Better English Pronunciation

BETTER ENGLISH PRONUNCIATION

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Preface

Pronunciation refers to the way a word or a language is spoken, or the manner in which someone utters a word. If one is said to have "correct pronunciation", then it refers to both within a particular dialect. 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, their ethnic group, their social class, or their education. A spelling pronunciation is a pronunciation that, instead of reflecting the way the word was pronounced by previous generations of speakers, is a rendering in sound of the word's spelling. In some cases, we cannot tell if a pronunciation is a true spelling pronunciation. The alternative is that a word is being pronounced *analogically*, in essence as the "sum of its parts". Thus, *forehead* is commonly pronounced as a sequence of *fore* plus *head*, instead of the historically earlier "forrid"; and *waistcoat* is commonly pronounced as a sequence of *waist* and *coat*, instead of the historically earlier "weskit". Spelling pronunciations give rise to varied opinions. Often those who retain the old pronunciation consider the spelling pronunciation to be a mark of ignorance or insecurity. Those who use a spelling pronunciation may not be aware that it is one, and consider the historically authentic version to be slovenly, since it "slurs over" a letter. Conversely, the users of some innovative pronunciations such as "Febuary" (for *February*) may regard the historically (and phonetically)

authentic version as a pedantic spelling pronunciation. Children who read a great deal often produce spelling pronunciations, since they have no way of knowing, other than the spelling, how the rare words they encounter are correctly pronounced. Well-read second language learners are likewise vulnerable to producing spelling pronunciations. However, since there are many words which one reads far more often than one hears, the problem also affects adult native-language speakers. This, in turn, leads to the language evolution mentioned above. What is a spelling pronunciation in one generation often becomes standard in the next.

This publication titled, "Better English Pronunciation" provides readers with an introductory overview of better English pronunciation. The focus lies on phonology, phonetics, articulation and speech perception. The subject areas of international phonetic alphabet, association and transcription are covered and supported with select case study. It provides a systematic and thorough introduction to the pronunciation of English to help intermediate and more advanced students improve their pronunciation of the spoken language. Also, the field of pronunciation respelling of English is dealt in detail, highlighting non-native pronunciations and foreign accent syndrome. Attempts have been made towards improving English pronunciation by evaluating role of English pronunciation test. This publication titled, "Better English Pronunciation" is completely user-friendly as it also gives readers a glossary, bibliography and index.

—Editor

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Introduction to Better English Pronunciation

ACCENT

In linguistics, an accent is a manner of pronunciation peculiar to a particular individual, location, or nation. An accent may identify the locality in which its speakers reside (a geographical or regional accent), the socio-economic status of its speakers, their ethnicity, their caste or social class, their first language (when the language in which the accent is heard is not their native language), and so on. Accents typically differ in quality of voice, pronunciation of vowels and consonants, stress, and prosody.

lthough grammar, semantics, vocabulary, and other language characteristics often vary concurrently with accent, the word 'accent' refers specifically to the differences in pronunciation, whereas the word 'dialect' encompasses the broader set of linguistic differences. Often 'accent' is a subset of 'dialect'.

History

As human beings spread out into isolated communities, stresses and peculiarities develop. Over time these can develop into identifiable accents. In North America, the interaction of people from many ethnic backgrounds

contributed to the formation of the different varieties of North American accents. It is difficult to measure or predict how long it takes an accent to formulate. Accents in the USA, Canada and Australia, for example, developed from the combinations of different accents and languages in various societies, and the effect of this on the various pronunciations of the British settlers, yet North American accents remain more distant, either as a result of time or of external or "foreign" linguistic interaction, such as the Italian accent. In many cases, the accents of non-English settlers from Great Britain and Ireland affected the accents of the different colonies quite differently. Irish, Scottish and Welsh immigrants had accents which greatly affected the vowel pronunciation of certain areas of Australia and Canada.

Development

Children are able to take on accents relatively quickly. Children of immigrant families, for example, generally have a more native-like pronunciation than their parents, though both children and parents may have a noticeable non-native accent. Accents seem to remain relatively malleable until a person's early twenties, after which a person's accent seems to become more entrenched. All the same, accents are not fixed even in adulthood.

An acoustic analysis by Jonathan Harrington of Elizabeth II's Royal Christmas Messages revealed that the speech patterns of even so conservative a figure as a monarch can continue to change over her lifetime.

Non-Native Accents

Pronunciation is the most difficult part of a non-native language to learn. Most individuals who speak a non-native language fluently speak it with an accent of their native tongue. The most important factor in predicting the

degree to which the accent will be noticeable (or strong) is the age at which the non-native language was learned. The critical period theory states that if learning takes place after the critical period (usually considered around puberty) for acquiring native-like pronunciation, an individual is unlikely to acquire a native-like accent.

This theory, however, is quite controversial among researchers. Although many subscribe to some form of the critical period, they either place it earlier than puberty or consider it more of a critical "window," which may vary from one individual to another and depend on factors other than age, such as length of residence, similarity of the non-native language to the native language, and the frequency with which both languages are used. Nevertheless, children as young as 6 at the time of moving to another country often speak with a noticeable non-native accent as adults. There are also rare instances of individuals who are able to pass for native speakers even if they learned their non-native language in early adulthood.

However, neurological constrains associated with brain development appear to limit most non-native speakers' ability to sound native-like. Most researchers agree that for adults, acquiring a native-like accent in a non-native language is near impossible.

Social Factors

When a group defines a standard pronunciation, speakers who deviate from it are often said to "speak with an accent". However, everyone speaks with an accent. People from the United States would "speak with an accent" from the point of view of an Australian, and vice versa. Accents such as BBC English or General American or Standard American may sometimes be erroneously designated in their countries of origin as "accentless" to indicate that

they offer no obvious clue to the speaker's regional or social background.

Being Understood

Many teachers of English as a second language neglect to teach speech/pronunciation. Many adult and near-adult learners of second languages have unintelligible speech patterns that may interfere with their education, profession, and social interactions. Pronunciation in a second or foreign language involves more than the correct articulation of individual sounds. It involves producing a wide range of complex and subtle distinctions which relate sound to meaning at several different levels.

Teaching of speech/pronunciation is neglected in part because of the following myths:

- Pronunciation isn't important: "This is patently false from any perspective." Speech/Pronunciation forms the vehicle for transmitting the speaker's meaning. If the listener does not understand the message, no communication takes place, and although there are other factors involved, one of the most important is the intelligibility of the speaker's pronunciation.
- Students will pick it up on their own: "Some will learn to pronounce the second language intelligibly; many will not."

Inadequate instruction in speech/pronunciation can result in a complete breakdown in communication. The proliferation of commercial "accent reduction" services is seen as a sign that many ESL teachers are not meeting their students' needs for speech/pronunciation instruction.

The goals of speech/pronunciation instruction should include: to help the learner speak in a way that is easy to understand and does not distract the listener, to increase

the self-confidence of the learner, and to develop the skills to self-monitor and adapt one's own speech.

Even when the listener does understand the speaker, the presence of an accent that is difficult to understand can produce anxiety in the listener that he will not understand what comes next, and cause him to end the conversation earlier or avoid difficult topics.

Prestige

Certain accents are perceived to carry more prestige in a society than other accents. This is often due to their association with the elite part of society. For example in the United Kingdom, Received Pronunciation of the English language is associated with the traditional upper class. However, in linguistics, there is no differentiation among accents in regards to their prestige, aesthetics, or correctness. All languages and accents are linguistically equal.

Accent Stereotyping and Prejudice

Stereotypes refer to specific characteristics, traits, and roles that a group and its members are believed to possess. Stereotypes can be both positive and negative, although negative are more common.

Stereotypes may result in prejudice, which is defined as having negative attitudes toward a group and its members. Individuals with non-standard accents often have to deal with both negative stereotypes and prejudice because of an accent. Researchers consistently show that people with accents are judged as less intelligent, less competent, less educated, having poor English/language skills, and unpleasant to listen to. Not only people with standard accents subscribe to these beliefs and attitudes, but individuals with accents also often stereotype against their own or others' accents.

Accent Discrimination

Discrimination refers to specific behaviors or actions directed at a group or its individual members based solely on the group membership. In accent discrimination, one's way of speaking is used as a basis for arbitrary evaluations and judgments. Unlike other forms of discrimination, there are no strong norms against accent discrimination in the general society. Rosina Lippi-Green writes,

Accent serves as the first point of gate keeping because we are forbidden, by law and social custom, and perhaps by a prevailing sense of what is morally and ethically right, from using race, ethnicity, homeland or economics more directly. We have no such compunctions about language, however. Thus, accent becomes a litmus test for exclusion, and excuse to turn away, to recognize the other.

Speakers with accents often experience discrimination in housing and employment. For example, landlords are less likely to call back speakers who have foreign or ethnic accents and are more likely to be assigned by employers to lower status positions than are those with standard accents. In business settings, individuals with non-standard accents are more likely to evaluated negatively. Accent discrimination is also present in educational institutions. For example, non-native speaking graduate students, lecturers, and professors, across college campuses in the US have been target for being unintelligible because of accent. On average, however, students taught by non-native English speaker do not underperform when compared to those taught by native speakers of English.

Studies have shown the perception of the accent, not the accent by itself, often results in negative evaluations of speakers. In a study conducted by Rubin (1992), students listened to a taped lecture recorded by the same native

English speaker with a standard accent. However, they were shown a picture of the lecturer who was either a Caucasian or Asian. Participants in the study who saw the Asian picture believed that they had heard an accented lecturer and performed worse on a task measuring lecture comprehension. Negative evaluations may reflect the prejudices rather than real issues with understanding accents.

Legal Implications

In the United States, Title VII of the Civil Rights Act of 1964 prohibits discrimination based on national origin, implying accents. However, employers may claim that a person's accent impairs his or her communication skills that are necessary to the effective business operation. The courts often rely on the employer's claims or use judges' subjective opinions when deciding whether the (potential) employee's accent would interfere with communication or performance, without any objective proof that accent was or might be a hindrance.

Kentucky's highest court in the case of *Clifford vs. Commonwealth* held that a white police officer, who had not seen the black defendant allegedly involved in a drug transaction, could, nevertheless, identify him as a participant by saying that a voice on an audiotape "sounded black." The police officer based this "identification" on the fact that the defendant was the only African American man in the room at the time of the transaction and that an audiotape contained the voice of a man the officer said "sounded black" selling crack cocaine to a white informant planted by the police.

PRONUNCIATION

Pronunciation refers to the way a word or a language is spoken, or the manner in which someone utters a word.

If one is said to have "correct pronunciation", then it refers to both within a particular dialect.

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, their ethnic group, their social class, or their education.

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).

PRONUNCIATION

Entries in the English Wiktionary may contain a *Pronunciation* section to indicate phonetic and phonological details of the headword.

Phonetics and Phonology

Most of the differences in the pronunciation across dialects is phonetic rather than phonemic in nature. Phonetic details indicate the physical sounds of the headword. Phonetic transcriptions are given within square brackets and are often for a particular dialect, indicated by an accent tag. The IPA symbols listed in w:IPA chart for English dialects are often used for phonetic transcriptions in English entries. Examples for free, pin, and better follow:

- (UK) IPA
- (US) IPA

- (Scotland) IPA
- (Cajun English) IPA
- (Welsh English) IPA
- IPA
- (US) IPA
- (UK) IPA, (before a vowel) IPA— commonly abbreviated IPA
- (Australia) IPA

By contrast, phonemic transcriptions, given within slashes, indicate the sounds of the headword in a mostly dialect-neutral way using phonemes for a particular language. Phonemically, the most significant accent groups are rhotic and non-rhotic. Most English terms have only one phonemic transcription. For example, the standard US pronunciation of law usually has a short [Q] sound while the standard UK pronunciation nearly always has a long [TD] sound, but neither dialect distinguishes phonemically between long [TD] or [QD] and short [T] or [Q], and US [Q] is a predictable reflex of UK [TD]. So, the only phonemic transcription given is /lTD/, optionally supplemented by phonetic transcriptions to show details of regional variation like vowel length.

Where it is necessary to illustrate a phonemic distinction between accents, the following accent tags can be used to clarify the major variation of English to which a phonemic transcription applies:

- {{a|rhotic}}: In rhotic accents of English, written <r> is pronounced in all positions as /y/.
- {{a|non-rhotic}}: In non-rhotic accents of English, [y] does not appear in the syllable coda, as in the word *better,* but is typically pronounced if it is followed by a vowel sound. Thus, the it may or may not be pronounced at the end of a word, depending

on context, so final <r> in non-rhotic accents is also transcribed phonemically. However, in a word like *bird,* the orthographic <r> can never be followed by a vowel and is never pronounced, and so is not transcribed.

- {{a|bad-lad-split}}: In Australian English and some varieties of British English, there is a phonemic distinction between the long /æD/ of terms like bad and the short /æ/ of terms like lad.
- {{a|bad-lad-merger}} (actually, the lack of a split): In most varieties of English, there is no phonemic distinction between short [æ] and long [æD]. The phoneme for standard English is always given as /æ/.

In the examples below for free, pin, and better, detailed sound qualities that are not important distinctions within English are ignored. However, a distinction is drawn between rhotic and non-rhotic pronunciations, as described above:

- IPA
- IPA
- (rhotic)
- (non-rhotic)

In phonemic transcriptions, it is important to choose from a consistent set of IPA symbols, such as those listed at w:Help:IPA for English, in order to avoid making unintended claims about what sounds are phonemically contrastive in English. If there is any doubt about whether a particular sound is phonemically contrastive in English or in any particular dialect, it is best to use phonetic transcription, given in square brackets.

Section Layout and Templates

A typical pronunciation section begins with

Pronunciation and may look like the based on the word portmanteau. The region or accent [(UK), (US), (Australia), *et al.*] is first if there is regional variation, followed by the pronunciation system (such as IPA, SAMPA, or enPR), a colon, then the pronunciation; the templates {{a}}, {{IPA}}, {{SAMPA}}, and {{enPR}} do this automatically.

Phonemic transcriptions are placed between diagonal strokes (/.../), while phonetic transcriptions are placed between square brackets ([...]); these must be done manually within the template, since the templates can be used both for phonemic and for phonetic transcriptions. enPR pronunciations should not have diagonals or brackets, as their purpose is to be simple, and further, enPR is a phonemic system, so diagonals are redundant and brackets incorrect.

Pronunciations should be given in the order: enPR, IPA, SAMPA; enPR is often given only for the US pronunciation, as such systems are more common in the US than in the UK.

Ad hoc Transcription

While there is a natural bias in favour of established systems of pronunciation, it is not wrong to use an arbitrary representation if that's all you know and there is an important point to be made. For the word reject, one could have /RE-ject/ and /re-JECT/ to make the important distinction between the pronunciations of the noun and verb forms. It may not be standard, but neither is it wrong. Whenever possible, however, such *ad hoc* pronunciations should be replaced with one in an unambiguous system, such as IPA.

Ideally, every entry should have a pronunciation section, and perhaps a sound sample to accompany it. However, pronunciations vary widely between dialects, and non-linguists often have trouble writing down pronunciations

properly. UK English pronunciations should give the Received Pronunciation of the entry.

Request Pronunciation

You can use the template {{rfp}} to request a pronunciation in a Wiktionary entry.

Additional Items

Rhymes

As per Rhymes:English and w:Rhyme#Rhyme in English, "Two words are rhymes if:

- they are stressed on the same syllable, counting from the end of the words, and
- are pronounced identically from the vowel in their stressed syllable to the end."

Add a link to the page in the "Rhymes" namespace that lists the rhymes for the word. Do not list the rhymes themselves on the page you are editing. So, for example, on the entry for hat, add the line

- {{rhymes|æt}}
  to the entry. This links to the page Rhymes:English:-æt and displays the text:

- Rhymes: -æt
  The {{rhymes}} template saves you some typing and makes the IPA display correctly. This template also accepts an optional argument to specify the language for non-English rhymes. See Template talk:rhymes for documentation and use instructions.

Homophones

List any homophones of the word in alphabetical order, wikifying each one. For example, the Pronunciation section of the English word right contains the line

- Homophones: [[rite]], [[wright]], [[write]]
  which results in
- Homophones: rite, wright, write
  which are the English words that sound identical to right.

If a word is a homophone in a particular dialect of English, it may be added provided the dialect is referred to (for example, medal is a homophone of metal in accents with flapping, and beater is a homophone of beta in non-rhotic accents). Examples (for beater and medal, respectively):

- Homophones: beta (in non-rhotic accents)
- Homophones: metal (in accents with flapping)

The following must not be added to the homophones section:

- Words that are "nearly" homophones or rhymes (for example, for right, the words white or light);
- Words that are homophones if they are mispronounced in some way (eg, for miss, the word myth when pronounced with a lisp);
- Foreign words. These are unlikely to be true homophones (eg, Italian tipi ("types") is *not* a homophone of English tepee; the sounds of the vowels and consonants are similar but different).

(Note that the term used here is homophone; the term homonym used by some is ambiguous as it can mean either "homophone" or "homograph".)

Homophones Template

A template for homophones has been drafted. See template talk:homophones. A vote for implementing the

homophones template ended on 1/2/2009 with "no conclusion". Objections revolve around cases where there is a qualification (eg, "rhotic accents"). If you are interested in the homophones template, you are encouraged to develop a proposal that addresses the objections and initiate a discussion. The draft of the homophones template:

- {{homophones | rite | wright | write}}
  results in
- Homophones: rite, wright, write
  The following are examples of the template with accents, which effected the "no conclusion" vote. New proposals should address the handling of these qualifiers. See WT:V for comments on improvements.
- Homophones: beta (in non-rhotic accents)
- Homophones: rite, wright, write, ride (in accents with flapping)

Hyphenation

Hyphenation describes how a word is broken across line breaks. It is a question of typography, of formatting printed or screen display of a word for aesthetic reasons. Hyphenation is not always the same in the United States and the United Kingdom (see hyphenation algorithm); British hyphenation more often considers word etymologies, whereas American English hyphenation more often follows syllabification. Unless there are peculiarities with multi-word terms, hyphenation should only be shown on single-word entries.

Hyphenation is distinct from syllabification, which is how a word is broken into spoken syllables, although these two issues are often conflated. Hyphenation is a property of written words, but syllabification is a property of spoken words. Although both properties break words into portions,

the placement of the breaks is not always at the same location. For example, when the word inexorably is broken for hyphenation, it is broken in any *one* of the following places indicated: in·ex·o·ra·bly. When the same word is spoken, it is broken at *every* place indicated in the pronunciation: /jÈn[ks.Yr.Y.bli/. Notice also that, in many words, the syllable breaks do not occur in the same location as the hyphenation breaks.

In Wiktionary, both syllabification and hyphenation are listed in the pronunciation section. List hyphenation using the template {{hyphenation}}. For example, on the entry for measure, the line:

- {{hyphenation|mea|sure}}
  yields:
- Hyphenation: mea’ sure

Audio Files

- Listening to audio files
  For help listening to Wiktionary audio, go to w:Wikipedia:Media_help_(Ogg).
- Requesting an audio file
  If an entry does not have an audio file demonstrating the pronunciation, you have two choices for requesting one. Option 1: You may request that a file be added at Wiktionary:Pronunciation file requests (shortcut: WT:APR). Option 2: You may add the template {{rfap}} in the Pronunciation section of an article. This will automatically add the entry to the list at Category:Requests for audio pronunciation where it will be handled.
- Uploading an audio file
  Help:Audio pronunciations descibes the process step-by-step.

Resource Links

General

- Complete guide to using IPA on your computer
- Wiktionary:International Phonetic Alphabet – Information on the symbols
- International Phonetic Alphabet
- International Phonetics Association

For English

- Pronunciation templates
- Wiktionary:English pronunciation key – explains those phonetic alphabets which are used for English entries (enPR, IPA, SAMPA) for various regional norms.
- w:IPA chart for English
- w:International Phonetic Alphabet for English
- w:Rhotic and non-rhotic accents
- Appendix:List of dialect-dependent homophones
- Appendix:List of dialect-independent homophones

For Other Languages

- Wiktionary:IPA pronunciation key - multilingual table covering Dutch, English, French, German, Spanish, among other languages.
- fr:Annexe:Prononciation - includes English, French, German, Japanese, Romanian, and Spanish
- ca:Viccionari:Pronuncia - includes Catalan and Occitan
- Dutch : w:Dutch phonology, w:nl:Klankinventaris van het Nederlands
- Finnish : w:Finnish phonology
- French : Wiktionary:About French#Pronunciation, w:French phonology, fr:Wiktionnaire:Phonétique

- German : w:German phonology, de:Wiktionary: Lautschrift
- Greek : Appendix:Greek pronunciation
- Hungarian : w:Hungarian phonology
- Irish : w:Irish phonology, w:WP:IPA-ga
- Italian : w:Italian phonology
- Latin : Wiktionary:About Latin/Pronunciation; w:Latin spelling and pronunciation (caution: articles are incomplete and contain errors)
- Norwegian : Appendix:Norwegian pronunciation
- Polish : w:Polish orthography
- Russian : w:Russian phonology
- Scottish Gaelic : Appendix:Scottish Gaelic pronunciation
- Spanish : w:Spanish phonology, w:es:Transcripción fonética del español con el IPA, Wiktionary:Spanish pronunciation
- Swedish : Wiktionary:About Swedish/Pronunciation
- Ukrainian : w:Ukrainian phonology
- Welsh : Appendix:Welsh pronunciation

RECEIVED PRONUNCIATION

Received Pronunciation (RP), also called the Queen's (or King's) English, Oxford English, or BBC English, is the accent of Standard English in England, with a relationship to regional accents similar to the relationship in other European languages between their standard varieties and their regional forms. RP is used to a much lesser extent in Scotland, Wales and Ireland. Although there is nothing intrinsic about RP that marks it as superior to any other variety, sociolinguistic factors have given Received Pronunciation particular prestige in England and Wales, especially since the early to mid 20th century. However,

since the 1960s, a greater permissiveness towards allowing regional English varieties has taken hold in education and the media in the United Kingdom; in some contexts Received Pronunciation is now perceived negatively.

History

The introduction of the term *Received Pronunciation* is usually credited to Daniel Jones after his comment in 1917 "In what follows I call it Received Pronunciation (abbreviation RP), for want of a better term." However, the expression had actually been used much earlier by Alexander Ellis in 1869 and Peter DuPonceau in 1818 (the term used by Henry C. K. Wyld in 1927 was "received standard"). According to *Fowler's Modern English Usage* (1965), the correct term is "*the* Received Pronunciation". The word *received* conveys its original meaning of *accepted* or *approved* – as in "received wisdom". The reference to this pronunciation as Oxford English is because it was traditionally the common speech of Oxford University; the production of dictionaries gave Oxford University prestige in matters of language. The extended versions of the *Oxford English Dictionary* give Received Pronunciation guidelines for each word.

RP is an accent (a form of pronunciation) and a register, rather than a dialect (a form of vocabulary and grammar as well as pronunciation). It may show a great deal about the social and educational background of a person who uses English. Anyone using RP will typically speak Standard English although the reverse is not necessarily true (e.g. the standard language may be pronounced with a regional accent, such as a Yorkshire accent; but it is very unlikely that someone speaking RP would use it to speak Scots).

RP is often believed to be based on the Southern accents of England, but it actually has most in common with the

Early Modern English dialects of the East Midlands. This was the most populated and most prosperous area of England during the 14th and 15th centuries. By the end of the 15th century, "Standard English" was established in the City of London. A mixture of London speech with elements from East Midlands, Middlesex and Essex, became known as RP.

Usage

Researchers generally distinguish between three different forms of RP: Conservative, General, and Advanced. Conservative RP refers to a traditional accent associated with older speakers with certain social backgrounds; General RP is often considered neutral regarding age, occupation, or lifestyle of the speaker; and Advanced RP refers to speech of a younger generation of speakers.

The modern style of RP is an accent often taught to non-native speakers learning British English. Non-RP Britons abroad may modify their pronunciation to something closer to Received Pronunciation in order to be understood better by people unfamiliar with the diversity of British accents. They may also modify their vocabulary and grammar to be closer to Standard English, for the same reason. RP is often used as the standard for English in most books on general phonology and phonetics and is represented in the pronunciation schemes of most dictionaries published in the United Kingdom.

Status

Traditionally, Received Pronunciation was the "everyday speech in the families of Southern English persons whose men-folk [had] been educated at the great public boarding-schools" and which conveyed no information about that speaker's region of origin prior to attending the school.

It is the business of educated people to speak so that no-one may be able to tell in what county their childhood was passed.

A. Burrell, *Recitation. A Handbook for Teachers in Public Elementary School*, 1891.

In the 19th century, there were still British prime ministers who spoke with some regional features, such as William Ewart Gladstone.

From the 1970s onwards, attitudes towards Received Pronunciation have been changing slowly. The BBC's use of announcers with strong regional accents, such as Yorkshire-born Wilfred Pickles, during World War II (in order to distinguish BBC broadcasts from German propaganda) is an earlier example of the use of non-RP accents.

Phonology

Consonants

When consonants appear in pairs, *fortis* consonants (i.e. aspirated or voiceless) appear on the left and *lenis* consonants (i.e. lightly voiced or voiced) appear on the right. Unless preceded by /s/, fortis plosives (/p/, /t/, and /k) are aspirated before stressed vowels; when a sonorant /l/, /y/, /w/, or /j/ follows, this aspiration is indicated by partial devoicing of the sonorant.

Syllable finals /p/, /t/, /tʃ/, and /k/ are either preceded by a glottal stop (see Glottal reinforcement) or, in the case of /t/, fully replaced by a glottal stop, especially before a syllabic nasal (*bitten*). The glottal stop may be realised as creaky voice; thus a true phonetic transcription of *attempt* would be. RP's long vowels are slightly diphthongised. Especially the high vowels /iD/ and /uD/ which are often

narrowly transcribed in phonetic literature as diphthongs [ji] and [Su].

"Long" and "short" are relative to each other. Because of phonological process affecting vowel length, short vowels in one context can be longer than long vowels in another context. For example, a long vowel followed by a fortis consonant sound (/p/, /k/, /s/, etc.) is shorter; *reed* is thus pronounced while *heat* is [hi" t].

Conversely, the short vowel /æ/ becomes longer if it is followed by a lenis consonant. Thus, *bat* is pronounced [b%æ"t] and *bad* is. In natural speech, the plosives /t/ and /d/ may be unreleased utterance-finally, thus distinction between these words would rest mostly on vowel length.

In addition to such length distinctions, unstressed vowels are both shorter and more centralised than stressed ones. In unstressed syllables occurring before vowels and in final position, contrasts between long and short high vowels are neutralised and short [i] and [u] occur (e.g. *happy*, *throughout*.

The neutralisation is common throughout many English dialects, though the phonetic realisation of e.g. [i] rather than [j] (a phenomenon called happy tensing) is not as universal.

Diphthong	*Example*	*Closing*
/ej/	/bej/	bay
/aj/	/baj/	buy
/Tj/	/bTj/	boy
/YS/	/bYS/	beau
/aS/	/baS/	bough

Centring

/jY/	/bjY/	beer
/eY/	/beY/	bear
/SY/	/bSY/	boor

Before World War II, /TY/ appeared in words like *door* but this has largely merged with /TD˜/. "Poor" traditionally had /SY/ (and is still listed with only this pronunciation by the OED), but a realisation with /TD˜/ has become more common, see poor-pour merger. In the closing diphthongs, the glide is often so small as to be undetectable so that *day* and *dare* can be narrowly transcribed as [d%eD] and [d%[D˜] respectively.

RP also possesses the triphthongs /ajY/ as in *ire* and /aSY/ as in *hour*. Different possible realisations of these diphthongs are indicated in the following table: furthermore, the difference between /aSY/, /ajY/, and /QD˜/ may be neutralised with both realised as [QD˜] or [äD].

Not all reference sources use the same system of transcription. In particular:

- /æ/ as in *trap* is also written /a/.
- /e/ as in *dress* is also written /[/.
- /\D/ as in *nurse* is also written /YD/.
- /aj/ as in *price* is also written /Œj/.
- /aS/ as in *mouse* is also written /QS/
- /eY/ as in *square* is also written /[Y/, and is also sometimes treated as a long monophthong /[D/.

Most of these variants are used in the transcription devised by Clive Upton for the *Shorter Oxford English Dictionary* (1993) and now used in many other Oxford University Press dictionaries.

Historical Variation

Like all accents, RP has changed with time. For example, sound recordings and films from the first half of the 20th century demonstrate that it was usual for speakers of RP to pronounce the /æ/ sound, as in *land*, with a vowel close to [[], so that *land* would sound similar to a present-day pronunciation of *lend*. RP is sometimes known as the Queen's English, but recordings show that even Queen Elizabeth II has changed her pronunciation over the past 50 years, no longer using an [[]-like vowel in words like *land*.

The 1993 Oxford Dictionary changed three main things in its description of modern RP, although these features can still be heard amongst old speakers of RP. Firstly, words such as *cloth*, *gone*, *off*, *often* were pronounced with /TD/ (as in General American) instead of /R/, so that *often* sounded close to *orphan* (See lot-cloth split). The Queen still uses the older pronunciations, but it is rare to hear them on the BBC any more. Secondly, there was a distinction between horse and hoarse with an extra diphthong /TY/ appearing in words like *hoarse*, *force*, and *pour*. Thirdly, final y on a word is now represented as an /i/ - a symbol to cover either the traditional /j/ or the more modern /iD/, the latter of which has been common in the south of England for some time.

Before World War II, the vowel of *cup* was a back vowel close to cardinal [Œ] but has since shifted forward to a central position so that [P] is more accurate; phonetic transcription of this vowel as (Œ) is common partly for historical reasons.

In the 1960s the transcription /YS/ started to be used for the "GOAT" vowel instead of Daniel Jones's /oS/, reflecting a change in pronunciation since the beginning of the century. Joseph Wright's work suggests that, during the early 20th

century, words such as *cure, fewer, pure*, etc. were pronounced with a triphthong /iuY/ rather than the more modern /juY/.

The change in RP may even be observed in the home of "BBC English". The BBC accent of the 1950s was distinctly different from today's: a news report from the 1950s is recognisable as such, and a mock-1950s BBC voice is used for comic effect in programs wishing to satirize 1950s social attitudes such as the Harry Enfield Show and its "Mr. Cholmondley-Warner" sketches. There are several words where the traditional RP pronunciation is now considered archaic.

Comparison with other Varieties of English

- Like most varieties of English outside Northern England, RP has undergone the foot-strut split: pairs like *put/putt* are pronounced differently.
- RP is a broad A accent, so words like *bath* and *chance* appear with /QD/ and not /æ/.
- RP is a non-rhotic accent, meaning /r/ does not occur unless followed immediately by a vowel. Pairs such as *father/farther*, *pawn/porn*, *caught/court* and *formally/formerly* are homophones.
- RP has undergone the wine-whine merger so the sequence /hw/ is not present except among those who have acquired this distinction as the result of speech training. R.A.D.A. (the Royal Academy of Dramatic Art), based in London, still teaches these two sounds as distinct phonemes. They are also distinct from one another in most of Scotland and Ireland, in the north-east of England, and in the southeastern United States.
- Unlike many other varieties of English language in England, there is no h-dropping in words like *head* or *horse*.

- Unlike most southern-hemisphere accents of English, RP has not undergone the weak vowel merger, meaning that pairs such as *Lenin/Lennon* are distinct.
- Unlike most North American accents of English, RP has not undergone the Mary-marry-merry, nearer-mirror, or hurry-furry mergers: all these words are distinct from each other.
- Unlike many North American accents, RP has not undergone the father-bother or cot-caught mergers.
- RP does not have yod dropping after /n/, /t/, /d/, /z/ and /è/ and has only variable yod-dropping after /s/ and /l/. Hence, for example, *new*, *tune*, *dune*, *resume* and *enthusiasm* are pronounced /njuD/, /tjuDn/, /djuDn/, /rjÈzjuDm/ and /jnÈèjuDziæzm/ rather than /nuD/, /tuDn/, /duDn/, /rjÈzuDm/ and /jnÈèuDziæzm/ . This contrasts with many East Anglian and East Midland varieties of English language in England and with many forms of American English, including General American. In words such as *pursuit* and *evolution*, both pronunciations (with and without /j/) are heard in RP. There are, however, several words where a yod has been lost with the passage of time: for example, the word *suit* originally had a yod in RP but this is now extremely rare.
- The flapped variant of /t/ and /d/ (as in much of the West Country, Ulster and most North American varieties including General American and the Cape Coloured dialect of South Africa) is not used very often. In traditional RP [~] is an allophone of /r/ (used only intervocalically).

DIFFERENCES BETWEEN GENERAL AMERICAN AND RECEIVED PRONUNCIATION

One aspect of American and British English

pronunciation differences is differences in accent. The General American (GAm) and the Southern British Received Pronunciation (RP) accents have some significant points of difference, described in this article. However, other regional accents in each country may show greater still differences, for which see regional accents of English speakers.

History

Phonological Differences

- GAm is rhotic while RP is non-rhotic; that is, the phoneme /r/, or what was historically a phoneme /r/, is only pronounced in RP when it is immediately followed by a vowel sound. Where GAm pronounces /r/ before a consonant and at the end of an utterance, RP either has nothing (if the preceding vowel is /TD/ or /QD/, as in *bore* and *bar*) or has a schwa instead (the resulting sequences are diphthongs or triphthongs). Similarly, where GAm has r-coloured vowels (/Z/ or /]/, as in *cupboard* or *bird*), RP has plain vowels /Y/ or /\D/. However many British accents, especially in Scotland and the West Country, are rhotic, and there are a few non-rhotic accents in the United States, especially in urban working-class areas like New York, Boston, and a few conservative dialects of Southern American English (especially among older-speakers). Non-rhoticity is also very common among speakers of African-American Vernacular English, which is a dialect that influences a great portion of African-American speakers to varying degrees.
- The "intrusive R" of many RP speakers (in such sequences as "the idea-r-of it") is absent in GAm; this is a consequence of the rhotic/non-rhotic distinction.

