Some Descriptive Terms

**Contrast**
Relationship of syntagmatic nature
There is a difference between two phonological adjacent units
Fruta ≠ rfuta
Plaza ≠ lpaza

**Defective Distribution**
Lack of /r/ in initial position
(it is not neutralization)

**Dephonomization**
Two phonemes stop opposing themselves in all environments
Il → y (malla → maya)
The opposition has disappeared: two phonemes dephonologize in one phoneme.
2 phonemes >> 1 phoneme

**Distribution**
Several manifestations or variations (allophones) of the same phoneme (variant unit).
a) Combinatory or contextual variants
   Complementary distribution (C.D.)
b) Free Variants (F.V.) – stylistic or facultative.
   Realizations of a phoneme appear in the same environment
   More of less conscious choice of the speaker
   Equivalent or free distribution

**Neutralization**
The phonological opposition stops being pertinent in certain positions of the utterance.
Opposition /r/ → /rr/ pero → perro
Neutralization /R/ coRtaR
It becomes an Archiphoneme (capital letters between slant bars):
Group of distinctive features common to both phonemes in the neutralized opposition
/r/ + /rr/ = /R/

**Phonological Opposition**
Relationship of paradigmatic nature
There is a difference between two or more distinctive units
Minimal pairs are created: pero → perro

Some Phonetic Phenomena Related to Phones

**ARTICULATORY ENERGY** (muscular effort): strong vs. weak
Lenition process. Weakening process

**VOICING** (vocal cords): voiced vs. voiceless
Sonorization process. Deafening process

**VOWEL ATTACk**
Soft
Hard > glottal occlusion
Aspiration
Lesson 8. Phonetic Phenomena Motivated by Sound Combination
Modifications of Sounds in Contact

Alterations produced by phonological rules
1) Change in the value of a feature (example: voicing in the suffix /s/ in English)
2) Manifestation of a new feature (example: aspiration in English, in word initial position
3) Segment loss (Example: final consonant in French /petit/ → [peti])
4) Manifestation of a new segment (example: initial /e/ in Spanish)
5) New segment order (example: Latin parábola > Spanish palabra)
6) Segment duplication

Assimilation (contact assimilation and distance assimilation)
Assimilation is when one sound is influenced and changed by a neighbouring sound. Generally speaking, there are three types of assimilation that can be identified; assimilation of place, manner or voice.

Assimilation of place can be demonstrated by “ratbag” or “oatmeal” where the /t/ sound is replaced by a /p/ sound. This is because the alveolar plosive /t/ is simplified into the /p/ sound which is closer to the bilabial plosive /b/.

Assimilation of manner refers to when two different manners of articulation influence each other to form a different type of manner of articulation. Examples of this are the pronunciation of “Indian” as [ɪndʒən] or the pronunciation of “soldier” [souldʒə]. This is because the alveolar /d/ combines with the palatal /j/ to form an affricate.

Assimilation of voice is illustrated by the pronunciation of “have to” with an /f/ sound rather than the /v/ as the voiced fricative is followed by a voiceless consonant.

The reason for assimilation is because the tongue cannot always move quickly enough to get from one position to another in order to articulate the next sound, or because the mouth is too busy anticipating the following sound. In either case, it approximates the sound before moving on to the next segment of sound. This approximation is assimilation.

- Regressive Assimilation
In anticipation (the first sound assimilates the second one)
For example, the Spanish nasal consonant in final position /N/ > [um beso]
This is a case of assimilation to the position (place) of articulation /N/ > [+bilabial] / _[+bilabial]

Palatalization
In English: education /d/ → /[dʒ]/ /l/ → []
In Portuguese: Curitiba [kuriʃiba], fútbol [futʃibol] /t/ → [tʃ]

Labialization
When a /t/ is followed by a /b/ or a /p/, it usually changes into a /p/ sound.
[ðeəp ˈpʰə-sə] that person
[ðeəp bɔɾ] that boy
light blue

When a /d/ is followed by a /b/ or a /p/, it usually changes into a /b/ sound.

[gub bɔːɻ] good boy
[gub'pʰɛktɪs] good practice

**Palatalization**

/tʃ/ and /dʒ/ are often assimilated in natural speech to the /tʃ/ and /dʒ/ sounds

[tʃuːn] rather than [tjuːn] for tune

[dʒuː] instead of [djuː] for dew

/ʃ/ affects any /s/ or /z/ that comes before it.

[ðiʃ ʃuː] for this shoe
[ðouʃ ʃuːz] for those shoes

- **Progressive Assimilation**

  The second sound assimilates the first one

  In English, the suffix /s/ for plurals and possessives: cat[s] dog[z]

  This is a voice assimilation case (voiced or voiceless)

  /s/ → [+voiced] / [+voiced]_

- **Harmony**

  (distance assimilation at a morphological and lexical level)

  Nasal harmony (Guarani)

  **Regressive**

  [dʒaˈha] [ɲaŋeʔė]

  [mbowaˈta] [mokaneʔô]

  [nde] [ne]

  **Progressive**

  [koˈt̬ɪpe] [tobaˈt̬ɪme]

  Vocal harmony (Guarani)

  [aha] [jaha] → [roho] [oho] [reho] [peho]

- **Metaphony**

  (distance assimilation at a phonetic level) = *inflection*

  Modification of a vowel's pitch by influence of a neighbour vowel

  Latin *feci* → Spanish *hice* ([e] in feci changed into [i] by influence of the [i] in feci

**Dissimilation**

(Distance dissimilation and contact dissimilation)

The difference between two sounds is highlighted. A sound changes one or two articulatory features to be more different from the other sound. It occurs when an assimilative tendency threatens with eliminating a phonological distinction. It breaks the continuity of articulatory movement between two phones.

- **Differentiation**

  (all phonetic change that creates difference between two adjacent sounds)

  In English: a pear → an apple

  In Guarani: ipochy → ijao  ipochy eterei→ikane’ō eterei

  *May be in Spanish:* las aguas frías→ el agua fría

- **Dissimilation**

  (all phonetic change that creates difference between two distant sounds)

  Latin *arbor* → Spanish *árbol*
Metathesis (distance metathesis and contact metathesis)
- Inversion (movement between two adjacent sounds)
  Permiso → premiso  
  Latin sibilare → Spanish silbar  
  Latin spatula → Spanish espalda
- Reciprocal Metathesis (movement between two distant sounds)
  Latin integrale → Spanish entregar  
  Latin periculu → Spanish peligro  
  Latin miraculum → Spanish milagro → English miracle
- Metathesis (movement of a single sound)
  Gabriel → Grabiel  
  reloj → regló
- Elision
  Elision refers to when a sound or syllable is lost or omitted. It particularly affects:
  consonant clusters; weakly stressed syllables that are not especially missed; and words that end in an alveolar consonant and that are immediately followed by a word beginning with a consonant. The sounds that are elided are those sounds that are so weakly articulated that they no longer have any auditory significance.
  Some elided syllables are represented in standard punctuation, for example, “I’m” should be “I am”. In standard speech, the missing vowel is understood and so meaning does not suffer from this contraction.
  Elision is one of the reasons for the great mismatches found in English between a word’s spelling and its pronunciation. “Wednesday”, for example, was originally a contraction of “Odin’s day” while today, Odin is barely discernable as the /d/ is no longer pronounced.
  Elision is most commonly used in, but is not exclusive to, connected speech. The faster the speech, the more likely that sounds and syllables will be elided.
Examples → One cause of elision is the loss of a weak vowel after the voiceless stops /p/, /t/ and /k/. [ptʰeɪteu] is an example of the schwa being elided after /p/.

