaar, Gracefool, Grafen, Great Scott, GregRobson, GreyCat, Grstain, Gurch, HMman, Haeleth, Hall Monitor, Hanacy, Haoie, Henrysteinberger, Herbythyme, Hereticam, Heron, Hilary.page, Hippi ippi, Hirpex, Homerjay, Hopiakuta, Hoplophile, Hq2u, Hsriniva, Hugh Mason, Human write, HumphreyW, Hy48, Icarus3, Igoldste, InBalance, Indefatigable, Indochinetn, Inka 888, Inkington, Invertzoo, IslandGyrl, It Is Me Here, Itsmeiam, J-beda, J.delanoy, JIP, JSpung, Jaberwocky6669, Jackol, Jackollie, Jake-helliwell, Janko, Jarble, Jdevlin413, JebJoya, Jenninle1, JeramieHicks, Jeronimo, JerrySteal, Jesdisciple, Jess Cully, Jfdwolff, Jgoard, Jh51681, Jim1138, JimVC3, Jncraton, Joe18, Joelloughead, JogLabJo2, Jogloran, Johnkarp, Josh Parris, Josh Triplett, JoshuaMD135, Jpeob, Jsnolan, Juanmanuel45, Just Another Dan, Just plain Bill, KConWiki, Kaiti, Kalaiarasy, Kappa, Karmosin, Ken Gallager, Kenny sh, Kindall, Kiwiviktor81, Kmill, KoenNoens, Koro Neil, Koshki, Koyaanis Qatsi, Kpufferfish, Kuaola, Kwamikagami, Kyorosuke, LA2, Ladywordconnoisseur, Lazarus666, Learning dave, Lee S. Svoboda, Lee Stanley, Lenaathi, Lgh, Lgirvin, Litalex, Little guru, LittleDan, LittleDora, Liujunbiao, Lobsterkins, Looie496, Lotje, Lova Falk, LucasVB, Luk, Lunboks, Lxrhee, MER-C, Mac Davis, Macedonian, Mackan79, Mactabbed, MadSurgeon, Maeglin Lómion, Magioladitis, Magmafox, Magnaclash, Makecat, Man vyi, Manop, Mark Barnes, Mark83, Marksdarcy, Matthew Yeager, Mattisse, Mav, Maximus Rex, Maxis ftw, Mazzatron5000, Mcduff, Meldyson, Melloss, Memorymentor, Miborovsky, Michael Hardy, Mike Young, Miles, Mindmatrix, Minghong, Mitsukai, Mnemo7, MnemonicDictionary, Monkeyblue, Monkeyman, Monozigote, Moogle, Moondyne, Mormegil, Mrcolj, Mrschimpf, Msheehan905, Msrkiran, Mvgossman, MyNameIsClare, NawlinWiki, Nesbit, Netalarm, Neurogrrrl, Nevit, Niceguyedc, Night Gyr, Njomany, Nlshraman, Nmourfield, Nohat, Nonc, Norm mit, Noroton, Notheruser, Nuno Tavares, Obikwan13, Odud, Oliver, Omegatron, Omicronpersei8, Oneoverzero, Optimist on the run, Orion99, Ottershrew, Ownlyanangel, Pako, Pascal666, Paullaw, Pfurrie, Pgiii, Phgao, PhilB100, PhilT2, Picatrix, Pigsonthewing, Pilibin, Pindaris, Pjotrw, PlanetCoder, Platypus222, Pliny, Pmemory, Poccil, Polaron, Populus, Porturology, Pr1268, Pseudonym214, Psyc3330, Pugetbill, PullUpYourSocks, Pwnasaurusrex38, Qaqaq, Qtoktok, Quadell, Quatonik, Quercusrobur, Quiddity, Qxz, R'n'B, R. S. Shaw, RHaworth, ROYGBIV, RRobin, Rainer, Rajkumar23, Random contributor, RandomCritic, Rangek, Raul654, Ravedave, Rbonvall, RedRollerskate, Reify-tech, Rememberway, Renaissanceperson, Rettetast, RexNL, Rich Farmbrough, Richard001, Richardkselby, Rick MILLER, Rimtect, Rizuri, Rjgodoy, Robbie Fischer, Robert Merkel, RobertoN347, Robo Cop, Robwf, Ronhjones, Ross Burgess, Ross Uber, RoySmith, Rsduhamel, Rshin, RuthieK, Ryan Postlethwaite, STHellRaiser, Sailorsun, Sailsbystars, Sam.Holloway, Samuelbshaw, Satanicbowlerhat, Schmiteye, Schzmo, Scottwnewton, Scythia, Sean Heron, Shaak ti jedi master, Shash, ShaunES, Sheehan, Shhi1229, Shoaler, Shoy, Siavash m689, Signals in Some, SimonP, Sintaku, SlackerMom, Slawojarek, Slivester, Slrubenstein, Somerandomer, SparklinSapphire, SpeedyGonsales, Spiffy sperry, Spxalpha, Squids and Chips, Steph.sin, Stromcarlson, Supten, Syndicate, TKD, Tangotango, Tanthalas39, Thambiap, That Guy, From That Show!, The Dogandpony, The Epopt, The Thing That Should Not Be, The prophet wizard of the crayon cake, TheHYPO, TheMadBaron, TheNeutroniumAlchemist, Theda, Thegeo, Thegn, Thorns among our leaves, Thuglas, Timvasquez, Titoxd, TjoeC, Toh, Tom Reedy, Tony Sidaway, TotoBaggins, Tregoweth, Tresiden, Trevj, TrickZ, Trinary M01, TwoOneTwo, TyA, Typhonius, U10ajf, Unmitigated Success, UserNumber06, Valchemishnu, Valethar, Vanischenu, Vanished User 0001, Vanished User 1004, Vinnyd12, Viriditas, WLU, Wareh, Warofdreams, Wavelength, Wayfarer, Wayward, Webmagnets, Weird Bird, Westendgirl, Whitecatfish, Whiteheadj, Wiki alf, Willmcgree, WinterSpw, WizardFusion, Wolfdog, Wolfkeeper, WpZurp, Xmnemonic, Y, Yossarian, Yurei-eggtart, Zbxgscqf, Zhile, Zippanova, Zmemory, Zucchinidreams, ماني, 1044 anonymous edits