- For some RP speakers (upper class), unlike in GAm, some or all of *tire*, *tower*, and *tar* are homophones; this reflects the merger of the relevant vowels; similarly the pour-poor merger is common in RP but not in GAm.
- RP has three open back vowels, where GAm has only two or even one. Most GAm speakers use the same vowel for RP "short O" /R/ as for RP "broad A" /QD/ (the father-bother merger); many also use the same vowel for these as for RP /TD/ (the cot-caught merger).
- For Americans without the cot-caught merger, the *lot-cloth split* results in /TD/ in some words which now have /R/ in RP; as reflected in the eye dialect spelling "dawg" for *dog*.
- The trap-bath split has resulted in RP having "broad A" /QD/ where GAm has "short A" /æ/, in most words where A is followed by either /n/ followed by another consonant, or /v/, /D/, /z/, /s/, /f/, or /è/ (e.g. *plant, pass, laugh, path*).
- RP has a marked degree of contrast of length between "short" and "long" vowels (The long vowels being the diphthongs, and /iD/, /uD/, /\D/, /TD/, /QD/). In GAm this contrast is much less evident, and the IPA length symbol (D) is often omitted.
- The "long O" vowel (as in *boat*) is realised differently: GAm pure [oD] or diphthongized [oS]; RP central first element [YS]. However there is considerable variation in this vowel on both sides of the Atlantic.
- The distinction between unstressed /j/ and /Y/ (e.g. *roses* vs *Rosa's*) is sometimes lost in GAm. In RP it is retained, in part because it helps avoid non-rhotic homophones; e.g. *batted* vs *battered* as /ÈbætjdÈbætjd/ vs /ÈbætYd/. It is, however, lost in Australian

English (which is also non-rhotic) meaning both words are pronounced the same, unlike American or British English.

- Where GAm has /iD/ in an unstressed syllable at the end of a morpheme, conservative RP has /j/, not having undergone *happY tensing*. This distinction is retained in inflected forms (e.g. *candied* and *candid* are homophones in RP, but not in GAm).
- In GAm, flapping is common: when either a /t/ or a /d/ occurs between a sonorant phoneme and an unstressed vowel phoneme, it is realized as an alveolar-flap allophone [~]. This sounds like a /d/ to RP speakers, although many GAm speakers distinguish the two phonemes by aspirating /t/ in this environment, especially after /j/ or /ej/ (thus *bitter* and *rated* are distinguishable from *bidder* and *raided*), or by lengthening the vowel preceding an underlying /d/. [~] is an allophone of /r/ in conservative RP, which is hence caricatured in America as a "veddy British" accent. The degree of flapping varies considerably among speakers, and is often reduced in more formal settings. It does occur to an extent in nearly every speakers of American English, with "better" pronounced with a flap almost ubiquitously regardless of background. Pronouncing the t would be considered overly-formal. This does not mean it always completely merges with "bedder", as many speakers enunciate the d as to distinguish it slightly from the flapped t.
- Yod-dropping occurs in GAm after all alveolar consonants, including /t/, /d/, /è/, /s/, /z/, /n/, /l/; i.e. historic /juD/ (from spellings *u*, *ue*, *eu*, *ew*), is pronounced /uD/ in a stressed syllable. In contrast, RP speakers:

- o always retain /j/ after /n/: e.g. *new* is RP /njuD/, GAm /nuD/;
- o retain or coalesce it after /t/, /d/: e.g. *due* is RP /djuD/ or /d'uD/, GAm /duD/;
- o retain or drop it after /è/, /l/: e.g. *allude* is RP / / or (as GAm) /YÈluDd/.
- o retain, coalesce or drop it after /s/, /z/: e.g. *assume* is RP /YÈsjuDm/ or /YE*ʃ*uDm/, or (as GAm) /YEsuDm/;
  - In some words where /j/ has been coalesced in GAm, it may be retained in RP: e.g. *issue* is RP /ÈjsjuD/ or (as GAm) /Èj*ʃ*uD/

IMPROVING YOUR ENGLISH PRONUNCIATION

Here are some tips to help you improve your English pronunciation. First of all, don't worry about not having a native-English accent. It's important to be able to speak clearly, so that people can understand you. However, it's almost impossible to sound exactly like a native English speaker if you are learning English as an adult in a non-English speaking country.

However, there are many things that you can do to improve your pronunciation and your speaking skills.

1. Listen to spoken English as often as possible.

Listen to how speakers pronounce various words and phrases and "model" your pronunciation on what you hear.

2. Learn the phonetic alphabet.

Use the phonetic alphabet page (at the beginning of most good dictionaries) as a guide to pronouncing new words.

3. Don't forget to learn the word stress of a new word.

Every English word has its own stress, or intonation. For example, the word "believe" has two syllables (be and lieve), but only the second syllable is stressed. We say be'lieve and not 'be lieve. Your dictionary will show the syllable stress by an apostrophe (') before the syllable to be stressed.

Word stress is important. In fact, it is more likely that someone misunderstands you because of wrong word stress than because of the wrong pronunciation of a sound.

4. Work out which sounds cause you most problems in English.

Depending on what your first language is, you may have problems with certain sounds. For example, French speakers have difficulties with "th"; speakers of Mandarin have difficulties with "r" or "l", and Arabic speakers have difficulties with "p" and "b".

5. Practise the sounds you find difficult.

A useful exercise is a "minimal pair" exercise. For example, if you have difficulty distinguishing between "p" and "b", try practising pairs of words which are the same except for the sound "p" and "b":

For example, "pair" and "bear"; "pond" and "bond"; "pie" and "buy" etc.

6. Be aware of intonation and sentence stress.

Not all words in a sentence have equal stress, and generally only the "information" words (nouns and verbs) are stressed.

'Where's the 'pen I 'gave you?

'Where's the 'red 'pen I 'gave you?

Where's the 'red and 'blue 'pen I 'gave you 'yesterday?

The unstressed words (such as "the", "I", "you" and "and") don't carry as much "weight" as the stressed words. They become much smaller in length, and are almost abbreviated. For example, "and" becomes "un".

Changing stress

Sentence stress isn't "fixed" like word stress. In fact, you can stress words that are normally unstressed in order to highlight different meanings.

For example:

I 'love you. (Love, rather than just like.)

'I love you. (With the stress on I to highlight that it's me rather than another person who loves you.)

I love 'you. (And nobody else.)

Intonation

There are a couple of easy to remember rules about intonation. Usually our voices go up at the end of the sentence to show a question, and down at the end to show a statement.

Intonation is also important in "tag questions":

You know him, don't you? (With rising intonation on "don't you?" to show it's a question)

You know him, don't you. (With falling intonation on "don't you" to show it's a statement you expect the other person to agree with.)

7. Learn to recognise spelling patterns.

For example, "tion" on the end of a word is pronounced "shun", while "sion" can be pronounced "zhun". There are often many ways to pronounce a particular spelling pattern, but it certainly helps to know what the variations are. For example, the pattern "ough" can be pronounced "uff" as in

"enough" and "tough", or "or" as in "ought" and "bought" or "oh" as in "although" and "dough".

8. Don't rush.

If you speak too fast, the danger is that you could skip over some words, fail to pronounce them completely, or mix them up. If you speak too slowly, you might end up sounding unnatural. But it's better to speak slowly and clearly than too quickly.

For more help with English pronunciation we recommend the Longman Pronunciation Dictionary which features 25,000 pronunciations in both British and American English. The dictionary comes with a CD-ROM so you can hear the correct pronunciation.

WAY TO SPEAK BETTER USING PRONUNCIATION

The English language is full of words that are hard to learn, hard to remember and hard to pronounce. Saying things differently to give them different meanings is a tricky skill to master. People from foreign countries that are not familiar with the many ways to convey meaning in English can become easily confused. However, even people who were born and raised here can have a hard time sorting it out. It's important to learn to portray the real meaning behind your words by using correct pronunciation.

Instructions

Things You'll Need

- An open mind
- Willingness to change what you think you know

1.

   - Implied meanings behind pronunciation. For example, the sentence "Nobody went there with

her." Now, look at the different ways to say it: "NOBODY went there with her"; "Nobody went THERE with her"; "Nobody went there with HER." See the difference? In the first, it implies that she went alone. In the second, it implies that she and whoever went with her went to that destination. In the third, they may have gone there, but not with her. There is a huge difference in each sentence and meaning. In writing, it is equally important to learn to stress the right word without using all capital letters constantly.

o In addition to sentence pronunciation, simple word pronunciation can make a big difference. For example, Milan, Italy as opposed to Milan, Michigan. The first is pronounced me-LAHN. The second is pronounced MEYE-lan. For the word "preferable", many people say "PREferable" while others say "preFERable". The actual, correct way is the former.

o Other circumstances include Heteronyms, or words that are spelled the same but have different meanings. For example, "produce." "PROduce" refers to grocery items, while "proDUCE" means to make or be in charge of something. Learning and using proper pronunciation of words can make a huge difference in your communication skills. Hopefully these few tips will give you a headstart!

Tips & Warnings

- Certain people, depending on background or upbringing, will have their own personal meanings behind certain words. In this circumstance you

will simply have to use your best judgment and speak so that they will understand.

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Comments

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2

Focus on Phonology, Phonetics, Articulation and Speech Perception

PHONOLOGY

Phonology (*phon*, "voice, sound" and *lógos*, "word, speech, subject of discussion") is, broadly speaking, the subdiscipline of linguistics concerned with "the sounds of language". That is, it is the systematic use of sound to encode meaning in any spoken human language, or the field of linguistics studying this use. In more narrow terms, "phonology proper is concerned with the function, behaviour and organization of sounds as linguistic items". Just as a language has syntax and vocabulary, it also has a phonology in the sense of a sound system. When describing the formal area of study, the term typically describes linguistic analysis either beneath the word (e.g., syllable, onset and rhyme, phoneme, articulatory gestures, articulatory feature, mora, etc.) or to units at all levels of language that are thought to structure sound for conveying linguistic meaning.

It is viewed as the subfield of linguistics that deals with the sound systems of languages. Whereas phonetics is about the physical production, acoustic transmission and perception of the sounds of speech, phonology describes the way sounds function within a given language or across languages to encode meaning. The term "phonology" was

used in the linguistics of a greater part of the 20th century as a cover term uniting phonemics and phonetics. Current phonology can interface with disciplines such as psycholinguistics and speech perception, resulting in specific areas like articulatory or laboratory phonology.

Overview

An important part of traditional forms of phonology has been studying which sounds can be grouped into distinctive units within a language; these units are known as phonemes. For example, in English, the [p] sound in *pot* is aspirated (pronounced [p°]), while the word- and syllable-final [p] in *soup* is not aspirated (indeed, it might be realized as a glottal stop). However, English speakers intuitively treat both sounds as variations (allophones) of the same phonological category, that is, of the phoneme /p/ . Traditionally, it would be argued that if a word-initial aspirated [p] were interchanged with the word-final unaspirated [p] in *soup*, they would still be perceived by native speakers of English as "the same" /p/. (However, speech perception findings now put this theory in doubt.) Although some sort of "sameness" of these two sounds holds in English, it is not universal and may be absent in other languages. For example, in Thai, Hindi, and Quechua, aspiration and non-aspiration differentiates phonemes: that is, there are word pairs that differ only in this feature (there are minimal pairs differing only in aspiration).

In addition to the minimal units that can serve the purpose of differentiating meaning (the phonemes), phonology studies how sounds alternate, i.e. replace one another in different forms of the same morpheme (allomorphs), as well as, e.g., syllable structure, stress, accent, and intonation.

The principles of phonological theory have also been

applied to the analysis of sign languages, even though the sub-lexical units are not instantiated as speech sounds. The principles of phonological analysis can be applied independently of modality because they are designed to serve as general analytical tools, not language-specific ones. On the other hand, it must be noted, it is difficult to analyze phonologically a language one does not speak, and most phonological analysis takes place with recourse to phonetic information.

Representing Phonemes

The writing systems of some languages are based on the phonemic principle of having one letter (or combination of letters) per phoneme and vice-versa. Ideally, speakers can correctly write whatever they can say, and can correctly read anything that is written. However in English, different spellings can be used for the same phoneme (e.g., *rude* and *food* have the same vowel sounds), and the same letter (or combination of letters) can represent different phonemes (e.g., the "th" consonant sounds of *thin* and *this* are different). In order to avoid this confusion based on orthography, phonologists represent phonemes by writing them between two slashes: " / / ". On the other hand, reference to variations of phonemes or attempts at representing actual speech sounds are usually enclosed by square brackets: " [ ] ". While the letters between slashes may be based on spelling conventions, the letters between square brackets are usually the International Phonetic Alphabet (IPA) or some other phonetic transcription system. Additionally, angled brackets " è' é' " can be used to isolate the graphemes of an alphabetic writing system.

Phoneme Inventories

Doing a Phoneme Inventory

Part of the phonological study of a language involves

looking at data (phonetic transcriptions of the speech of native speakers) and trying to deduce what the underlying phonemes are and what the sound inventory of the language is. Even though a language may make distinctions between a small number of phonemes, speakers actually produce many more phonetic sounds. Thus, a phoneme in a particular language can be instantiated in many ways.

Traditionally, looking for minimal pairs forms part of the research in studying the phoneme inventory of a language. A minimal pair is a pair of words from the same language, that differ by only a single categorical sound, and that are recognized by speakers as being two different words. When there is a minimal pair, the two sounds are said to be examples of realizations of distinct phonemes. However, since it is often impossible to detect or agree to the existence of all the possible phonemes of a language with this method, other approaches are used as well.

Phonemic Distinctions or Allophones

If two similar sounds do not belong to separate phonemes, they are called allophones of the same underlying phoneme. For instance, voiceless stops (/p/, /t/, /k/) can be aspirated. In English, voiceless stops at the beginning of a stressed syllable (but not after /s/) are aspirated, whereas after /s/ they are not aspirated. This can be seen by putting the fingers right in front of the lips and noticing the difference in breathiness in saying *pin* versus *spin*. There is no English word *pin* that starts with an unaspirated p, therefore in English, aspirated [p°] (the [°] means aspirated) and unaspirated [p] are allophones of the same phoneme /p/. This is an example of a complementary distribution.

The /t/ sounds in the words *tub*, *stub*, *but*, *butter*, and *button* are all pronounced differently in American English, yet are all intuited to be of "the same sound", therefore

they constitute another example of allophones of the same phoneme in English. However, an intuition such as this could be interpreted as a function of post-lexical recognition of the sounds. That is, all are seen as examples of English /t/ once the word itself has been recognized.

The findings and insights of speech perception and articulation research complicates this idea of interchangeable allophones being perceived as the same phoneme, no matter how attractive it might be for linguists who wish to rely on the intuitions of native speakers. First, interchanged allophones of the same phoneme can result in unrecognizable words. Second, actual speech, even at a word level, is highly co-articulated, so it is problematic to think that one can splice words into simple segments without affecting speech perception. In other words, interchanging allophones is a nice idea for intuitive linguistics, but it turns out that this idea cannot transcend what co-articulation actually does to spoken sounds. Yet human speech perception is so robust and versatile (happening under various conditions) because, in part, it can deal with such co-articulation.

There are different methods for determining why allophones should fall categorically under a specified phoneme. Counter-intuitively, the principle of phonetic similarity is not always used. This tends to make the phoneme seem abstracted away from the phonetic realities of speech. It should be remembered that, just because allophones can be grouped under phonemes for the purpose of linguistic analysis, this does not necessarily mean that this is an actual process in the way the human brain processes a language. On the other hand, it could be pointed out that some sort of analytic notion of a language beneath the word level is usual if the language is written alphabetically. So one could also speak of a phonology of reading and writing.

Change of a Phoneme Inventory Over Time

The particular sounds which are phonemic in a language can change over time. At one time, [f] and [v] were allophones in English, but these later changed into separate phonemes. This is one of the main factors of historical change of languages as described in historical linguistics.

Other Topics in Phonology

Phonology also includes topics such as phonotactics (the phonological constraints on what sounds can appear in what positions in a given language) and phonological alternation (how the pronunciation of a sound changes through the application of phonological rules, sometimes in a given order which can be feeding or bleeding,) as well as prosody, the study of suprasegmentals and topics such as stress and intonation.

Development of the Field

In ancient India, the Sanskrit grammarian PaGini (4th century BC) in his text of Sanskrit phonology, the *Shiva Sutras*, discusses something like the concepts of the phoneme, the morpheme and the root. The *Shiva Sutras* describe a phonemic notational system in the fourteen initial lines of the *Acmadhyayî*. The notational system introduces different clusters of phonemes that serve special roles in the morphology of Sanskrit, and are referred to throughout the text. Panini's grammar of Sanskrit had a significant influence on Ferdinand de Saussure, the father of modern structuralism, who was a professor of Sanskrit.

The Polish scholar Jan Baudouin de Courtenay, (together with his former student Miko³aj Kruszewski) coined the word *phoneme* in 1876, and his work, though often unacknowledged, is considered to be the starting point of modern phonology. He worked not only on the theory of the phoneme but also on phonetic alternations (i.e., what

is now called allophony and morphophonology). His influence on Ferdinand de Saussure was also significant.

Prince Nikolai Trubetzkoy's posthumously published work, the *Principles of Phonology* (1939), is considered the foundation of the Prague School of phonology. Directly influenced by Baudouin de Courtenay, Trubetzkoy is considered the founder of morphophonology, though morphophonology was first recognized by Baudouin de Courtenay. Trubetzkoy split phonology into phonemics and archiphonemics; the former has had more influence than the latter. Another important figure in the Prague School was Roman Jakobson, who was one of the most prominent linguists of the 20th century.

In 1968 Noam Chomsky and Morris Halle published *The Sound Pattern of English* (SPE), the basis for Generative Phonology. In this view, phonological representations are sequences of segments made up of distinctive features. These features were an expansion of earlier work by Roman Jakobson, Gunnar Fant, and Morris Halle. The features describe aspects of articulation and perception, are from a universally fixed set, and have the binary values + or ". There are at least two levels of representation: underlying representation and surface phonetic representation. Ordered phonological rules govern how underlying representation is transformed into the actual pronunciation (the so called surface form). An important consequence of the influence SPE had on phonological theory was the downplaying of the syllable and the emphasis on segments. Furthermore, the Generativists folded morphophonology into phonology, which both solved and created problems.

Natural Phonology was a theory based on the publications of its proponent David Stampe in 1969 and (more explicitly) in 1979. In this view, phonology is based

on a set of universal phonological processes which interact with one another; which ones are active and which are suppressed are language-specific. Rather than acting on segments, phonological processes act on distinctive features within prosodic groups. Prosodic groups can be as small as a part of a syllable or as large as an entire utterance. Phonological processes are unordered with respect to each other and apply simultaneously (though the output of one process may be the input to another). The second-most prominent Natural Phonologist is Stampe's wife, Patricia Donegan; there are many Natural Phonologists in Europe, though also a few others in the U.S., such as Geoffrey Nathan. The principles of Natural Phonology were extended to morphology by Wolfgang U. Dressler, who founded Natural Morphology.

In 1976 John Goldsmith introduced autosegmental phonology. Phonological phenomena are no longer seen as operating on *one* linear sequence of segments, called phonemes or feature combinations, but rather as involving *some parallel sequences* of features which reside on multiple tiers. Autosegmental phonology later evolved into Feature Geometry, which became the standard theory of representation for the theories of the organization of phonology as different as Lexical Phonology and Optimality Theory.

Government Phonology, which originated in the early 1980s as an attempt to unify theoretical notions of syntactic and phonological structures, is based on the notion that all languages necessarily follow a small set of principles and vary according to their selection of certain binary parameters. That is, all languages' phonological structures are essentially the same, but there is restricted variation that accounts for differences in surface realizations. Principles are held to be inviolable, though parameters may sometimes come

into conflict. Prominent figures include Jonathan Kaye, Jean Lowenstamm, Jean-Roger Vergnaud, Monik Charette, John Harris, and many others.

In a course at the LSA summer institute in 1991, Alan Prince and Paul Smolensky developed Optimality Theory — an overall architecture for phonology according to which languages choose a pronunciation of a word that best satisfies a list of constraints which is ordered by importance: a lower-ranked constraint can be violated when the violation is necessary in order to obey a higher-ranked constraint. The approach was soon extended to morphology by John McCarthy and Alan Prince, and has become the dominant trend in phonology. Though this usually goes unacknowledged, Optimality Theory was strongly influenced by Natural Phonology; both view phonology in terms of constraints on speakers and their production, though these constraints are formalized in very different ways.

Broadly speaking government phonology (or its descendant, strict-CV phonology) has a greater following in the United Kingdom, whereas optimality theory is predominant in North America.

ENGLISH PHONOLOGY

English phonology is the study of the sound system (phonology) of the English language. Like many languages, English has wide variation in pronunciation, both historically and from dialect to dialect. In general, however, the major regional dialects of English are mutually intelligible.

Although there are many dialects of English, the following are usually used as prestige or standard accents: Received Pronunciation for the United Kingdom, General American for the United States, and General Australian for Australia.

Phonemes

The number of speech sounds in English varies from dialect to dialect, and any actual tally depends greatly on the interpretation of the researcher doing the counting. The *Longman Pronunciation Dictionary* by John C. Wells, for example, denotes 24 consonants and 23 vowels used in Received Pronunciation, plus two additional consonants and four additional vowels used in foreign words only. For General American, it provides for 25 consonants and 19 vowels, with one additional consonant and three additional vowels for foreign words. The *American Heritage Dictionary*, on the other hand, suggests 25 consonants and 18 vowels (including r-colored vowels) for American English, plus one consonant and five vowels for non-English terms.

Consonants

The following table shows the consonant phonemes found in most dialects of English. When consonants appear in pairs, fortis consonants (i.e., aspirated or voiceless) appear on the left and lenis consonants (i.e., lightly voiced or voiced).

1. Some phonologists identify syllabic nasals and liquids in unstressed syllables, while others analyse these phonemically as /YC/.
2. Postalveolar consonants are usually labialized (e.g., [*ʃ*·]), as is word-initial or pre-tonic /r/ (i.e., [y·]), though this is rarely transcribed.
3. The voiceless velar fricative /x/ is dialectal, occurring largely in Scottish English. In other dialects, words with these sounds are pronounced with /k/. It may appear in recently-domiciled words such as *chutzpah*.
4. The sequence /hw/, a voiceless labiovelar approximant [hw%], is sometimes considered an additional phoneme. For most speakers, words that

historically used to have these sounds are now pronounced with /w/; the phoneme /hw/ is retained, for example, in much of the American South, Scotland, and Ireland.

5. Depending on dialect, /r/ may be an alveolar approximant [y], postalveolar approximant, retroflex approximant [{], or labiodental approximant [(].
6. Many dialects have two allophones of /l/—the "clear" L and the "dark" or velarized L. In some dialects, /l/ may be always clear (e.g. Wales, Ireland, the Caribbean) or always dark (e.g. Scotland, most of North America, Australia, New Zealand).

/p/	pit	/b/	bit
/t/	tin	/d/	din
/k/	cut	/a/	gut
/tʃ/	cheap	/d'/	jeep
/f/	fat	/v/	vat
/è/	thin	/D/	then
/s/	sap	/z/	zap
/ʃ/	she	/'/	measure
/x/	loch		
/w/	we	/m/	map
/l/	left	/n/	nap
/y/	run (also (r), ({))	/j/	yes
/h/	ham	/K/	bang

Allophones

Although regional variation is very great across English dialects, some generalizations can be made about

pronunciation in all (or at least the vast majority) of English accents:

- The voiceless stops /p t k/ are aspirated at the beginnings of words (for example *tomato*) and at the beginnings of word-internal stressed syllables (for example *potato*). They are unaspirated [p t k] after /s/ *(stan, span, scan)* and at the ends of syllables.
- For many people, /r/ is somewhat labialized in some environments, as in *reed* and *tree*. In the latter case, the [t] may be slightly labialized as well.

The phoneme /t/ has six different allophones, differing somewhat between British and American English. As noted above, /t/ is aspirated as [t] at the beginning of a word or stressed syllable, but unaspirated as [t] after /s/. After a stressed syllable and at the beginning of an unstressed syllable, after a vowel or /r/ and before a vowel or a syllabic /l/, as in *water* or *bottle*, in American English it is pronounced as a voiced flap [~] that is indistinguishable from /d/ (so that, for example, *petal* and *peddle* sound alike); this flap may even appear at word boundaries, as in *put it on*. But British English does not use the flap, instead de-aspirating [t] somewhat. When /t/ follows /n/ and precedes an unstressed vowel, as in *winter*, the /t/ is pronounced in American English as a nasalized flap that is identical to the /n/ flap and hence becomes essentially silent, so that for example /nt/ is indistinguishable from /n/ in *winter* / *winner*. Before /n/, as in *catnip* and *button*, British and American English pronounce /t/ as a glottal stop [ʔ], allowing a distinction in pronunciation between, for example, *Sutton* and *sudden* or *bitten* and *bidden*. Finally, final /t/ as in *cat* is not released, and may be glottalized in British English. However, in speech with careful enunciation, in all situations /t/ may be pronounced as [t] or [t°].

The phoneme /n/ is usually pronounced as [n], but before /k/ the allophone [K] usually appears (mandatorily in stressed syllables and optionally in unstressed syllables). For example, *sink* is pronounced as [sjKk], never as [sjnk]. This allophonic change can even occur across syllable boundaries: *synchrony* is pronounced whereas *synchronic* may be pronounced.. Note that when not followed by /k/, /K/ serves as an English phoneme in its own right, as for example in *sing*; but there is no phonemic distinction between [Kk] and [nk].

Vowels

The vowels of English differ considerably between dialects. Because of this, corresponding vowels may be transcribed with various symbols depending on the dialect under consideration. When considering English as a whole, no specific phonemic symbols are chosen over others; instead, lexical sets are used, each named by a word containing the vowel in question. For example, the vowel of the LOT set ("short o") is transcribed /R/ in Received Pronunciation, /T/ in Australian English, and /Q/ in General American. For an overview of these diaphonemic correspondences, see IPA chart for English dialects. The vowel of STRUT is closer to a Near-open central vowel ([P]) in RP, though (Œ) is still used for tradition (it was historically a back vowel) and because it is still back in other varieties.

The monophthong phonemes of General American differ in a number of ways from Received Pronunciation:

1. The central vowel of *nurse* is rhotic [] (also transcribed as a syllabic [y)].
2. Speakers make a phonemic distinction between rhotic /Z/ and non-rhotic /Y/.
3. No distinction is made between /R/ and /QD/, nor for many speakers between these vowels and /TD.

Reduced vowels occur in some unstressed syllables. (Other unstressed syllables may have full vowels, which some dictionaries mark as secondary stress.) The number of distinctions made among reduced vowels varies by dialect. In some dialects vowels are centralized but otherwise kept mostly distinct, while in Australia, New Zealand and some US dialects all reduced vowels collapse to a schwa [Y]. In Received Pronunciation, there is a distinct high reduced vowel, which the OED.

- [ɟ]: roses (merged with [Y] in Australian and New Zealand English)
- [Y]: Rosa's, runner
- [l)]: bottle
- [n)]: button
- [m)]: rhythm

English diphthongs

	RP	*Australian*	*American*
low	/YS/	/Y‰/	/oS/
loud	/aS/	/æT/	/aS/
lied	/aj/	/Qe/	/aj/
lane	/ej/	/æj/	/ej/
loin	/Tj/	/oj/	/Tj/
leer	/jY/	/jY/	/jZ/
lair	/[Y/	/eD/	/[Z/
lure	/SY/	(/SY/)	/SZ/

1. In rhotic dialects, words like *pair*, *poor*, and *peer* can be analyzed as diphthongs, although other descriptions analyze them as vowels with /r/ in the coda.
2. In Received Pronunciation, the vowels in *lair* and *lure* may be monophthongized to [[D] and [oD] respectively.

3. In Australian English, the vowel /SY/ is often omitted from descriptions as for most speakers it has split into the long monophthong /oD/ (e.g. *poor*, *sure*) or the sequence e.g. *cure*, *lure*.

Reduced Vowels

Linguists such as Ladefoged and Bolinger argue that vowel reduction is phonemic in English, and that there are two "tiers" of vowels in English, full and reduced; traditionally many English dictionaries have attempted to mark the distinction by transcribing unstressed full vowels as having "secondary" stress, though this was later abandoned by the *Oxford English Dictionary*. Though full unstressed vowels may derive historically from stressed vowels, either because stress shifted over time (such as stress shifting away from the final syllable of French loan words in British English) or because of loss or shift of stress in compound words or phrases *(overseas voyage* from *overséas* or *óverséas* plus *vóyage),* the distinction is not one of stress but of vowel quality (Bolinger 1989:351), and over time, if the word is frequent enough, the vowel tends to reduce.

English has up to five reduced vowels, though this varies with dialect and speaker. Schwa /Y/ is found in all dialects, and a rhotic schwa ("schwer") /Z/ is found in rhotic dialects. Less common is a high reduced vowel ("schwi") /j/; the two are distinguished by many people in *Rosa's* vs *roses*. More unstable is a rounded schwa, /o/ (also /u/); this contrasts for some speakers in *a mission* and *omission*. In words like *following,* the following vowel is preceded by a [w] even in dialects that otherwise don't have a rounded schwa. A high rounded schwa /S/ may be found in words such as *into*, though in many dialects this is not be distinguished from /u/.

Though speakers vary, full and reduced unstressed vowels may contrast in pairs of words like *Shogun* and *slogan*, *chickaree* and chicory, *Pharaoh* and *farrow* (Bolinger 1989:348), *Bantu* and *into* OED.

Allophones

- A distinction is made between tense and lax vowels in pairs like *beet/bit* and *bait/bet*, although the exact phonetic implementation of the distinction varies from accent to accent. However, this distinction collapses before [K].
- Wherever /r/ originally followed a tense vowel or diphthong (in Early Modern English) a schwa offglide was inserted, resulting in centering diphthongs like [iY] in *beer* in *poor*], in *fire*, in *sour*, and so forth. This phenomenon is known as *breaking*. The subsequent history depends on whether the accent in question is rhotic or not: In non-rhotic accents like RP the postvocalic [y] was dropped, leaving and the like (now usually transcribed and so forth). In rhotic accents like General American, on the other hand, the [Yy] sequence was coalesced into a single sound, a non-syllabic [Z], giving and the like (now usually transcribed and so forth). As a result, originally monosyllabic words like those just mentioned came to rhyme with originally disyllabic words like *seer*, *doer*, *higher*, *power*.
- In many (but not all) accents of English, a similar breaking happens to tense vowels before /l/, resulting in pronunciations like for *peel*, for *pool*, for *pail*, and for *pole*.
- The quality of the vowel /aj/ is influenced by a following unvoiced stop, fricative, or affricate, which makes the vowel less open. Thus, for example, *writer* is distinguished from *rider* even though the

/t/ and /d/ are pronounced essentially identically in this environment; and the vowel quality in *fife* differs from that in *five*.

Transcription Variants

The choice of which symbols to use for phonemic transcriptions may reveal theoretical assumptions or claims on the part of the transcriber. English "lax" and "tense" vowels are distinguished by a synergy of features, such as height, length, and contour (monophthong vs. diphthong); different traditions in the linguistic literature emphasize different features.

For example, if the primary feature is thought to be vowel height, then the non-reduced vowels of General American English may be represented according to the table to the left and below.

If, on the other hand, vowel length is considered to be the deciding factor, the symbols in the table to the below and center may be chosen (this convention has sometimes been used because the publisher did not have IPA fonts available, though that is seldom an issue any longer.)

Stress

Stress is phonemic in English. For example, the words *desert* and *dessert* are distinguished by stress, as are the noun *a record* and the verb *to record.* Stressed syllables in English are louder than non-stressed syllables, as well as being longer and having a higher pitch. They also tend to have a fuller realization than unstressed syllables.

Examples of stress in English words, using boldface to represent stressed syllables, are *holiday, alone, admiration, confidential, degree,* and *weaker.* Ordinarily, grammatical words (auxiliary verbs, prepositions, pronouns, and the like) do not receive stress, whereas lexical words (nouns,

verbs, adjectives, *etc.*) must have at least one stressed syllable.

English is a *stress-timed* language. That is, stressed syllables appear at a roughly steady tempo, and non-stressed syllables are shortened to accommodate this.

Traditional approaches describe English as having three degrees of stress: Primary, secondary, and unstressed. However, if stress is defined as relative respiratory force (that is, it involves greater pressure from the lungs than unstressed syllables), as most phoneticians argue, and is inherent in the word rather than the sentence (that is, it is lexical rather than prosodic), then these traditional approaches conflate two distinct processes: stress, and vowel reduction.

In this case, primary stress is actually prosodic stress, whereas secondary stress is simple stress in some positions, and an unstressed but not reduced vowel in others. Either way, there is a three-way phonemic distinction: Either three degrees of stress, or else stressed, unstressed, and reduced. The two approaches are sometimes conflated into a four-way 'stress' classification: *primary* (tonic stress), *secondary* (lexical stress), *tertiary* (unstressed full vowel), and *quaternary* (reduced vowel).

Initial-stress-derived nouns are nouns that are derived from verbs by changing the position of their stress. For example, a *rebel* (stress on the first syllable) is inclined to *rebel* (stress on the second syllable) against the powers that be.

The number of words using this pattern as opposed to only stressing the second syllable in all circumstances doubles every century or so, and includes words such as *object*, *convict*, and *addict*.

Intonation

Prosodic stress is extra stress given to words when they appear in certain positions in an utterance, or when they receive special emphasis. It normally appears on the final stressed syllable in an intonation unit.

So, for example, when the word *admiration* is said in isolation, or at the end of a sentence, the syllable *ra* is pronounced with greater force than the syllable *ad.* (This is traditionally transcribed).

This is the origin of the primary stress-secondary stress distinction. However, the difference disappears when the word is not pronounced with this final intonation.

Prosodic stress can shift for various pragmatic functions, such as focus or contrast. For instance, consider the dialogue

"Is it brunch tomorrow?"

"No, it's *dinner* tomorrow."

In this case, the extra stress shifts from the last stressed syllable of the sentence, *tomorrow,* to the last stressed syllable of the emphasized word, *dinner.* Compare

"I'm going *tomorrow*."

with

"It's *dinner* tomorrow."

Although grammatical words generally do not have lexical stress, they do acquire prosodic stress when emphasized. Compare ordinary

"Come in"!

with more emphatic

"Oh, *do* come in!"

Phonotactics

Most languages of the world syllabify CVCV and CVCCV sequences as /CV.CV/ and /CVC.CV/ or /CV.CCV/, with consonants preferentially acting as the onset of a syllable containing the following vowel.

According to one view, English is unusual in this regard, in that stressed syllables attract following consonants, so that ÈCVCV and ECVCCV syllabify as /ECVC.V/ and / ECVCC.V/, as long as the consonant cluster CC is a possible syllable coda. In addition, according to this view, /r/ preferentially syllabifies with the preceding vowel even when both syllables are unstressed, so that CVrV occurs as /CVr.V/. However, many scholars do not agree with this view.

Syllable Structure

The syllable structure in English is (C)V(C), with a near maximal example being *strengths*, although it can be pronounced. Because of an extensive pattern of articulatory overlap, English speakers rarely produce an audible release in consonant clusters. This can lead to cross-articulations that seem very much like deletions or complete assimilations.