Another cause of elision is when a weak vowel is elided before the syllabic consonants /l/ or /n/. [leɪʃn] demonstrates the loss of the schwa before the /n/.

Complex clusters are often elided in order to simplify the saying of the sound.

[dʒɔ:dʒ ə sɪksθəs ərəʊn] is elided into the much simpler: [dʒɔ:dʒ ə sɪks θərəʊn]

/ə/ is often elided when it comes before a consonant. [leʊdəz əˈmænɪ]

Contracted forms of words are caused by elision. → [aɪm] instead of [aɪ əm]

Some elisions are just by convention or to speed up or simplify the way we speak. [ˈsɛkərtəri] rather than [ˈsɛkərtəri]

Note: When a vowel is elided, it is usually a weak vowel, typically the schwa. When a consonant is elided, it is usually because it’s in an environment with other consonants.
Lesson 9. Suprasegmental Features (Prosodic Properties)

Prosodic Features: They characterize determined chunks of the speech. They do not always match with a phoneme.

1. Length

Length seems to play a role in stress. Generally, if one syllable has a longer length than the others in the word then it is deemed to be the one carrying stress. Length is one of the more important determiners of stress.

Correlation of Quantity = distinction between short and long
Short, semishort, hypershort syllables, → long, semilong, hyperlong syllables
Actual physical time used in sound articulation and syllables vs. perceived psychological time
Absolute duration of sounds vs. relative duration of sounds (elocution time).

Phonemically between morphemes
Vowels in German: Stadt /stat/ city → Staat /staːt/ estate
Consonants in Italian (and Arabic) /nono/ ninth → /nonːo/ grandfather

Phonetically between morphemes
Vowels in English: bit /bɪt/ → [bɪd] pedacito
bid /bɪd/ → [bɪd] apostar (remate)
V→[+long]/[+voiced] beat /bɪːt/→[bɪ:t] golpear
bead /bɪːd/→[bɪ:d] cuentas

2. Intensity - Stress: Impulse Energy

Intensity is the stress (or voice strength) that is given to a specific syllable. It is the stress highlight in comparison to other syllables pronounced by the same person.

Articulatory Energy: the stressed syllable is more prominent than the unstressed one. Stressed syllables get more voice intensity. (NOTE: this intensity is relative). The intensity is like the rhythm of a tune, like the beat of a drum that marks the rhythm of a song. The sounds are strong or weak, according to their more or less wave width (it refers to acoustics.)

Every language has its own intensity system. (which is the rhythm of the intonation)

Degrees of Intensity
2 degrees in Spanish: strong or “tónico” /ˈtôniko/ vs weak or “átono” /ˈaːtoŋo/
3 degrees in English: strong /ˈstrɒŋ/, medium /ˈmedʒərn/, y weak (o zero) /ˈwɛkn/
How many degrees of intensity are there in Guarani?

Preferred word stress location (word stress)
Spanish: last syllable (when it finishes in v, n or s); and penultimate syllable (when it finishes in another consonant)
English: normally in the first syllable for two-syllable words, but this is not systematic
Guarani: in the last syllable

Importance of intensity in short phrases (Phrase stress)
The intensity of a given word gives the word specific meaning
Un soldado simple ≠ un simple soldado (it changes the intensity and the order)
The white house ≠ the White House (the order in not changeable, only
(de color blanco) (del presidente) the intensity is)

Distribution of intensity in sentences or phonic group (sentence stress)
Spanish: 4 or 5 unstressed syllables and then a stressed one – similar to a machine gun (staccato)
English: alternated without a systematic regularity among strong, medium and weak (nothing).

Behaviour of unstressed syllables
Spanish: length and vowel quality is kept (it does not decrease)
English: Syllable length decreases significantly (a part of its length yields)
The vowel (simple nuclei) becomes schwa and may disappear
Syllability can be assumed by a resonant consonant.

Phonetic Feature of Intensity (Stress) in morphemes (Minimal Pairs)
In Spanish: /'papa/→/pa'pa/ /'este/→/es'te/ /'hablo/→/a'blo/
In English: /'torment/→/'tor'ment/ 'conduct→con'duct 'address→a'ddress
In Guarani: /'pora/→/'po'ra/ /'ipe/→/'ipe/

Function of stress in Spanish (Quilis, p. 70-72):
Contrastive Function (sintagmatic axis)
Highlights a superior linguistic unit over the phoneme (for example, syllable, word.)
Distinguishes between linguistic units of the same level: contrast between stressed and unstressed units
Distinctive Function (paradigmatic axis)
Distinguishes two units of different meaning (ánimo, anímo, animó)
Finishing Function
Other unstressed units group around the central unit near the tonic syllable.

Emphatic accent (or insistence) (Quilis, p. 75)
¿Quién estaba aquí? ÉL estaba aquí
¿Dónde estaba? Él estaba AQUÍ
¿Está aquí todavía? ÉL ESTABA aquí

How to determine where stress lies.
English is not a language that follows precise rules for the placement of stress. In French, the last syllable is usually the stressed one; in Polish, it is usually the penultimate one; and in Czech, it is generally the first syllable that is stressed. Unfortunately, English has a very complex set of procedures that determine stress. It should be noted that nearly all English speakers agree on where stress should be placed in individual words so our system of stress does have some method to its madness.

One syllable words
Obviously, these present no problems because, when pronounced in isolation, they receive the primary stress. (There is no other syllable competing with it.) \[ \text{haus} \] [\text{θɪn}]\]

Two syllable words
The choice is still quite simple; either the first or the second syllable will be stressed. It is usually the case with verbs that, if the second syllable of the verb contains a long vowel or diphthong, or if it ends with more than one consonant, then the second syllable is stressed. \[ \text{θeɪkt} \] [\text{θeɪtər}]\]
If the final syllable contains a short vowel and one or no final consonant, then usually, the first syllable will be stressed. \[ \text{θiŋ} \] [\text{θiŋ}]\]
Two syllable adjectives are stressed in the same manner. \[ \text{holəv} \] [\text{kæ\.rɛkt}]\]
Nouns generally use a different rule. If the second syllable contains a short vowel, then the stress usually comes on the first syllable - otherwise it will be on the second syllable.

**Thres syllable and more words**

Determining stress becomes very complicated from this point on. The rules start to become quite arbitrary with more exceptions than can easily be explained away. One general hint to remember is that weak syllables never carry stress. Therefore, any syllable with a schwa in it will never be the stressed syllable.

Despite the large amount of research done on the subject of stress, it is still one area of which we have little understanding.

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3. **Juncture (final inflexions, final stitches)**

It is the phenomenon that characterizes the final part of a phonic group, of a melodic unit, represented by vertical bars turned into arrows according to the tone’s rising or decreasing.

**Phonic Group** = less contrast

*Platero es pequeño, peludo, suave.*

It is also the part of speech between two pauses. (Quilis p. 76), from a word to a sentence. Between intermediate pauses that can be logical, expressive or breathing (it does not always have to do with spelling).