Phonetic algorithm *Source*: http://en.wikipedia.org/w/index.php?oldid=546925110 *Contributors*: 213.253.39.xxx, Angr, Augurar, Borrible, Bryan Derksen, Chmod007, ChrisGualtieri, Derek farn, Don4of4, Doradus, Dysprosia, E946, Fadesga, Gioto, Heron, Hippietrail, Jda, Jogloran, Kyoakoa, Lam Kin Keung, LarryGilbert, Michael Hardy, Mikellewellyn, Mlessard, Msh210, N2e, Nikola Smolenski, Niwrat, Nojacko, Nunh-huh, Octahedron80, RainbowCrane, Ruud Koot, Saranary, Someone else, Tregoweth, Vicki Rosenzweig, 16 anonymous edits

Metaphone *Source*: http://en.wikipedia.org/w/index.php?oldid=550859864 *Contributors*: 213.253.39.xxx, Aalaap, Aaronbrick, Albeider, Angr, Ardonik, Ariel., AvicAWB, Benizi, ChrisGualtieri, Colonies Chris, DS1953, DanBishop, Daniel Newby, Don4of4, Fthiess, Gioto, Hakamadare, Isloera, JLaTondre, JoaquinFerrero, Kaszeta, KnightRider, Kwamikagami, LarsMarius, Ltickett, MaNeMeBasat, Mik01aj, Mikeblas, Mikedominice, Morphh, Msh210, Nakerlund, Nikola Smolenski, Richard W.M. Jones, Rob cowie, RossPatterson, Ruud Koot, Sdornan, SilverWoodchuck47, Spencerk, Stevietheman, Sun Creator, Timfletcher, Van der Hoorn, Winterstein, Wxidea, Xueexueg, 77 anonymous edits

Soundex *Source*: http://en.wikipedia.org/w/index.php?oldid=554166408 *Contributors*: Abednigo, Acdx, Akhbaig, AndersFeder, Asdfgbnmkiuytfv, Ashmoo, Bbb23, Bfinn, Birczanin, Briaboru, ChrisGualtieri, Christopher.Madsen, ClockworkSoul, Copyeditor42, Creol, DGamey, Darkoneko, Datatune, David Shay, Diiscool, Discospinster, Dispenser, Femto, Froid, Gaolu, Garygregory, Gioto, Gregstoll, Gunnar Guðvarðarson, Haephrati, Isnow, Isoxyl, Javier Carro, Jbass, Jerome Charles Potts, Jfhennessy, Jim Grisham, JoaquinFerrero, LarryGilbert, Ltickett, Mathew.vijay, Matt Crypto, Mheberger, Mmsmatt, Morcheeba, Myxomatose, Nakerlund, Neo139, NeonMerlin, Nikola Smolenski, Nojacko, Norm mit, Octahedron80, Paddy3118, Permutationcity, Piggy@baqaqi.chi.il.us, Pne, Qwertyus, RobSiddall, RossPatterson, Ruud Koot, STIX445, Saintrain, Seidenstud, Sgeo, Short Circuit, Simsong, SqlPac, TJRC, Timfletcher, Tlextrait, TomH, Tregoweth, VinceBowdren, W1tgf, Whosasking, Wikedcoder, Winterstein, Wnare, 94 anonymous edits

Rhyme Genie *Source*: http://en.wikipedia.org/w/index.php?oldid=553223011 *Contributors*: CaroleHenson, CodeCruncher, Hyacinth, Man vyi, Mr. Stradivarius, 2 anonymous edits

Image Sources, Licenses and Contributors

File:IPA in IPA.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:IPA_in_IPA.svg *License*: Public Domain *Contributors*: User:Kjoonlee