For example, *hundred pounds* may sound like but X-ray and electropalatographic studies demonstrate that inaudible and possibly weakened contacts may still be made so that the second /d/ in *hundred pounds* does not entirely assimilate a labial place of articulation, rather the labial co-occurs with the alveolar one.

When a stressed syllable contains a pure vowel (rather than a diphthong), followed by a single consonant and then another vowel, as in *holiday,* many native speakers feel that the consonant belongs to the preceding stressed syllable.

However, when the stressed vowel is a long vowel or diphthong, as in *admiration* or *pekoe,* speakers agree that the consonant belongs to the following syllable. Wells (1990) notes that consonants syllabify with the preceding rather than following vowel when the preceding vowel is the nucleus of a more salient syllable, with stressed syllables being the most salient, reduced syllables the least, and secondary stress / full unstressed vowels intermediate. But there are lexical differences as well, frequently with compound words but not exclusively.

Onset

The following can occur as the onset:

All single consonant phonemes except /K/

Plosive plus approximant other than /j/: /pl/, /bl/, /kl/, /al/, /pr/, /br/, /tr/, /dr/, /kr/, /ar/, /tw/, /dw/, /aw/, /kw/, /pw/ play, blood, clean, glove, prize, bring, tree, dream, crowd, green, twin, dwarf, language, quick, puissance

Voiceless fricative plus approximant other than /j/: /fl/, /sl/, /èl/, /fr/, /èr/, /ƒr/, /hw/, /sw/, /èw/, /vw/floor, sleep, thlipsis, friend, three, shrimp, what, swing, thwart, reservoir

Consonant plus /j/ (before /uD/ or /Sr/): /pj/, /bj/, /tj/, /dj/, /kj/, /aj/, /mj/, /nj/, /fj/, /vj/, /èj/, /sj/, /zj/, /hj/, /lj/pure, beautiful, tube, during, cute, argue, music, new, few, view, thew, suit, Zeus, huge, lurid/s/ plus voiceless plosive: /sp/, /st/, /sk/ speak, stop, skill

/s/ plus nasal other than /K/: /sm/, /sn/ smile, snow

/s/ plus voiceless fricative: /sf/, /sè/ sphere, sthenic

/s/ plus voiceless plosive plus approximant: /spl/, /skl/, /spr/, /str/, /skr/, /skw/, /smj/, /spj/, /stj/, /skj/ split, sclera, spring, street, scream, square, smew, spew, student, skewer

/s/ plus voiceless fricative plus approximant: /sfr/ sphragistics

Notes:

- In some American dialects, /tr/ and /dr/ tend to affricate, so that *tree* resembles "chree", and *dream* resembles "jream". This is sometimes transcribed as [tʃr] and [d'r] respectively, but the pronunciation varies and may, for example, be closer to [t,] and [d•] or with a fricative release similar in quality to the rhotic.
- In some dialects, /wr/ (rather than /r/) occurs in words beginning in wr- (*write, wrong, wren,* etc.).
- Words beginning in unusual consonant clusters that originated in latinized Greek loanwords tend to drop the first phoneme.
- The onset /hw/ is simplified to /w/ in many dialects (wine–whine merger).
- There is an on-going sound change (yod-dropping) by which /j/ as the final consonant in a cluster is being lost. In RP, words with /sj/ and /lj/ can usually be pronounced with or without this sound, e.g., [suDt] or [sjuDt]. For some speakers of English, including some British speakers, the sound change is more advanced and so, for example, General American does not contain the onsets /tj/, /dj/, /nj/ , /ѐj/, /sj/, /stj/, /zj/, or /lj/.
- Many clusters beginning with /ʃ/ and paralleling native clusters beginning with /s/ are found initially in German and Yiddish loanwords, such as /ʃl/, /ʃp/, /ʃt/, /ʃm/, /ʃn/, /ʃpr/, /ʃtr/ (in words such as *schlep, spiel, shtick, schmuck, schnapps, Shprintzen's, strudel).* /ʃw/ is found initially in the Hebrew loanword schwa. Before /r/ however, the native cluster is /ʃr/. The opposite cluster /sr/ is found in loanwords such as *Sri Lanka*, but this can be nativized by changing it to /ʃr/.

Other Onsets

Certain English onsets appear only in contractions: e.g., /zbl/ (*'sblood*), and /zw/ or /dzw/ (*'swounds* or *'dswounds*). Some, such as /pʃ/ (*pshaw*), /fw/ (*fwoosh*), or /vr/ (*vroom*), can occur in interjections. An archaic voiceless fricative plus nasal exists, /fn/ (*fnese*), as does an archaic /snj/ (*snew*).

A few other onsets occur in further (anglicized) loan words, including /bw/ (*bwana*), /mw/ (*moiré*), /nw/ (*noire*), /zw/ (*zwieback*), /kv/ (*kvetch*), /ʃv/ (*schvartze*), /tv/ (*Tver*), /vl/ (*Vladimir*), and /zl/ (*zloty*).

Some clusters of this type can be converted to regular English phonotactics by simplifying the cluster: e.g. /(d)z/ (*dziggetai*), /(h)r/ (*Hrolf*), /kr(w)/ (*croissant*), /(p)f/ (*pfennig*), /(f)è/ (*phthalic*), and /(t)s/ (*tsunami*).

Others can be substituted by native clusters differing only in voice: /zb ~ sp/ (*sbirro*), and /zar ~ skr/ (*sgraffito*).

Nucleus

The following can occur as the nucleus:

- All vowel sounds
- /m/, /n/ and /l/ in certain situations (see below under word-level rules)
- /r/ in rhotic varieties of English (e.g. General American) in certain situations (see below under word-level rules)

Coda

Most (in theory, all) the following except those that end with /s/, /z/, /ʃ/, /ʼ/, /tʃ/ or /dʼ/ can be extended with /s/ or /z/ representing the morpheme -s/z-. Similarly, most (in theory, all) the following except those that end with /t/ or /d/ can be extended with /t/ or /d/ representing the morpheme -t/d-.

Wells (1990) argues that a variety of syllable codas are possible in English, even /ntr, ndr/ in words like *entry* /È[ntr.j/ and *sundry*, with /tr, dr/ being treated as affricates along the lines of /tʃ, d'/. He argues that the traditional assumption that pre-vocalic consonants form a syllable with the following vowel is due to the influence of languages like French and Latin, where syllable structure is CVC.CVC regardless of stress placement.

Disregarding such contentious cases, which do not occur at the ends of words, the following sequences can occur as the coda:

The single consonant phonemes except /h/, /w/, /j/ and, in non-rhotic varieties, /r/

Lateral approximant + plosive or affricate: /lp/, /lb/, /lt/, /ld/ , /ltʃ/, /ld'/, /lk/ help, bulb, belt, hold, belch, indulge, milk

In rhotic varieties, /r/ + plosive or affricate: /rp/, /rb/, /rt/, /rd/, /rtʃ/, /rd'/, /rk/, /ra/ harp, orb, fort, beard, arch, large, mark, morgue

Lateral approximant + fricative: /lf/, /lv/, /lè/, /ls/, /lʃ/ golf, solve, wealth, else, Welsh

In rhotic varieties, /r/ + fricative: /rf/, /rv/, /rè/, /rs/, /rʃ/ dwarf, carve, north, force, marsh

Lateral approximant + nasal: /lm/, /ln/ film, kiln

In rhotic varieties, /r/ + nasal or lateral: /rm/, /rn/, /rl/ arm, born, snarl

Nasal + homorganic plosive or affricate: /mp/, /nt/, /nd/, /ntʃ/, /nd'/, /Kk/ jump, tent, end, lunch, lounge, pink

Nasal + fricative: /mf/, /mè/ in non-rhotic varieties,[*clarification needed*] /nè/, /ns/, /nz/, /Kè/ in some varieties t r i u m p h , warmth, month, prince, bronze, length

Voiceless fricative + voiceless plosive: /ft/, /sp/, /st/, /sk/ left, crisp, lost, ask

Two voiceless fricatives: /fè/ fifth

Two voiceless plosives: /pt/, /kt/opt, act

Plosive + voiceless fricative: /pè/, /ps/, /tè/, /ts/, /dè/, /dz/, /ks/ depth, lapse, eighth, klutz, width, adze, box

Lateral approximant + two consonants: /lpt/, /lfè/, /lts/, /lst/ , /lkt/, /lks/ sculpt, twelfth, waltz, whilst, mulct, calx

In rhotic varieties, /r/ + two consonants: /rmè/, /rpt/, /rps/, / rts/, /rst/, /rkt/ warmth, excerpt, corpse, quartz, horst, infarct

Nasal + homorganic plosive + plosive or fricative: /mpt/, / mps/, /ndè/, /Kkt/, /Kks/, /Kkè/ in some varieties prompt, glimpse, thousandth, distinct, jinx, length

Three obstruents: /ksè/, /kst/ sixth, next

Note: For some speakers, a fricative before /e/ is elided so that these never appear phonetically.

Syllable-Level Rules

- Both the onset and the coda are optional
- /j/ at the end of an onset cluster (/pj/, /bj/, /tj/, /dj/, /kj/, /fj/, /vj/, /èj/, /sj/, /zj/, /hj/, /mj/, /nj/, /lj/, /spj/, /stj, /skj/) must be followed by /uD/ or /SY/
- Long vowels and diphthongs are not found before / K/ except for the mimetic word *boing!*
- /S/ is rare in syllable-initial position
- Stop + /w/ before /uD, S, Œ, aS/ (all presently or historically /u(D)/) are excluded
- Sequences of /s/ + C_1 + V + C_1, where C_1 is a consonant other that /t/ and V is a short vowel, are virtually nonexistent

Word-Level Rules

- /Y/ does not occur in stressed syllables

- /ʔ/ does not occur in word-initial position in native English words although it can occur syllable-initial, e.g., *luxurious*.
- /m/, /n/, /l/ and, in rhotic varieties, /r/ can be the syllable nucleus (i.e. a syllabic consonant) in an unstressed syllable following another consonant, especially /t/, /d/, /s/ or /z/
- Certain short vowel sounds, called checked vowels, cannot occur without a coda in a single-syllable word. In RP, the following short vowel sounds are checked: /j/, /ɪ/, /æ/, /ʀ/, /ɶ/, and /ʃ/.

History of English Pronunciation

English consonants have been remarkably stable over time, and have undergone few changes in the last 1500 years. On the other hand, English vowels have been quite unstable. Not surprisingly, then, the main differences between modern dialects almost always involve vowels.

Around the late 14th century, English began to undergo the Great Vowel Shift, in which

- The high long vowels [iː] and [uː] in words like *price* and *mouth* became diphthongized, first to [ɤɪ] and [ɤʊ] (where they remain today in some environments in some accents such as Canadian English) and later to their modern values [aɪ] and [aʊ]. This is not unique to English, as this also happened in Dutch (first shift only) and German (both shifts).
- The other long vowels became higher:
- [eː] became [iː] (for example *meet*).
- [aː] became [eː] (later diphthongized to [eɪ], for example *name*).
- [oː] became [uː] (for example *goose*).

- [TD] become [oD] (later diphthongized to [oS], for example *bone*).

Later developments complicate the picture: whereas in Geoffrey Chaucer's time *food*, *good*, and *blood* all had the vowel and in William Shakespeare's time they all had the vowel [uD], in modern pronunciation *good* has shortened its vowel to [S] and *blood* has shortened and lowered its vowel to in most accents. In Shakespeare's day (late 16th-early 17th century),[23] many rhymes were possible that no longer hold today. For example, in his play *The Taming of the Shrew*, *shrew* rhymed with *woe*.

Dialectical Differences

æ-Tensing

æ-tensing is a phenomenon found in many varieties of American English by which the vowel /æ/ has a longer, higher, and usually diphthongal pronunciation in some environments, usually to something like [eY]. Some American accents, for example those of New York City, Philadelphia, and Baltimore, make a marginal phonemic distinction between /æ/ and /eY/ although the two occur largely in mutually exclusive environments.

Bad-Lad Split

The bad-lad split refers to the situation in some varieties of southern British English and Australian English, where a long phoneme /æD/ in words like *bad* contrasts with a short /æ/ in words like *lad*.

Cot-Caught Merger

The cot-caught merger is a sound change by which the vowel of words like *caught*, *talk*, and *tall* (/T/), is pronounced the same as the vowel of words like *cot*, *rock*, and *doll* (/R/ in New England /QD/ elsewhere). This merger is widespread

in North American English, being found in approximately 40% of American speakers and virtually all Canadian speakers.

Father-bother merger

The father-bother merger is the pronunciation of the short O /R/ in words such as "bother" identically to the broad A /QD/ of words such as "father", nearly universal in all of the United States and Canada save New England and the Maritime provinces; many American dictionaries use the same symbol for these vowels in pronunciation guides.

PRONUNCIATION RESPELLING FOR ENGLISH

Pronunciation respelling is a notation used to convey the pronunciation of words, in a language, such as English, which does not have a phonemic orthography.

Traditional respelling systems for English use only the 26 ordinary letters with diacritics, and are meant to be easy for native readers to understand. English dictionaries have used various such respelling systems to convey phonemic representations of the spoken word since at least the early nineteenth century.

Today such systems remain in use in American dictionaries for native English speakers, but they have been replaced by the International Phonetic Alphabet in linguistics references, bilingual dictionaries, and most dictionaries outside the United States. A few dictionaries use "sound-alike" pronunciation, sometimes called *newspaper respelling* or *non-phonemic respelling*.

The pronunciation which these dictionaries refer to is some chosen "normal" one, thereby excluding other regional accents or dialect pronunciation. In England this standard is normally the so-called Received Pronunciation, based

upon the educated speech of southern England. Outside of dictionaries, press agencies in English periodically release lists of respelled given names of international relevant people, in order to help news TV and radio announcers and spokespersons to pronounce them as closely as possible to their original languages.

More sophisticated phonetic systems have been developed, such as James Murray's scheme for the original Oxford English Dictionary, and the International Phonetic Alphabet (IPA), which replaced it in later editions and has been adopted by many British and international dictionaries.

The IPA system is not a respelling system because it uses symbols such as *D* and *è* which are not used in English spelling. Most current British dictionaries use IPA for this purpose.

Traditional Respelling Systems

The following chart matches the IPA symbols used to represent the sounds of the English language with the phonetic symbols used in several dictionaries, a majority of which transcribe American English.

The following consonant letters have the same values in IPA and all other systems listed: b, d, f, g, k, l, m, n, p, r, s, t, v, w, z.

These works adhere (for the most part) to the one-symbol-per-sound principle. Other works not included here, such as *Webster's New Twentieth Century Dictionary of the English Language* (unabridged, 2nd ed.), do not, and thus have several different symbols for the same sound (partly to allow for different phonemic mergers and splits).

Title Abbreviations

- IPA1 – Compromise dialect-neutral English

pronunciation using the International Phonetic Alphabet (IPA), as used in Wikipedia.

- IPA2 – General American pronunciation using IPA in *A Pronouncing Dictionary of American English* (1944 [1953]), John S. Kenyon, Thomas A. Knott. Springfield, Mass.: Merriam-Webster.
- APA – Americanist phonetic notation, used primarily in linguistics literature in the U.S.
- NOAD – *New Oxford American Dictionary* (2001, 2005, 2010). New York: Oxford University Press. (Diacritical transcription).
- AHD – *American Heritage Dictionary of the English Language* (2000). Boston: Houghton-Mifflin. Also used by the *Columbia Encyclopedia*.
- RHD – *Random House Dictionary of the English Language* (1966).
- WBO – *World Book Online* (1998).
- MECD – *Microsoft Encarta College Dictionary*.
- DPL – *Dictionary of Pronunciation*, Abraham Lass and Betty Lass.
- DPN – *Dictionary of Pronunciation*, Samuel Noory.
- NBC – *NBC Handbook of Pronunciation*.
- MWCD – *Merriam Webster's Collegiate Dictionary*.
- COD – *The Concise Oxford Dictionary* (1964 [1974]), 5th edition, E. McIntosh, ed. Oxford: OUP. (This notation was used up to the 7th edition; newer editions use the IPA.)
- POD – *The Pocket Oxford Dictionary* (2006), 2nd edition, E. Jewell, Oxford: OUP.
- Cham – *The Chambers Dictionary* (2003).
- AB – Arpabet, a commonly used computerized encoding of English pronunciation. It is used by the CMU Pronouncing Dictionary.

- Dictcom – Dictionary.com offers both spelled pronunciation and IPA
- BBC – *BBC text spelling*.

Notes

- 1 The more precise IPA symbol [y] is sometimes used for English /r/.
- 2 Older editions of *The Chambers Dictionary* used o^o for m and o^o for oo.
- 3 Nasalized vowel, as in the French phrase *un bon vin blanc*.
- 4 Older editions of the Concise Oxford Dictionary used a mix of two systems: the "phonetic scheme" shown in the table above and a system "without respelling". The latter added diacritics to conventional spellings.
- 5 These are the stress marks in the print edition. Online, primary and secondary are both written ˈ.

Secondary/tertiary stress is only marked when judged to be unpredictable, but is not distinguished from primary stress when it is marked.

Pronunciation without Respelling

Some dictionaries indicate hyphenation and syllabic stress in the headword. A few have even used diacritics to show pronunciation "without respelling" in the headwords.

The *Concise Oxford Dictionary*, 1st through 4th edition, used a mix of two systems. Some editions of Webster's Unabridged Dictionary have offered a method for teachers to indicate pronunciation without respelling as a supplement to the respelling scheme used in the dictionary. Pronunciation without respelling is also sometimes used in texts with lots of unusual words, such as Bibles, when it is desirable to show the received pronunciation. These will

often be more exhaustive than dictionary respelling keys because all possible digraphs or readings need to have a unique spelling.

International Phonetic Alphabet

The International Phonetic Alphabet is a standardized method of phonetic transcription developed by a group of English and French language teachers in 1888. In the beginning, only specialized pronunciation dictionaries for linguists used it, for example, the *English Pronouncing Dictionary* edited by Daniel Jones (EPD, 1917). The IPA was used by English teachers as well, and started to appear in popular dictionaries for learners of English as a foreign language, such as the *Oxford Advanced Learner's Dictionary* (1948), and *Longman Dictionary of Contemporary English* (1978).

IPA is very flexible, allowing for a wide variety of transcriptions between broad phonemic transcriptions which describe the significant units of meaning in language, and phonetic transcriptions which may indicate every nuance of sound in detail.

The IPA transcription conventions used in the first twelve editions of the EPD was relatively simple, using a *quantitative* system indicating vowel length using a colon, and requiring the reader to infer other vowel qualities. Many phoneticians preferred a *qualitative* system, which used different symbols to indicate vowel timbre and colour. A.C. Gimson introduced a *quantitative-qualitative* IPA notation system when he took over editorship of the EPD (13th edition, 1967), and by the 1990s, the Gimson system had become a de facto standard for phonetic notation of British Received Pronunciation (RP).

Comparison of short and long vowels in various IPA schemes for RP

word	*quant.*	*qual.*	*Gimson*
rid	rid	rjd	rjd
reed	riDd	rid	riDd
cod	kTd	kRd	kRd
cord	kTDd	kTd	kTDd

The first native (not learner's) English dictionary using IPA may have been the *Collins English Dictionary* (1979), and others followed suit. The *Oxford English Dictionary*, 2nd edition (OED2, 1989) used IPA, transcribed letter-for-letter from entries in the first edition, which had been noted in a scheme by the original editor, James Murray.

While IPA has not been adopted by popular dictionaries in the United States, there is a demand for learner's dictionaries which provide both British and American English pronunciation. Some dictionaries, such as the *Cambridge English Pronouncing Dictionary* and the *Longman Dictionary of Contemporary English* provide a separate transcription for each.

British and American English dialects have a similar set of phonemes, but some are pronounced differently; in technical parlance, they consist of different phones. Although developed for RP, the Gimson system being phonemic, it is not far from much of General American pronunciation as well. A number of recent dictionaries, such as the *Collins COBUILD Advanced Learner's English Dictionary*, add a few non-phonemic symbols /ɜ i u J"l J"n/ to represent both RP and General American pronunciation in a single IPA transcription.

Adaptations of the Gimson system for American English

/R/ Pronounced [QD] in General American.

/e/ In American English falls between [e] and [æ] (sometimes transcribed /[/)

/Yu/ This traditional transcription is probably more accurately replaced by /ou/ in American English.

/r/ Regular r is always pronounced

/^{3}/ Superscript r is only pronounced in rhotic dialects, such as General American, or when followed by a vowel (for example adding a suffix to change *dear* into *dearest*)

/i/ *Medium i* can be pronounced [j] or [iD], depending on the dialect

/TD/ Many Americans pronounce /TD/ the same as /R/ ([QD])

/J"l/ Syllabic l, sometimes transcribed /l/ or /Yl/

/J"n/ Syllabic n, sometimes transcribed /n/ or /Yn/

Clive Upton updated the Gimson scheme, changing the symbols used for five vowels. He served as pronunciation consultant for the influential *Concise Oxford English Dictionary*, which adopted this scheme in its ninth edition (1995). Upton's reform is controversial: it reflects changing pronunciation, but critics say it represents a narrower regional accent, and abandons parallelism with American and Australian English. In addition, the UCL linguist John C Wells said that he could not understand why Upton had altered the presentation of "price".

Upton outlined his reasons for the transcription in a chapter of *A Handbook of Varieties of English*. He said that the PRICE vowel represented how the starting point could be anything from centralised front to centralised back. The change in the NURSE vowel was intended as a simplification as well as a reflection that n\Ds was not the only possible realisation in RP. The other alterations were intended to reflect changes that have occurred over time.

Upton's Reform

word	Gimson	Upton
bet	bet	b[t
bat	bæt	bat
nurse	n\Ds	nYDs
square	skweY	skw[D
price	prajs	prŒjs

The in-progress 3rd edition of the Oxford English Dictionary uses Upton's scheme for representing British pronunciations. For American pronunciations it uses an IPA-based scheme devised by Prof. William Kretzschmar of the University of Georgia.

PHONATION

Phonation has slightly different meanings depending on the subfield of phonetics. Among some phoneticians, *phonation* is the process by which the vocal folds produce certain sounds through quasi-periodic vibration. This is the definition used among those who study laryngeal anatomy and physiology and speech production in general. Other phoneticians, though, call this process quasi-periodic vibration voicing, and they use the term phonation to refer to any oscillatory state of any part of the larynx that modifies the airstream, of which voicing is just one example. As such, voiceless and supra-glottal phonation are included under this definition, which is common in the field of linguistic phonetics.

Voicing

The phonatory process, or voicing, occurs when air is expelled from the lungs through the glottis, creating a pressure drop across the larynx. When this drop becomes

sufficiently large, the vocal folds start to oscillate. The minimum pressure drop required to achieve phonation is called the phonation threshold pressure, and for humans with normal vocal folds, it is approximately 2–3 cm H_2O. The motion of the vocal folds during oscillation is mostly lateral, though there is also some superior component as well. However, there is almost no motion along the length of the vocal folds. The oscillation of the vocal folds serves to modulate the pressure and flow of the air through the larynx, and this modulated airflow is the main component of the sound of most voiced phones.

The sound that the larynx produces is a harmonic series. In other words, it consists of a fundamental tone (called the fundamental frequency, the main acoustic cue for the percept pitch) accompanied by harmonic overtones, which are multiples of the fundamental frequency. According to the Source-Filter Theory, the resulting sound excites the resonance chamber that is the vocal tract to produce the individual speech sounds.

The vocal folds will not oscillate if they are not sufficiently close to one another, are not under sufficient tension or under too much tension, or if the pressure drop across the larynx is not sufficiently large. In linguistics, a phone is called voiceless if there is no phonation during its occurrence. In speech, voiceless phones are associated with vocal folds that are elongated, highly tensed, and placed laterally (abducted) when compared to vocal folds during phonation.

Fundamental frequency, the main acoustic cue for the percept *pitch*, can be varied through a variety of means. Large scale changes are accomplished by increasing the tension in the vocal folds through contraction of the cricothyroid muscle. Smaller changes in tension can be

effected by contraction of the thyroarytenoid muscle or changes in the relative position of the thyroid and cricoid cartilages, as may occur when the larynx is lowered or raised, either volitionally or through movement of the tongue to which the larynx is attached via the hyoid bone. In addition to tension changes, fundamental frequency is also affected by the pressure drop across the larynx, which is mostly affected by the pressure in the lungs, and will also vary with the distance between the vocal folds. Variation in fundamental frequency is used linguistically to produce intonation and tone.

There are currently two main theories as to how vibration of the vocal folds is initiated: the myoelastic theory and the aerodynamic theory. These two theories are not in contention with one another and it is quite possible that both theories are true and operating simultaneously to initiate and maintain vibration. A third theory, the neurochronaxic theory, was in considerable vogue in the 1950s, but has since been largely discredited.

Myoelastic and Aerodynamic Theory

The myoelastic theory states that when the vocal cords are brought together and breath pressure is applied to them, the cords remain closed until the pressure beneath them—the subglottic pressure—is sufficient to push them apart, allowing air to escape and reducing the pressure enough for the muscle tension recoil to pull the folds back together again. Pressure builds up once again until the cords are pushed apart, and the whole cycle keeps repeating itself. The rate at which the cords open and close—the number of cycles per second—determines the pitch of the phonation.

The aerodynamic theory is based on the Bernoulli energy law in fluids. The theory states that when a stream of

breath is flowing through the glottis while the arytenoid cartilages are held together by the action of the interarytenoid muscles, a push-pull effect is created on the vocal fold tissues that maintains self-sustained oscillation. The push occurs during glottal opening, when the glottis is convergent, whereas the pull occurs during glottal closing, when the glottis is divergent. During glottal closure, the air flow is cut off until breath pressure pushes the folds apart and the flow starts up again, causing the cycles to repeat. The textbook entitled Myoelastic Aerodynamic Theory of Phonation by Ingo Titze credits Janwillem van den Berg as the originator of the theory and provides detailed mathematical development of the theory.Template:Titze,I.R., 2006

Neurochronaxic Theory

This theory states that the frequency of the vocal fold vibration is determined by the chronaxy of the recurrent nerve, and not by breath pressure or muscular tension. Advocates of this theory thought that every single vibration of the vocal folds was due to an impulse from the recurrent laryngeal nerves and that the acoustic center in the brain regulated the speed of vocal fold vibration. Speech and voice scientists have long since left this theory as the muscles have been shown to not be able to contract fast enough to accomplish the vibration. In addition, persons with paralyzed vocal folds can produce phonation, which would not be possible according to this theory. Phonation occurring in excised larynges would also not be possible according to this theory.

State of the Glottis

In linguistic phonetic treatments of phonation, such as those of Peter Ladefoged, phonation was considered to be a matter of points on a continuum of tension and closure

of the vocal cords. More intricate mechanisms were occasionally described, but they were difficult to investigate, and until recently the state of the glottis and phonation were considered to be nearly synonymous.

If the vocal cords are completely relaxed, with the arytenoid cartilages apart for maximum airflow, the cords do not vibrate. This is voiceless phonation, and is extremely common with obstruents. If the arytenoids are pressed together for glottal closure, the vocal cords block the airstream, producing stop sounds such as the glottal stop. In between there is a sweet spot of maximum vibration. This is modal voice, and is the normal state for vowels and sonorants in all the world's languages. However, the aperture of the arytenoid cartilages, and therefore the tension in the vocal cords, is one of degree between the end points of open and closed, and there are several intermediate situations utilized by various languages to make contrasting sounds.

For example, Gujarati has vowels with a partially lax phonation called breathy voice or murmured, while Burmese has vowels with a partially tense phonation called creaky voice or laryngealized. Both of these phonations have dedicated IPA diacritics, an under-umlaut and under-tilde. The Jalapa dialect of Mazatec is unusual in contrasting both with modal voice in a three-way distinction. (Note that Mazatec is a tonal language, so the glottis is making several tonal distinctions simultaneously with the phonation distinctions.) Javanese does not have modal voice in its plosives, but contrasts two other points along the phonation scale, with more moderate departures from modal voice, called slack voice and stiff voice. The "muddy" consonants in Shanghainese are slack voice; they contrast with tenuis and aspirated consonants.

Although each language may be somewhat different, it is convenient to classify these degrees of phonation into discrete categories. A series of seven alveolar plosives, with phonations ranging from an open/lax to a closed/ tense glottis. The IPA diacritics *under-ring* and *subscript wedge*, commonly called "voiceless" and "voiced", are sometimes added to the symbol for a voiced sound to indicate more lax/open (slack) and tense/closed (stiff) states of the glottis, respectively. (Ironically, adding the 'voicing' diacritic to the symbol for a voiced consonant indicates *less* modal voicing, not more, because a modally voiced sound is already fully voiced, at its sweet spot, and any further tension in the vocal cords dampens their vibration.)

Alsatian, like several Germanic languages, has a typologically unusual phonation in its stops. The consonants transcribed /b%/, /d%/, /a/ (ambiguously called "lenis") are partially voiced: The vocal cords are positioned as for voicing, but do not actually vibrate. That is, they are technically voiceless, but without the open glottis usually associated with voiceless stops. They contrast with both modally voiced /b, d, a/ and modally voiceless /p, t, k/ in French borrowings, as well as aspirated /k/ word initially.

Glottal Consonants

It has long been noted that in many languages, both phonologically and historically, the glottal consonants [", f, h] do not behave like other consonants. Phonetically, they have no manner or place of articulation other than the state of the glottis: *glottal closure* for ["], *breathy voice* for [f], and *open airstream* for [h]. Some phoneticians have described these sounds as neither glottal nor consonantal, but instead as instances of pure phonation, at least in many European languages. However, in Semitic languages they do appear to be true glottal consonants.

Supra-Glottal Phonation

In the last few decades it has become apparent that phonation may involve the entire larynx, with as many as six valves and muscles working either independently or together. From the glottis upward, these articulations are:

1. glottal (the vocal cords), producing the distinctions described above
2. ventricular (the 'false vocal cords', partially covering and damping the glottis)
3. arytenoid (sphincteric compression forwards and upwards)
4. epiglotto-pharyngeal (retraction of the tongue and epiglottis, potentially closing onto the pharyngeal wall)
5. raising or lowering of the entire larynx
6. narrowing of the pharynx

Until the development of fiber-optic laryngoscopy, the full involvement of the larynx during speech production was not observable, and the interactions among the six laryngeal articulators is still poorly understood. However, at least two supra-glottal phonations appear to be widespread in the world's languages. These are harsh voice ('ventricular' or 'pressed' voice), which involves overall constriction of the larynx, and faucalized voice ('hollow' or 'yawny' voice), which involves overall expansion of the larynx.

The Bor dialect of Dinka has contrastive modal, breathy, faucalized, and harsh voice in its vowels, as well as three tones. The *ad hoc* diacritics employed in the literature are a subscript double quotation mark for faucalized voice, [aH], and underlining for harsh voice, [a1]. Other languages with these contrasts are Bai (modal, breathy, and harsh

voice), Kabiye (faucalized and harsh voice, previously seen as ±ATR), Somali (breathy and harsh voice).

Elements of laryngeal articulation or phonation may occur widely in the world's languages as phonetic detail even when not phonemically contrastive. For example, simultaneous glottal, ventricular, and arytenoid activity (for something other than epiglottal consonants) has been observed in Tibetan, Korean, Nuuchahnulth, Nlaka'pamux, Thai, Sui, Amis, Pame, Arabic, Tigrinya, Cantonese, and Yi.

Familiar Language Examples

In languages such as French, all obstruents occur in pairs, one modally voiced and one voiceless.

In English, every voiced fricative corresponds to a voiceless one. For the pairs of English plosives, however, the distinction is better specified as voice onset time rather than simply voice: In initial position /b d g/ are only partially voiced (voicing begins during the hold of the consonant), while /p t k/ are aspirated (voicing doesn't begin until well after its release). Certain English morphemes have voiced and voiceless allomorphs, such as the plural, verbal, and possessive endings spelled *-s* (voiced in *kids* /kjdz/ but voiceless in *kits* /kjts/) and the past-tense ending spelled *-ed* (voiced in *buzzed* /bŒzd/ but voiceless in *fished* /fjʃt/.

A few European languages, such as Finnish, have no phonemically voiced obstruents but pairs of long and short consonants instead. Outside of Europe, a lack of voicing distinctions is not uncommon; indeed, in Australian languages it is nearly universal. In languages without the distinction between voiceless and voiced obstruents, it is often found that they are realized as voiced in voiced environments such as between vowels, and voiceless elsewhere.

Vocal Registers

In Phonology

In phonology, a register is a combination of tone and vowel phonation into a single phonological parameter. For example, among its vowels, Burmese combines modal voice with low tone, breathy voice with falling tone, creaky voice with high tone, and glottal closure with high tone. These four registers contrast with each other, but no other combination of phonation (modal, breath, creak, closed) and tone (high, low, falling) is found.

In Pedagogy and Speech Pathology

Among vocal pedagogues and speech pathologists, a vocal register also refers to a particular phonation limited to a particular range of pitch, which possesses a characteristic sound quality. The term "register" may be used for several distinct aspects of the human voice::

- A particular part of the vocal range, such as the upper, middle, or lower registers, which may be bounded by vocal breaks
- A particular phonation
- A resonance area such as chest voice or head voice
- A certain vocal timbre

Four combinations of these elements are identified in speech pathology: the vocal fry register, the modal register, the falsetto register, and the whistle register.

PHONETICS

Phonetics (*phônç*, "sound, voice") is a branch of linguistics that comprises the study of the sounds of human speech. It is concerned with the physical properties of speech sounds (phones): their physiological production, acoustic properties, auditory perception, and neurophysiological status.

Phonology, on the other hand, is concerned with abstract, grammatical characterization of systems of sounds.

The study of phonetics is a multiple layered subject of linguistics that focuses on speech. In this field of research there are three basic areas of study.

- Articulatory phonetics- the study of the production of speech by the articulatory and vocal tract by the speaker
- Acoustic phonetics- the study of the transmission of speech from the speaker to the listener
- Auditory Phonetics- the study of phonetics of the reception and perception of speech by the listener

All parts of phonetics are inter-connected because the process of human communication is both a system of auditory mechanisms which correspond to each other and are mediated by wavelength, pitch, and the other physical properties of sound.

History

Phonetics was studied as early as 500 BC in ancient India, with PaGini's account of the place and manner of articulation of consonants in his 5th century BC treatise on Sanskrit. The major Indic alphabets today order their consonants according to PaGini's classification. The Ancient Greeks are credited as the first to base a writing system on a phonetic alphabet. Modern phonetics began with Alexander Melville Bell, whose *Visible Speech* (1867) introduced a system of precise notation for writing down speech sounds.