**Intonation Group** (Intensity group, intensive group) = more contrast:

*Platero es pequeño, peludo, suave*

*Cristóbal Colón descubrió América*

“En español el sintagma nominal que funciona como sujeto suele formar un grupo de entonación” (Quilis p.77)

Gruppo de entonación (Quilis p. 76) = “porción de discurso comprendida entre dos pausas, entre pausa e inflexión del fundamental, entre inflexión del fundamental y pausa, o entre dos inflexiones del fundamental, que configura una unidad sintáctica más o menos larga o compleja (sintagma, cláusula, oración).”

[“*Fundamental = primer armónico en la descripción acústica.” Quilis, p. 35]

Between finishing pauses, “encuadramiento entre inflexiones finales.”

[“*Pausa= cese, omisión de voz cuando estamos hablando (silencio o ausencia de voz)“]

[“*Oposición= con pausa vs. sin pausa“]

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**There are three junctures (or tonemes) in English and Spanish:**

(Gili Gaya refers to 5 tonemes that were described by Tomás Navarro)

**Falling movement of the fundamental (cadence o semicadence)**

- The voice falls (but keeping the same tone).
- (Instant suppression of intensity)
- It is represented by a downward vertical arrow ↓
- The intensity decreases and then stops

**Rising movement of the fundamental (anticadence o semianticadence)**

- The voice rises (but keeping the same tone)
- It is represented by an upward vertical arrow ↑
- The intensity increases and then stops

**Immutable movement of the fundamental (pause)**

- The voice is kept at the same level
- Because there is no modulation, it is represented by an arrowless vertical bar |
- The intensity is kept until the end

However, when comparing languages, there are many differences in the distribution of these junctures.
4. Tone (Tonal register, melodic tone, musical height)

Modulated tone→simple and complex modulated in relationship to high and low tones.

Tone description based on the articulation:

“La frecuencia vibratoria de las cuerdas vocales está determinada por su longitud y por su tensión. La longitud varía de un individuo a otro. Cuando las cuerdas vocales son más largas, el registro de voz es más grave (como en los hombres). Cuando las cuerdas vocales son más cortas, el registro de voz es más agudo (como en las mujeres). Dentro del registro individual de voz, las cuerdas vocales se tienden o se distienden para cada sonido a causa de las contracciones y relajaciones de los músculos insertos en los cartílagos laríngeos. A mayor tensión corresponden notas más agudas.”

(Gili Gaya, pp. 52-55)

Tone description based on acoustics:

“Las vibraciones rápidas o lentas de la molécula (en el movimiento de vaivén) tienen período más corto o más largo, respectivamente. El número de vibraciones por segundo es la frecuencia del movimiento ondulatorio, y de ella depende el tono del sonido. A mayor número de vibraciones por segundo corresponde un sonido más agudo; si el número es menor, el sonido será más grave. Hay sonidos tensos y relajados. Función contrastiva de la frecuencia fundamental en el nivel de la palabra acústicamente” (Quilis, p. 35)

[“Frecuencia fundamental: el tiempo que dura un periodo del fundamental (primer armónico).”]

Tonal Languages. Languages with registers: examples of tonal languages: Chinese, Vietnamese (with 6 tones!), they posses phonemic contrastive tones in morphemes (tone is a phoneme).

Examples of phonemic tones:

FALLING (The tone goes down to a lower height →lower)
RISING (The tone goes up to a higher height →less low)
HORIZONTAL (levelled – lack of melody)
FALLING AND RISING

Example: Chinese 媽媽罵馬

Tones in Spanish & English: function in the sentence.

Tone – Height rank that we give to our voice to express what we feel or think.

Tone variations express our emotions and attitudes, even without describing them using words. Your tone of voice can convey a message that does not match with the words you are using. With different tones of voice, we communicate emotions such as good or bad mood, compassion, conformism, fear, anger, offence, sarcasm, disapproval, wrath, indignation, over enthusiasm, pride, etc.

We pay more attention to the tone of voice than to the words that we hear to judge or interpret the real intention of a person’s message.

Spanish has three tone levels (1-bajo, 2-medio, 3-alto)

Normal speech is based on a combination of tone levels 1 and 2.

In Spanish, tone 3 is used to express enthusiasm and lots of excitement. (excessive use of tone 3 can communicate anger or wrath)

English has 4 tone levels (1-very low, 2-semi-low, 3-semi-high, 4-very high)

Normal speech is based on a combination of tone levels 2 and 3

In English, tone 4 is used to show enthusiasm and lots of excitement (Excessive use of tone 1 shows disapproval, lack of interest or a servant-master relationship)
Tones in English are much more marked than in Spanish. You can see and compare them next.

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Spanish

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English

5. **Intonation:**

The messages that we convey to one another depends just as much on *how* we say something as on *what* it is that we actually say. Most of the information on this site deals with the mechanics of articulating sounds. However, it is possible to use the same words to convey a huge variety of meanings, moods or intentions. The way we do this is by using intonation.

In the study of intonation, pitch, loudness and length are the most important factors. They work together to give certain syllables prominence over the others. The concepts of intonation are very closely related to those in stress, the difference being that stress is concerned with individual words, whereas intonation extends over a phrase or utterance.

**Intonation:** “*función de la frecuencia fundamental en el nivel de la oración*” (Quilis).

“*Los patrones de entonación se manifiestan a través de tonos ascendentes y descendentes. La entonación es la función lingüísticamente significativa, socialmente representativa e individualmente expresiva de la frecuencia del fundamental en el nivel de la oración.*” (Quilis, p. 76-77)

**Three functions of intonation** (Quilis): *nivel lingüístico, sociolingüístico y expresivo.*

**Intonation field:** the area between the highest and lowest linguistic sounds. The voice movements in the language are much more restricted than in music.

**Intonation patterns between individuals and speech communities:**

The expressive habits of each language influence in that their ordinary field of intonation be more or less wide. (Italian over two octaves→modulation singing effect, Spanish over one octave).

Each person has their own normal voice tone, the key that within their individual register is produced with more ease. Around this key (or tone), rising and falling movements perform in the speech of that person.

Eliminating individual differences, people from specific regions or countries express themselves using a medium, higher or lower normal tone.

Spanish has a lower tone than French or Italian

- Castilla – The Spanish’s lowest
- Andalucía – predominates a higher tone
- Asunción versus Guairá?

Intonation has dialectal and idiomatic shades. Frequently, it is said that the inhabitants of a specific region “sing” when they speak. Actually, we all sing, but only by contrast do we realise of the peculiar “song” of our speech community.

**Melodic inflections tell where people are from.**

**Examples from Spanish** (Llorach, p. 205.)

1. **Cadencia y Semicadencia** (inflexiones descendentes)
   Generalmente, la afirmación y la terminación de lo expresado

2. **Anticadencia y Semianticadencia** (inflexiones ascendentes)
   Generalmente, la no conclusión de lo expresado y la interrogación

3. **Suspensión** (tono mantenido a la misma altura)
Examples from English (Meis & Jones, p. 283):

1. **Rising-falling intonation**
   - **Affirmative sentences (affirmative & imperative sentences, lists, conditional sentences, "if/then")**
   - **Question forms**
     - Question tags (you can go, can’t you?)
     - Wh_ questions (what, where, when, who, etc)

2. **Falling-rising intonation**
   - Polite questions, open-ended questions (this or that)
   - Final “interrogative” questions that actually request for information

3. **Rising intonation**
   - Wh_ questions to clarify previously known information
   - Yes/no questions.