File:IPA chart 2005.png *Source*: http://en.wikipedia.org/w/index.php?title=File:IPA_chart_2005.png *License*: GNU Free Documentation License *Contributors*: Kwamikagami (talk) 21:28, 2 October 2008 (UTC)

File:Cursive IPA open o.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Cursive_IPA_open_o.png *License*: Public Domain *Contributors*: Okon E. Essien

File:IPA chart (C)2005.pdf *Source*: http://en.wikipedia.org/w/index.php?title=File:IPA_chart_(C)2005.pdf *License*: Creative Commons Attribution-Sharealike 3.0 *Contributors*: IPA

File:Phonetik.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Phonetik.svg *License*: GNU Free Documentation License *Contributors*: Fvasconcellos 20:42, 14 April 2007 (UTC)

File:RPGA international.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:RPGA_international.svg *License*: Public Domain *Contributors*: Fvasconcellos 18:16, 14 April 2007 (UTC)

File:Loudspeaker.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Loudspeaker.svg *License*: Public Domain *Contributors*: Bayo, Frank C. Müller, Gmaxwell, Gnosygnu, Husky, Iamunknown, Mirithing, Myself488, Nethac DIU, Omegatron, Rocket000, Shanmugamp7, Snow Blizzard, The Evil IP address, Túrelio, Wouterhagens, 26 anonymous edits

File:Blank vowel trapezoid.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Blank_vowel_trapezoid.svg *License*: GNU Free Documentation License *Contributors*: Blank_vowel_trapezoid.png: IPA_vowel_trapezium.svg: *Ga_open_allophones.svg: Angr derivative work: Moxfyre (talk) derivative work: Moxfyre (talk)

File:Cardinal vowel tongue position-front.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Cardinal_vowel_tongue_position-front.svg *License*: Creative Commons Attribution-Share Alike *Contributors*: Badseed

File:Cardinal vowels-Jones x-ray.jpg *Source*: http://en.wikipedia.org/w/index.php?title=File:Cardinal_vowels-Jones_x-ray.jpg *License*: Creative Commons Attribution-ShareAlike 3.0 Unported *Contributors*: Ishwar, 1 anonymous edits

Image:Ipa-chart-all-1000px.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Ipa-chart-all-1000px.png *License*: GNU Free Documentation License *Contributors*: Basilicofresco, Crux, Dcoetzee, Duesentrieb, Hazmat2, Ilmari Karonen, Imz, Oghmoir, Rudloff, 1 anonymous edits

Image:VisibleSpeech-illustrations.jpg *Source*: http://en.wikipedia.org/w/index.php?title=File:VisibleSpeech-illustrations.jpg *License*: Public Domain *Contributors*: Harryzilber, Javier Carro, Primordial, Qvarie

File:Ahoa eta eztarria zenbakiekin.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Ahoa_eta_eztarria_zenbakiekin.png *License*: Creative Commons Zero *Contributors*: User:Gorkaazk

Image:Syllable.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable.svg *License*: Public Domain *Contributors*: User:Crissov

File:Syllable onset rhyme.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_onset_rhyme.png *License*: Public Domain *Contributors*: User:Crissov

File:Syllable onset nucleus coda.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_onset_nucleus_coda.png *License*: Public Domain *Contributors*: User:Crissov

File:Syllable body coda.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_body_coda.png *License*: Public Domain *Contributors*: User:Crissov

File:Syllable initial medial rhyme.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_initial_medial_rhyme.png *License*: Public Domain *Contributors*: User:Crissov

Image:Syllable illustration 1.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_illustration_1.svg *License*: Public Domain *Contributors*: Gringer (talk)

Image:Syllable illustration 2.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_illustration_2.svg *License*: Public Domain *Contributors*: Gringer (talk)

Image:Syllable illustrations 3and4.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_illustrations_3and4.svg *License*: Public Domain *Contributors*: Gringer (talk)

File:Syllable initial final.png *Source*: http://en.wikipedia.org/w/index.php?title=File:Syllable_initial_final.png *License*: Public Domain *Contributors*: User:Crissov

File:Phoneme-allophone-determination-chart.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Phoneme-allophone-determination-chart.svg *License*: Public Domain *Contributors*: AnonMoos

File:Homograph homophone venn diagram.svg *Source*: http://en.wikipedia.org/w/index.php?title=File:Homograph_homophone_venn_diagram.svg *License*: Creative Commons Attribution-Sharealike 3.0 *Contributors*: Homograph_homophone_venn_diagram.png: Will Heltsley derivative work: Cmglee (talk)

File:Knucklemnemonic.jpg *Source*: http://en.wikipedia.org/w/index.php?title=File:Knucklemnemonic.jpg *License*: GNU Free Documentation License *Contributors*: Chico, Error

File:Giordano Bruno Campo dei Fiori cropped.jpg *Source*: http://en.wikipedia.org/w/index.php?title=File:Giordano_Bruno_Campo_dei_Fiori_cropped.jpg *License*: Public Domain *Contributors*: User:Jastrow, User:Nolanus

License