Phonetic Transcription

The International Phonetic Alphabet(IPA) is used as the basis for the phonetic transcription of speech. It is based on the Latin alphabet and is able to transcribe most

features of speech such as consonants, vowels, and suprasegmental features. Every documented phoneme available within the known languages in the world is assigned its own corresponding symbol.

The Difference Between Phonetics and Phonemes

Phonemes include all significant differences of sound, including features of voicing, place and manner of articulation, accents, and secondary features of nasalization and labialization. Whereas phonetics refers to the study of the production, perception, and physical nature of speech sounds. Using an Edison phonograph, Ludimar Hermann investigated the spectral properties of vowels and consonants. It was in these papers that the term *formant* was first introduced. Hermann also played back vowel recordings made with the Edison phonograph at different speeds in order to test Willis' and Wheatstone's theories of vowel production.

Subfields

Phonetics as a research discipline has three main branches:

- articulatory phonetics is concerned with the articulation of speech: The position, shape, and movement of *articulators* or speech organs, such as the lips, tongue, and vocal folds.
- acoustic phonetics is concerned with acoustics of speech: The spectro-temporal properties of the sound waves produced by speech, such as their frequency, amplitude, and harmonic structure.
- auditory phonetics is concerned with speech perception: the perception, categorization, and recognition of speech sounds and the role of the auditory system and the brain in the same.

Transcription

Phonetic transcription is a system for transcribing sounds that occur in spoken language or signed language. The most widely known system of phonetic transcription, the International Phonetic Alphabet (IPA), uses a one-to-one mapping between phones and written symbols. The standardized nature of the IPA enables its users to transcribe accurately and consistently the phones of different languages, dialects, and idiolects. The IPA is a useful tool not only for the study of phonetics, but also for language teaching, professional acting, and speech pathology.

Applications

Application of phonetics include:

- forensic phonetics: the use of phonetics (the science of speech) for forensic (legal) purposes.
- Speech Recognition: the analysis and transcription of recorded speech by a computer system.

Relation to Phonology

In contrast to phonetics, phonology is the study of how sounds and gestures pattern in and across languages, relating such concerns with other levels and aspects of language. Phonetics deals with the articulatory and acoustic properties of speech sounds, how they are produced, and how they are perceived. As part of this investigation, phoneticians may concern themselves with the physical properties of meaningful sound contrasts or the social meaning encoded in the speech signal (e.g. gender, sexuality, ethnicity, etc.). However, a substantial portion of research in phonetics is not concerned with the meaningful elements in the speech signal.

While it is widely agreed that phonology is grounded in phonetics, phonology is a distinct branch of linguistics,

concerned with sounds and gestures as abstract units (e.g., features, phonemes, mora, syllables, etc.) and their conditioned variation (via, e.g., allophonic rules, constraints, or derivational rules). Phonology relates to phonetics via the set of distinctive features, which map the abstract representations of speech units to articulatory gestures, acoustic signals, and/or perceptual representations.

ACOUSTIC PHONETICS

Acoustic phonetics is a subfield of phonetics which deals with acoustic aspects of speech sounds. Acoustic phonetics investigates properties like the mean squared amplitude of a waveform, its duration, its fundamental frequency, or other properties of its frequency spectrum, and the relationship of these properties to other branches of phonetics (e.g. articulatory or auditory phonetics), and to abstract linguistic concepts like phones, phrases, or utterances.

The study of acoustic phonetics was greatly enhanced in the late 19th century by the invention of the Edison phonograph. The phonograph allowed the speech signal to be recorded and then later processed and analyzed. By replaying the same speech signal from the phonograph several times, filtering it each time with a different band-pass filter, a spectrogram of the speech utterance could be built up. A series of papers by Ludimar Hermann published in Pflüger's Archiv in the last two decades of the 19th century investigated the spectral properties of vowels and consonants using the Edison phonograph, and it was in these papers that the term *formant* was first introduced. Hermann also played back vowel recordings made with the Edison phonograph at different speeds to distinguish between Willis' and Wheatstone's theories of vowel production.

Further advances in acoustic phonetics were made possible by the development of the telephone industry. (Incidentally, Alexander Graham Bell's father, Alexander Melville Bell, was a phonetician.) During World War II, work at the Bell Telephone Laboratories (which invented the spectrograph) greatly facilitated the systematic study of the spectral properties of periodic and aperiodic speech sounds, vocal tract resonances and vowel formants, voice quality, prosody, etc.

On a theoretical level, acoustic phonetics really took off when it became clear that speech acoustic could be modeled in a way analogous to electrical circuits. Lord Rayleigh was among the first to recognize that the new electric theory could be used in acoustics, but it was not until 1941 that the circuit model was effectively used, in a book by Chiba and Kajiyama called "The Vowel: Its Nature and Structure". (Interestingly, this book by Japanese authors working in Japan was published in English at the height of World War II.) In 1952, Roman Jakobson, Gunnar Fant, and Morris Halle wrote "Preliminaries to Speech Analysis", a seminal work tying acoustic phonetics and phonological theory together.

This little book was followed in 1960 by Fant "Acoustic Theory of Speech Production", which has remained the major theoretical foundation for speech acoustic research in both the academy and industry. (Fant was himself very involved in the telephone industry.) Other important framers of the field include Kenneth N. Stevens, Osamu Fujimura, and Peter Ladefoged.

AUDITORY PHONETICS

Auditory phonetics is a branch of phonetics concerned with the hearing of speech sounds and with speech perception.

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MANNER OF ARTICULATION

In linguistics (articulatory phonetics), manner of articulation describes how the tongue, lips, jaw, and other speech organs are involved in making a sound. You can see a movie clip showing the human articulators in action here. Often the concept is only used for the production of consonants, even though the movement of the articulars will also greatly alter the resonant properties of the vocal tract, thereby changing the formant structure of speech sounds that is crucial for the identification of vowels. For any place of articulation, there may be several manners, and therefore several homorganic consonants.

One parameter of manner is *stricture,* that is, how closely the speech organs approach one another. Parameters other than stricture are those involved in the r-like sounds (taps and trills), and the sibilancy of fricatives. Often nasality and laterality are included in manner, but phoneticians such as Peter Ladefoged consider them to be independent.

Stricture

From greatest to least stricture, speech sounds may be classified along a cline as stop consonants (with *occlusion*, or blocked airflow), fricative consonants (with partially blocked and therefore strongly turbulent airflow), approximants (with only slight turbulence), and vowels (with full unimpeded airflow). Affricates often behave as if they were intermediate between stops and fricatives, but phonetically they are sequences of stop plus fricative.

Historically, sounds may move along this cline toward less stricture in a process called lenition. The reverse process is fortition.

Other Parameters

Sibilants are distinguished from other fricatives by the shape of the tongue and how the airflow is directed over the teeth. Fricatives at coronal places of articulation may be sibilant or non-sibilant, sibilants being the more common.

Taps and flaps are similar to very brief stops. However, their articulation and behavior is distinct enough to be considered a separate manner, rather than just length.

Trills involve the vibration of one of the speech organs. Since trilling is a separate parameter from stricture, the two may be combined. Increasing the stricture of a typical trill results in a trilled fricative. Trilled affricates are also known.

Nasal airflow may be added as an independent parameter to any speech sound. It is most commonly found in nasal stops and nasal vowels, but nasal fricatives, taps, and approximants are also found. When a sound is not nasal, it is called *oral.* An oral stop is often called a *plosive,* while a nasal stop is generally just called a *nasal.*

Laterality is the release of airflow at the side of the tongue. This can also be combined with other manners, resulting in lateral approximants (the most common), lateral flaps, and lateral fricatives and affricates.

Individual Manners

- Plosive, or oral stop, where there is complete *occlusion* (blockage) of both the oral and nasal cavities of the vocal tract, and therefore no air flow. Examples include English /p t k/ (voiceless) and /b d g/ (voiced). If the consonant is voiced, the voicing is the only sound made during occlusion; if it is voiceless, a plosive is completely silent. What we hear as a /p/ or /k/ is the effect that the *onset* of the occlusion has on the preceding vowel, as well as the release burst and its effect on the following vowel. The shape and position of the tongue (the *place* of articulation) determine the resonant cavity that gives different plosives their characteristic sounds. All languages have plosives.
- Nasal stop, usually shortened to nasal, where there is complete occlusion of the oral cavity, and the air passes instead through the nose. The shape and position of the tongue determine the resonant cavity that gives different nasal stops their characteristic sounds. Examples include English /m, n/. Nearly all languages have nasals, the only exceptions being in the area of Puget Sound and a single language on Bougainville Island.

- Fricative, sometimes called spirant, where there is continuous *frication* (turbulent and noisy airflow) at the place of articulation. Examples include English /f, s/ (voiceless), /v, z/ (voiced), etc. Most languages have fricatives, though many have only an /s/. However, the Indigenous Australian languages are almost completely devoid of fricatives of any kind.
- Sibilants are a type of fricative where the airflow is guided by a groove in the tongue toward the teeth, creating a high-pitched and very distinctive sound. These are by far the most common fricatives. Fricatives at coronal (front of tongue) places of articulation are usually, though not always, sibilants. English sibilants include /s/ and /z/.
- Lateral fricatives are a rare type of fricative, where the frication occurs on one or both sides of the edge of the tongue. The "ll" of Welsh and the "hl" of Zulu are lateral fricatives.
- Affricate, which begins like a plosive, but this releases into a fricative rather than having a separate release of its own. The English letters "ch" and "j" represent affricates. Affricates are quite common around the world, though less common than fricatives.
- Flap, often called a tap, is a momentary closure of the oral cavity. The "tt" of "utter" and the "dd" of "udder" are pronounced as a flap in North American English. Many linguists distinguish *taps* from *flaps*, but there is no consensus on what the difference might be. No language relies on such a difference. There are also lateral flaps.
- Trill, in which the articulator (usually the tip of the tongue) is held in place, and the airstream causes it to vibrate. The double "r" of Spanish

"perro" is a trill. Trills and flaps, where there are one or more brief occlusions, constitute a class of consonant called rhotics.

- Approximant, where there is very little obstruction. Examples include English /w/ and /r/. In some languages, such as Spanish, there are sounds which seem to fall between *fricative* and *approximant*.
- One use of the word semivowel, sometimes called a glide, is a type of approximant, pronounced like a vowel but with the tongue closer to the roof of the mouth, so that there is slight turbulence. In English, /w/ is the semivowel equivalent of the vowel /u/, and /j/ (spelled "y") is the semivowel equivalent of the vowel /i/ in this usage. Other descriptions use *semivowel* for vowel-like sounds that are not syllabic, but do not have the increased stricture of approximants. These are found as elements in diphthongs. The word may also be used to cover both concepts.
- Lateral approximants, usually shortened to lateral, are a type of approximant pronounced with the side of the tongue. English /l/ is a lateral. Together with the *rhotics*, which have similar behavior in many languages, these form a class of consonant called liquids.

Broader Classifications

Manners of articulation with substantial obstruction of the airflow (plosives, fricatives, affricates) are called obstruents. These are prototypically voiceless, but voiced obstruents are extremely common as well. Manners without such obstruction (nasals, liquids, approximants, and also vowels) are called sonorants because they are nearly always voiced. Voiceless sonorants are uncommon, but are found in Welsh and Classical Greek (the spelling "rh"), in Tibetan

(the "lh" of Lhasa), and the "wh" in those dialects of English which distinguish "which" from "witch".

Sonorants may also be called resonants, and some linguists prefer that term, restricting the word 'sonorant' to non-vocoid resonants (that is, nasals and liquids, but not vowels or semi-vowels). Another common distinction is between stops (plosives and nasals) and continuants (all else); affricates are considered to be both, because they are sequences of stop plus fricative.

Other Airstream Initiations

All of these manners of articulation are pronounced with an airstream mechanism called pulmonic egressive, meaning that the air flows outward, and is powered by the lungs (actually the ribs and diaphragm). Other airstream mechanisms are possible. Sounds that rely on some of these include:

- Ejectives, which are *glottalic egressive*. That is, the airstream is powered by an upward movement of the glottis rather than by the lungs or diaphragm. Plosives, affricates, and occasionally fricatives may occur as ejectives. All ejectives are voiceless.
- Implosives, which are *glottalic ingressive*. Here the glottis moves downward, but the lungs may be used simultaneously (to provide voicing), and in some languages no air may actually flow into the mouth. Implosive oral stops are not uncommon, but implosive affricates and fricatives are rare. Voiceless implosives are also rare.
- Clicks, which are *velaric ingressive*. Here the back of the tongue is used to create a vacuum in the mouth, causing air to rush in when the forward occlusion (tongue or lips) is released. Clicks may be oral or nasal, stop or affricate, central or lateral,

voiced or voiceless. They are extremely rare in normal words outside Southern Africa. However, English has a click in its "tsk tsk" (or "tut tut") sound, and another is often used to say "giddy up" to a horse.

ARTICULATORY PHONETICS

The field of articulatory phonetics is a subfield of phonetics. In studying articulation, phoneticians explain how humans produce speech sounds via the interaction of different physiological structures.

Generally, articulatory phonetics is concerned with the transformation of aerodynamic energy into acoustic energy. Aerodynamic energy refers to the airflow through the vocal tract. Its potential form is air pressure; its kinetic form is the actual dynamic airflow. Acoustic energy is variation in the air pressure that can be represented as sound waves, which are then perceived by the human auditory system as sound.

Overview

The vocal tract can viewed through an aerodynamic-biomechanic model which includes three main components:

1. air cavities
2. pistons
3. air valves

Air cavities are containers of air molecules of specific volumes and masses. The main air cavities present in the articulatory system are the supraglottal cavity and the subglottal cavity. They are so-named because the glottis, the openable space between the vocal folds internal to the larynx, separates the two cavities. The supraglottal cavity or the orinasal cavity is divided into an oral subcavity (the

cavity from the glottis to the lips excluding the nasal cavity) and a nasal subcavity (the cavity from the velopharyngeal port which can be closed by raising the velum to the nostrils). The subglottal cavity consists of the trachea and the lungs. The atmosphere external to the articulatory stem may also be consisted an air cavity whose potential connecting points with respect to the body are the nostrils and the lips.

Pistons are initiators. The term *initiator* refers to the fact that they are used to initiate a change in the volumes of air cavities, and, by Boyle's Law, the corresponding air pressure of the cavity. The term *initiation* refers to the change. Since changes in air pressures between connected cavities lead to airflow between the cavities, initiation is also referred to as an *airstream mechanism*. The three pistons present in the articulatory system are the larynx, the tongue body, and the physiological structures used to manipulate lung volume (particularly the floor and the walls of the chest). The lung pistons are used to initiate a pulmonic airstream (found in all human languages). The larynx is used to initiate the glottalic airstream mechanism by changing the volume of the supraglottal and subglottal cavities via vertical movement of the larynx (with a closed glottis). Ejectives and implosives are made with this airstream mechanism. The tongue body creates a velaric airsteam by changing the pressure within in the oral cavity: the tongue body changes the mouth subcavity. Click consonants use the velaric airstream mechanism. Pistons are controlled by various muscles.

Valves regulate airflow between cavities. Airflow occurs when an air valve is open and there is a pressure difference between in the connecting cavities. When an air valve is closed, there is no airflow. The air valves are the vocal folds (the glottis) which regulate between the supraglottal

and subglottal cavities, the velopharyngeal port which regulates between the oral and nasal cavities, the tongue which regulates between the oral cavity and the atmosphere, and the lips which also regulate between the oral cavity and the atmosphere. Like the pistons, the air valves are also controlled by various muscles.

Initiation

Pulmonic

- thoracic diaphragm
- external intercostal muscles
- rectus abdominis muscle
- transversus abdominis muscle
- abdominal internal oblique muscle
- abdominal external oblique muscle
- internal intercostal muscles
- (latissimus dorsi muscle)
- Lung volumes
- alveoli

Airflow

For all practical purposes, temperature can be treated as constant in the articulatory system. Thus, Boyle's Law can usefully be written as the following two equations.

What the above equations express is that given an initial pressure P_1 and volume V_1 at time 1 the product of these two values will be equal to the product of the pressure P_2 and volume V_2 at a later time 2. This means that if there is an increase in the volume of cavity, there will be a corresponding decrease in pressure of that same cavity, and vice versa. In other words, volume and pressure are inversely proportional (or negatively correlated) to each other. As applied to a description of the subglottal cavity, when the lung pistons contract the lungs, the volume of

the subglottal cavity decreases while the subglottal air pressure increases. Conversely, if the lungs are expanded, the pressure decreases.

A situation can be considered where (1) the vocal fold valve is closed separating the supraglottal cavity from the subglottal cavity, (2) the mouth is open and, therefore, supraglottal air pressure is equal to atmospheric pressure, and (3) the lungs are contracted resulting in a subglottal pressure that has increased to a pressure that is greater than atmospheric pressure. If the vocal fold valve is subsequently opened, the previously two separate cavities become one unified cavity although the cavities will still be aerodynamically isolated because the glottic valve between them is relatively small and constrictive. Pascal's Law states that the pressure within a system must be equal throughout the system. When the subglottal pressure is greater than supraglottal pressure, there is a pressure inequality in the unified cavity. Since pressure is a force applied to a surface area by definition and a force is the product of mass and acceleration according to Newton's Second Law of Motion, the pressure inequality will be resolved by having part of the mass in air molecules found in the subglottal cavity move to the supraglottal cavity. This movement of mass is airflow. The airflow will continue until a pressure equilibrium is reached. Similarly, in an ejective consonant with a glottalic airstream mechanism, the lips or the tongue (i.e. the buccal or lingual valve) are initially closed and the closed glottis (the laryngeal piston) is raised decreasing the oral cavity volume behind the valve closure and increasing the pressure compared to the volume and pressure at a resting state. When the closed valve is opened, airflow will result from the cavity behind the initial closure outward until intraoral pressure is equal to atmospheric pressure. Generally stated, air will flow

from a cavity of higher pressure to a cavity of lower pressure until the equilibrium point; the pressure as potential energy is thus converted into airflow as kinetic energy.

Sound Sources

Sound sources refer to the conversion of aerodynamic energy into acoustic energy. There are two main types of sound sources in the articulatory system: periodic (or more precisely semi-periodic) and aperiodic. A periodic sound source is vocal fold vibration produced at the glottis found in vowels and voiced consonants. A less common periodic sound source is the vibration of an oral articulator like the tongue found in alveolar trills. Aperiodic sound sources are the turbulent noise of fricative consonants and the short noise burst of plosive releases produced in the oral cavity.

Periodic Sources

- Non-vocal fold vibration: 20-40 cycles per second
- Vocal fold vibration
  - Lower limit: 70-80 modal (bass), 30-40 creaky
  - Upper limit: 1170 (soprano)

Vocal Fold Vibration

- larynx:
  - cricoid cartilage
  - thyroid cartilage
  - arytenoid cartilage
  - interarytenoid muscles (fold adduction)
  - posterior cricoarytenoid muscle (fold abduction)
  - lateral cricoarytenoid muscle (fold shortening/ stiffening)

- thyroarytenoid muscle (medial compression/fold stiffening, internal to folds)
- cricothyroid muscle (fold lengthening)
- hyoid bone
- sternothyroid muscle (lowers thyroid)
- sternohyoid muscle (lowers hyoid)
- stylohyoid muscle (raises hyoid)
- digastric muscle (raises hyoid)

Experimental Techniques

- Plethysmography
- Electromyography
- Photoglottography
- Electrolaryngography
- Magnetic resonance imaging
- Radiography
- Medical ultrasonography
- Electromagnetic articulography
- Aerometry
- Endoscopy
- Videokymography

Palatography

In order to understand how sounds are made, experimental procedures are often adopted. Palatography is one of the oldest instrumental phonetic techniques used to record data regarding articulators. In traditional, static palatography, a speaker's palate is coated with a dark powder. The speaker then produces a word, usually with a single consonant. The tongue wipes away some of the powder at the place of articulation. The experimenter can then use a mirror to photograph the entire upper surface of the speaker's mouth. This photograph, in which the place of

articulation can be seen as the area where the powder has been removed, is called a palatogram.

Technology has since made possible electropalatography (or EPG). In order to collect EPG data, the speaker is fitted with a special prosthetic palate, which contains a number of electrodes. The way in which the electrodes are "contacted" by the tongue during speech provides phoneticians with important information, such as how much of the palate is contacted in different speech sounds, or which regions of the palate are contacted, or what the duration of the contact is.

SPEECH PERCEPTION

Speech perception is the process by which the sounds of language are heard, interpreted and understood. The study of speech perception is closely linked to the fields of phonetics and phonology in linguistics and cognitive psychology and perception in psychology. Research in speech perception seeks to understand how human listeners recognize speech sounds and use this information to understand spoken language. Speech perception research has applications in building computer systems that can recognize speech, in improving speech recognition for hearing- and language-impaired listeners, as well as in foreign-language teaching.

Basics of Speech Perception

The process of perceiving speech begins at the level of the sound signal and the process of audition. (For a complete description of the process of audition see Hearing.) After processing the initial auditory signal, speech sounds are further processed to extract acoustic cues and phonetic information. This speech information can then be used for higher-level language processes, such as word recognition.

Acoustic Cues

The speech sound signal contains a number of acoustic cues that are used in speech perception. The cues differentiate speech sounds belonging to different phonetic categories. For example, one of the most studied cues in speech is voice onset time or VOT. VOT is a primary cue signaling the difference between voiced and voiceless stop consonants, such as "b" and "p". Other cues differentiate sounds that are produced at different places of articulation or manners of articulation. The speech system must also combine these cues to determine the category of a specific speech sound. This is often thought of in terms of abstract representations of phonemes. These representations can then be combined for use in word recognition and other language processes.

It is not easy to identify what acoustic cues listeners are sensitive to when perceiving a particular speech sound:

At first glance, the solution to the problem of how we perceive speech seems deceptively simple. If one could identify stretches of the acoustic waveform that correspond to units of perception, then the path from sound to meaning would be clear. However, this correspondence or mapping has proven extremely difficult to find, even after some forty-five years of research on the problem.

If a specific aspect of the acoustic waveform indicated one linguistic unit, a series of tests using speech synthesizers would be sufficient to determine such a cue or cues. However, there are two significant obstacles:

1. One acoustic aspect of the speech signal may cue different linguistically relevant dimensions. For example, the duration of a vowel in English can indicate whether or not the vowel is stressed, or

whether it is in a syllable closed by a voiced or a voiceless consonant, and in some cases (like American English /[/ and /æ/) it can distinguish the identity of vowels. Some experts even argue that duration can help in distinguishing of what is traditionally called short and long vowels in English.

2. One linguistic unit can be cued by several acoustic properties. For example in a classic experiment, Alvin Liberman (1957) showed that the onset formant transitions of /d/ differ depending on the following vowel (see Figure 1) but they are all interpreted as the phoneme /d/ by listeners.

Linearity and the Segmentation Problem

Although listeners perceive speech as a stream of discrete units (phonemes, syllables, and words), this linearity is difficult to be seen in the physical speech signal (see Figure 2 for an example). Speech sounds do not strictly follow one another, rather, they overlap. A speech sound is influenced by the ones that precede and the ones that follow. This influence can even be exerted at a distance of two or more segments (and across syllable- and word-boundaries).

Having disputed the linearity of the speech signal, the problem of segmentation arises: one encounters serious difficulties trying to delimit a stretch of speech signal as belonging to a single perceptual unit. This can be again illustrated by the fact that the acoustic properties of the phoneme /d/ will depend on the production of the following vowel (because of coarticulation).

Lack of Invariance

The research and application of speech perception has to deal with several problems which result from what has been termed the lack of invariance. As was suggested

above, reliable constant relations between a phoneme of a language and its acoustic manifestation in speech are difficult to find. There are several reasons for this:

- *Context-induced variation.* Phonetic environment affects the acoustic properties of speech sounds. For example, /u/ in English is fronted when surrounded by coronal consonants. Or, the VOT values marking the boundary between voiced and voiceless stops are different for labial, alveolar and velar stops and they shift under stress or depending on the position within a syllable.
- *Variation due to differing speech conditions.* One important factor that causes variation is differing speech rate. Many phonemic contrasts are constituted by temporal characteristics (short vs. long vowels or consonants, affricates vs. fricatives, stops vs. glides, voiced vs. voiceless stops, etc.) and they are certainly affected by changes in speaking tempo. Another major source of variation is articulatory carefulness vs. sloppiness which is typical for connected speech (articulatory "undershoot" is obviously reflected in the acoustic properties of the sounds produced).
- *Variation due to different speaker identity.* The resulting acoustic structure of concrete speech productions depends on the physical and psychological properties of individual speakers. Men, women, and children generally produce voices having different pitch. Because speakers have vocal tracts of different sizes (due to sex and age especially) the resonant frequencies (formants), which are important for recognition of speech sounds, will vary in their absolute values across individuals. Dialect and foreign accent cause variation as well.

Perceptual Constancy and Normalization

Despite the great variety of different speakers and different conditions, listeners perceive vowels and consonants as constant categories. It has been proposed that this is achieved by means of the perceptual normalization process in which listeners filter out the noise (i.e. variation) to arrive at the underlying category. Vocal-tract-size differences result in formant-frequency variation across speakers; therefore a listener has to adjust his/her perceptual system to the acoustic characteristics of a particular speaker. This may be accomplished by considering the ratios of formants rather than their absolute values. This process has been called vocal tract normalization.

Similarly, listeners are believed to adjust the perception of duration to the current tempo of the speech they are listening to – this has been referred to as speech rate normalization.

Whether or not normalization actually takes place and what is its exact nature is a matter of theoretical controversy (see theories below). Perceptual constancy is a phenomenon not specific to speech perception only; it exists in other types of perception too.

Categorical Perception

Categorical perception is involved in processes of perceptual differentiation. People perceive speech sounds categorically, that is to say, they are more likely to notice the differences *between* categories (phonemes) than *within* categories. The perceptual space between categories is therefore warped, the centers of categories (or "prototypes") working like a sieve or like magnets for incoming speech sounds.

In an artificial continuum between a voiceless and a voiced bilabial stop, each new step differs from the preceding

one in the amount of VOT. The first sound is a pre-voiced [b], i.e. it has a negative VOT. Then, increasing the VOT, it reaches zero, i.e. the stop is a plain unaspirated voiceless [p]. Gradually, adding the same amount of VOT at a time, the stop is eventually a strongly aspirated voiceless bilabial [p°U]. (Such a continuum was used in an experiment by Lisker and Abramson in 1970. The sounds they used are available online.) In this continuum of, for example, seven sounds, native English listeners will identify the first three sounds as /b/ and the last three sounds as /p/ with a clear boundary between the two categories. A two-alternative identification (or categorization) test will yield a discontinuous categorization function.

In tests of the ability to discriminate between two sounds with varying VOT values but having a constant VOT distance from each other (20 ms for instance), listeners are likely to perform at chance level if both sounds fall within the same category and at nearly-100% level if each sound falls in a different category.

The conclusion to make from both the identification and the discrimination test is that listeners will have different sensitivity to the same relative increase in VOT depending on whether or not the boundary between categories was crossed. Similar perceptual adjustment is attested for other acoustic cues as well.

Top-Down Influences

The process of speech perception is not necessarily uni-directional. That is, higher-level language processes connected with morphology, syntax, or semantics may interact with basic speech perception processes to aid in recognition of speech sounds. It may be the case that it is not necessary and maybe even not possible for a listener to recognize phonemes before recognizing higher units, like

words for example. After obtaining at least a fundamental piece of information about phonemic structure of the perceived entity from the acoustic signal, listeners are able to compensate for missing or noise-masked phonemes using their knowledge of the spoken language.

In a classic experiment, Richard M. Warren (1970) replaced one phoneme of a word with a cough-like sound. His subjects restored the missing speech sound perceptually without any difficulty and what is more, they were not able to identify accurately which phoneme had been disturbed. This is known as the phonemic restoration effect. Another basic experiment compares recognition of naturally spoken words presented in a sentence (or at least a phrase) and the same words presented in isolation. Perception accuracy usually drops in the latter condition. Garnes and Bond (1976) also used carrier sentences when researching the influence of semantic knowledge on perception. They created series of words differing in one phoneme (bay/day/gay, for example). The quality of the first phoneme changed along a continuum. All these stimuli were put into different sentences each of which made sense with one of the words only. Listeners had a tendency to judge the ambiguous words (when the first segment was at the boundary between categories) according to the meaning of the whole sentence.

Research Topics

Infant Speech Perception

Infants begin the process of language acquisition by being able to detect very small differences between speech sounds. They are able to discriminate all possible speech contrasts (phonemes). Gradually, as they are exposed to their native language, their perception becomes language-specific, i.e. they learn how to ignore the differences within phonemic categories of the language (differences that may

well be contrastive in other languages – for example, English distinguishes two voicing categories of stop consonants, whereas Thai has three categories; infants must learn which differences are distinctive in their native language uses, and which are not). As infants learn how to sort incoming speech sounds into categories, ignoring irrelevant differences and reinforcing the contrastive ones, their perception becomes categorical. Infants learn to contrast different vowel phonemes of their native language by approximately 6 months of age. The native consonantal contrasts are acquired by 11 or 12 months of age. Some researchers have proposed that infants may be able to learn the sound categories of their native language through passive listening, using a process called statistical learning. Others even claim that certain sound categories are innate, that is, they are genetically-specified.

If day-old babies are presented with their mother's voice speaking normally, abnormally (in monotone), and a stranger's voice, they react only to their mother's voice speaking normally. When a human and a non-human sound is played, babies turn their head only to the source of human sound. It has been suggested that auditory learning begins already in the pre-natal period.

How do researchers know if infants can distinguish between speech sounds? One of the techniques used to examine how infants perceive speech, besides the head-turn procedure mentioned above, is measuring their sucking rate. In such an experiment, a baby is sucking a special nipple while presented with sounds. First, the baby's normal sucking rate is established. Then a stimulus is played repeatedly. When the baby hears the stimulus for the first time the sucking rate increases but as the baby becomes habituated to the stimulation the sucking rate decreases and levels off. Then, a new stimulus is played to the baby.

If the baby perceives the newly introduced stimulus as different from the background stimulus the sucking rate will show an increase. The sucking-rate and the head-turn method are some of the more traditional, behavioral methods for studying speech perception. Among the new methods (see Research methods below) that help us to study speech perception, NIRS is widely used in infants.

Cross-Language and Second-Language Speech Perception

A large amount of research studies focus on how users of a language perceive foreign speech (referred to as cross-language speech perception) or second-language speech (second-language speech perception). The latter falls within the domain of second language acquisition.

Languages differ in their phonemic inventories. Naturally, this creates difficulties when a foreign language is encountered. For example, if two foreign-language sounds are assimilated to a single mother-tongue category the difference between them will be very difficult to discern. A classic example of this situation is the observation that Japanese learners of English will have problems with identifying or distinguishing English liquid consonants /l/ and /r/.

Best (1995) proposed a Perceptual Assimilation Model which describes possible cross-language category assimilation patterns and predicts their consequences. Flege (1995) formulated a Speech Learning Model which combines several hypotheses about second-language (L2) speech acquisition and which predicts, in simple words, that an L2 sound that is not too similar to a native-language (L1) sound will be easier to acquire than an L2 sound that is relatively similar to an L1 sound (because it will be perceived as more obviously "different" by the learner).

Speech Perception in Language or Hearing Impairment

Research in how people with language or hearing impairment perceive speech is not only intended to discover possible treatments. It can provide insight into what principles underlie non-impaired speech perception. Two areas of research can serve as an example:

- *Listeners with aphasia.* Aphasia affects both the expression and reception of language. Both two most common types, Broca's and Wernike's aphasia, affect speech perception to some extent. Broca's aphasia causes moderate difficulties for language understanding. The effect of Wernike's aphasia on understanding is much more severe. It is agreed upon, that aphasics suffer from perceptual deficits. They are usually unable to fully distinguish place of articulation and voicing. As for other features, the difficulties vary. It has not yet been proven whether low-level speech-perception skills are affected in aphasia sufferers or whether their difficulties are caused by higher-level impairment alone.
- *Listeners with cochlear implants.* Cochlear implantation allows partial restoration of hearing in deaf people. The acoustic information conveyed by an implant is usually sufficient for implant users to properly recognize speech of people they know even without visual clues. For cochlear implant users, it is more difficult to understand unknown speakers and sounds. The perceptual abilities of children that received an implant after the age of two are significantly better than of those who were implanted in adulthood. A number of factors have been shown to influence perceptual performance.

These are especially duration of deafness prior to implantation, age of onset of deafness, age at implantation (such age affects may be related to the Critical period hypothesis) and the duration of using an implant. There are differences between children with congenital and acquired deafness. Postlingually deaf children have better results than the prelingually deaf and adapt to a cochlear implant faster.

Noise

One of the basic problems in the study of speech is how to deal with the noise in the speech signal. This is shown by the difficulty that computer speech recognition systems have with recognizing human speech. These programs can do well at recognizing speech when they have been trained on a specific speaker's voice, and under quiet conditions. However, these systems often do poorly in more realistic listening situations where humans are able to understand speech without difficulty.

Music-Language Connection

Research into the relationship between music and its cognitive affects on the brain is an emerging field related to the study of speech perception. Originally it was theorized that the neural signals for music were processed in a specialized "module" in the right hemisphere of the brain. Conversely, the neural signals for language were to be processed by a similar "module" in the left hemisphere. However, utilizing technologies such as fMRI machines, research has shown that two regions of the brain traditionally considered exclusively to process speech, Broca's and Wernicke's areas) also become active during musical activities such as listening to a sequence of musical chords. Other studies, such as one performed by Marques et al. in

2006 showed that 8-year old's that were given six months of musical training showed a positive increase in both their pitch detection performance as well as in there electrophysiological measures when made to listen to an unknown foreign language

Conversely, some research has revealed that, rather than music affecting our perception of speech, our native speech can affect our perception of music. One example is the tritone paradox. The tritone paradox is where a listener is presented with two computer-generated tones (such as C and C-Sharp) that are half an octave (or a tritone) apart and are then asked to determine whether the pitch of the sequence is descending or ascending. One such study, performed by Ms. Diana Deutsch, found that the listeners interpretation of ascending or descending pitch was influenced by the listeners language or dialect, showing variation between those raised in the south of England and those in California or from those in Vietnam and those in California whose native language was English. A second study, performed in 2006 on a group of English speakers and 3 groups of East Asian students at University of Southern California, discovered that English speakers who had begun musical training at or before age 5 had a 8% chance of having perfect pitch. For the East Asian students that were fluent in their native tone language, 92 percent of the students had perfect pitch.