6. The rhythm of intonation
   Preference for specific stress types is characteristic of each language
   Tendency to the alternative of relative stress, starting with the main stress
   Unconscious zigzag in the relative syllabic trend – it organizes itself with a specific rhythmic tendency

**Spanish _ the rhythm is based on syllables: syllable-based rhythm**
All syllables have approximately the same duration
Rhythm is marked by counting the syllables (ex. Songs and poems)

**English – it is based on strong stress (stressed syllables): Stress-based rhythm**
From stressed syllable to stressed syllable they have approximately the same duration
Rhythm is marked by counting the stressed syllables (the strong intensities) (ex. Songs and poems)

7. **INTERESTING OBSERVATION OF THE ENGLISH LANGUAGE (Fromkin & Rodman, p. 333):**
60% out of the 20.000 frequently used words are loan words from other languages. 30% out of the 500 most common words are loan words. The frequency of words of English origin of daily use is 80%.
English also has several morphosyntactic structures that were borrowed from other languages:
   Comparative/superlative
   English origin: pretty - prettier - prettiest
   Borrowed structure: beautiful - more beautiful - most beautiful
   Pluralization with the suffix /s/ came from French
   Only the irregular plural forms in Modern English came from Old English.

**Pitch** is an auditory sensation that places sounds on a scale from high to low. Every syllable has pitch, however, any syllable that is articulated with a noticeably different pitch will be deemed to carry stress.
This can go either way: if all the syllables are said in a low pitch except one, then that higher pitch syllable will be deemed to carry the stress of the word.
Pitch also plays a central role in intonation.
Lesson 10. Phonology: Analysis of Foreign Languages

The contrast of phonemes in minimal word pairs has also been referred to as **contrast in identical environments.**

**Example (English)** The segments [l] and [ɹ] contrast in identical environments in the following minimal pair: [lip] [ɹip]

The implication is that /l/ and /ɹ/ are separate phonemes.

**Example (Cashinahua, Peru/Brazil)** The segments [s] and [ʃ] contrast in identical environments in the following minimal pair: [mulsu]'swollen hand' → [mulʃu]'black, dark'

The implication is that /s/ and /ʃ/ are separate phonemes.

**Near minimal pairs (subminimal pairs) occur in analogous environments**

/ʃ/ and /ʒ/ are subminimal pairs in analogous environments in the words vision / fishin' = [vɪʒən] [fɪʒən]

Contrast in analogous environments is the difference between two phonetically similar segments that occur in two separate words and have similar adjacent sounds. If neither segment has been modified or affected by its environment, the segments are separate phonemes.

**Example (Kaiwa, Brazil)** The segments [p] and [b] contrast in analogous environments in the following words:

[opə] 'it is finished' → [aba] 'place'

The implication is that /p/ and /b/ are separate phonemes.

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**Q:** I am currently taking a language acquisition course and do not understand the purpose nor the difference between complementary distribution and free variation. Are they both in reference to only allophones?? What is the difference and why is it important??

**A:** **COMPLEMENTARY DISTRIBUTION** refers to the situation where, of two linguistic elements (most often segments, but they may be other types of elements), neither is ever found in environments where the other is found. We usually only talk about this (in phonology) with respect to 2 allophones of a particular phoneme, but there are other cases. So, for example, an unaspirated [p] and the aspirated [pʰ] are in complementary distribution before a stressed vowel: in absolute word-initial position, we find only [pʰ]; if it occurs after an /s/, though, only the unaspirated variant is encountered. So we get 'pin' [pʰɪn] but 'spin' [spɪn]. In many varieties of English, however, the situation is different at the end of the word. Here, the [p] and the [pʰ] are in FREE VARIATION. That is, words like 'sip' can be pronounced *either* [sɪp], with no aspiration, or [sɪpʰ], with aspiration. So both terms refer to the existence of 2 or more variants in similar environments, but in C.D. they are mutually exclusive with respect to the environments, while in F.V. both may occur at different moments in the identical environment. Note that in my example, we find both phenomena with the same pair of segments; however, we do not find the same pair of segments showing both phenomena in the “same” environment. **Note that not only aspirated [pʰ] but also [tʰ] and [kʰ] are in complementary distribution with unaspirated [p].** They are of course not considered allophones of [p] (but rather of [t] and [k], respectively), because they are not “phonetically similar” to it, but they “are” in fact in C.D. with respect to [p].
**Problem # 1 Hypothetical language**

Pick out the minimal and sub-minimal word pairs that indicate contrast between phonemes. You will have to isolate suspicious pairs first.

<table>
<thead>
<tr>
<th></th>
<th>Minimal Word Pair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[vatok] Gun</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>[bilog] Car</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>[pison] Joke</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>[nagan] Juice</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>[kansir] Sick</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>[pirol] Anger</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>[firfel] Fall</td>
<td>16</td>
</tr>
</tbody>
</table>

**Problem # 2. Spanish**

In Spanish, [b] and [β], [d] and [ð], [g] and [گ] are allophones of /b/, /d/, and /g/, respectively. That is, they are suspicious pairs which have been shown to be in complementary distribution. Based on the data presented below, what is the CD of the allophones?

<table>
<thead>
<tr>
<th></th>
<th>Minimal Word Pair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>[agusar] To sharpen</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>[gringgo] Foreigner</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>[gordō] Fat</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>[pągar] To pay</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>[tjeŋda] Shop</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>[tigge] Tiger</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>[tablado] Flooring</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>[tabako] Tobacco</td>
<td>16</td>
</tr>
</tbody>
</table>

Based on your analysis above, predict the phonetic form of the following items, written phonemically as: /doβle/ 'double', and /boβada/ 'nonsense.' Remember that a "phonemic rewrite" uses only one of the allophones of the phoneme to represent the whole phonemic class.

**Problem # 3. English**

Suppose a speaker of English fluctuates between the pronunciation of *either* as [aiðə] and [i:ðə]. Would you consider this to be a fluctuation between phonemes or allophones? Why?

**Problem # 4. Unknown Dialect.**

For each suspicious pair of phones in this dialect, state if the phones are two distinct phonemes or if they are allophones of the same phoneme by identifying either a minimal pair in identical environments; subminimal pairs in analogous environments or complementary distribution in mutually exclusive environments. You need to justify and explain each answer:

<table>
<thead>
<tr>
<th></th>
<th>Minimal Word Pair</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>sama Man</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>eka Stem</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>tamza Polen</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>tatsa Flower</td>
<td>8</td>
</tr>
</tbody>
</table>

Note: there is a case of assimilation. Identify it and explain how it works.
**Problem # 5. Kalabaa**

For each suspicious pair of phones in the KALABAA dialect, state if the phones are two distinct phonemes or if they are allophones of the same phoneme by identifying either a minimal pair in identical environments; subminimal pairs in analogous environments or complementary distribution in mutually exclusive environments. You need to justify and explain each answer:

\[
[s] \& [z] \quad [n] \& [m] \quad [k] \& [g]
\]

Concerning the three pairs of phones, examine the 15 statements of the linguistic corpus.