Research Methods

The methods used in speech perception research can be roughly divided into three groups: behavioral, computational, and, more recently, neurophysiological methods. Behavioral experiments are based on an active role of a participant, i.e. subjects are presented with stimuli and asked to make conscious decisions about them. This

can take the form of an identification test, a discrimination test, similarity rating, etc. These types of experiments help to provide a basic description of how listeners perceive and categorize speech sounds.

Computational modeling has also been used to simulate how speech may be processed by the brain to produce behaviors that are observed. Computer models have been used to address several questions in speech perception, including how the sound signal itself is processed to extract the acoustic cues used in speech, as well as how speech information is used for higher-level processes, such as word recognition.

Neurophysiological methods rely on utilizing information stemming from more direct and not necessarily conscious (pre-attentative) processes. Subjects are presented with speech stimuli in different types of tasks and the responses of the brain are measured. The brain itself can be more sensitive than it appears to be through behavioral responses. For example, the subject may not show sensitivity to the difference between two speech sounds in a discrimination test, but brain responses may reveal sensitivity to these differences. Methods used to measure neural responses to speech include event-related potentials, magnetoencephalography, and near infrared spectroscopy. One important response used with event-related potentials is the mismatch negativity, which occurs when speech stimuli are acoustically different from a stimulus that the subject heard previously.

Neurophysiological methods were introduced into speech perception research for several reasons:

> *Behavioral responses may reflect late, conscious processes and be affected by other systems such as orthography, and thus they may mask speker's ability to recognize sounds based on lower-level acoustic distributions.*

Without the necessity of taking an active part in the test, even infants can be tested; this feature is crucial in research into acquisition processes. The possibility to observe low-level auditory processes independently from the higher-level ones makes it possible to address long-standing theoretical issues such as whether or not humans possess a specialized module for perceiving speech or whether or not some complex acoustic invariance (see lack of invariance above) underlies the recognition of a speech sound.

Theories

Research into speech perception (SP) has by no means explained every aspect of the processes involved. A lot of what has been said about SP is a matter of theory. Several theories have been devised to develop some of the above mentioned and other unclear issues. Not all of them give satisfactory explanations of all problems, however the research they inspired has yielded a lot of useful data.

Motor Theory

Some of the earliest work in the study of how humans perceive speech sounds was conducted by Alvin Liberman and his colleagues at Haskins Laboratories. Using a speech synthesizer, they constructed speech sounds that varied in place of articulation along a continuum from /bQ/ to /dQ/ to /aQ/. Listeners were asked to identify which sound they heard and to discriminate between two different sounds. The results of the experiment showed that listeners grouped sounds into discrete categories, even though the sounds they were hearing were varying continuously. Based on these results, they proposed the notion of categorical perception as a mechanism by which humans are able to identify speech sounds.

More recent research using different tasks and methodologies suggests that listeners are highly sensitive

to acoustic differences within a single phonetic category, contrary to a strict categorical account of speech perception.

In order to provide a theoretical account of the categorical perception data, Liberman and colleagues worked out the motor theory of speech perception, where "the complicated articulatory encoding was assumed to be decoded in the perception of speech by the same processes that are involved in production" (this is referred to as analysis-by-synthesis). For instance, the English consonant /d/ may vary in its acoustic details across different phonetic contexts (see above), yet all /d/'s as perceived by a listener fall within one category (voiced alveolar stop) and that is because "lingustic [*sic?*] representations are abstract, canonical, phonetic segments or the gestures that underlie these segments." When describing units of perception, Liberman later abandoned articulatory movements and proceeded to the neural commands to the articulators and even later to intended articulatory gestures, thus "the neural representation of the utterance that determines the speaker's production is the distal object the lister perceives". The theory is closely related to the modularity hypothesis, which proposes the existence of a special-purpose module, which is supposed to be innate and probably human-specific.

The theory has been criticized in terms of not being able to "provide an account of just how acoustic signals are translated into intended gestures" by listeners. Furthermore, it is unclear how indexical information (e.g. talker-identity) is encoded/decoded along with liguistically-relevant information.

Direct Realist Theory

The direct realist theory of speech perception (mostly associated with Carol Fowler) is a part of the more general theory of direct realism, which postulates that perception

allows us to have direct awareness of the world because it involves direct recovery of the distal source of the event that is perceived. For speech perception, the theory asserts that the objects of perception are actual vocal tract movements, or gestures, and not abstract phonemes or (as in the Motor Theory) events that are causally antecedent to these movements, i.e. intended gestures. Listeners perceive gestures not by means of a specialized decoder (as in the Motor Theory) but because information in the acoustic signal specifies the gestures that form it. By claiming that the actual articulatory gestures that produce different speech sounds are themselves the units of speech perception, the theory bypasses the problem of lack of invariance.

Fuzzy-Logical Model

The fuzzy logical theory of speech perception developed by Dominic Massaro proposes that people remember speech sounds in a probabilistic, or graded, way. It suggests that people remember descriptions of the perceptual units of language, called prototypes. Within each prototype various features may combine. However, features are not just binary (true or false), there is a fuzzy value corresponding to how likely it is that a sound belongs to a particular speech category. Thus, when perceiving a speech signal our decision about what we actually hear is based on the relative goodness of the match between the stimulus information and values of particular prototypes. The final decision is based on multiple features or sources of information, even visual information (this explains the McGurk effect). Computer models of the fuzzy logical theory have been used to demonstrate that the theory's predictions of how speech sounds are categorized correspond to the behavior of human listeners.

Acoustic Landmarks and Distinctive Features

In addition to the proposals of Motor Theory and Direct

Realism about the relation between phonological features and articulatory gestures, Kenneth N. Stevens proposed another kind of relation: between phonological features and auditory properties. According to this view, listeners are inspecting the incoming signal for the so-called acoustic landmarks which are particular events in the spectrum carrying information about gestures which produced them. Since these gestures are limited by the capacities of humans' articulators and listeners are sensitive to their auditory correlates, the lack of invariance simply does not exist in this model. The acoustic properties of the landmarks constitute the basis for establishing the distinctive features. Bundles of them uniquely specify phonetic segments (phonemes, syllables, words).

Exemplar Theory

Exemplar models of speech perception differ from the four theories mentioned above which suppose that there is no connection between word- and talker-recognition and that the variation across talkers is "noise" to be filtered out.

The exemplar-based approaches claim listeners store information for word- as well as talker-recognition. According to this theory, particular instances of speech sounds are stored in the memory of a listener. In the process of speech perception, the remembered instances of e.g. a syllable stored in the listener's memory are compared with the incoming stimulus so that the stimulus can be categorized. Similarly, when recognizing a talker, all the memory traces of utterances produced by that talker are activated and the talker's identity is determined. Supporting this theory are several experiments reported by Johnson that suggest that our signal identification is more accurate when we are familiar with the talker or when we have visual representation of the talker's gender. When the talker is

unpredictable or the sex misidentified, the error rate in word-identification is much higher.

The exemplar models have to face several objections, two of which are (1) insufficient memory capacity to store every utterance ever heard and, concerning the ability to produce what was heard, (2) whether also the talker's own articulatory gestures are stored or computed when producing utterances that would sound as the auditory memories.

MOTOR THEORY OF SPEECH PERCEPTION

The motor theory of speech perception is the hypothesis that people perceive spoken words by identifying the vocal tract gestures with which they are pronounced rather than by identifying the sound patterns that speech generates. It originally claimed that speech perception is done through a specialized module that is innate and human-specific. Though the idea of a module has been qualified in more recent versions of the theory, the idea remains that the role of the speech motor system is not only to produce speech articulations but also to detect them.

The hypothesis has gained more interest outside the field of speech perception than inside. This has increased particularly since the discovery of mirror neurons that link the production and perception of motor movements, including those made by the vocal tract. An alternative interpretation of research linking speech perception to speech production, however, is that it links to speech imitation rather than speech perception.

The theory was initially proposed in the Haskins Laboratories in the 1950s by Alvin Liberman and Franklin S. Cooper, and developed further by Donald Shankweiler, Michael Studdert-Kennedy, Ignatius Mattingly, Carol Fowler and Douglas Whalen.

Origins and Development

The hypothesis has its origins in research using pattern playback to create reading machines for the blind that would substitute sounds for orthographic letters. This led to a close examination of how spoken sounds correspond to the acoustic spectrogram of them as a sequence of auditory sounds. This found that successive consonants and vowels overlap in time with one another (a phenomenon known as coarticulation). This suggested that speech is not heard like an acoustic "alphabet" or "cipher," but as a "code" of overlapping speech gestures.

Associationist Approach

Initially, the theory was associationist: infants mimic the speech they hear and that this leads to behavioristic associations between articulation and its sensory consequences. Later, this overt mimicry would be short-circuited and become speech perception. This aspect of the theory was dropped, however, with the discovery that prelinguistic infants could already detect most of the phonetic contrasts used to separate different speech sounds.

Cognitivist Approach

The behavioristic approach was replaced by a cognitivist one in which there was a speech module. The module detected speech in terms of hidden distal objects rather than at the proximal or immediate level of their input. The evidence for this was the research finding that speech processing was special such as duplex perception.

Changing Distal Objects

Initially, speech perception was assumed to link to speech objects that were both

- the invariant movements of speech articulators
- the invariant motor commands sent to muscles to move the vocal tract articulators

This was later revised to include the phonetic gestures rather than motor commands, and then the gestures intended by the speaker at a prevocal, linguistic level, rather than actual movements.

Modern Revision

The "speech is special" claim has been dropped, as it was found that speech perception could occur for nonspeech sounds (for example, slamming doors for duplex perception).

Mirror Neurons

The discovery of mirror neurons has led to renewed interest in the motor theory of speech perception, and the theory still has its advocates, although there are also critics.

Support

Nonauditory Gesture Information

If speech is identified in terms of how it is physically made, then nonauditory information should be incorporated into speech percepts even if it is still subjectively heard as "sounds". This is, in fact, the case.

- The McGurk effect shows that seeing the production of a spoken syllable that differs from one an auditory one synchronized with it affects the perception of the auditory one. In other words, if someone hears "ba" but sees a video of someone pronouncing "ga", what they hear is different—some people believe they hear "da".
- People find it easier to hear speech in noise if they can see the speaker.
- People can hear syllables better when their production can be felt haptically.

Categorical Perception

Using a speech synthesizer, speech sounds can be varied

in place of articulation along a continuum from /bQ/ to /dQ/ to /aQ/, or in voice onset time on a continuum from /dQ/ to /tQ/ (for example). When listeners to discriminate between two different sounds, they perceive sounds as belonging to discrete categories, even though the sounds vary continuously.

In other words, 10 sounds (with the sound on one extreme being /dQ/ and the sound on the other extreme being /tQ/, and the ones in the middle varying on a scale) may all be acoustically different from one another, but the listener will hear all of them as either /dQ/ or /tQ/. Likewise, the English consonant /d/ may vary in its acoustic details across different phonetic contexts (the /d/ in /du/ does not technically sound the same as the one in /di/, for example), but all /d/'s as perceived by a listener fall within one category (voiced alveolar stop) and that is because "linguistic representations are abstract, canonical, phonetic segments or the gestures that underlie these segments."

This suggests that humans identify speech using categorical perception, and thus that a specialized module, such as that proposed by the motor theory of speech perception, may be on the right track.

Speech Imitation

If people can hear the gestures in speech, then the imitation of speech should be very fast, as in when words are repeated that are heard in headphones as in speech shadowing.

People can repeat heard syllables more quickly than they would be able to produce them normally.

Speech Production

- Hearing speech actives vocal tract muscles, and the motor cortex and premotor cortex. The

integration of auditory and visual input in speech perception also involves such areas.

- Disrupting the premotor cortex disrupts the perception of speech units such as stop consonants.
- The activation of the motor areas occurs in terms of the phonemic features which link with the vocal track articulators that create speech gestures.
- The perception of a speech sound is aided by pre-emptively stimulating the motor representation of the articulators responsible for its pronunciation.

Perception-Action Meshing

Evidence exists that perception and production are generally coupled in the motor system. This is supported by the existence of mirror neurons that are activated both by seeing (or hearing) an action and when that action is carried out.

Another source of evidence is that for common coding theory between the representations used for perception and action.

Criticisms

The motor theory of speech perception is not widely held in the field of speech perception, though it is more popular in other fields, such as theoretical linguistics.

As three of its advocates have noted, "it has few proponents within the field of speech perception, and many authors cite it primarily to offer critical commentary". Several critiques of it exist.

Multiple Sources

Speech perception is affected by nonproduction sources of information, such as context. Individual words are hard to understand in isolation but easy when heard in sentence

context. It therefore seems that speech perception uses multiple sources that are integrated together in an optimal way.

Production

The motor theory of speech perception would predict that speech motor abilities in infants predict their speech perception abilities, but in actuality it is the other way around.

It would also predict that defects in speech production would impair speech perception, but they do not. However, this only affects the first and already superseded behaviorist version of the theory, where infants were supposed to learn *all* production-perception patterns by imitation early in childhood.

This is no longer the mainstream view of motor-speech theorists.

Speech Module

Several sources of evidence for a specialized speech module have failed to be supported.

- Duplex perception can be observed with door slams.
- The McGurk effect can also be achieved with nonlinguistic stimuli, such as showing someone a video of a basketball bouncing but playing the sound of a ping-pong ball bouncing.
- As for categorical perception, listeners can be sensitive to acoustic differences within single phonetic categories.

As a result, this part of the theory has been dropped by some researchers.

Sublexical Tasks

The evidence provided for the motor theory of speech perception is limited to tasks such as syllable discrimination that use speech units not full spoken words or spoken sentences. As a result, "speech perception is sometimes interpreted as referring to the perception of speech at the sublexical level.

However, the ultimate goal of these studies is presumably to understand the neural processes supporting the ability to process speech sounds under ecologically valid conditions, that is, situations in which successful speech sound processing ultimately leads to contact with the mental lexicon and auditory comprehension."

This however creates the problem of " a tenuous connection to their implicitt target of investigation, speech recognition".

Imitation

The motor theory of speech perception faces the problem that the research linking speech perception to speech production is also consistent with the brain processing speech to imitate spoken words.

The brain must have a means to do this if language is to exist, since a child's vocabulary expansion requires a means to learn novel spoken words, as does an adult's picking up of new names.

Imitation has to be initiated for all vocalizations since a word's novelty cannot be known until after it is heard, and so after when the information needed to identify its articulation gestures and motor goals has gone.

As result vocal imitation needs to be initiated by default into short term memory for every heard spoken vocalizations. If speech perception uses multiple sources of information,

this default imitation processing would provide as a secondary use an extra source for word perception. Since imitation will be most needed for vocalizations that are not proper words, this could explain why sublexical tasks that do not use proper words so strongly link to processing of motor gestures.

Birds

It has been suggested that birds also hear each others' bird song in terms of vocal gestures.

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3

International Phonetic Alphabet, Association and Transcription: Select Case Study

INTERNATIONAL PHONETIC ALPHABET

The International Phonetic Alphabet (IPA) 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 spoken language. The IPA is used by foreign language students and teachers, linguists, speech pathologists and therapists, singers, actors, lexicographers, artificial language enthusiasts (conlangers), and translators.

The IPA is designed to represent only those qualities of speech that are distinctive in spoken language: phonemes, intonation, and the separation of words and syllables. 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,

[t:°], depending on how precise one wishes to be. Occasionally letters or diacritics are added, removed, or modified by the International Phonetic Association. As of 2008, there are 107 letters, 52 diacritics, and four prosodic marks in the IPA.

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*). 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. For example, the sound [*ʃ*] (the *sh* in *shoe*) was originally represented with the letter (c) in English, but with the letter (x) in French. However, in 1888, the alphabet was revised so as to be uniform across languages, thus providing the base for all future revisions.

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. The alphabet was last revised in May 2005, with the addition of a letter for a labiodental flap. 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 of the alphabet are relatively recent; "Extensions to the IPA" was created in 1990 and officially adopted by the International Clinical Phonetics and Linguistics Association in 1994.

Description

The general principle of the IPA is to provide one letter for each distinctive sound (speech segment). This means that it does not use combinations of letters to represent single sounds, the way English does with (sh) and (ng), or single letters to represent multiple sounds the way (x) represents /ks/ or /az/ in English. There are no letters that have context-dependent sound values, as (c) does in English and other European languages, and 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".

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.

Letterforms

The letters chosen for the IPA are meant to harmonize with the Latin alphabet. For this reason, most letters are either Latin or Greek, or modifications thereof. However, there are letters that 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. In fact, there are a few letters, such as that of the voiced pharyngeal fricative, (ʕ), which, though modified to fit the Latin alphabet, were inspired by other writing systems (in this case.

Despite its preference for harmonizing with the Latin alphabet, the International Phonetic Association has occasionally admitted letters that do not have this property. For example, before 1989, the IPA letters for click consonants were (ʘ), (ǀ), (ǁ), and (ǃ), all of which were derived either from existing IPA letters, or from Latin and Greek

letters. However, except for (U), none of these letters was widely used among Khoisanists or Bantuists, and as a result they were replaced by the more widespread symbols (U), (A), (A), (A), and (A) at the IPA Kiel Convention in 1989. 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 (VU ,U sU), and implosion by a top hook, (SU WU 'U), but other pseudo-featural elements are due to haphazard derivation and coincidence. For example, all nasal consonants but uvular (tU) are based on the form (n): (m qU n rU sU K). However, the similarity between (m) and (n) is a historical accident, (rU) and (K) are derived from ligatures of *gn* and *ng,* and (qU) is an *ad hoc* imitation of (K). In none of these is the form consistent with other letters that share these places of articulation.

Some of the new letters were ordinary Roman letters typeset "turned" (= upside-down) (e.g. ZU yU " YU eU TU), which was easily done before mechanical typesetting machines came into use.

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) (aU), (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 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 derived or taken from the Greek alphabet, though the sound values may differ. For example, ((U) is a vowel in Greek, but an only indirectly related consonant in the IPA. Three of these ((a), (è) and (÷)) are used unmodified in form; for others (including (cU), ([U), (xU), and ((U)) subtly different glyph shapes have been devised, which may be encoded in Unicode separately from their "parent" letters.

The sound values of modified Latin letters can often be derived from those of the original letters. 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 /pjn/ and /spjn/, with the same /p/ phoneme. However, to capture the difference between them (the allophones of /p/), they can be transcribed phonetically as [p°jn] and [spjn].

Two 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 this convention may not be considered sufficiently clear for individual letters and digraphs. The true angle brackets ⟨è'...é'⟩ (U+27E8, U+29E9) 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).

Usage

Although the IPA offers over a 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, and this broad (imprecise) transcription is an accurate (approximately correct) description of many pronunciations.

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, piDk/ or /pjk, 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.

Linguists

Although IPA is popular for transcription by linguists, it is also common to use Americanist phonetic notation or 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), mainland China, and in Taiwan textbooks for children and adults for studying English and French consistently use the IPA.

Dictionaries

English

Many British dictionaries, among which are 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.

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, 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 *grasshopper*.)

Other Languages

The IPA is also not universal among dictionaries in languages other than English. Monolingual dictionaries of languages with generally phonemic orthographies generally don't 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 alphabet for transcription of foreign words. Monolingual Hebrew dictionaries use pronunciation respelling for words with unusual spelling

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 íýì in brackets for the French word ïåíñíå (pince-nez) to indicate that the å doesn't iotate the í.

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.

Standard Orthographies and Capital Variants

IPA letters have been incorporated into the standard orthographies of various languages, notably in Sub-Saharan Africa but in other regions as well, for example: Hausa, Fula, Akan, Gbe languages, Manding languages, and Lingala.

The above-mentioned and other capital forms are supported by Unicode, but appear in Latin ranges other than the IPA extensions.

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 and Timothy Cheek's book *Singing in Czech*.

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."

Letters

The International Phonetic Alphabet organizes its letter symbols into three categories: pulmonic consonants, non-pulmonic consonants, and vowels. Each character is assigned a number, to prevent confusion between similar letters (such as uU and è), for example in printing manuscripts. Different categories of sounds are assigned different ranges of numbers.

Pulmonic Consonants

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.

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.

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.

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 taU for tas, paralleling kaU ~ kax. The letters for the palatal plosives c and _U, are often used as a convenience for ta*ʃ*U and da' or similar affricates, even in official IPA publications, so they must be interpreted with care. On browsers that use *Arial Unicode MS* to display IPA characters, the following incorrectly formed sequences may look better due to a bug.

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) and ejectives (found in many Amerindian and Caucasian languages).

- 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. When the dorsal articulation is omitted, a [k] may usually be assumed. However, recent research disputes the concept of 'accompaniment'. In these approaches, the click letter represents both articulations, there is no velar-uvular distinction, and the accompanying letter represents the manner.
- Letters for the voiceless implosives are no longer supported by the IPA, though they remain in Unicode. Instead, the IPA typically uses the voiced equivalent with a voiceless diacritic.
- 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.
- The ejective diacritic often stands in for a superscript glottal stop in glottalized but pulmonic sonorants.

Vowels

The IPA defines a vowel as a sound which occurs at a syllable center. 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, [Q] (said as the "a" in "palm") is at the bottom because the tongue is lowered in this position.

However, [i] (said as 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 [[], the vowel in "met") are to the left in the chart, while those in which it is moved to the back (such as [Œ], the vowel in "but") are placed to the right in the chart.

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.

- (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.

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. Sub-diacritics (markings normally placed below a letter) may be placed above a letter having a descender (informally called a tail), e.g. K, 7.

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.

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.

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. 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 T and falling T for the higher-pitched of the rising and falling tonesand to use the non-standard subscript diacritics T and T for the lower-pitched rising and falling tones.

When a language has four level tones, the two mid tones are sometimes transcribed as high-mid T (non-standard) and low-mid T.

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 (w) which has been standardised to (S). Several letters indicating secondary articulation have been dropped altogether, with the idea that such things should be indicated with diacritics. In addition, the rare voiceless implosive series has been dropped; they are now written. A rejected competing proposal for transcribing clicks, is still sometimes

seen, as the official letters may cause problems with legibility, especially when used with brackets.

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".

IPA Extensions

Extensions to the IPA, also often abbreviated as extIPA, is a group of 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 set of symbols for the Extended IPA. Extensions to the IPA were first published in 1990, and modified over the next few years before its official publication in the *Journal of the International Phonetic Association* in 1994 allowed it to be officially adopted by the ICPLA.

While its original purpose was to transcribe disordered speech, linguists have used it to designate a number of unique sounds within standard communication, such as hushing, gnashing teeth, and smacking lips. The Extensions to the IPA have also been used to record certain peculiarities in an individual's voice, such as nasalized voicing.

Aside from the extIPA, another set of symbols is 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 example for the retroflex lateral flap and the voiceless lateral fricative series, the epiglottal trill, and the labiodental plosives. Diacritics can supply much of the remainder, which would indeed be appropriate if the sounds were allophones.

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, [a] and [D] respectively. Similarly, voiced lateral fricatives would be written as raised lateral approximants. 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.

Similarly, a labiodental trill would be written (bilabial trill and the dental sign), and labiodental stops [p* b*] rather than with the *ad hoc* letters sometimes found in the literature. Other taps can be written as extra-short plosives or laterals, though in some cases the diacritic would need to be written below the letter. A retroflex trill can be written as a retracted, just as retroflex fricatives sometimes are. The remaining consonants, the uvular laterals 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. For example, the unrounded equivalent of [S] can be transcribed as mid-centered [o=], and the rounded equivalent of [æ] as raised [v"]. True mid vowels are lowered, while centered [j S] and [a] 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.

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.

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 ["epsilon", but Unicode calls it "small letter open E".

The traditional names of the Latin and Greek letters are usually used for unmodified letters. Letters which are not directly derived from these alphabets, 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.

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. 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, 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.

INTERNATIONAL PHONETIC ASSOCIATION

The International Phonetic Association (IPA) is an organization that promotes the scientific study of phonetics and the various practical applications of that science. The IPA's major contribution to phonetics is the International Phonetic Alphabet—a notational standard for the phonetic representation of all languages. The acronym IPA is used to refer to both the association and the alphabet.

The IPA also publishes the *Journal of the International Phonetic Association*.

Early History

In 1886, in Paris, a small group of language teachers formed an association to encourage the use of phonetic notation in schools to help children acquire realistic pronuonciations of foreign languages and also to aid in teaching reading to young children. The group, led by Paul Passy, called itself initially *Dhi Fonètik Tîcerz' Asóciécon* (the *FTA*). In January 1889, the name of the Association was changed to *L'Association Phonétique des Professeurs de Langues Vivantes (AP),* and, in 1897, to *L'Association Phonétique Internationale (API)*—in English, the *International Phonetic Association (IPA)*. The IPA's early peak of membership and influence in education circles was around 1914, when there were 1751 members in 40 countries.

World War I and its aftermath severely disrupted the Association's activities, and the Journal did not resume regular publication until 1922.

Development of the Alphabet

The group's initial aim was to create a set of phonetic symbols to which different articulations could apply, such that each language would have an alphabet particularly suited to describe the sounds of the language. Eventually it was decided that a universal alphabet, with the same symbol being used for the same sound in different languages was the ideal, and development of the International Phonetic Alphabet progressed rapidly up to the turn of the 20th century. Since then, there have been several sets of changes to the Alphabet, with additions and deletions that the progress of the science of phonetics has indicated.

Examinations

The IPA also has given examinations in phonetics since 1908, awarding Certificates of Proficiency in the phonetics of English, French, or German.

UNITED STATES DICTIONARY TRANSCRIPTION

This phonetic notation is a generic US dictionary-style respelling system, similar to those used by *American Heritage, Merriam Webster,* and *Random House* dictionaries. Such systems were once used in other anglophone countries, before being abandoned for the International Phonetic Alphabet (IPA), and are still more familiar to people educated in the United States than the IPA is.

This transcription covers most dialects of English, but not the *fur-fir-fern* distinction of Scottish English, nor the *bad-lad split* of Australian English. It has been designed only for English and is not adequate for other languages.

The following tables show the transcriptions of English phonemes, along with the IPA equivalents as used on Wikipedia.

Key

Not all dialects distinguish all of the sounds found in English. The guide below gives key words for each phoneme; however you pronounce the letters in bold is how you should pronounce that symbol in your dialect.

For example, many US speakers conflate the vowels *a, o,* and *O*. If you do this, just pronounce them as if they were all *a*.

This could be remedied by replacing *ûr* with *ur* for *fur, furry,* and *curd,* with *ir* for *fir, stirring,* and *bird,* and with *er* for *her* and *fern.* However, this distinction is not supported by many dictionaries, and so would be difficult to maintain.

When using the IPA for English, Wikipedia transcribes long vowels and diphthongs differently before /r/ than elsewhere. In many dialects, when *O* and *ô* are not followed by *r,* they are pronounced like *a*. This does not need to be transcribed separately, as it is automatic.

The vowels *ôô* and *OO* are not distinguished before *r,* so the diacritic can be omitted. In many dialects, *tune* is pronounced *tôôn.* This does not need to be transcribed separately, as it is automatic.

Many dictionaries mark the syllable *nun* with secondary stress. However, the difference is in prosody, not part of the word, and disappears when the word is embedded in a longer utterance.

Some dictionaries mark the syllable *ship* for secondary stress. This is not necessary, and here would be confused with true stress.

PHONETIC TRANSCRIPTION

Phonetic transcription (or phonetic notation) is the visual representation of speech sounds (or 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 and English, 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. In French, for example, the 's' at the end of words 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, and French. However, in other languages, such as Spanish and Italian, 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 sounds, unlike the traditional Roman alphabet. 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.

History

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 /ÈljtYl/ or [Èljtk)]; 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/ ([k]) is dark (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 tap [~]. Many people in 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 which 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.

Alphabetic

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. (See Wikipedia:United States dictionary transcription for a generic version.)

Another commonly encountered alphabetic tradition is the Americanist phonetic alphabet, originally created

for the transcription of Native American and European languages. There exist somewhat similar traditions used by linguists of Indic, Uralic, Caucasian, and Slavic languages.

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).

There are also extended versions of the IPA, for example: extIPA, VoQs, and Luciano Canepari's *IPA*.

Other Transcription Systems

The IPA is not the only phonetic transcription system in use. The other common Latin-based system is the Americanist phonetic notation, devised for representing American languages, but used by some US linguists as an alternative to the IPA.

There are also sets of symbols specific to Slavic, Indic, Uralic, and Caucasian linguistics, as well as other regional specialties. The differences between these alphabets and IPA are relatively small, although often the special characters of the IPA are abandoned in favour of diacritics or digraphs.

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 phonetic transcription should be enclosed in square brackets "[ ]".

A transcription that specifically denotes only phonological contrasts may be enclosed in 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 phonemically 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 [aj] when "long". So phonemic /nixt/ is equivalent to phonetic [najt], 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.)

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 which notes several phonetic features that may not be evident even to a native speaker.

An example of a broad transcription, which only indicates some of the easier to hear features. A yet broader transcription.. 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. 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 /ta*ʃ*]Dta*ʃ*/, 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 /crc/.

Occasionally a transcription will be enclosed in pipes. This goes beyond phonology into morphological analysis. 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 angle 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.

Iconic

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.

IPA FOR ENGLISH

The pronunciation of English words in Wikipedia is given in the International Phonetic Alphabet (IPA) using the following transcription, which is not specific to any one dialect. To compare these symbols with non-IPA American dictionary conventions you may be more familiar with, see pronunciation respelling for English, which lists the pronunciation guides of fourteen English dictionaries published in the United States. If you feel it is necessary to add a pronunciation respelling, please use the conventions of Wikipedia's pronunciation respelling key.

To compare these symbols with dictionary IPA conventions you may be more familiar with, see Help:IPA conventions for English, which lists the conventions of eight English dictionaries published in Britain, Australia, and the United States.

For a more complete key to the IPA, see Wikipedia:IPA, which includes sounds that do not occur in English. If the

IPA symbols do not display properly on your browser, see the links at the bottom of this page.

Understanding the Key

This key accommodates standard General American, Received Pronunciation, Canadian English, South African English, Australian English, and New Zealand English pronunciations. Therefore, not all of the distinctions shown here will be relevant to your dialect.

In many dialects /r/ occurs only before a vowel; if you speak such a dialect, simply ignore /r/ in the pronunciation guides where you would not pronounce it, as in *cart*/. In other dialects, /j/ (a *y* sound) cannot occur after /t/, /d/, /n/ etc. in the same syllable; if you speak such a dialect, ignore the /j/ in transcriptions.

For most people from England, and for some New Yorkers, the /r/ in /ÈjTrk/ is not pronounced and can be ignored; for most people from the United States, including some New Yorkers, the /j/ in /njuD/ is not pronounced and can be ignored.On the other hand, there are some distinctions which you might make but which this key does not encode, as they are seldom reflected in the dictionaries used as sources for Wikipedia articles. Examples include the difference between the vowels of *fir*, *fur* and *fern* in Scottish and Irish English, the vowels of *bad* and *had* in many parts of Australia and the Eastern United States, and the vowels of *spider* and *spied her* in some parts of Scotland and North America.Other words may have different vowels depending on the speaker. *Bath,* for example, originally had the /æ/ vowel of *cat,* but for many speakers it now has the /QD/ vowel of *father.*

Such words are transcribed twice, once for each pronunciation. The IPA stress mark (È) comes *before* the syllable that has the stress, in contrast to stress marking

in pronunciation keys of some dictionaries published in the United States.

If the two characters (a) and () do not match and if the first looks like a (a), then you have an issue with your default font. See Rendering issues.

Although the IPA symbol [r] represents a trill, /r/ is widely used instead of /y/ in broad transcriptions of English. /hw/ is not distinguished from /w/ in dialects with the wine-whine merger, such as RP and most varieties of GenAm. A number of English words, such as *genre* and *garage*, are pronounced with either /ʼ/ or /dʼ/. In most dialects, /x/ is replaced by /k/ in *loch* and by /h/ in *Chanukah*.

In non-rhotic accents like RP, /r/ is not pronounced unless followed by a vowel. In some Wikipedia articles, /jYr/ *etc.* may not be distinguished from /jr/ *etc.* When they are distinguished, the long vowels are sometimes transcribed /iDr/ *etc.* by analogy with vowels not followed by /r/. These should be fixed to correspond.

Instead of [, many dictionaries use /e/ as a simplification, in other words without actually intending this sound,though in some dialects it can indeed approach [e].

Instead of [, many dictionaries use /e/ as a simplification, in other words without actually intending this sound. The GenAm pronunciation is [r. Instead of using [in RP [Yr and GenAm [r, many dictionaries use /e/ (eYr in RP and er in GenAm) as a simplification, in other words without actually intending this sound, /TD/ is not distinguished from /QD/ (except before /r/) in dialects with the cot-caught merger such as some varieties of GenAm.

Commonly transcribed /YS/ or /oD/. /TYr/ is not distinguished from /Tr/ in dialects with the horse-hoarse merger, which include most dialects of modern English. /

SYr/ is not distinguished from /Tr/ in dialects with the pour-poor merger, including many younger speakers. In dialects with yod-dropping, /juD/ is pronounced the same as /uD/ after coronal consonants (/t/, /d/, /s/, /z/, /n/, /è/, and /l/) in the same syllable, so that *dew* /djuD/ is pronounced the same as *do* /duD/. In dialects with yod-coalescence, /tj/ , /dj/, /sj/ and /zj/ are pronounced /tʃ/, /dʾ/, /ʃ/ and /ʾ/, so that the first syllable in *Tuesday* is pronounced the same as *choose*.

This phoneme is not used in the northern half of England, some bordering parts of Wales, and some broad eastern Ireland accents.

These words would take the S vowel: there is no foot-strut split. In some articles /\r/ is transcribed as /]D/, and /Yr/ as /Z/, when not followed by a vowel. Pronounced [Y] in Australian and many US dialects, and [j] in Received Pronunciation.

Many speakers freely alternate between a reduced [j] and a reduced [Y]. Many phoneticians (vd. Olive & Greenwood 1993:322) and the OED use the pseudo-IPA symbol ɟ, and Merriam–Webster uses Y.

Pronounced [Y] in many dialects, and [uw] or [Yw] before another vowel, as in *cooperate*. Sometimes pronounced as a full /oS/, especially in careful speech. (Bolinger 1989) Usually transcribed as /Y(S)/ (or similar ways of showing variation between /YS/ and /Y/) in British dictionaries.

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4

Pronunciation Respelling of English: Highlighting Non-Native Pronunciations and Foreign Accent Syndrome

PRONUNCIATION OF ENGLISH TH

In English, the digraph ⟨th⟩ represents in most cases one of two different phonemes: the voiced dental fricative /D/ (as in *this*) and the voiceless dental fricative /e/ (*thing*). More rarely, it can stand for /t/ (*Thailand*, *Thame* [place in Oxfordshire]) or the consonant cluster /t.h/ (*lighthouse*) or, in some dialects, even the cluster /tè/ (*eighth*).

Phonetic Realization

General Description

In standard English, both in Britain and the United States, the phonetic realization of the dental fricative phonemes shows less variation than for many other English consonants. Both are pronounced either interdentally, with the blade of the tongue resting against the lower part of the back of the upper teeth and the tip protruding slightly (though less prominently than for the corresponding sound in Spanish) or alternatively with the tip of the tongue against the back of the upper teeth. The interdental position

might also be described as "apico-" or "lamino-dental". These two positions may be free variants, but for some speakers they are complementary allophones, the position behind the teeth being used when the dental fricative stands in proximity to an alveolar fricative, as in *clothes* (/Dz/) or *myths* (/es/). Lip configuration may vary depending on phonetic context. The vocal folds are abducted. The velopharyngeal port is closed. Air forced between tongue surface and cutting edge of the upper teeth (interdental) or inside surface of the teeth (dental) creates audible frictional turbulence.

The difference between /è/ and /D/ is normally described as a voiceless-voiced contrast, as this is the aspect native speakers are most aware of. However, the two phonemes are also distinguished by other phonetic markers. There is a difference of energy (see: Fortis and lenis), the fortis /è/ being pronounced with more muscular tension than the lenis /D/. Also, /è/ is more strongly aspirated than /D/, as can be demonstrated by holding a hand a few centimeters in front of the mouth and noticing the differing force of the puff of air created by the articulatory process.

As with many English consonants, a process of assimilation can result in the substitution of other speech sounds in certain phonetic environments. Most surprising to native speakers, who do this subconsciously, is the use of [n] and [l] as realisations of /D/ in the following phrases:

join the army

fail the test

In rapid speech, *sixths* may be pronounced like *six*. *Them* may be contracted to *'em*, and in this case the contraction is often indicated in writing. (In fact, *'em* is originally a separate word, a remnant of Old English *hem*,

but as the apostrophe shows, it is perceived in modern English as a contraction.)

Realisation in Non-Standard Englishes

th-fronting

In some areas such as London, many people realise the phonemes /è/ and /D/ as [f] and [v] respectively. Although traditionally stigmatised as typical of a Cockney accent, this pronunciation is fairly widespread, and has recently been an increasingly noticeable feature of the Estuary English accent of South East England. It has in at least one case been transferred into standard English as a neologism: a *bovver boy* is a thug, a "boy" who likes "bother" (fights). Joe Brown and his Bruvvers was a Pop group of the 1960s. In the musical *Oliver* there is a song "Fings ain't what they used to be".

th-stopping

Many speakers of Hiberno-English use voiceless and voiced dental plosives /t*, d*/ (still usually distinct from alveolar /t, d/) instead of, or in free variation with, the fricatives /è, D/.

th-alveolarization

In African American Vernacular English, /D/ is often pronounced [d], especially in unstressed words (for example *the*, *them*, *with*).

th-debuccalization

In many varieties of Scottish English, /è/ becomes /h/ word initially and intervocalically.

Acquisition Problems

Children generally learn the less marked phonemes of their native language before the more marked ones. In the case of English-speaking children, /è/ and /D/ are often

among the last phonemes to be learned, frequently not being mastered before the age of five. Prior to this age, many children substitute the sounds [f] and [v] respectively. For small children, *fought* and *thought* are therefore homophones. As British and American children begin school at five, this means that many are learning to read and write before they have sorted out these sounds, and the infantile pronunciation is frequently reflected in their spelling errors: *ve fing* for *the thing*.

Children with a lisp, however, have trouble distinguishing /è/ and /D/ from /s/ and /z/ respectively, using a single [s*] or [z*] pronunciation for both, and may never master the correct sounds without speech therapy. This is by far the most common speech impediment in English.

Foreign learners may have parallel problems. In English popular culture the substitution of /z/ for /D/ is a common way of parodying a French accent, but in fact learners from very many cultural backgrounds have difficulties with English dental fricatives, usually caused by interference with either sibilants or stops. Words with a dental fricative adjacent to an alveolar sibilant, such as *clothes*, *truths*, *fifths*, *sixths*, *anesthetic*, etc., are commonly very difficult for foreign learners to pronounce.

A popular advertisement for Berlitz language school plays on the difficulties Germans may have with dental fricatives.

Phonology and Distribution

In modern English, /è/ and /D/ bear a phonemic relationship to each other, as is demonstrated by the presence of a small number of minimal pairs: *thigh:thy, ether:either, teeth:teethe*. They are distinguished from the neighbouring

labiodental fricatives, sibilants and alveolar stops by such minimal pairs as *thought:fought / sought / taught* and *then:Venn / Zen / den*.

The vast majority of words in English with (th) have /è/, and almost all newly created words do. However, the constant recurrence of the function words, particularly *the*, means that /D/ is nevertheless more frequent in actual use.

The distribution pattern may be summed up in the following rule of thumb which is valid in most cases: in initial position we use /è/ except in function words; in medial position we use /D/ except for foreign loan words; and in final position we use /è/ except in verbs. A more detailed explanation follows.

Initial Position

- Almost all words beginning with a dental fricative have /è/.
- A small number of common function words (the Middle English anomalies mentioned below) begin with /D/. The words in this group are:
- 5 demonstratives: *the, this, that, these, those*
- 2 personal pronouns each with four forms: *thou, thee, thy, thine; they, them, their, theirs*
- 7 adverbs and conjunctions: *there, then, than, thus, though, thence, thither* (though some speakers pronounce *thence* and *thither* with initial /è/)
- Various compound adverbs based on the above words: *therefore, thereupon, thereby, thereafter, thenceforth, etc.*
- But note also the few words with initial (th) for /t/ (e.g. *Thomas*): see below.

Medial Position

- Most native words with medial (th) have /D/.
- Between vowels: *heathen*, *earthen*, *fathom*; and the frequent combination -ther-: *bother, brother, dither, either, father, Heather, lather, mother, other, rather, slither, southern, together, weather, whether, wither*, *smithereens*; *Caruthers, Gaithersburg, Netherlands, Witherspoon*, and similar compound names where the first component ends in '-ther' or '-thers'. But *Rutherford* has either /D/ or /è/.
- Preceded by /r/: *Worthington*, *farthing*, *farther, further*, *northern*.
- Followed by /r/: *brethren*.
- A few native words have medial /è/:
- The adjective suffix -y normally leaves terminal /è/ unchanged: *earthy, healthy*, *pithy, stealthy, wealthy*; but *worthy* and *swarthy* have /D/.
- Compound words in which the first element ends or the second element begins with (th) frequently have /è/, as these elements would in isolation: *bathroom, Southampton; anything, everything, nothing, something*.
- The only other native words with medial /è/ would seem to be *brothel* and *Ethel*.
- Most loan words with medial (th) have /è/.
- From Greek: *Agatha, anthem, atheist, Athens, athlete, cathedral, Catherine, Cathy, enthusiasm, ether, ethics, ethnic, lethal, lithium, mathematics, method, methyl, mythical, panther, pathetic, sympathy*
- From Latin: *author, authority* (though in Latin these had /t/; see below). Also names borrowed from or via Latin: *Bertha, Gothic, Hathaway, Othello, Parthian*

- From Celtic languages: *Arthur* (Welsh has /è/ medially); *Abernathy, Abernethy*
- From Hebrew: *Ethan*, *Jonathan*, *Bethlehem*, *Bethany*, *leviathan*, *Bethel*
- From German: *Luther*, as an anglicized spelling-pronunciation (see below).
- Loanwords with medial /D/:
- Greek words with the combination -thm-: *algorithm, logarithm, rhythm*. Also *asthma*, though here the (th) is nowadays usually silent.
- Note also the few words with medial (th) for /t/ or /th/ (e.g. *lighthouse*).

Final Position

- Nouns and adjectives
- Nouns and adjectives ending in a dental fricative usually have /è/: *bath, breath, cloth, froth, health, hearth, loath, sheath, sooth, tooth/teeth, width, wreath*.
- Exceptions are usually marked in the spelling with (-the): *tithe, lathe, lithe* with /D/.
- *blythe, booth, scythe, smooth* have either /D/ or /è/ .
- Verbs
- Verbs ending in a dental fricative usually have /D/ , and are frequently spelled (-the): *bathe, breathe, clothe, loathe, scathe, scythe, seethe, sheathe, soothe, teethe, tithe, wreathe, writhe.* Spelled without (e): *mouth* (verb) nevertheless has /D/.
- *froth* has either /è/ or /D/ as a verb, but only /è/ as a noun.
- The verb endings -s, -ing, -ed do not change the pronunciation of a (th) in the final position in the stem: *bathe* has /D/, therefore so do *bathed, bathing,*

bathes; *frothing* with either /è/ or /D/. Likewise *clothing* used as a noun, *scathing* as an adjective etc.

- Others
- *with* has either /è/ or /D/ (see below), as do its compounds: *within*, *without*, *outwith*, *withdraw*, *withhold*, *withstand*, *wherewithal*, etc.

Plurals

- Plural (s) after (th) may be realised as either /Dz/ or /ès/:
- Some plural nouns ending in 'ths', with a preceding vowel, have /Dz/, although the singulars always have /è/; however a variant in /ès/ will be found for many of these: *baths, mouths, oaths, paths, sheaths, truths, wreaths, youths* exist in both varieties; *clothes* always has /Dz/ (if not pronounced like "close", the traditional pronunciation)
- Others have only /ès/: *azimuths, breaths, cloths, deaths, faiths, Goths, growths, mammoths, moths, myths, smiths, sloths, zeniths*, etc. This includes all words in 'th' preceded by a consonant (*earths*, *hearths*, *lengths*, *months*, *widths*, etc.) and all numeric words, whether preceded by vowel or consonant (*fourths, fifths, sixths, sevenths, eighths* /ejtès/, *twelfths, fifteenths, twentieths, hundredths* / hŒndrYdès/, *thousandths*).
- *Booth* has /D/ in the singular and hence /Dz/ in the plural for most speakers in England. In American English it has /è/ in the singular and /ès/ or /Dz/ in the plural. This pronunciation also prevails in Scotland.

Grammatical Alternation

In pairs of related words, an alternation between /è/

and /D/ is possible, which may be thought of as a kind of consonant mutation. Typically [è] appears in the singular of a noun, [D] in the plural and in the related verb: *cloth* /è/, *clothes* /D/, *to clothe* /D/. This is directly comparable to the /s/-/z/ or /f/-/v/ alternation in *house, houses* or *wolf, wolves*. It goes back to the allophonic variation in Old English (see below), where it was possible for (þ) to be in final position and thus voiceless in the basic form of a word, but in medial position and voiced in a related form. The loss of inflections then brought the voiced medial consonant to the end of the word. Often a remnant of the old inflection can be seen in the spelling in the form of a silent (e), which may be thought of synchronically as a marker of the voicing.

Regional Differences in Distribution

The above discussion follows Daniel Jones' English Pronouncing Dictionary, an authority on standard British English, and Webster's New World College Dictionary, an authority on American English. Usage appears much the same between the two. Regional variation within standard English includes the following:

- The final consonant in *with* is pronounced /è/ (its original pronunciation) in northern Britain, but /D/ in the south, though some speakers of Southern British English use /è/ before a voiceless consonant and /D/ before a voiced one. A 1993 postal poll of American English speakers showed that 84% use /è/, while 16% have /D/ (Shitara 1993). (The variant with /D/ is presumably a sandhi development.)
- In Scottish English, /è/ is found in many words which have /D/ further south. The phenomenon of nouns terminating in /è/ taking plurals in /Dz/ does not occur in the north. Thus the following have /ès/ : *baths*, *mouths* (noun), *truths*. Scottish English

does have the termination /Dz/ in verb forms, however, such as *bathes*, *mouths* (verb), *loathes*, and also in the noun *clothes*, which is a special case, as it has to be clearly distinguished from *cloths*. Scottish English also has /è/ in *with, booth, thence* etc., and the Scottish pronunciation of *thither*, almost uniquely, has both /è/ and /D/ in the same word. Where there is an American-British difference, the North of Britain generally agrees with America on this phoneme pair.

History of the English Phonemes

Germanic Origins

Proto-Indo-European (PIE) had no dental fricatives, but these evolved in the earliest stages of the Germanic languages. In West Germanic, the Proto-Germanic *D shifted further to *d, leaving only one dental fricative phoneme. However, a new [D] appeared as an allophone of /è/ in medial positions by assimilation of the voicing of the surrounding vowels remained in initial and presumably in final positions (though this is uncertain as later terminal devoicing would in any case have eliminated the evidence of final [D]).

This West Germanic phoneme, complete with its distribution of allophones, survived into Old English. In German and Dutch, it shifted to a /d/, the allophonic distinction simply being lost.

In German, West Germanic *d shifted to /t/ in what may be thought of as a chain shift, but in Dutch, *þ, *D and *d merged into a single /d/. For more on these phonemes from a comparative perspective, see Grammatischer Wechsel. For the developments in German and Dutch see High German consonant shift.

Old English

Thus English inherited a phoneme /è/ in positions where other West Germanic languages have /d/ and most other Indo-European languages have /t/: English *thou*, German *du*, Latin *tu*.

In Old English, the phoneme /è/, like all fricative phonemes in the language, had two allophones, one voiced and one voiceless, which were distributed regularly according to phonetic environment.

- [D] (like [v] and [z]) was used between two voiced sounds (either vowels or voiced consonants).
- [è] (like [f] and [s]) was spoken in initial and final position, and also medially if adjacent to another unvoiced consonant.

Development up to Modern English

The most important development on the way to modern English was the investing of the existing distinction between [D] and [è] with phonemic value. Minimal pairs, and hence the phonological independence of the two phones, developed as a result of three main processes.

- In early Middle English times, a group of very common function words beginning with /è/ (the, they, there, etc.) came to be pronounced with /D/ instead of /è/. Possibly this was a sandhi development; as these words are frequently found in unstressed positions they can sometimes appear to run on from the preceding word, which may have resulted in the dental fricative being treated as though it were word-internal.
- English has borrowed many words from Greek, including a vast number of scientific terms. Where

the original Greek had the letter (è) (theta), English retained the Late Greek pronunciation /è/, regardless of phonetic environment (*thermometer*, *methyl*, etc.).

- English has lost its original verb inflections. When the stem of a verb ends with a dental fricative, this was usually followed by a vowel in Old English, and was therefore voiced. It is still voiced in modern English, even though the verb inflection has disappeared leaving the /D/ at the end of the word. Examples are to bathe, to mouth, to breathe.

Other changes which affected these phonemes included a shift /d/ '! /D/ when followed by unstressed suffix -er. Thus Old English *fæder* became modern English *father*; likewise *mother, gather, hither, together, weather*. In a reverse process, Old English *burthen* and *murther* become *burden* and *murder*.

Dialectally, the alternation between /d/ and /D/ sometimes extends to other words, as *bladder, ladder, solder* with /D/. On the other hand some dialects retain original *d,* and extend it to other words, as *brother, further, rather*.

The Welsh name *Llewelyn* appears in older English texts as *Thlewelyn* (Rolls of Parliament (*Rotuli parliamentorum*) I. 463/1, King Edward I or II), and *Fluellen* (Shakespeare, *Henry V*).

Th also occurs dialectally for *wh,* as in *thirl, thortleberry, thorl,* for *whirl, whortleberry, whorl*. Conversely, Scots has *whaing, whang, white, whittle,* for *thwaing, thwang, thwite, thwittle*.

The old verb inflection *-eth* (Old English *-eþ*) was replaced by *-s* (*he singeth '! he sings*), not a sound shift but a completely new inflection, the origin of which is still being

debated. Possibilities include a "de-lisping" (since *s* is easier to pronounce there than *th*), or displacement by a nonstandard English dialect.

History of the Digraph

(th) for /è/ and /D/

Though English speakers take it for granted, the digraph (th) is in fact not an obvious combination for a dental fricative. The origins of this have to do with developments in Greek.

Proto-Indo-European had an aspirated which came into Greek as /t°/, spelled with the letter theta. In the Greek of Homer and Plato this was still pronounced /t/, and therefore when Greek words were borrowed into Latin theta was transcribed with (th). Since /t/ sounds like /t/ with a following puff of air, (th) was the logical spelling in the Latin alphabet.

By the time of New Testament Greek (koiné), however, the aspirated stop had shifted to a fricative: /t°/'!/è/. Thus theta came to have the sound which it still has in Modern Greek, and which it represents in the IPA. From a Latin perspective, the established digraph (th) now represented the voiceless fricative /è/, and was used thus for English by French-speaking scribes after the Norman Conquest, since they were unfamiliar with the Germanic graphemes D (eth) and þ (thorn). Likewise, the spelling (th) was used for /è/ in Old High German prior to the completion of the High German consonant shift, again by analogy with the way Latin represented the Greek sound.

The history of the digraphs (ph) for /f/ and (ch) for Scots or German /x/ is parallel.

(th) for /t/

Since neither /t°/ nor /è/ was a native sound in Latin, the tendency must have emerged early, and at the latest

by medieval Latin, to substitute /t/. Thus in many modern languages, including French and German, the (th) digraph is used in Greek loan-words to represent an original /è/, but is now pronounced /t/: examples are French *théatre*, German *Theater*. In some cases, this etymological (th), which has no remaining significance for pronunciation, has been transferred to words in which there is no etymological justification for it. For example German *Tal* ('valley', cognate with English *dale*) appears in many place-names with an archaic spelling *Thal* (see Neanderthal). The German family names *Theuerkauf* and *Thürnagel* are other examples. The German spelling reform of 1901 largely reversed these, but they remain in some proper nouns.

Examples of this are also to be found in English, perhaps influenced immediately by French. In some Middle English manuscripts, (th) appears for (t) or (d): *tho* 'to' or 'do', *thyll* till, *whythe* white, *thede* deed. In Modern English we see it in *Esther*, *Thomas*, *Thames*, *thyme*, *Witham* and the old spelling of Satan as *Sathan*. In a small number of cases, this spelling later influenced the pronunciation: *amaranth, amianthus* and *author* have spelling-pronunciations with /è/, and some English speakers use /è/ in *Neanderthal*.

(th) for /th/

A few English compound words, such as *lightheaded* or *hothouse*, have the letter combination (th) split between the parts, though this is not a digraph. Here, the (t) and (h) are pronounced separately (*light-headed*) as a cluster of two consonants. Other examples are *anthill, outhouse, lighthouse, pothead, Chatham, Wytham, Yetholm*; also in words formed with the suffix *-hood*: *knighthood*, and the similarly formed Afrikaans loanword *apartheid*.0In a few place names ending in t+ham the t-h boundary has been lost and become a spelling pronunciation, for example Grantham.

SPELLING PRONUNCIATION

A spelling pronunciation is a pronunciation that, instead of reflecting the way the word was pronounced by previous generations of speakers, is a rendering in sound of the word's spelling.

Examples of English Words with Common Spelling Pronunciations

- *often*, pronounced with /t/, though the pronunciation without it is more prevalent. Older dictionaries do not even list the pronunciation with /t/, though the 2nd edition of the OED does (and the first edition notes the pronunciation with the comment that it is prevalent in the south of England and "often used in singing"; see the *Dictionary of American Regional English* for contemporaneous citations discussing the status of the competing pronunciations) The sporadic nature of such shifts is apparent upon examination of examples such as *whistle,* where the *t* remains universally unpronounced.
- *clothes* was historically pronounced the same way as the verb *close* ("Whenas in silks my Julia goes/ .../The liquefaction of her clothes" —Herrick), but many speakers now insert a /D/, pronouncing a voiced *th*.
- *salmon*, occasionally pronounced with /l/.
- *falcon* is now invariably pronounced with /l/, which was lacking in the old pronunciation: compare French *faucon* and the older English spellings *faucon* and *fawcon*. This may suggest either analogical change or the reborrowing of the original Latin.
- *alm*, *balm*, *calm*, *palm*, *psalm*; often now pronounced with /l/ in the United States. In the United Kingdom,

the traditional /QDm/ pronunciation continues to prevail.

- *comptroller*, often pronounced with /mp/; accepted pronunciation is "controller" (the *mp* spelling is based on the mistaken idea that the word has something to do with *comp*(*u*)*tare* "count, compute", but it comes from *contre-roll* "file copy", both the verb and its agent noun meaning "compare originals and file copies").
- *ye* the article, pronounced as if spelled with a *y* instead of the printer's mark for Þ, the letter thorn.
- taking the "insular flat-topped *g* of northern scripts as a *z*- in names like *Mackenzie, Menzies, Dalziel* (in the last with the value of /j/ originally).
- *tortilla* and other words from Spanish with the double-L pronounced /l/ instead of /j/ (the latter being the closest approximation to the sound in Spanish); similarly the Italian sourced *maraschino* (cherry) with /ʃ/ instead of /sk/.
- *victuals* "vittles" whose -*c*- (for a consonant lost long before the word was borrowed from French) was reintroduced on etymological grounds, and sometimes pronounced with /kt/.
- The pronunciation of *waistcoat* as *waist-coat* is now more common than the previous pronunciation *weskit*.
- *medicine*, historically pronounced with two syllables but now quite often with three (some speakers use two when they mean medicaments and three when they mean medical knowledge; the pronunciation with three syllables is standard in the United States).
- *figure* originally rhymed with *bigger* (and still does in the Received Pronunciation); in United States, it is widely pronounced rhyming with *pure*.

- *Anthony* (< Lat. *Antonius*), now (in USA).
- Probably to be included in this general category are the place-names whose traditional ("old-fashioned") pronunciations have been displaced by ones influenced by the spelling.
- Sir George Everest's surname is pronounced. The mountain named after him – *Mount Everest* – is generally pronounced.
- Interjections such as *tsk tsk!* or *tut tut!* (a pair of dental clicks).
- The words *arctic*, *antarctic*, and *Antarctica*. These were originally pronounced without /k/, but the spelling pronunciation has become very common. The "c" was originally added to the spelling for etymological reasons and was then misunderstood as not being silent.

Spelling Pronunciation vs. Analogical Pronunciation

In some cases, we cannot tell if a pronunciation is a true spelling pronunciation. The alternative is that a word is being pronounced *analogically*, in essence as the "sum of its parts". Thus, *forehead* is commonly pronounced as a sequence of *fore* plus *head*, instead of the historically earlier "forrid"; and *waistcoat* is commonly pronounced as a sequence of *waist* and *coat*, instead of the historically earlier "weskit".

Opinions about Spelling Pronunciation

Spelling pronunciations give rise to varied opinions. Often those who retain the old pronunciation consider the spelling pronunciation to be a mark of ignorance or insecurity. Those who use a spelling pronunciation may not be aware that it is one, and consider the historically authentic version to be slovenly, since it "slurs over" a letter. Conversely, the users of some innovative pronunciations such as "Febuary" (for *February*) may regard

the historically (and phonetically) authentic version as a pedantic spelling pronunciation.

Fowler reports that in his day there was a conscious movement among schoolteachers and others encouraging people to abandon anomalous traditional pronunciations and "speak as you spell". According to major scholars of early modern English (Dobson, Wyld et al.), already in the 17th century there was beginning an "intellectual" trend in England to "pronounce as you spell".

This of course presupposes a standard spelling system which was in fact beginning to form at that time. Similarly, quite a large number of "corrections" slowly spread from scholars to the general public in France, starting several centuries ago.

Others would argue that this trend, though understandable from a socio-psychological point of view, is, from a strictly linguistic perspective, irrational, since writing was invented to represent the sounds of the language and not vice versa.

According to this belief, there is no good reason to "speak as one spells", but there are many good reasons to "spell as one speaks", i.e. to reform the orthography of a language whenever it does not render its pronunciation clearly and unambiguously – which is the task of a writing system. How easy such a reform would be in practice is of course quite another matter.

A different variety of spelling pronunciations are phonetic adaptations, i.e. pronunciations of the written form of foreign words within the frame of the phonematic system of the language that accepts them: an example of this process is *garage* ([aaÈ•aD'] in French) sometimes pronounced [Èaærjda'] in English. Such adaptations are

quite natural, and often preferred by speech-conscious and careful speakers.

Spelling Pronunciations in Children and Foreigners

Children who read a great deal often produce spelling pronunciations, since they have no way of knowing, other than the spelling, how the rare words they encounter are correctly pronounced. Well-read second language learners are likewise vulnerable to producing spelling pronunciations.

However, since there are many words which one reads far more often than one hears, the problem also affects adult native-language speakers. This, in turn, leads to the language evolution mentioned above. What is a spelling pronunciation in one generation often becomes standard in the next.

In other Languages

In French, the contemporary pronunciation of the 16th century French author Montaigne as [mTÞt[r], rather than the contemporary [mTÞtar], is a spelling pronunciation.

When English *club* was first borrowed into French, the approved pronunciation was /klab/, as being a reasonable approximation of the English. The standard then became /klyb/ on the basis of the spelling, and later, in Europe, /klœb/, deemed closer to the English original. The standard pronunciation in Canada remains /klyb/. Similarly, *shampooing* "product for washing the hair" at the time of borrowing. In Hebrew, there is a vowel called *patach genuvah*, consisting of an "a" sign placed underneath a final guttural but pronounced before it: an example is *ruach* (meaning 'spirit), which looks like **rucha*. Where the final consonant is a sounded *he* (h), many speakers do indeed place the vowel after it, mistakenly pronouncing *Eloah* (meaning God) as "Eloha" and *gavoah* (meaning

high) as "gavoha". Other examples of spelling pronunciations are the Sephardic "kal" for "kol" (meaning all) and "tsahorayim" for "tsohorayim" (meaning noon): see Sephardic Hebrew language.

PRONUNCIATION SPELLING

A pronunciation spelling of a word is a spelling different from the standard spelling, used to emphasize a particular pronunciation of the word. The spelling uses the regular spelling rules of the language. Most are nonce coinages, but some have become standardised, e.g. *gonna* to represent the pronunciation of *going to,* as in *I'm gonna catch you.*

Respelling

Pronunciation spellings may be used informally to indicate the pronunciation of foreign words or those whose spelling is irregular or not sufficient to deduce the pronunciation. This is called respelling. In such cases, typeface, punctuation or letter case may also be used, e.g. to indicate stress or syllabication. "Diarrhoea" is pronounced DYE-uh-REE-a. This offers a sometimes intuitive alternative to systems like the International Phonetic Alphabet, which offer precise descriptions but need to be learned. However, it relies on the writer's encoding mapping to the same phonemes as the reader's; e.g. *Föhn* is pronounced "Fern" might be adequate for a non-rhotic reader but not a rhotic one.

Literary Dialect

Pronunciation spellings are frequently used in narratives to represent nonstandard dialects or idiolects, often to create an impression of backwardness or illiteracy. This is called literary dialect, or often called eye dialect, though originally the latter term was applied only where the resulting pronunciation is the same as the standard one, e.g.

"Pleese, mistur," said the beggar.

Other Uses

Pronunciation spellings as deliberate misspellings may be used for humorous effect. The origin of the word okay is disputed, but the most common view is that it derives from "Oll Korrect", an 1830s comical spelling of "All Correct".

Such spellings may also be used for branding, e.g. "Lite" foods, Froot Loops. See also sensational spelling.

FOREIGN ACCENT SYNDROME

Foreign accent syndrome is a rare medical condition involving speech production that usually occurs as a side effect of severe brain injury, such as a stroke or head trauma. Two cases have been reported of individuals with the condition as a development problem and one associated with severe migraine. Between 1941 and 2009 there have been sixty recorded cases. Its symptoms result from distorted articulatory planning and coordination processes. It must be emphasized that the speaker does not suddenly gain a foreign language (vocabulary, syntax, grammar, etc.); they merely pronounce their native language with an accent that to listeners may be mistaken as foreign or dialectical. People with foreign accent syndrome may also tend to speak genuine foreign languages with their accent. Despite a recent unconfirmed news report that a Croatian speaker has gained the ability to speak fluent German after emergence from a coma, there has been no verified case where a patient's foreign language skills have improved after a brain injury. There have been a few reported cases of children and siblings picking up the new accent from someone with foreign accent syndrome.

Description

To the untrained ear, those with the syndrome sound

as though they speak their native languages with a foreign accent; for example, an American native speaker of English might sound as though he spoke with a south-eastern English accent, or a native British speaker might speak with a New York American accent. However, researchers at Oxford University have found that certain, specific parts of the brain were injured in some foreign accent syndrome cases, indicating that certain parts of the brain control various linguistic functions, and damage could result in altered pitch or mispronounced syllables, causing speech patterns to be distorted in a non-specific manner. More recently, there is mounting evidence that the cerebellum, which controls motor function, may be crucially involved in some cases of foreign accent syndrome, reinforcing the notion that speech pattern alteration is mechanical, and thus non-specific. Thus, the perception of a foreign accent is likely a case of pareidolia on the part of the listener.

For example, damage to the brain might result in difficulty pronouncing the letter 'r' at the end of words, forcing a rhotic speaker to use a non-rhotic accent, even if they have never spoken with one. In the U.S., non-rhoticity is a particularly notable feature of a Boston accent, thus the person might seem to speak with a Boston accent to the casual listener. However, many of the other features of a Boston accent may be wholly missing.

It has been suggested that in order to maintain a sense of normality and flow, someone with the syndrome then augments the accent effect by imitating the rest of the accent. Depending on how important a certain phoneme is to a person's original accent, he might find speaking in a different accent to be much easier and his usual accent very difficult to consistently pronounce after some motor skills have been lost.

Occurrences

The condition was first described in 1907 by the French neurologist Pierre Marie, and another early case was reported in a Czech study in 1919. Other well-known cases of the syndrome have included one that occurred in Norway in 1941 after a young woman, Astrid L., suffered a head injury from shrapnel during an air-raid. After apparently recovering from the injury, she was left with what sounded like a strong German accent and was shunned by her fellow Norwegians. Another well-known case is that of Judi Roberts, also known as Tiffany Noel, who was born and raised in Indiana, USA. In 1999, at the age of 57, Roberts suffered a stroke and, after recovering, her voice spoke with what resembled an English accent, though she never had been to Britain.

In March 2001, Jerry Conner, a man who was living in Asheville, North Carolina, suffered a stroke while at work and after transfer to the hospital passed out and upon awaking began speaking with a very proper British accent. This was before much was known about foreign language syndrome and merely inscribed in doctors records and hospital records.

In February of 2004, a woman in Dallas, Texas was given an iodine contrast injection for a chest CT scan, although she was allergic to iodine. The resulting allergic reaction resulted in a 24-hour paralysis during which time she was unable to speak. As the paralysis wore off, she was speaking with a Russian sounding accent. Along with the change in her speech, she also began having seizures. Over time the accent became more normal but gets stronger when she has had a seizure. The Foreign Accent Syndrom website at the University of Dallas http://www.utdallas.edu/research/FAS/about/samples.html has sound clips of her

speech from before the incident, and after her speech was affected.

In January 2006, an Australian man suffered a stroke as a result of diazepam abuse while on holiday in Thailand. When he awoke, his friends noticed he spoke with a mixture of Irish and American accents, sometimes swapping between the two in mid-sentence. This was the first recorded example of dual foreign accent syndrome.

A further case of foreign accent syndrome occurred to Linda Walker, a 60-year-old woman from the Newcastle area of UK. Again following a stroke, her normal Geordie accent was transformed and has been variously described as resembling a Jamaican, as well as a French Canadian, Italian, and a Slovak accent. She was interviewed by BBC News 24 and appeared on the *Richard & Judy* show in the UK in July 2006 to speak of her ordeal.

On 14 July 2007, a boy named Rajesh in a remote town in India suddenly started speaking in English, even though he never been out of his hometown. He was reported as supposedly being the reincarnation of an American scientist. This case was poorly understood and was never associated with Foreign Accent Syndrome. The reported symptoms, however, were quite clear indication. (A video of the boy, speaking in accented English, may be found at the link in the reference).

In the July 2008 issue of the *Canadian Journal of Neurological Sciences*, researchers from McMaster University reported a study where a woman from Windsor, Ontario, after suffering a stroke, began speaking with what some people described as a Newfoundland accent.

In 2008, Cindy Lou Romberg of Port Angeles, Washington, who had suffered a brain injury 17 years earlier, developed foreign accent syndrome after a neck

adjustment from her chiropractor. A visit to the hospital ruled out a stroke. Afterwards she spoke with a Russian accent and even appeared to make the grammatical mistakes of a Russian speaking English, as if English was not her native language. She was featured on the Discovery Health Channel's *Mystery ER* show on October 26, 2008, and she was also featured on the October 31 edition of *Inside Edition*.

In 2008, Julie Frazier, a woman from Fort Wayne, Indiana, with severe Sporadic Hemiplegic Migraine developed foreign accent syndrome. After several months of multiple, daily hemiplegic migraine attacks, her accent began sounding British to Russian, depending on fatigue levels and the perception of the listener. Frazier's case is, to date, the first confirmed association of foreign accent syndrome with a migraine condition.

In 2010, another case associated with severe migraine was publicly reported. Sarah Colwill, a frequent migraine sufferer from Devon in the UK, experienced a headache so extreme that she had to call an ambulance. When waking in the hospital later, her accent sounded Chinese.

Another incident involving migraine was recorded in September 2010, again with a British woman. After lying down for a while because of her migraine, 49-year-old Kay Russell, from Gloucestershire UK, woke up with a French accent.

In December 2010, an African gentleman awoke with an Italian accent, after a headache that had lasted for weeks.

On May 5, 2011, *The Huffington Post* reported the case of Karen Butler, a woman from Newport, Oregon, who emerged from oral surgery with an Irish accent. Other sources have indicated that her new accent had an Eastern European sound.

NON-NATIVE PRONUNCIATIONS OF ENGLISH

Non-native pronunciations of English result from the common linguistic phenomenon in which non-native users of any language tend to carry the intonation, phonological processes and pronunciation rules from their mother tongue into their English speech. They may also create innovative pronunciations for English sounds not found in the speaker's first language.

Overview

The speech of non-native English speakers may exhibit pronunciation characteristics that result from such speakers imperfectly learning the pronunciation of English, either by transferring the phonological rules from their mother tongue into their English speech ("interference") or through implementing strategies similar to those used in primary language acquisition.

They may also create innovative pronunciations for English sounds not found in the speaker's first language.

The age at which speakers begin to immerse themselves into a language (such as English) is linked to the degree in which native speakers are able to detect a non-native accent; the exact nature of the link is disputed amongst scholars and may be affected by "neurological plasticity, cognitive development, motivation, psychosocial states, formal instruction, language learning aptitude," and the usage of their first (L1) and second (L2) languages.