1. sugap  
   Hammer  
2. kasan  
   Pumkin  
3. pabas  
   Ear  
4. pudam  
   Mother  
5. tusut  
   Some  
6. kubup  
   Basket  
7. naban  
   Smoke  
8. tugak  
   Wet  
9. kagas  
   Coffee  
10. zugak  
    Horse  
11. nazuz  
    Bread  
12. maban  
    Valley  
13. zadat  
    Cousin  
14. tazut  
    Coat  
15. pabaz  
    Thunder

Note: Identify and explain the general rule about the phonemic characteristic of oclusives in this language. This rule should also be represented using a notational phonological rule.

**Problem # 6. Kalabaa**

\[
[s] \& [z] \quad [n] \& [m] \quad [V] \& [V:\:] (\text{duration of } [a], [i], [u])
\]

1. nipaz  
   To spend  
2. stupa:z  
   Nearby  
3. musu  
   Lip  
4. ka:ni  
   To pray  
5. tsu:sit  
   To soften  
6. nipat  
   Knowledge  
7. ki:ta:z  
   Trial  
8. ku:mi  
   Egg  
9. tsu:ni  
   Acknowledge  
10. spantuz  
    pebbles  
11. misu:  
    To shine  
12. ni:pat  
    Woman  
13. tsisu  
    To rain  
14. kani  
    Spilt  
15. ta:nu  
    Nothing

Note: in order to analyse vowels you need to compare:

\[
[a] \& [a:] \quad [i] \& [i:] \quad [u] \& [u:]
\]

**Problem # 7. Hebrew**

Consider these phonetic forms of Hebrew words. Are [b] and [v] allophones of one phoneme? Can you formulate a rule to explain their distribution? Does the same rule, or lack of a rule, apply to [p] and [f]? If not, why not? (NOTE: [ʔ] represents a glottal stop, and [x^h] represents a pharyngeal fricative.)

<table>
<thead>
<tr>
<th>bika</th>
<th>&quot;lamented&quot;</th>
<th>litef</th>
<th>&quot;stroked&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>mugbal</td>
<td>&quot;limited&quot;</td>
<td>sefer</td>
<td>&quot;book&quot;</td>
</tr>
<tr>
<td>šavkar</td>
<td>&quot;broke&quot; (masc.)</td>
<td>sataf</td>
<td>&quot;washed&quot;</td>
</tr>
<tr>
<td>šavra</td>
<td>&quot;broke&quot; (fem.)</td>
<td>pa:fa</td>
<td>&quot;cow&quot;</td>
</tr>
<tr>
<td>ṣikev</td>
<td>&quot;delayed&quot;</td>
<td>mitpax^h:at</td>
<td>&quot;handkerchief&quot;</td>
</tr>
<tr>
<td>bara</td>
<td>&quot;created&quot;</td>
<td>ha?alpim</td>
<td>&quot;the Alps&quot;</td>
</tr>
</tbody>
</table>
Problem # 8. Tojolabal (Mexico)

At the time of first European contact, probably close to 1,000 American Indian languages were spoken in North, Central, and South America. Although the number of languages in daily use has steadily declined because of persecution and pressures on the Indians to adopt English, Spanish, and other originally European languages, well over 700 different American Indian or, as they are sometimes called, Amerindian or Native American languages are spoken today. Tojolabal is a language that belongs to the large Mayan family from Central America.

<table>
<thead>
<tr>
<th></th>
<th>[t]</th>
<th>[tʰ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>tʃitam</td>
<td>pig</td>
</tr>
<tr>
<td>2</td>
<td>makton</td>
<td>a patch</td>
</tr>
<tr>
<td>3</td>
<td>potot</td>
<td>kind of plant</td>
</tr>
<tr>
<td>4</td>
<td>tinan</td>
<td>upside down</td>
</tr>
<tr>
<td>5</td>
<td>tʃatatʰ</td>
<td>kind of plant</td>
</tr>
<tr>
<td>6</td>
<td>mutʰ</td>
<td>Chicken</td>
</tr>
<tr>
<td>7</td>
<td>nahatʰ</td>
<td>Long</td>
</tr>
<tr>
<td>8</td>
<td>ʔinatʰ</td>
<td>Seed</td>
</tr>
</tbody>
</table>

Problem # 9. Tojolabal (Mexico)

[k] simple

<table>
<thead>
<tr>
<th></th>
<th>[k?] glottalised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>kisim</td>
</tr>
<tr>
<td>2</td>
<td>kɔktik</td>
</tr>
<tr>
<td>3</td>
<td>pʔakan</td>
</tr>
<tr>
<td>4</td>
<td>sak</td>
</tr>
<tr>
<td>5</td>
<td>skutʃu</td>
</tr>
<tr>
<td>6</td>
<td>snika</td>
</tr>
<tr>
<td>7</td>
<td>tʃakʔa</td>
</tr>
<tr>
<td>8</td>
<td>kʔak</td>
</tr>
<tr>
<td>9</td>
<td>kʔaʔam</td>
</tr>
<tr>
<td>10</td>
<td>kʔiʃin</td>
</tr>
<tr>
<td>11</td>
<td>kʔuotes</td>
</tr>
<tr>
<td>12</td>
<td>ʔakʔ</td>
</tr>
<tr>
<td>13</td>
<td>kak</td>
</tr>
</tbody>
</table>

Problem # 10. Persian

<table>
<thead>
<tr>
<th>[ɾ] voiced trill</th>
<th>[ɾ] voiced flap</th>
<th>[ɾ] voiceless trill</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ʔeɾ'teʃ</td>
<td>Army</td>
<td>9 ahaɾi</td>
</tr>
<tr>
<td>2 'faɾ'si</td>
<td>Persian</td>
<td>10 bæɾaday</td>
</tr>
<tr>
<td>3 'qædɾi</td>
<td>A little bit</td>
<td>11 'beɾid</td>
</tr>
<tr>
<td>4 'ɾah</td>
<td>Road</td>
<td>12 biɾæŋ</td>
</tr>
<tr>
<td>5 'ɾast</td>
<td>Right</td>
<td>13 boɾos</td>
</tr>
<tr>
<td>6 'ɾæŋ</td>
<td>Paint</td>
<td>14 'tʃeɾa</td>
</tr>
<tr>
<td>7 'ɾiʃ</td>
<td>Beard</td>
<td>15 daɾid</td>
</tr>
<tr>
<td>8 'ɾuzz</td>
<td>Day</td>
<td>16 ʃiɾini</td>
</tr>
</tbody>
</table>

[ɾ ɾ ɾ] are in complementary distribution and form one phoneme. State the distribution. Forms marked * contain both allophones.
Problem # 11. Ganda (East Africa)
The Ganda are a Bantu-speaking people who constitute the largest population group in Uganda, numbering about 3 million in 1995. In their traditional kingdom of Buganda, the patrilineal Ganda developed a civil administration that was more centralized and elaborately hierarchical than that of any other Bantu kingdom in the region around Lake Victoria and, perhaps, in much of precolonial Africa. When the Europeans arrived, Buganda was the largest and most powerful of the region's great states, including Ankole, Bunyoro, Busoga, Nyamwezi, Ruanda, Rundi, and others.

The heart of Buganda was the capital of the kabaka, or king, at Kampala. A British protectorate established in 1894 was accepted by Buganda's leading chiefs in exchange for freehold rights over most of Buganda's fertile land for themselves. This led to a series of struggles between landlords and Ganda peasants. Religion meshed with politics in often-violent factional struggles that pitted groups of Christian Ganda against one another and against Muslims. After a power struggle between Buganda and the government of independent Uganda, the kabaka was exiled in 1966; Uganda's four kingdoms were abolished in 1967. In 1993 the government restored the Buganda monarchy, although the kabaka was not allowed to hold political office.

<table>
<thead>
<tr>
<th></th>
<th>Ganda</th>
<th>English</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>òkúdydyúlà</td>
<td>To be full of</td>
<td>[l]</td>
</tr>
<tr>
<td>2</td>
<td>òkúdydyúlà</td>
<td>To dish up</td>
<td>[l]</td>
</tr>
<tr>
<td>3</td>
<td>òkúgúlú</td>
<td>To buy</td>
<td>[l]</td>
</tr>
<tr>
<td>4</td>
<td>òkúgːúlǎ</td>
<td>To open</td>
<td>[l]</td>
</tr>
<tr>
<td>5</td>
<td>òkúléːtǎ</td>
<td>To bring</td>
<td>[l]</td>
</tr>
<tr>
<td>6</td>
<td>òkútábaːlǎ</td>
<td>To attack</td>
<td>[l]</td>
</tr>
<tr>
<td>7</td>
<td>òmúlúlǎ</td>
<td>Mad man</td>
<td>[l]</td>
</tr>
<tr>
<td>8</td>
<td>òmúlèmǎ</td>
<td>Lame person</td>
<td>[l]</td>
</tr>
<tr>
<td>9</td>
<td>náálwáːná</td>
<td>Fought</td>
<td>[l]</td>
</tr>
<tr>
<td>10</td>
<td>túlèːgà</td>
<td>We tighten</td>
<td>[l]</td>
</tr>
<tr>
<td>11</td>
<td>éfíːimbí</td>
<td>A whistle</td>
<td>[r]</td>
</tr>
<tr>
<td>12</td>
<td>éndyáːrò</td>
<td>*Beam</td>
<td>[r]</td>
</tr>
<tr>
<td>13</td>
<td>érǐná</td>
<td>Name</td>
<td>[r]</td>
</tr>
<tr>
<td>14</td>
<td>étːúːndírò</td>
<td>Shop</td>
<td>[r]</td>
</tr>
<tr>
<td>15</td>
<td>myérːéːrè</td>
<td>Only</td>
<td>[r]</td>
</tr>
<tr>
<td>16</td>
<td>ṇdyírì</td>
<td>Gospel</td>
<td>[r]</td>
</tr>
<tr>
<td>17</td>
<td>òkúlíːrà</td>
<td>*To eat with</td>
<td>[r]</td>
</tr>
<tr>
<td>18</td>
<td>Òlúgérò</td>
<td>*Story</td>
<td>[r]</td>
</tr>
<tr>
<td>19</td>
<td>ókúmíːrá</td>
<td>To swallow</td>
<td>[r]</td>
</tr>
<tr>
<td>20</td>
<td>píríːpírí</td>
<td>Pepper</td>
<td>[r]</td>
</tr>
</tbody>
</table>

[1] [r] are in complementary distribution and form one phoneme. State the distribution. Forms marked * contain both allophones. /'/marks high pitch. /'/marked low pitch. /dy/ is an alveopalatal stop.

A member of the Ural-Altaic family of languages, Korean was brought down into the peninsula by early invaders who first entered the region during the diffusion of the Altaic peoples in early times. Each of the three kingdoms (18 - 935) of Silla, Koguryo, and Paekche appears to have had a different variety of Old Korean, but the sources for these earliest stages of the language are too fragmentary to make clear whether Old Korean was one language with three dialects or three different, but probably related, languages.
Middle Korean was apparently the final stage in the historical development of the variety of Old Korean used in the Silla kingdom, especially as that language had survived into the period of Unified Silla, from the 7th to the 10th century. Not until late Middle Korean are there extensive records, written in an indigenous phonetic script of great precision and efficiency, called hangul (한글), the development of which about 1443-44 remains one of the major achievements of Korean civilization. Today the north employs hangul exclusively. In the south, the use of borrowed Chinese characters to supplement hangul is discouraged but continues to be tolerated.

\[ ] \[ r \] are in complementary distribution and form one phoneme. State the distribution. /a/ is a high back unrounded vowel.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>kʰal</td>
<td>That’ll go</td>
<td>12</td>
<td>silgwa</td>
<td>silgoa</td>
</tr>
<tr>
<td>2</td>
<td>gʰnil</td>
<td>Shade</td>
<td>13</td>
<td>ᴹょґɜŋ</td>
<td>tiltʰan</td>
</tr>
<tr>
<td>3</td>
<td>mul</td>
<td>Water</td>
<td>14</td>
<td>ᴹょґɜŋ</td>
<td>ᵺмана</td>
</tr>
<tr>
<td>4</td>
<td>bʰal</td>
<td>Leg</td>
<td>15</td>
<td>ᶔム</td>
<td>ᵺɨм</td>
</tr>
<tr>
<td>5</td>
<td>pʰal</td>
<td>Arm</td>
<td>16</td>
<td>ᶔム</td>
<td>gʰil</td>
</tr>
<tr>
<td>6</td>
<td>saʔul</td>
<td>Seoul</td>
<td>17</td>
<td>ᶔム</td>
<td>kʰam</td>
</tr>
<tr>
<td>7</td>
<td>ᴹょґɜŋ</td>
<td>All of them</td>
<td>18</td>
<td>ᶔム</td>
<td>gʰirō</td>
</tr>
<tr>
<td>8</td>
<td>ilgob</td>
<td>Seven</td>
<td>19</td>
<td>ᶔム</td>
<td>saram</td>
</tr>
<tr>
<td>9</td>
<td>ᴹょґɜŋ</td>
<td>Barber</td>
<td>20</td>
<td>ᶔム</td>
<td>uri</td>
</tr>
<tr>
<td>10</td>
<td>onilbam</td>
<td>Tonight</td>
<td>21</td>
<td>ᶔム</td>
<td>jorim</td>
</tr>
<tr>
<td>11</td>
<td>bulpʰjan</td>
<td>Discomfort</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Problem # 13. Korean**