English is unusual in that speakers rarely produce an audible release between consonant clusters and often overlap constriction times. Speaking English with a timing pattern that is dramatically different may lead to speech that is difficult to understand.

More transparently, differing phonological distinctions

between a speaker's first language and English create a tendency to neutralize such distinctions in English, and differences in the inventory or distribution of sounds may cause substitutions of native sounds in the place of difficult English sounds and/or simple deletion. This is more common when the distinction is subtle between English sounds or between a sound of English and of a speaker's primary language. While there is no evidence to suggest that a simple absence of a sound or sequence in one language's phonological inventory makes it difficult to learn, several theoretical models have presumed that non-native speech perceptions reflect both the abstract phonological properties and phonetic details of the native language.

Such characteristics may be transmitted to the children of bilinguals, who will then exhibit a number of the same characteristics even if they are monolingual.

Examples

Arabic

- Speakers tend to speak with a rhotic accent and pronounce /r/ as a flap or trill.

French

- Because of the phonetic differences between English and French rhotics, speakers may perceive /r/ as /w/-like and have trouble distinguishing between /r/ and /w/.
- French speakers have difficulty with /h/ and systematically delete it. Paradoxically, some French speakers may erroneously prefix /h/ to words beginning with long vowels.

German

- Speakers may not velarize /l/ in coda positions as most native speakers do.

Hebrew

- The lack of discrimination in Hebrew between tense and lax vowels makes correctly pronouncing English words such as *hit*/*heat* and *cook*/*kook* difficult.
- Dental fricatives–/D/ (as in "the") and /è/ (as in "think") –are often mispronounced.
- Hebrew speakers may confuse /w/ and /v/.
- In Hebrew, word stress is usually on the last (ultimate) or penultimate syllable of a word; speakers may carry their stress system into English, which has a much more varied stress system. Hebrew speakers may also use Hebrew intonation patterns which mark them as foreign speakers of English.

Hungarian

- The dental fricatives /è/ and /D/ may be replaced by [s;] and [d*]
- Since Hungarian lacks the phoneme /w/, many Hungarian speakers substitute /v/ for /w/ when speaking in English. A less frequent practice is hypercorrection: substituting /w/ for /v/ in instances where the latter is actually correct.

Italian

A study on Italian children's pronunciation of English revealed the following characteristics:

- Tendency to replace the English high lax vowels / j/ /S/ with [i] [u] (ex: "fill" and "feel", "put" "poot" are homophones), since Italian does not have these vowels.
- Tendency to replace /K/ with [Ka] ("singer" rhymes with "finger") or as [n] (combined with the above tendency makes the words "king" and "keen" homophones) because Italian [K] is an allophone of /n/ before velar stops.

- Tendency to replace word-initial /sm/ with [zm], e.g. *small* [zmTl]. This voicing also applies to /sl/ and /sn/.
- Tendency to add /h/ to some vowel-initial words.
- Tendency to replace /Œ/ with [a] so that *mother* since Italian does not have this vowel.
- Italian does not have dental fricatives:
  - Voiceless /è/ may be replaced with a dental [t*] or with [f].
  - Voiced /D/ may become a dental [d*].
- Since /t/ and /d/ are typically pronounced as dental stops anyway, words like *there* and *dare* can become homophones.
- /æ/ is replaced with [[], so that *bag* sounds like *beg* [b[a].
- Tendency to pronounce /p t k/ as unaspirated stops.
- Schwa [Y] does not exist in Italian; speakers tend to give the written vowel its full pronunciation, e.g. *lemon*, *television*, *parrot*, *intelligent*, *water*, *sugar*.
- Italian speakers may pronounce consonant-final English words with a strong vocalic offset, especially in isolated words, e.g. *dog*. This has led to the stereotype of Italians adding [Y] to the ends of English words.
- Tendency to pronounce /r/ as a trill [r] rather than the English approximant /y/, e.g. *parrot* [Èpærot].

In addition, Italians learning English have a tendency to pronounce words as they are spelled, so that *walk* is [wRlk], *guide* is [awid], and *boiled*. This is also true for loanwords borrowed from English as *water*, which is pronounced.

Related to this is the fact that many Italians produce

/r/ wherever it is spelled (e.g. *star* [star]), resulting in a rhotic accent, even when the dialect of English they are learning is nonrhotic. Consonants written double may be pronounced as geminates, e.g. Italians pronounce *apple* with a longer [p] sound than English speakers do.

Japanese

- Speakers tend to confuse /l/ and /r/ both in perception and production, since the Japanese language does not make such a distinction. The closest Japanese phoneme to either of these is /z/, though speakers may hear English /r/ as similar to the Japanese /w/.

Russian

- There is no /w/ in Russian; speakers typically substitute [v]
- Native Russian speakers tend to produce an audible release for final consonants and in consonant clusters and are likely to transfer this to English speech, creating inappropriate releases of final bursts that sound overly careful and stilted and even causing native listeners to perceive extra unstressed syllables.

Spanish

- Since Spanish does not make voicing contrasts between its fricatives (and its one affricate), speakers may neutralize contrasts between /s/ and /z/; likewise, fricatives may assimilate the voicing of a following consonant.
- Speakers tend to merge /tʃ/ with /ʃ/, and /d'/ and /ʒ/ with /j/.
- /j/ and /w/ often have a fluctuating degree of closure.
- For the most part (especially in colloquial speech),

Spanish allows only five (or six) word-final consonants: /s/, /n/, /r/, /l/ and /d/ (plus /è/ in Castilian Spanish); speakers may omit word-final consonants other than these.

- In Spanish, /s/ must immediately precede or follow a vowel; often a word beginning with [s] + consonant will obtain an epenthetic vowel (typically [e]) to make *stomp* pronounced [esÈtQmp] rather than [stQmp].
- In Spanish, a voiceless dental fricative /è/ phoneme exists only in certain Peninsular dialects; where this sound appears in English, speakers of other Spanish dialects substitute /t/, /s/ or /f/ for it.
- Speakers tend to merge /D/ and /d/, pronouncing both as voiced dental plosive unless they occur in intervocalic position, in which case they are pronounced [D]. A similar process occurs with /v/ and /b/.
- The three nasal phonemes of Spanish neutralize in coda-position; speakers may invariably pronounce nasal consonants as homorganic to a following consonant; if word-final (as in *welcome*) common realizations include [n], deletion with nasalization of the preceding vowel, or [K].

Vietnamese

There are two main dialects in Vietnamese, a northern one centered around Hanoi and a southern one centered around Ho Chi Minh City.

- Speakers may not produce final consonants since there are fewer final consonants in Vietnamese and those that do exist differ in their phonetic quality:
  - Final /b/ is likely to be confused with /p/

- Final /d/ is likely to be confused with /t/
- Final /f/ is likely to be confused with /p/
- Final /v/ is likely to be confused with /b/ or /p/
- Final /s/ is likely to be confused with /ʃ/ or simply omitted
- Final /ʃ/ is likely to be omitted
- Final /z/ is likely to be confused with /ʃ/ or /s/
- Final /tʃ/ is likely to be confused with /ʃ/
- Final /l/ is likely to be confused with /n/

- Speakers also have difficulty with English consonant clusters, with segments being omitted or epenthetic vowels being inserted.
- Speakers may not aspirate initial /t/ and /k/, making native listeners perceive them as /d/ and /a/ respectively.
- Speakers often have difficulty with the following phonemes:
  - /è/, which is confused with /t/ or /s/
  - /D/, which is confused with /d/ or /z/
  - /p/, which is confused with /b/
  - /a/, which is confused with /k/
  - /d'/, which is confused with /z/
  - /'/, which is confused with /z/ or /d'/
  - /s/, which is confused with /ʃ/
  - /ty/, which is confused with /d'/, /tʃ/ or /t/
  - /v/, which is confused with /j/
  - /j/, which is confused with /i/
  - /S/, which is confused with /u/ or /Œ/
  - /[/, which is confused with /æ/
  - /æ/, which is confused with /[/ or /Q/

- Vietnamese is a tonal language and speakers may try to use the Vietnamese tonal system or use a monotone with English words. They may also associate tones onto the intonational pattern of a sentence and becoming confused with such inflectional changes.

ANGLOPHONE PRONUNCIATION OF FOREIGN LANGUAGES

The following is a list of common non-native pronunciations English-speakers make when trying to speak foreign languages. Much of it is due to transfer of phonological rules from English to the new language as well as differences in grammar and syntax that they encounter.

This article uses International Phonetic Alphabet pronunciation. See Help:IPA pronunciation key and IPA chart for English for an introduction.

Arabic

- English has no pharyngeal consonants and speakers are likely to have difficulty with the both the voiced and voiceless pharyngeal fricatives.
  - o The voiceless pharyngeal fricative (/ʔ/) may be pronounced as the voiceless glottal fricative ([h])
  - o The voiced pharyngeal fricative /ʕ/ has no clear equivalent in English and speakers may simply omit it.
- Speakers may omit the glottal stop /ʔ/
- English has no voiced velar fricative /ɣ/ and speakers may replace it with [a].
- Arabic distinguishes certain emphatic (pharyngealized) consonants (mostly alveolar) with

non-emphatic ones; English makes no such distinction and speakers are likely to pronounce them as their English equivalents.

- Speakers have difficulty with gemination of consonants, which is contrastive in Arabic (i.e. /darrasa/ 'taught' vs. /darasa/ 'studied') but not in English.

German

There are several German vowels that create problems for English speakers:

- One of the most difficult is German /eD/ as it is further forward in the mouth than in varieties of Standard English so that speakers may pronounce German *Geht* as if it were English *gate*.
- Similarly, /a/ is more open than in English, but very similar to the accent of northern and central England. Hall (2003) suggests that the vowel in English *hut* is closest.

Japanese

- Speakers may have trouble distinguishing between long and short vowels. They may also pronounce short vowels closer to English lax vowels:
  - Short /i/ may become [j]
  - Short /o/ *listen (help·info)* may become [S]
  - Short /e/ may become [[]
  - Short /o/ *listen (help·info)* may become [T]
  - Short /a/ may become [æ]
- May use stress accent, as is normal in English, rather than the standard Japanese pitch accent, and may replace /a/ with a schwa when making syllables unstressed.

- Standard Japanese postalveolars (the sounds spelled with *sh, ch* and *j*) are alveolo-palatal and English speakers may pronounce them.
- May have difficulty producing geminated consonants.
- Speakers may fail to pronounce an utterance-final [t] as uvular and, instead, may pronounce it as a velar nasal.

Mandarin Chinese

- English speakers have difficulty with the 4 lexical tones of Mandarin Chinese.
- Chinese initials also cause a problem.
  - The aspiration is stronger in Chinese and the English voiced consonants have voiceless Chinese counterparts: /d/, /b/, /g/ are missing in Chinese and are pronounced as unaspirated /t/, /p/, /k/, English speakers often pronounce them as /d/, /b/, /g/.
- Final /y/ (ü) is often mispronounced [u].
- Final [h] (in zhi, zi, chi, ci, shi, si, ri) is often substituted with [i] by English speakers.

Portuguese

- Although rare, speakers may forget that orthographic <h> is always silent in Portuguese (as in French and Spanish).
- As with French, Portuguese <ch> represents the equivalent of English <sh>. English speakers may commit a spelling pronunciation error and say [t$\int$] instead of [$\int$].
- As with French, the voiced postalveolar fricative /’/ may be pronounced as an affricate ([d’]).
- Speakers may have trouble distinguishing between similar Portuguese diphthongs like /ei/ and /[i/, /oi/ and /Ti/, and /eu/ and /[u/.

- Speakers may have difficulty with stressed vowel alternations such as *novo* [novu] (new, sing.) versus *novos* [nTvu*f*] (new, plural).
- Speakers may have difficulty with the various realizations of Portuguese /r/. See Guttural R in Portuguese.
- Since many Anglophone speakers learning Portuguese have previously studied Spanish (but are not fluent), subtle, yet obligatory differences in pronunciation may be overlooked. Examples: Spanish *dos* (two) instead of *dois*, Spanish *no* (no) instead of *nao*, and Spanish *pequeño* (small) instead of *pequeno*.

Russian

- Speakers are likely to have difficulty with Russian's extensive palatalization system. Instead of palatalized sounds they may produce a C+[j]:
  - Speakers of English dialects that have undergone yod-dropping may have more difficulty with /t^{2}/, /d^{2}/, /s^{2}/, /z^{2}/, and /n^{2}/ (coronal consonants) than other speakers.
  - Most speakers have little difficulty with /f^{2}/ and /v^{2}/.
- Some speakers have difficulty with the trilled [r] in Russian, especially the palatalized [r^{2}] since neither are sounds of English. Jones & Ward (1969:185)
  - Non-rhotic speakers, even after learning the rolled-r, are prone to omit /r/ in such Russian words.
- Depending on the speaker's dialect, they may have difficulty with "dark l" (that is, velarized /l/, which in Russian contrasts with a palatalized /l^{2}/) in

positions other than in the syllable coda.Jones & Ward (1969:168)

- Speakers may have trouble with consonant clusters that do not exist in English such as 'darkness', 'to wait', 'prodded',, always', 'me', instrumental and 'sea-shore'. Most likely, they will insert an epenthetic schwa.
- Difficulty with Russian vowels:
  - Most English speakers have no [h] (although it is an allophone in some dialects) and speakers generally have difficulty producing the sound.Jones & Ward (1969:33) They may instead produce [j].
  - Speakers may replace /e/ with the diphthong in *day*. Jones & Ward (1969:41)
  - Speakers may also diphthongize /i/ in a similar fashion, especially in open syllablesJones & Ward (1969:30)
  - Speakers may have difficulty with Russian /o/ , pronouncing it as either [T] or the diphthong in *boat*.Jones & Ward (1969:56). It is likely that speakers will make the second element of Russian diphthongs insufficiently close, making them resemble English diphthongs or pronounce it too long. Jones & Ward (1969:75)
  - Speakers may pronounce /a/ as [æ] in closed syllables òaê ('so') and [Q] in open syllables äaa ('two').Jones & Ward (1969:47)
- Speakers may also have difficulty with the Russian vowel reduction system as well as other allophonic vowels.
  - Tendency to reverse the distribution of [P] and [Y]. English speakers tend to pronounce [Y] in the pretonic position, right where [P] is required

in Russian, while they pronounce [P] in pre-pretonic positions, where [Y] occurs. .Jones & Ward (1969:55)

- There are no cues to indicate correct stress in Russian. Speakers must memorize where primary and secondary stress resides in each word and are likely to make mistakes.Jones & Ward (1969:212)
- Speakers tend to forget to geminate double consonants.Jones & Ward (1969:214)

Spanish

- Some speakers may fail to distinguish between the trilled /r/ and the tapped /~/, making word pairs like *ahorra* ('save') and *ahora* ('now') homophones.
- Non-rhotic speakers often omit /~/ in words like *carne* ('meat') and *tercer* ('third').
- Speakers may not pronounce voiced stops (/b/ /d/ /a/) as fully voiced. They may also fail to pronounce them as approximants or fricatives between vowels and word-finally (in such positions, /b/ is realized as [a], /d/ as [D], and /a/ as [c].
- Speakers may pronounce orthographic B as [b] and orthographic V as [v]; or, in an attempt to imitate native speakers, pronounce both as /b/ initially and /v/ between vowels. In most dialects of Spanish, these two letters represent a single /b/ phoneme with an allophone [a]; /v/ does not exist in Spanish.
- English speakers frequently split diphthongs into two distinct vowels, pronouncing words like *tienes* ('you have').

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5

Towards Improving English Pronunciation: Evaluating Role of English Pronunciation Test

TIPS FOR BETTER ENGLISH PRONUNCIATION

English is a language that has many different accents. It is important to note that accents are different from pronunciation. Pronunciation is the way in which a word is pronounced. Accent is a series of pronunciation, rhythm and emphasis that is local to a region or city. It is important to pronounce words correctly so that you are understandable. Accent isn't necessarily important, you can speak English with a Spanish accent for example and be totally understandable if you are pronouncing the words correctly. This accent will tell people that you are from Spain and that your first language is probably not English. If you wish for people to think that you are from the US, Canada, England, or Ireland you can try and take on an accent, however, it generally shouldn't be the most important part of your studies. Below I will go through some common mispronunciation problems that many Spanish speakers have.

- failure to pronounce the end consonant accurately or strongly enough ; e.g. cart for the English word

card or brish for bridge or thing for think

- problems with the /v/ in words such as vowel or revive
- difficulties in sufficiently distinguishing words such as see/she or jeep/sheep/cheap
- the tendency to prefix words beginning with a consonant cluster on s- with an /å/ sound; so, for example, school becomes eschool and strip becomes estrip
- the swallowing of sounds in other consonant clusters; examples: next becomes nes and instead becomes istead.

Below are some common emphasis problems in English.

1. English is considered a stressed language while many other languages are considered syllabic.
2. In other languages, such as French or Italian, each syllable receives equal importance (there is stress, but each syllable has its own length).
3. English pronunciation focuses on specific stressed words while quickly gliding over the other, non-stressed, words.
4. Stressed words are considered content words: Nouns e.g. kitchen, Peter – (most) principal verbs e.g. visit, construct – Adjectives e.g. beautiful, interesting – Adverbs e.g. often, carefully

Generally English is spoken from the middle of the mouth and the tongue is fairly still.

In English, the jaw is fairly relaxed, and the mouth is held in a medium open position. The tongue is held in the middle of the mouth, and the corners of the mouth are relaxed. The tongue hits the gums above the front teeth more often than the teeth themselves.

Whereas in Spanish, speakers keep their jaws loose, their mouth in a medium open position. The tongue is held slightly raised and forward, always in the vicinity of the front teeth. The lips are relaxed, but the muscles at the corners of the mouth are slightly tensed. The point of articulation is near the front of the mouth.

ENGLISH PRONUNCIATION TEST

While most of you non-native speakers of English speak English quite well, there is always room for improvement (of course, the same could be said for every person for any subject, but that is another matter). To that end, I'd like to offer you a poem. Once you've learned to correctly pronounce every word in this poem, you will be speaking English better than 90% of the native English speakers in the world.

If you find it tough going, do not despair, you are not alone: Multi-national personnel at North Atlantic Treaty Organization headquarters near Paris found English to be an easy language ... until they tried to pronounce it. To help them discard an array of accents, the verses below were devised. After trying them, a Frenchman said he'd prefer six months at hard labor to reading six lines aloud. Try them yourself.

English is Tough Stuff

Dearest creature in creation,
Study English pronunciation.
I will teach you in my verse
Sounds like corpse, corps, horse, and worse.
I will keep you, Suzy, busy,
Make your head with heat grow dizzy.
Tear in eye, your dress will tear.

So shall I! Oh hear my prayer.
Just compare heart, beard, and heard,
Dies and diet, lord and word,
Sword and sward, retain and Britain.
(Mind the latter, how it's written.)
Now I surely will not plague you
With such words as plaque and ague.
But be careful how you speak:
Say break and steak, but bleak and streak;
Cloven, oven, how and low,
Script, receipt, show, poem, and toe.
Hear me say, devoid of trickery,
Daughter, laughter, and Terpsichore,
Typhoid, measles, topsails, aisles,
Exiles, similes, and reviles;
Scholar, vicar, and cigar,
Solar, mica, war and far;
One, anemone, Balmoral,
Kitchen, lichen, laundry, laurel;
Gertrude, German, wind and mind,
Scene, Melpomene, mankind.
Billet does not rhyme with ballet,
Bouquet, wallet, mallet, chalet.
Blood and flood are not like food,
Nor is mould like should and would.
Viscous, viscount, load and broad,
Toward, to forward, to reward.
And your pronunciation's OK
When you correctly say croquet,

Rounded, wounded, grieve and sieve,
Friend and fiend, alive and live.
Ivy, privy, famous; clamour
And enamour rhyme with hammer.
River, rival, tomb, bomb, comb,
Doll and roll and some and home.
Stranger does not rhyme with anger,
Neither does devour with clangour.
Souls but foul, haunt but aunt,
Font, front, wont, want, grand, and grant,
Shoes, goes, does. Now first say finger,
And then singer, ginger, linger,
Real, zeal, mauve, gauze, gouge and gauge,
Marriage, foliage, mirage, and age.
Query does not rhyme with very,
Nor does fury sound like bury.
Dost, lost, post and doth, cloth, loth.
Job, nob, bosom, transom, oath.
Though the differences seem little,
We say actual but victual.
Refer does not rhyme with deafer.
Foeffer does, and zephyr, heifer.
Mint, pint, senate and sedate;
Dull, bull, and George ate late.
Scenic, Arabic, Pacific,
Science, conscience, scientific.
Liberty, library, heave and heaven,
Rachel, ache, moustache, eleven.
We say hallowed, but allowed,

People, leopard, towed, but vowed.
Mark the differences, moreover,
Between mover, cover, clover;
Leeches, breeches, wise, precise,
Chalice, but police and lice;
Camel, constable, unstable,
Principle, disciple, label.
Petal, panel, and canal,
Wait, surprise, plait, promise, pal.
Worm and storm, chaise, chaos, chair,
Senator, spectator, mayor.
Tour, but our and succour, four.
Gas, alas, and Arkansas.
Sea, idea, Korea, area,
Psalm, Maria, but malaria.
Youth, south, southern, cleanse and clean.
Doctrine, turpentine, marine.
Compare alien with Italian,
Dandelion and battalion.
Sally with ally, yea, ye,
Eye, I, ay, aye, whey, and key.
Say aver, but ever, fever,
Neither, leisure, skein, deceiver.
Heron, granary, canary.
Crevice and device and aerie.
Face, but preface, not efface.
Phlegm, phlegmatic, ass, glass, bass.
Large, but target, gin, give, verging,
Ought, out, joust and scour, scourging.

Ear, but earn and wear and tear
Do not rhyme with here but ere.
Seven is right, but so is even,
Hyphen, roughen, nephew Stephen,
Monkey, donkey, Turk and jerk,
Ask, grasp, wasp, and cork and work.
Pronunciation — think of Psyche!
Is a paling stout and spikey?
Won't it make you lose your wits,
Writing groats and saying grits?
It's a dark abyss or tunnel:
Strewn with stones, stowed, solace, gunwale,
Islington and Isle of Wight,
Housewife, verdict and indict.
Finally, which rhymes with enough —
Though, through, plough, or dough, or cough?
Hiccough has the sound of cup.

Appendices

APPENDIX I

PRONUNCIATION GLOSSARY

Air flow: The flow or passage of air out of the mouth.

Aspiration: A small "explosion" of air when you make a sound.

Auditory: Hearing (not seeing).

Clusters (blended sounds): Two or more sounds put together to make a single sound.

Curl: A position of the tongue where the tongue is shaped in a curve, not flat.

Flatten: A position of the tongue where the tongue is flat not round.

Glide / Slide: Move the tongue as you say the sound.

Hard palate: Hard part of the roof of the mouth.

Intonation: Change in pitch of a sentence, up and down.

Lengthen sound: Make the duration of the sound longer.

Lips spread: Lips are open slightly and pulled back.

Lower: Bottom of mouth.

Pitch: Amount of height or depth of a sound.

Pressed lips: Top and bottom lips touching.

Protruded lips: Rounded lips, pushed out.

Roof: Top part of your mouth, inside.

Round lips: Make a circle with lips.

Shorten sound: Make the duration of the sound shorter.

Soft palate: Soft part of the roof of the mouth.

Tap: Touch quickly.

Tooth ridge: The hard area directly behind your top front teeth.

Top of mouth / Roof of mouth: Area of tooth ridge, hard palate and soft palate.

Unvoiced (voiceless): The vocal cords do not vibrate.

Upper: Top of mouth.

Visual: Seeing (not hearing).

Voiced: The sound is made by vibrating the vocal cords (voice box). To test whether you are making the sound voiced, put your fingers on your voice box. With a voiced sound you should feel a vibration. All vowels are voiced.

APPENDIX II

PRONUNCIATION OF SOME CONFUSED ENGLISH WORDS

1.	Access	I have an easy *access* to the Principal.
	Excess	*Excess* of everything is bad.
2.	Accept	Please *accept* my invitation.
	Except.	All the girls *except* Sarala were present today.
3.	Adapt	I can *adapt* myself to any new place.
	Adept	Rajini is *adept* in music.
4.	Angel	About saw an *angel* in his dream.
	Angle	Draw an *angle* of 60 degree.
5.	Affect	Drinking has *affected* his liver.
	Effect	My advise had some *effect* on him.
6.	Answer	How many questions did you *answer?*
	Replay	Why did you not *reply* to my letter?
7.	Advice	Listen to your father's *advice.*
	Advise	I *advise* you to leave bad company.

8.	Afflict	He was *afflicted* with mental agony.
	Inflict	The principal *inflicted* corporal punishment on him.
9.	Allusion	There is no *allusion* to the holy Gita in your speech.
	Illusion	All the worldly relations are mere *illusions*.
10.	Alter	Don't *alter* your opinion every now and then.
	Altar	Call the bride to the *altar*.
11.	Alternate	She takes a bath on *alternate* days.
	Alternative	Hard work has no *alternative*.
12.	Accident	The old lady met with a serious *accident*.
	Incident	Narrate some *incident* from the life of Gandhi.
13.	Artist	A poet is an *artist*.
	Artisan	A carpenter is an *artisan*.
14.	Assent	I cannot *assent* to your silly proposal.
	Ascent	The *ascent* to some mountains is very steep.
15.	Avenge	I shall *avenge* my brother's murder.
	Revenge	I shall *revenge* myself upon my neighbour.
16.	Aught	Is there *aught* I can do for you?
	Ought	We *ought* to respect the teachers.
17.	Ail	She has been *ailing* since monday.
	Ale	She is fond of cakes and *ale*.
18.	Air	Smoking spoils the *air*.
	Airs	Don't give yourself *airs*.
	Heir	Jahangir was Akbar's *heir*.
19.	Anti	The terrorist are *anti*-national.
	Ante	I know nothing about his *ante*-college days.
20.	Allow	You are *allowed* to read aloud.
	Permit	The Principal *permitted* the students to go home.
21.	Admission	I obtained *admission* to the college.

	Admittance	Have you sought *admittance* to the hall?
22.	Amiable	She is a lady of *amiable* nature.
	Amicable	Try to settle the dispute *amicably*.
23.	Abstain	Gandhi *abstained* from wine all his life.
	Refrain	Nehru *refrained* from telling lies.
24.	Admit	She did not *admit* the truth of my remark.
	Acknowledge	The office *acknowledged* the receipt of my letter.
	Confess	*Confession* is a crime.
25.	Ago	I met my friend two months *ago*.
	Before	She stood *before* her parents.
	Before	I shall return *before* noon.
	Since	I have not seen Sarla *since* July.
26.	Ancient	*Ancient* history of India is interesting.
	Old	*Old* rice is tastier than new rice.
27.	Apposite	You have made an *Apposite* remark.
	Opposite	Light is the *opposite* of heavy/ darkness.
28.	Artistic	Bimla possesses an *artistic* hand.
	Artful	Beware of her *artful* designs.
	Artificial	City life is *artificial*.
29.	As	Her voice is *as* sweet as honey.
	Like	Brass is yellow *like* gold.
30.	Astonished	I was *astonished* to see her in my room.
	surprised	I was *surprised* at Kamla's failure.
31.	Avocation	Medicine is my *avocation*.
	Vocation	Teaching is my *vocation*.
32.	Bad	Don't mix with *bad* boy.
	Bed	I go to *bed* at midnight.
33.	Bale	Can you carry this heavy *bale* of cotton?
	Bail	Mangu was released on *bail*.
34.	Brake	Your cycle has no *brakes*.
	Break	Can you *break* the bundle of sticks?
35.	Bare	Do not go *bare-footed* in the sun.
	Bear	I cannot *bear* this insult.

	Bear	A *bear* can climb a tree.
36.	Bridal	My *bridal* ring is lost.
	Bridle	*Bridle your tongue.*
37.	Blow	The wind is *blowing.*
		Do not *blow* the whistle.
	Below	Never hit *below* the belt.
38.	Berth	I have got my *berth* reserved.
	Birth	*Birth* of a son is a favour from God.
39.	Born	I was *born* in Haryana.
	Borne	She has *borne* many hardships in her life.
40.	Beside	Don't sit *beside* that girl.
	Besides	*Besides* being caned, he was expelled from school.
41.	Battle	When was the first *Battle* of Panipat fought?
	War	The first *War* for independence began in 1857.
	Fight	There was a *fight* between the students and the police.
42.	Beautiful	The bride is very *beautiful.*
	Handsome	The bridegroom is very *handsome.*
43.	Bring	Should I *bring* a book for you?
	Fetch	*Fetch* a bucketful of water from the tap.
44.	Beet	My garden in full of *beet* plants.
	Beat	Your mummie will *beat* you if you reach home late.
45.	Bath	Have you taken your *bath?*
	Bathe	I *bathed* in hot water before sunrise.
	Bathe	The Nurse is *bathing* the infant.
46.	Breath	I cannot hold my *breath* for long.
	Breathe	To *breathe* in fresh air is good for health.
47.	Between	She saw a snake *between* her legs.
	Among	Ram, Sham and Gopal quarrelled *among* themselves.

48.	Barbarism	*Barbarism* has now becomes a fine art in warfare.
	Barbarity	Jahangir was notorious for his *barbarity*.
49.	Banish	Hilter *banished* the jews from Germany.
	Exile	Lala Har Dayal was *exiled* from India.
50.	Beneficial	Morning walk is *beneficial* for health.
	Beneficent	Akbar was a *beneficent* ruler.
51.	Blunder	Gandhiji did not make a *blunder* by stopping the non–co–operation movement.
	Error	Your composition is full of *errors*.
	Mistake	I took my friend's umbrella by *mistake*.
52.	Bold	The *bold* policemen nabbed the thief.
	Brave	Only the *brave* soldiers win the wars.
	Courage	Courage *conquers* everything in the world.
	Daring	She spoke some *daring* sentences at the meeting
53.	Cast	Don't *cast* pearls before swine.
	Caste	I am a brahman by *caste*.
54.	Canvas	My shoes are made of *canvas*.
	Canvas	I am *canvassing* for my brother.
55.	Complement	This verb does not require a *complement*.
	Compliment	Convey my *Compliment* to your mother.
56.	Council	My uncle is a member of the legislative *council*.
	Counsel	Don't give a wise *counsel* to a fool.
57.	Coarse	The poor live upon *coarse* food.
	Course	The river has changes it *course*.
58.	Check	The clerk *checked* the entries in my pass book.
	Cheque	I shall issue you a *cheque* for one thousand rupees.

59.	Childish	I don't like your *childish* habits.
	Childlike	I like your *Childlike* innocence.
60.	Cattle	The *cattle* are grazing in the field.
	Kettle	Boil the water in the *kettle*.
61.	Cool	Ice *cools* water.
	Cold	January is quite *cold* in Delhi.
62.	Cite	I can *cite* many verses from the Gita.
	Site	This is the suitable *site* for the cinema hall.
	Sight	Get your eye-*sight* tested.
63.	Card	This is our ration *card*.
	Chord	The *chord* of the harp was broken.
64.	Corpse	The *corpse* is cremated.
	Corps	The soldier was dismissed from the *corps*.
65.	Cannon	Our soldiers won the castle with the help of *cannons*.
	Canon	A Muslim acts upon the *canons* of the Quran.
66.	Calender	I shall give you the *calender* of 2001.
	Calender	This is a well *calendered* piece of cloth.
67.	Ceiling	We have painted the *ceiling* of our room.
	Sealing	Seal the envelope with *sealing* wax.
	Roof	Some children are flying kites on the *roofs* of their houses.
68.	Cell	The Prisoners were kept in small *cells* in the past.
	Sell	Rajat wants to *sell* his house but there is no customer.
69.	Cession	The *cession* of Allahabad reduced the kingdom of Shujaud-Daulah.
	Session	The academic *session* lasts from April to March.
	Cessation	Poverty is the root cause of the *cessation* of my studies.

70.	Censer	Place a stick of incense of the *censer*.
	Censor	The *censor* board should ban the indecent films.
	Censure	Two M.P.s were *censured* by the speaker.
71.	Corporal	Teachers are not allowed to inflict *corporal* punishment on students.
	Corporeal	The angels are not *corporeal* beings.
72.	Cereal	The price of *cereals* has risen high.
	Serial	Have you seen the Ramayana *serial?*
73.	Current	I deposited some money in my *current* account.
		A *Current* of water flows by our village.
	Currant	The rates of *currants* are very high.
74.	Clothes	The bride was wearing silken *clothes*.
	Cloth	I bought a roll of *cloth*.
75.	Ceremonial	My sister comes to my house only on *ceremonial* occasions.
	Ceremonious	He unveiled the picture with a *ceremonious* gesture.
76.	Contemptible	He is a *contemptible* fellow.
	Contemptuous	Never used *contemptuous* words for others.
77.	Continuation	We liked the *continuation* of his speech.
	Continuance	The *continuance* of pyramids is proof of the skill of its builders.
78.	Continual	Rise and fall of nations is a *continual* process.
	Continuous	The motion of time is *continuous*.
79.	Courtesy	She showed me due *courtesy*.
	Curtesy	The courtiers made a *curtsey* to the emperor.
80.	Completeness	Nobody can claim *Completeness* in this world.

	Completion	The Labourers were removed after the *completion* of the building.
81.	Crime	Bribery is a *crime*.
	Sin	To tell a lie is a *sin*.
	Vice	Eve teasing is a *vice*.
82.	Character	She possesses a loose *character*.
	Conduct	The student's *conduct* is agreeable.
83.	Clear	Your intention is quite *clear*.
	Clean	The maid has not swept the room *clean*.
84.	Conscious	She was not *conscious* of her son's mischiefs.
	Conscientious	Manoj is a *conscientious* worker.
85.	Capable	She is not *capable* for the job of a receptionist.
	Capacious	The hall was very *capacious*.
86.	Custom	Lord William Bentinck abolished the *custom* of Sati.
	Habit	Bluffing others is a bad *habit*.
87.	Causal	I am on *casual* leave today.
	Casual	There is a *causal* connection between rights and duties.
88.	Collision	There was a *collision* between a car and a truck.
	Collusion	The gate–keeper was in *collusion* with burglars.
89.	Coma	The patient was in (a state of) *Coma*.
	Comma	No *Comma* is needed at this place.
90.	Compare	*Compare* her handwriting with yours.
	Contrast	*Contrast* the policy of Bismarch with that of Nehru.
91.	Compensation	Her job is hard but it has its *compensation*.
	Remuneration	The remuneration paid to him for his services was insufficient.
92.	Complacent	We must not be *complacent* about our achievements.

	Complaisant	Sarla is lucky enough to get a *complaisant* husband.
93.	Complete	I hope to *complete* my studies next year.
	Finish	I *finished* my dinner in a hurry.
94.	Comprehensive	This book is quite *comprehensive.*
	Comprehensible	The expression of his ideas is not *comprehensible.*
95.	Compulsion	She agreed to my proposal under *compulsion.*
	Obligation	It is your *obligation* to show me the right path.
96.	Confident	I am quite *confident* of my success.
	Confidant	I have no *confidant* whom I may disclose the secrets.
97.	Considerable	My father spends a *considerable* sum of my education.
	Considerate	Be *considerate* towards the poor.
98.	Contagious	Small pox is a *contagious* disease.
	Infectious	Malaria is an *infectious* disease.
99.	Credulous	Indians are *credulous* by nature.
	Credible	Her talks were not *credible.*
	Creditable	You have achieved a *creditable* success.
100.	Die	The old lady *died* a miserable death.
	Dye	Never *dye* your hair.
101.	Dear	Nikunj and Mukul are *dear* to me.
	Deer	The *deer* can take long jumps.
102.	Diary	Note down my address in your *diary.*
	Dairy	We buy milk from the Mother *Dairy.*
103.	Dose	I have taken two *doses* of medicine.
	Doze	Do not *doze* in the classroom.
104.	Draught	He drank the water at (in) one *draught.*
	Drought	Lack of rain causes *drought.*
105.	Desert	The camel is the ship of the *desert.*
	Dessert	Apples are a common *dessert* after lunch.

106.	Due	Pay your fees on the *due* date.
	Dew	*Dew* drops shine like pearls.
107.	Drown	Even a good swimmer can *drown* in deep water.
	Sink	The ship *sank* into the sea.
108.	Discover	Columbus *discovered* America.
	Invent	Who *invented* the steam-engine?
109.	Doubt	I *doubt* her integrity.
	Suspect	The police *suspects* him of murder.
110.	Duel	The Kauravas dared not fight a *duel* with Bhim.
	Dual	How much does a *dual* desk cost?
111.	Differ	I *differ* from you on this point.
	Defer	Why has Sarla *deferred* her visit to Mumbai?
112.	Disease	Cancer is a fatal *disease.*
	Decease	Your mother's untimely *decease* has shocked me.
113.	Deference	I paid due *deference* to the guests.
	Difference	There are no *difference* between us.
114.	Defend	The B.S.F. *defends* our borders.
	Protect	The umbrella *protects* us from sun and rain.
115.	Deface	The atom bomb *defaced* Hiroshima.
	Efface	She tried to *efface* the memory of her past life.
116.	Dependence	*Dependence* on others for help is a sign of servility.
	Dependency	India was Britishers' *dependency* before 1947.
117.	Disinterested	Free India needs *disinterested* leaders.
	Uninterested	My brother is altogether *uninterested* in studies.
118.	Distinctness	Everybody praised Sheela for *distinctness* of her speech.
	Distinction	He won many *distinctions* in his college career.

119.	Dearness	Besides pay, I get the *dearness* allowance.
	Dearth	There is *dearth* of dedicated politicians in India.
120.	Decided	Mottoo is *decidedly* a greedy fellow.
	Decisive	The third battle of Panipat was really a *decisive* one.
121.	Decry	All the nations of the world decry the activities of the hijackers.
	Descry	The fisherman *descried* a sale on the horizon.
122.	Deduce	Don't try to *deduce* absurd conclusions.
	Deduct	The clerk has *deducted* one thousand rupees from my salary.
123.	Defective	The book-seller sent me a *defective* book.
	Deficient	You are *deficient* in English grammar.
124.	Defy	Don't try to *defy* the orders of your boss.
	Deify	Indians have *deified* Gandhi.
125.	Delicious	I ate a delicious dish this morning.
	Delightful	Your joke is really *delightful*.
126.	Deliverance	Death alone will give me *deliverance* from the cares and anxieties.
	Delivery	The *delivery* of some children is very painful for their mothers.
127.	Deny	You can't *deny* your misconduct.
	Refuse	He *refused* to give me a lift on his scooter.
128.	Depository	Banks are the trusted *depositories* of money and ornaments.
	Depositary	My father is a veritable *depositary* of learning.
129.	Deprecate	He *deprecated* my attempt to help the poor widow.
	Depreciate	She *depreciates* the value of time.

130.	Dissent	Why did you *dissent* the proposal of marriage.
	Descent	The Brahmins trace their *descent* from the mouth of Brahma. Or The hill has a sloppy *descent*.
131.	Destination	We shall take rest only on reaching our *destination*.
	Destiny	Man is the maker of his *destiny*.
132.	Device	Her *device* to rob her neighbour proved effective.
	Devise	He *devised* a plan to harass me.
133.	Elder	Ram was *Sham's elder* brother.
	Older	Ravi is *older* than Santu.
134.	Eligible	You are not *eligible* for this post.
	Illegible	Your handwriting is *illegible*.
135.	Elicit	The police tried to *elicit* truth from the thieves.
	Illicit	She has *illicit* relations with the local holigans.
136.	Eminent	Satbir Singh is an *eminent* physician.
	Imminent	There is a likelihood of *imminent* plague.
137.	Emigrant	There are many *emigrants* of India in foreign countries.
	Immigrant	India provides shelter to all the *immigrants*.
138.	Edition	This is the fifth *edition* of this book.
	Addition	There has been an *addition* in the list of crimes during the last two years.
139.	Emerge	We saw an elephant *emerging* from the river.
	Immerge	The dog *immerged* into the river and then came out.
140.	Efficient	Some teachers are quite *efficient* in their subjects.
	Efficacious	Quinine proves *efficacious* in malarial fever.

	Effectual	The means I adopted did not prove effectual.
	Effective	The arguments of the pleader were very *effective*.
141.	Exceedingly	She was *exceedingly* hospitable to her guests.
	Excessively	She fondles her children *excessively*.
142.	Exceptional	Damyanti was queen of *exceptional* beauty.
	Exceptionable	Your intention is highly *exceptionable*.
143.	Expedient	It is not *expedient* on your part to shout at your mother.
	Expeditious	He used the most *expeditious* means and reached the examination hall in time.
144.	Exhaustive	I have prepared *exhaustive* notes in all the subjects.
	Exhausting	A farmer's work is extremely *exhausting* by nature.
145.	Enviable	Manorama enjoys *enviable* health.
	Envious	Some women are *envious* of others' progress.
	Jealous	The neighbours are *jealous* of his progress.
146.	Incursion	The infiltrators from Pakistan made *incursion* into Kashmir.
	Excursion	Our school has organized an *excursion* for students and staff.
147.	Envelop	An *envelop* costs three rupees now.
	Envelop	The room was *enveloped* in darkness.
148.	Farmer	The *farmer* tills the land.
	Former	Out of Kamla and Bimla, the *former* is my neighbour.
149.	Form	Fill up the *form* for admission.
	Farm	He is sowing seeds in his *farm*.
150.	Feat	The juggler is showing his *feats*.
	Feet	Toes and heels are parts of the *feet*.

151.	Floor	Why are you sleeping on the *floor?*
	Flour	Bread is made of *flour.*
152.	Fair	She has a *fair* face.
	Fair	We went to see the Trade *Fair.*
	Fare	I have aid the taxi *fare.*
153.	Foul	Don't adopt *foul* means in the examination.
	Fowl	My neighbour keeps *fowls.*
154.	Famous	Pt. Deep Chand was a *famous* writer.
	Notorious	Shri Mohan is a *notorious* pick-pocket.
155.	Fissure	The earthquake caused many *fissures* in the roads and the fields.
	Fisher	Some *fishers* are expert in fishing.
156.	Forth	I ran *forth* to carry out my father's order.
	Fourth	Four is one-*fourth* of sixteen.
157.	Felicity	Human beings do not know what real *felicity* is.
	Facility	I have never enjoyed the *facilities* of life.
158.	Fateful	Last years was a *fateful* year of my life.
	Fatalist	The Indian farmers are great *fatalists.*
	Fatal	Drinking cheap liquor sometimes proves *fatal* to the drunkard.
159.	Forgo	A rich man cannot *forgo* the luxuries of life.
	Forego	The *foregoing* examples will make your concept clear.
160.	Feign	The criminal *feigned* madness in the court.
	Fain	I would *fain* help you in English.
161.	Gate	The *gate* of the school is closed.
	Gait	The swan has a graceful *gait.*
162.	Gaol	Many prisoners escaped from the *gaol.*
	Goal	To remain healthy is the *goal* of my life.

163.	Gamble	Ghaseeta has *gambled* away his wealth and has become a pauper.
	Gambol	The lamb is *gamboling* merrily.
164.	Gentle	His grandmother is a *gentle* lady.
	Genteel	You can win the hearts of the people by your *genteel* ways.
165.	Graceful	The Director had a *graceful* personality.
	Gracious	The host was most *gracious* to all the guests.
166.	Ghostly	The *ghostly* figure of his grandmother ever haunts him.
	Ghastly	She stared at the visitor with *ghastly* eyes.
167.	Guard	The watchman *guards* us against thieves at night.
	Gourd	I like the *gourd* vegetable very much.
168.	Great	Though Gandhi was thin yet he was a *great* man.
	Grate	The people in cold countries keep coal in *grate* to warm the room.
169.	Heal	The wound on my leg has *healed* up.
	Heel	The *heel* of my shoes has gone off.
170.	Here	When did you come *here?*
	Hear	We *hear* with our ears.
	Listen	Do not *listen* to his advice?
171.	Hair	Her *hair* is jet black.
	Hare	The tortoise defeated the *hare* in the race.
	Heir	Sohan in the sole *heir* of his father's property.
172.	Heart	Never lose *heart* in the hour of trial.
	Hurt	Many persons were badly *hurt* in the road accident.
	Hart	A *hart* is a male deer.
173.	Hole	A snake lives in a *hole.*
	Whole	I have answered the *whole* paper.

174.	Herd	Elephants live in *herds.*
	Heard	I heard his *heart*-rending story.
175.	Hale	My grandmother is *hale* and hearty.
	Hail	*Hails* are hurling outside.
	Hailed	We *hailed* the P.M.'s visit with a welcome song.
176.	Hoard	Never *hoard* money.
	Horde	A *horde* of robbers pounced upon the lonely traveller.
177.	Human	Most of the *human* beings lack humanity.
	Humane	Ashoka was a *humane* emperor.
178.	Healthful	Rani Khet has a *healthful* climate.
	Healthy	My father is *healthy,* wealthy and wise.
179.	Hew	Do not *hew* down the forests.
	Hue	Your turban is of dark *hue.*
180.	Historic	Gandhiji made a *historic* march to Dandi.
	Historical	The Taj is a *historical* building.
181.	Humility	Always show *humility* to the guests.
	Humiliation	She suffered life-long *humiliation* at the hands of her husband.
182.	Holly	We decorated our house with *holly* leaves on Diwali.
	Holy	The Ganga is a *holy* river.
183.	Honorary	Only rare persons hold *honorary* posts.
	Honourable	Our principal is a learned and *honourable* man.
184.	Habit	Varun has the *habit* of taking a drink every night.
	Custom	It is a *custom* among the Muslims to bury their dead.
185.	Idle	An *idle* brain is devil's workshop.
	Lazy	She is a dull and *lazy* girl.
	Idol	He bowed his head before Hanuman's *idol.*
186.	Industrial	Faridabad is an *industrial* town.

	Industrious	Only *Industrious* people make progress in life.
187.	Ice	*Ice* melts in the sun/open.
	Snow	I saw the *snow*-fall at Simla.
188.	Imperial	The general belongs to the *imperial* service.
	Imperious	The owner of the firm dismissed some workers in an *imperious* manner.
189.	Inapt	Being *inapt,* the P.M. could not organize his party.
	Inept	Your absurd remarks are *inept* for the occasion.
190.	Illude	You will be nabbed if you try to *illude* me.
	Elude	The burglars *eluded* the grasp of the constables.
191.	Illusion	This world is a big *illusion.*
	Allusion	There are several classical *allusions* in the Puranas.
192.	Imaginary	All the incidents in his story are *imaginary.*
	Imaginative	Some Children are very *imaginative.*
193.	Informer	The *informer* was stoned to death by the mob.
	Informant	Don't believe your *informant* because he is a cunning and deceitful fellow.
194.	Ingenious	Everybody praised his *ingenious* plan.
	Ingenuous	She is *ingenuous* in her remarks.
195.	Impossible	Nothing is *impossible* in this world for a man of wisdom.
	Impassable	The stream becomes *impassable* during the monsoons.
196.	Implicit	She has *implicit* faith in her husband's abilities.
	Explicit	Your statement is quite *explicit.*
197.	Indigent	The government should help the *indigent* farmers.

	Indigenous	The government should try to promote *indigenous* crafts.
198.	Judicial	The *Judicial* magistrate decided the case in my favour.
	Judicious	We should make a *judicious* choice of friends.
199.	Knotty	Independent India has faced many *knotty* problems.
	Naughty	*Naughty* students should be taken to task.
200.	Knight	*Knights* were given ranks of honour.
	Night	We do our home–work at *night* before going to bed.
201.	Knap	Hilary hoisted the flag on the *knap* or Mt-Everest.
	Nap	I am in the habit of enjoying a *nap* after lunch.
202.	Later	Sushma reached school *later* than Kamla.
	Latter	Out of Dimple and Ganita, the *latter* is more intelligent.
203.	Lessen	The medicine *lessened* my pain.
	Lesson	Learn your *lesson* daily and regularly.
204.	Lovely	These flowers are *lovely*.
	Lovable	You have a *lovable* nature.
205.	Loose	Always wear *loose* clothes.
	Lose	Don't *lose* your temper every time.
206.	Lion	The *lion* is the king of the forest.
	Loin	The dhoti is a *loin* cloth.
207.	Luxuriant	The tree had a *luxuriant* growth.
	Luxurious	The car is no longer a *luxurious* item.
208.	Lawyer	The *lawer* pleaded my case fearlessly.
	Liar	Nobody believes the words of a liar.
209	Lair	Do not approach the *lair* of the lion unarmed.
	Layer	Several thin *layers* of clothing will keep you warmer than one thick one (cloth).

210.	Lever	Heavy weights can be lifted by *lever*.
	Liver	*Liver* helps the digestion of food.
211.	Loan	You should repay your *loan* in time.
	Lone	He was the *lone* figure to manage his household.
212.	Lightning	Alas! the poor fellow has been struck by *lightning*.
	Lightening	My letter of condolence *lightened* my friend's heart.
213.	Loath	I am *loath* to help that cunning fellow.
	Loathe	I *loathe* selfish and silly fellows.
214.	Male	Indian society is *male* dominated.
	Mail	Letters are carried by *mail* train.
215.	Medal	Cassius Clay received a gold *medal*.
	Meddle	Never *meddle* with others affairs.
216.	Merry	Eat, drink and be *merry*.
	Marry	*Marry* in haste and repent at leisure.
217.	Meal	Have you taken your *meal?*
	Mile	Six *Miles* is equal to ten kilometers.
218.	Metal	Gold is a costly *metal*.
	Mettle	This horse has great *mettle*.
219.	Miner	A *Miner*'s job is very risky.
	Minor	Don't create a fuss over her *minor* mistakes.
220.	Momentary	Worldly pleasures are *momentary*.
	Momentous	Nehru had a *momentous* talk with Churchill.
221.	Mane	Thick *mane* is hanging over the lion's shoulders.
	Main	What is the *main* objective of your life?
222.	Meet	At what time will you *meet* me tomorrow?
	Meat	The pigeon is not a *meat* eater bird.
223.	Manor	The lords used to live on their *manors*.
	Manner	Her *manners* are despicable.
224.	Maze	You cannot find a way through the *maze* easily.

	Maize	The people of some states prefer eating *maize* to millet.
225.	Mean	Never adopt *mean* tactics to gain your end.
	Mien	Her *mien* and moans betrayed her mental unrest.
226.	Moat	A deep *moat* runs round the Agra fort.
	Mote	Even a tiny *mote* causes pain to the eye.
227.	Mayor	The *Mayor* is the first citizen of the city.
	Mare	The bridegroom rides a well-decorated *mare*.
228.	Mental	*Mental* workers need greater amount of rest than manual workers.
	Mantle	The mourners were wearing black *mantles*.
	Mantel	Don't put the mirror on the *mantel*.
229.	Memorial	The Indian Government has set up many *memorials* to honour Gandhiji.
	Memorable	15th August is a *memorable* day in the history of India.
230.	Mystic	Surdas was a *mystic*.
	Mysterious	*Mysterious* are the ways of women.
231.	Naughty	The Principal punished the *naughty* boy.
	Knotty	I cannot solve this *knotty* problem.
232.	Nice	Gita is a *nice* girl.
	Niece	My brother's and sister's daughters are my nieces.
233.	Nay	He said '*nay*' to my request.
	Neigh	Elephants trumpet but horses *neigh*.
234.	Notable	Kalidas was a *notable* dramatist.
	Notorious	A *notorious* dacoit fired at a constable.
235.	Negligent	Nobody will spare you if you are *negligent* in the discharge of your duties.
	Negligible	The loss sustained by her was not *negligible*.

	Neglectful	He is *neglectful* of his personal interests.
236.	Official	The Principal sent me an *official* letter.
	Officious	Nobody likes an *officious* fellow.
237.	Our	We should help *our* neighbours.
	Hour	Do not waste any *hour* of your life.
238.	Oar	Boats are sailed with *oars*.
	Ore	Iron can be obtained from *ores*.
239.	Ordinance	The President ordered an *ordinance*.
	Ordnance	My brother works in *ordnance* depot.
240.	Pane	Who has broken the window-*pane?*
	Pain	This tablet will remove your *pain*.
241.	Plain	She is *plain* in her talks. The Gangetic plain is very fertile.
	Plane	I went to Bombay by *plane*.
242.	Peace	We should live in *peace* with all.
	Piece	This *piece* of advise will be useful for you.
243.	Pray	*Pray* to God and do the right.
	Prey	The tiger is a beast of *prey*.
244.	Pour	*Pour* some tea into my cup.
	Pore	Human body is full of *pores*.
245.	Principal	The *Principal* is all in all in the school.
	Principle	A man of *principle* suffers many hardships in life.
246.	Popular	Gandhiji was a *popular* leader.
	Populous	Calcutta is the most *populous* city in India.
247.	Practice	*Practice* makes a man perfect.
	Practise	If you *practise* the sums, you will become a scholar.
248.	Pale	She looks *pale* after her illness.
	Pail	The *pail* is full of milk.
249.	Pair	Some *pairs* of shoes are very durable.
	Pare	*Pare* your nails and shave your beard.
250.	Peel	*Peel* off the oranges.
	Peal	I heard a *peal* of laughter behind me.

251.	Patrol	The police *patrols* at night.
	Petrol	Many engines are worked by *petrol.*
252.	Pole	Can you climb up a *pole?*
	Poll	Some parties create nuisance at the time of *polls.*
253.	Pitiable	The poor old lady is *Pitiable*.
	Pitiful	The *pitiful* girl showed pity towards me.
	Piteous	The old lady gave out a *piteous* shriek before she died.
254.	part	Divide this cloth into three *parts.*
	Portion	Can I rent a *portion* of your house.
255.	Proceed	How will you reach your destination if you do not *proceed* on your journey?
	Precede	A common noun is *preceded* by an article.
256.	Persecute	The police often *persecute* the innocent people.
	Prosecute	The poor boy could not *prosecute* his studies.
257.	Perpetrate	The Britishers *perpetrated* many atrocities on innocent people.
	Perpetuate	The government has decided to erect a statue to *perpetuate* the memory of Subhash.
258.	Prescribe	The board *prescribes* the books for the students.
	Proscribe	Seditious books should be *proscribed* by the state.
259.	Precipitate	The *precipitate* action sometimes leads one to trouble. *Or* Your action will *precipitate* a crisis.
	Precipitous	Even a mountaineer finds it difficult to climb a *precipitous* hill.
260.	President	Who is the *president* of your college union?

	Precedent	Can you quote any *precedent* in support of your case?
261.	Practical	The luckless boy failed in the *practical* examination. *Or* You are ignorant of the *practical* ways of life.
	Practicable	Your suggestions are not *practicable.*
262.	Physic	This does of *physic* will cure you of the chronic disease.
	Physique	Only a man of good *physique* can remain cheerful.
263.	Primary	Literacy is the *primary* need of the country.
	Primitive	The *primitive* people led a very hard life.
264.	Personal	This is my *personal* opinion that the dowry system should be banned.
	Personnel	The *personnel* of the Committee are doing their best to restore hygienic conditions in the colony.
265.	Quite	I am *quite* all right here.
	Quiet	Either talk in sense or keep *quiet.*
266.	Reign	Ashoka forbade killing of animals during his *reign.*
	Rain	The umbrella will protect you from sun and *rain.*
	Rein	The horse is controlled with the *rein.*
267.	Right	I eat with my *right* hand. *Or* Your objection is *right.*
	Rite	All the sacrificial *rites* were duly observed.
268.	Root	Gambling is the *root* cause of his ruin.
	Route	Which is the shortest *route* to the post office?

	Rout	The Chinese army was *routed* in the war.
269.	Ring	The golden *ring* is very costly.
	Wring	*Wring* the clothes and leave them in the sun to dry.
270.	Road	Do not run on the *road*.
	Rode	He *rode* his horse and set out on his journey.
271.	Rest	*Rest* is necessary after work.
	Wrest	The crow *wrested* the piece of bread from the child.
272.	Respectful	Be *respectful* to your elders.
	Respectable	Nehru was a *respectable* leader.
	Respective	The labourers return to their *respective* homes at sunset.
273.	Roll	The ball *rolled* down the hill.
	Role	She performed her *role* in the drama successfully.
274.	Row	The boatman *rowed* the boat across the river.
	Row	Don't create a *row* here.
	Row	Why don't you stand in *rows*.
	Roe	The roe runs very fast.
275.	Resource	All my *resources* have failed to bring my neighbour round.
	Recourse	Why has she taken *recourse* to begging?
276.	Raise	Indira Gandhi *raised* India's status in the eyes of the world.
	Raze	Many building were *razed* to the ground during the earthquake.
277.	Sale	This shop is for *sale*.
	Sail	Let us *sail* across the sea.
278.	Sore	Her eyes are *sore*.
	Sour	The milk has gone *sour*.
	Soar	Birds are *soaring* in the sky.
279.	Soul	The body is the seat of the *soul*.
	Sole	Earning money is his *sole* concern.

280.	Story	I do not believe your cock and bull *story*.
	Storey	Our building has two *storeys*.
281.	Steal	Thou shalt not *steal*.
	Steel	The almirah is made of *steel*.
282.	See	We *see* with our eyes.
	Sea	Ships sail on the *sea*.
283.	Sensible	The girl is quite *sensible*.
	Sensitive	Being a *sensitive* woman, she took her insult to heart.
284.	Shade	I sat in the *shade* of a tree.
	Shadow	The dog saw his *shadow* in the water.
285.	Suit	This suit does not *suit* me.
	Soot	The chimney is full of *soot*.
	Suite	She has rented a *suite* of rooms.
286.	Sun	The *sun* blazes hot in June.
	Son	The birth of a *son* is a matter of pride.
287.	Stationery	I bought a ream of paper from the *stationery* shop.
	Stationary	The pole star is *stationary*.

APPENDIX III

IMPROVING YOUR ENGLISH PRONUNCIATION

Here are some tips to help you improve your English pronunciation.

First of all, don't worry about not having a native-English accent. It's important to be able to speak clearly, so that people can understand you. However, it's almost impossible to sound exactly like a native English speaker if you are learning English as an adult in a non-English speaking country.

However, there are many things that you can do to improve your pronunciation and your speaking skills.

1. Listen to spoken English as often as possible

Listen to how speakers pronounce various words and phrases and "model" your pronunciation on what you hear.

2. Learn the phonetic alphabet

Use the phonetic alphabet page (at the beginning of most good dictionaries) as a guide to pronouncing new words.

3. Don't forget to learn the word stress of a new word

Every English word has its own stress, or intonation. For example, the word "believe" has two syllables (be and lieve), but only the second syllable is stressed. We say be'lieve and not 'be lieve. Your dictionary will show the syllable stress by an apostrophe (') before the syllable to be stressed.

Word stress is important. In fact, it is more likely that someone misunderstands you because of wrong word stress than because of the wrong pronunciation of a sound.

4. Work out which sounds cause you most problems in English

Depending on what your first language is, you may have problems with certain sounds. For example, French speakers have difficulties with "th"; speakers of Mandarin have difficulties with "r" or "l", and Arabic speakers have difficulties with "p" and "b".

5. Practise the sounds you find difficult

A useful exercise is a "minimal pair" exercise. For example, if you have difficulty distinguishing between "p" and "b", try practising pairs of words which are the same except for the sound "p" and "b":

For example, "pair" and "bear"; "pond" and "bond"; "pie" and "buy" etc.

6. Be aware of intonation and sentence stress

Not all words in a sentence have equal stress, and generally only the "information" words (nouns and verbs) are stressed.

'Where's the 'pen I 'gave you?
'Where's the 'red 'pen I 'gave you?
Where's the 'red and 'blue 'pen I 'gave you 'yesterday?

The unstressed words (such as "the", "I", "you" and "and") don't carry as much "weight" as the stressed words. They become much smaller in length, and are almost abbreviated. For example, "and" becomes "un".

Changing stress

Sentence stress isn't "fixed" like word stress. In fact, you can stress words that are normally unstressed in order to highlight different meanings.

For example:

I 'love you. (Love, rather than just like.)

'I love you. (With the stress on I to highlight that it's me rather than another person who loves you.)

I love 'you. (And nobody else.)

Intonation

There are a couple of easy to remember rules about intonation. Usually our voices go up at the end of the sentence to show a question, and down at the end to show a statement.

Intonation is also important in "tag questions":

You know him, don't you? (With rising intonation on "don't you?" to show it's a question)

You know him, don't you. (With falling intonation on "don't you" to show it's a statement you expect the other person to agree with.)

7. Learn to recognise spelling patterns

For example, "tion" on the end of a word is pronounced "shun", while "sion" can be pronounced "zhun". There are often many ways to pronounce a particular spelling pattern, but it certainly helps to know what the variations are. For example, the pattern "ough" can be pronounced "uff" as in "enough" and "tough", or "or" as in "ought" and "bought" or "oh" as in "although" and "dough".

8. Don't rush

If you speak too fast, the danger is that you could skip over some words, fail to pronounce them completely, or mix them up. If you speak too slowly, you might end up sounding unnatural. But it's better to speak slowly and clearly than too quickly.

Glossary

accent: the unique speech patterns of a person or group

air flow/airstream: the flow or passage of air out of the mouth

alveolar: sound formed by touching the tip of the tongue to the upper alveolar ridge, as in /t/ or /d/

alveolar ridge: the bony region at the roof and bottom of the mouth behind the front teeth; contains the tooth sockets

approximants: consonants with a partial obstruction of airflow, as in /w/ and /r/

articulation: the act of making speech sounds

aspiration: a small "explosion" of air when you make a sound

auditory: hearing (not seeing)

bilabial: consonant sounds formed using both lips, as in /p/ or /b/

close vowel (sometimes called "high" vowel): a vowel sound that is pronounced with the tongue close to the roof of the mouth (but not close enough to constrict the air and make a consonant), as in /i:/ in the word "free"

consonant: a speech sound made when there is complete or partial obstruction of air in the mouth, as in /v/ , /h/, /d/ (compare vowel)

clusters: blended sounds put together to make a single sound

curl: a position of the tongue where the tongue is shaped in a curve, not flat

dental: a consonant sound made when the tongue touches the upper teeth, as in /t/ and /n/

dialect: unique vocabulary, pronunciation and usage that is typical of a certain group of people

diphthong: a sound made by the combination of two vowel sounds in a single syllable, as in "boy", "loud" or "wide", where the sound starts as one vowel and moves towards another vowel

flatten: a positioning of the tongue where the tongue is flat not round

fricative: a speech sound (consonant) in which air is forced to pass through a small opening and creates friction, as in /f/ and /v/

glide/slide: moving the tongue while saying a word

glottal stop: the sound that is made when the vocal folds are closed very briefly; as in the middle of the word "uh-oh" (common in American English)

gum: the tissue around the base of the teeth

hard palate: hard part of the roof of the mouth

intonation: change in pitch of a sentence, up and down; the music or rhythm of speech

labiodental: sounds that are made with the lower lip and upper teeth, as in /f/ and /v/

larynx: the hollow, muscular organ in the throat that holds the vocal chords; the voice box

lateral: a speech sound that is made by touching the tongue to the middle of the alveolar ridge, allowing air to pass on both sides

lengthen sound: make the duration of the sound longer

linking: the joining of words when speaking, as in "Ca-nI-ha-va-bi-to-fegg?" (Can I have a bit of egg?)

lips spread: lips are open slightly and pulled back

lower: bottom of mouth

minimal pairs: two words that differ only in terms of one sound, as in "cat and bat" OR "fine and vine"

monophthong: a single vowel sound that does not change in auditory quality; also called a "pure vowel"

nasal consonants: consonant sounds made by pushing air through the nose, as in /m/, /n/ and /K/

non-pulmonic: when the air comes from a source other than the lungs

obstruction: a blockage of air flow

open vowel (also called "low" vowel): a vowel that is produced with the tongue far down from the roof of the mouth, as in the /a:/ sound in "far"

palatal: a sound that is made when the tongue is near or touching the roof of the mouth

palate: the roof of the mouth

phoneme: an individual speech sound

phonetic alphabet: an alphabet that represents the sounds of speech

phonetic transcription: a form of notation that uses symbols to identify the individual sounds (phonemes) in a word

plosive: a consonant sound produced when there is a complete obstruction of air followed by its sudden release, as in the /p/ of "pot"

pitch: amount of highness or lowness of a sound or speech

postalveolar: a consonant sound made with the tip of the tongue slightly back from the alveolar ridge, as in /ʃ/ in "shut"

pressed lips: top and bottom lips touching

protruded lips: rounded lips, pushed out

pulmonic: a sound that is made using the airstream directly from the lungs

raised: higher than the neutral position

reduction: the natural shortening of sounds when speaking (e.g. "going to" reduced to "gonna")

rhotic: a variety or dialect of English in which "r" is pronounced before a consonant (as in "hard") and at the end of words (as in "car"); Midwestern American English, for example, is "rhotic"

roof: the inside top part of the mouth

rounded lips: lips formed into the shape of a circle

rounded vowel: a vowel made with rounded lips

sentence stress: the placement of emphasis on specific words within a sentence or phrase

shorten sound: make the duration of a sound shorter

soft palate: soft part of the roof of the mouth

sonorant: sounds that are made when air is impeded only slightly, as in /m/, /n/

stop (stop consonant): a consonant sound that is produced when the airflow is (temporarily) stopped entirely by the lips or tongue, as in /p/

syllable: a single unit of sound that creates one beat in a word; the word "coffee" has two syllables (cof-fee)

syllable nucleus: the central part of a syllable, usually a vowel

tap: touch quickly

tone: the emotion that is conveyed through the sound of speech (e.g. anger or sadness)

tongue: muscular tissue in the mouth used for tasting and articulating

tooth ridge: the hard area directly behind the top front teeth

trill: a vibrating sound made with a flapping tongue, as in

the rolled "r" sound made when people roll their r's

upper: top of mouth

velar: of a sound that is made with the back of the tongue near the soft palate, as in the the /K/ in "sing"

velum: a soft membrane on the roof of the mouth (also called "soft palate")

vocal chords: two muscles inside the larynx that vibrate and create the voice

vocal tract: the entire apparatus that produces voice, starting in the lungs and ending at the lips and nostrils (openings of the mouth and nose)

voiced: of a sound made with the vocal chords (voice box) vibrating

voiceless/unvoiced: of a sound made without the vocal chords (voice box) vibrating

vowel: a speech sound made when air is free to pass through the mouth with little or no obstruction, as in sounds made with the letters a, e, i, o, u, and sometimes y (compare consonant)

vowel backness: position of the tongue in relation to the back of the mouth when making a vowel sound (positions include front, near-front, centre, near-back, back)

vowel height: distance between the tongue and the roof of the mouth when pronouncing a vowel sound (IPA has 7 heights: close (highest), near-close, mid-close, mid, open-mid, near-open, open (lowest)

word stress: the placement of emphasis within a word that has more than one syllable

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Preface

Pronunciation refers to the way a word or a language is spoken, or the manner in which someone utters a word. If one is said to have "correct pronunciation", then it refers to both within a particular dialect. 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, their ethnic group, their social class, or their education. A spelling pronunciation is a pronunciation that, instead of reflecting the way the word was pronounced by previous generations of speakers, is a rendering in sound of the word's spelling. In some cases, we cannot tell if a pronunciation is a true spelling pronunciation. The alternative is that a word is being pronounced *analogically*, in essence as the "sum of its parts". Thus, *forehead* is commonly pronounced as a sequence of *fore* plus *head*, instead of the historically earlier "forrid"; and *waistcoat* is commonly pronounced as a sequence of *waist* and *coat*, instead of the historically earlier "weskit". Spelling pronunciations give rise to varied opinions. Often those who retain the old pronunciation consider the spelling pronunciation to be a mark of ignorance or insecurity. Those who use a spelling pronunciation may not be aware that it is one, and consider the historically authentic version to be slovenly, since it "slurs over" a letter. Conversely, the users of some innovative pronunciations such as "Febuary" (for *February*) may regard the historically (and phonetically)

authentic version as a pedantic spelling pronunciation. Children who read a great deal often produce spelling pronunciations, since they have no way of knowing, other than the spelling, how the rare words they encounter are correctly pronounced. Well-read second language learners are likewise vulnerable to producing spelling pronunciations. However, since there are many words which one reads far more often than one hears, the problem also affects adult native-language speakers. This, in turn, leads to the language evolution mentioned above. What is a spelling pronunciation in one generation often becomes standard in the next.

This publication titled, "Better English Pronunciation" provides readers with an introductory overview of better English pronunciation. The focus lies on phonology, phonetics, articulation and speech perception. The subject areas of international phonetic alphabet, association and transcription are covered and supported with select case study. It provides a systematic and thorough introduction to the pronunciation of English to help intermediate and more advanced students improve their pronunciation of the spoken language. Also, the field of pronunciation respelling of English is dealt in detail, highlighting non-native pronunciations and foreign accent syndrome. Attempts have been made towards improving English pronunciation by evaluating role of English pronunciation test. This publication titled, "Better English Pronunciation" is completely user-friendly as it also gives readers a glossary, bibliography and index.

—Editor

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Better English Pronunciation