\[ s \] \[ s \] \[ z \] are in complementary distribution and form one phoneme. State the distribution. Items marked with * contain two allophones.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>satan</td>
<td>Division</td>
<td>10</td>
<td>son</td>
<td>hand</td>
</tr>
<tr>
<td>2</td>
<td>sek</td>
<td>Colour</td>
<td>11</td>
<td>som</td>
<td>sack</td>
</tr>
<tr>
<td>3</td>
<td>se:</td>
<td>New</td>
<td>12</td>
<td>us</td>
<td>Upper</td>
</tr>
<tr>
<td>4</td>
<td>so:sol</td>
<td>Novel</td>
<td>13</td>
<td>insa</td>
<td>Greetings</td>
</tr>
<tr>
<td>5</td>
<td>su</td>
<td>Number</td>
<td>14</td>
<td>ᵸжɡǔง</td>
<td>Receipt</td>
</tr>
<tr>
<td>6</td>
<td>su:l</td>
<td>Wine</td>
<td>15</td>
<td>ᵴʰɛʰɛʰɛʰ</td>
<td>*washroom</td>
</tr>
<tr>
<td>7</td>
<td>susul</td>
<td>operation</td>
<td>16</td>
<td>ᵸжɡɜసాం</td>
<td>*Thirteen</td>
</tr>
<tr>
<td>8</td>
<td>sege</td>
<td>World</td>
<td>17</td>
<td>ᵸжɡ</td>
<td>*mistake</td>
</tr>
<tr>
<td>9</td>
<td>swekʰum</td>
<td>Taxes</td>
<td>18</td>
<td>ᶔム</td>
<td>maʃi</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>ʃinho</td>
<td>Signal</td>
</tr>
<tr>
<td>20</td>
<td>ʃihap</td>
<td>Game</td>
</tr>
<tr>
<td>21</td>
<td>ʃktän</td>
<td>Dining room</td>
</tr>
<tr>
<td>22</td>
<td>ʃinbu</td>
<td>bride</td>
</tr>
<tr>
<td>23</td>
<td>ᶔमɪɟdʒɜమ</td>
<td>Restaurant</td>
</tr>
<tr>
<td>24</td>
<td>ᵸжɡɜసాం</td>
<td>Custom</td>
</tr>
<tr>
<td>25</td>
<td>ᵸжɡɜసాం</td>
<td>Cushion</td>
</tr>
<tr>
<td>26</td>
<td>ᵸжɡɜసాం</td>
<td>Business</td>
</tr>
<tr>
<td>27</td>
<td>ізwe</td>
<td>Publisher</td>
</tr>
</tbody>
</table>
Problem # 14. Swahili (East Africa)

The Swahili are not an ethnic unit but the coastal dwellers of a number of East African countries. They speak dialects of the Swahili tongue, structurally a Bantu language but with many borrowings from Arabic. The name Swahili, derived from an Arabic word meaning "coast," can be applied to nearly half a million East Africans whose culture, trading economy, and language developed with the spread of Islam after Arab traders arrived among them about A.D. 500. The language is a lingua franca across East Africa to Zambia and the Congo and in places as distant as south Arabia, the Persian Gulf, and even the coast of Pakistan.

[ɔ] [o] are in complementary distribution and form one phoneme. State the distribution.
Forms marked * contain both allophones.

<table>
<thead>
<tr>
<th>[ɔ] more open</th>
<th>[o] more close</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ngoma</td>
<td>12 watoto</td>
</tr>
<tr>
<td>Drum</td>
<td>Children</td>
</tr>
<tr>
<td>2 boma</td>
<td>13 ndoto</td>
</tr>
<tr>
<td>Fort</td>
<td>Dream</td>
</tr>
<tr>
<td>3 nombe</td>
<td>14 mboga</td>
</tr>
<tr>
<td>Cattle</td>
<td>Vegetable</td>
</tr>
<tr>
<td>4 bamba</td>
<td>15 ndogo</td>
</tr>
<tr>
<td>Pipe</td>
<td>Little</td>
</tr>
<tr>
<td>5 emba</td>
<td>16 d3ogo</td>
</tr>
<tr>
<td>Pray</td>
<td>Rooster</td>
</tr>
<tr>
<td>6 na</td>
<td>17 soka</td>
</tr>
<tr>
<td>See</td>
<td>Axe</td>
</tr>
<tr>
<td>7 pona</td>
<td>18 okota</td>
</tr>
<tr>
<td>Cure</td>
<td>Pick up</td>
</tr>
<tr>
<td>8 noha</td>
<td>19 mod3a</td>
</tr>
<tr>
<td>Nurse</td>
<td>One</td>
</tr>
<tr>
<td>9 nd3a</td>
<td>20 mtego</td>
</tr>
<tr>
<td>Taste</td>
<td>Trap</td>
</tr>
<tr>
<td>10 ng3eza</td>
<td>21 k3ondo</td>
</tr>
<tr>
<td>Increase</td>
<td>*sheep</td>
</tr>
<tr>
<td>11 ng3ga</td>
<td>22 kar3ngo</td>
</tr>
<tr>
<td>strangle</td>
<td>*wash-out</td>
</tr>
</tbody>
</table>
**Problem # 15. Karok (California)**

Karok belongs to the large language group of the native American from the North of Mexico. The Pacific rim of northwestern North America and the plateau drained by the Columbia and Fraser rivers formed a uniquely hospitable niche for its native American inhabitants because of salmon-spawning streams throughout, draining into the north Pacific. From north to south important groups were the Tlingit, Haida, Tsimshian, Kwakiutl, Nootka, Salish, Hupa, Yurok, and **Karok**. Most languages spoken in the Northwest Coast culture area are of Athabascan, Penutian, or Mosan linguistic stock.

<table>
<thead>
<tr>
<th>[C:] long consonants</th>
<th>[C] short consonants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 θúk:in Bile</td>
<td>6 tʃaná:kat Mosquito</td>
</tr>
<tr>
<td>2 ʔip:at Doe</td>
<td>7 ʔá:pun On the ground</td>
</tr>
<tr>
<td>3 ʔátʃ:akitʃ Puppy</td>
<td>8 ʔá:tʃip Middle</td>
</tr>
<tr>
<td>4 júf:i Nose</td>
<td>9 pú:fitʃ Deer</td>
</tr>
<tr>
<td>5 ʔás:ar Wet</td>
<td>10 ʔá:si Cave</td>
</tr>
</tbody>
</table>

The difference between long and short consonants is not phonemic. State the distribution.

**Problem # 16. Karok (California)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 'atrex Arm</td>
<td>5 ?atʃ'nat Rat</td>
</tr>
<tr>
<td>2 'tatʃ Mama</td>
<td>6 'ʔaxak Two</td>
</tr>
<tr>
<td>3 'sarə Bread</td>
<td>7 'ʔasər Wet</td>
</tr>
<tr>
<td>4 tʃə'nak Mosquito</td>
<td>8 tənu'kjənər Shovel</td>
</tr>
</tbody>
</table>

Are [a ə] allophones of one phoneme? State your evidence.

**Problem # 17. Sindhi**

The following data are from Sindhi, an Indo-European language spoken in India and Pakistan. Examine the phones [p], [pʰ] and [b]. Determine if the three are allophones of separate phonemes or allophones of the same phoneme. What is your evidence? Is the relationship among the sounds the same as in English? Why or why not?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. [pənu] Leaf</td>
<td>8. [təru] bottom</td>
<td></td>
</tr>
<tr>
<td>4. [gədo] Dull</td>
<td>11. [bənu] forest</td>
<td></td>
</tr>
<tr>
<td>5. [dəru] Door</td>
<td>12. [bətʃu] be safe</td>
<td></td>
</tr>
</tbody>
</table>
Problem # 18. Zulu (South Africa)
The Zulu are an African people belonging to the southern segment of the Nguni peoples who settled in southern Africa centuries before the arrival of Europeans (see Africa, history of). Speakers of Zulu, a Bantu language, they numbered more than 9.5 million in 1997. Zululand, the traditional home of the Zulu, was formally incorporated into Natal province in 1897. Under apartheid, part of Zululand became the Zulu homeland of KwaZulu. KwaZulu was reincorporated into Natal province (now KwaZulu/Natal) in 1994.

The Zulu formerly consisted of numerous tribes, each under the political leadership of an independent chief. Historically, Zulu refers only to the clan of Shaka, who subjugated scores of tribes to create the powerful Zulu nation during the early 19th century. By the end of the century, however, the Zulu had lost much of their land and wealth during prolonged warfare with European settlers.

The traditional Zulu economy was based on cattle raising and grain farming. Polygynous (multiple-wife) marriage is practiced and involves elaborate patrilineal ties and alliances between lineages. Traditional Zulu religion was centered on ancestor worship and belief in a creator god. Healing practices based on magic were highly developed.

Today the Zulu work primarily as wage laborers in South African cities or on white-owned farms. Violence between urbanized Zulus supporting the African National Congress (ANC) and more traditional rural Zulu backers of the Inkatha Freedom party (IFP) in South Africa’s black townships claimed an estimated 16,000 lives between 1986 and 1996. Zulu king Goodwill Zwelithini, who assumed the throne in 1971, moved toward reconciliation with the ANC after South Africa’s April 1994 all-race elections. In September he openly broke with Chief Mangosuthu Gatsha Buthelezi, the leader of Inkatha. Violence between the ANC and the IFP in KwaZulu-Natal subsequently declined as Buthelezi shifted his tactics and sought to achieve a degree of autonomy for the province through constitutional means, an effort encouraged by South African president Nelson Mandela.

1. bona  
2. bopha  
3. mosa  
4. umona  
5. imato  
6. iqolo  
7. ixolo  
8. isicoco  
9. ibodwe  
10. isithombe  
11. indadara  
12. umfakazi  
13. iboni  
14. umondli  
15. ibokisi  
16. inoni  
17. udoli  
18. lolu  
19. isitofu  
20. imomfu  
21. umosi  
22. nomutbi  
23. udodilu  
24. umxoxi

[ɔ] [o] are in complementary distribution and form one phoneme. State the distribution. 
[/c/ /x/ /q/] are clicks. [/b/] is a voiced bilabial implosive stop.
Problem # 19. Oneida (New York)
The Iroquoian-speaking Oneida tribe from earliest times inhabited a region of central New York State north of Binghamton, eastward to Raquette Lake, and southward to the Oneonta vicinity. West of the Oneida lived the Onondaga, and east of them the Mohawk. They were members of the original Five Nations Iroquois League and were represented on the League's Grand Council by nine sachems. Maize, beans, and squash, their staple crops, were tended by the women, who also gathered wild plant foods. The business of men included trading, clearing fields for gardens, hunting, and warfare. Oneida villages were composed of bark-covered longhouses that sheltered families related through the female line. The matrilineal principle also served as a basis for their social and political institutions.

Greatly influenced by the Protestant missionary Samuel Kirkland, the Oneida alone among the Five Nations Iroquois sided with the colonists during the American Revolution. Despite their faithful support, they eventually lost their homelands and were removed to a reservation in what was then the Wisconsin Territory. Today small communities of Oneida live near Oneida and Red Hook, N.Y., as well as on reserves in Wisconsin (1991 est. pop., 4,923) and the province of Ontario, Canada (1988 pop., 4,546).

<table>
<thead>
<tr>
<th>[z] lenis voiceless</th>
<th>[s] fortis voiceless</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 'ʒatjə</td>
<td>Sit down</td>
</tr>
<tr>
<td>2 ʒa'jolhəneʔ</td>
<td>Next day</td>
</tr>
<tr>
<td>3 lakə</td>
<td>Boy</td>
</tr>
<tr>
<td>4 'łożuʔ</td>
<td>He's finished it</td>
</tr>
<tr>
<td>5 thaʔ'zɔθaʔ</td>
<td>He drops it here</td>
</tr>
<tr>
<td>6 tkakh'wakə</td>
<td>The worst food</td>
</tr>
<tr>
<td>7 'tɔkat</td>
<td>The same</td>
</tr>
<tr>
<td>8 'wahζekəʔ</td>
<td>You ate it</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[z] lenis voiced</th>
<th>[ʃ] fortis voiceless alveopalatal</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 kəwənɛ'zuzeʔ</td>
<td>Long words</td>
</tr>
<tr>
<td>10 kəh'wizeʔ</td>
<td>I'm taking it along</td>
</tr>
<tr>
<td>11 ɬazəl</td>
<td>Let him drag it</td>
</tr>
<tr>
<td>12 ta'haziʔteʔ</td>
<td>He dropped it</td>
</tr>
<tr>
<td>13 tuzahətiʔni</td>
<td>They changed it again</td>
</tr>
<tr>
<td>14 weζa'ko</td>
<td>She saw you</td>
</tr>
</tbody>
</table>

[ z ʂ s ʃ ] are in complementary distribution and form one phoneme. State the distribution
Problem # 20. Keresan (New Mexico)
Acoma, a pueblo founded about A.D. 1100, is possibly the oldest continuously inhabited settlement in the United States. It is located 135 km (84 mi) west of Albuquerque, N.Mex. Perched atop a sandstone mesa that rises 109 m (357 ft) above the valley floor, it stands at an elevation of 2,130 m (about 7,000 ft). Since a long time, a Pueblo Indian people who speak a Western Keresan language have lived at Acoma in three-storied homes made of flat stones plastered with adobe and supported with wooden beams.

The aboriginal population of Acoma at the time of European contact was probably about 3,000. In 1760, 1,052 villagers were reported; in the 1920s their numbers had declined to fewer than 1,000. Their population in 1993 exceeded 6,000.

[\$ \$] are in complementary distribution and form one phoneme. State the distribution. It will be necessary to describe four environments, two for each allophone. Forms marked * contain both allophones

| 1  | hana$'i$jeñ | It is dangerous |
| 2  | 'ma$aw | Vulture |
| 3  | 'mu$e$s | *bison |
| 4  | si$'jut$$su$s | *be not afraid |
| 5  | sa$'ak | Pipe |
| 6  | 'wi$u$n | Face |
| 7  | hi$'ka$i | Knife |
| 8  | 'kan$a$k | His head |
| 9  | 'ma$?a$t | Fox |
| 10 | 'pon | Water bottle |
| 11 | 'ju$pi$n | Shoulder |
| 12 | ?istu? | arrow |
| 13 | na$'su$im | Moccasin |
| 14 | 'sa$wit | Parrot |
| 15 | 'se? | And it was |
| 16 | 'suw | Serpent |
| 17 | 'suwatja$?m | Witch doctor |
| 18 | jawa$'at | Sand |
| 19 | hasti$?sa$s | *seat |
| 20 | he$'ja$?a$s | Mist |
| 21 | 'ka$?a$s | Fished |
| 22 | 'kukama$s | He buried it |
| 23 | s$'tjut$$su$s | *I'll not be afraid |
| 24 | 'to$mi$s | Cloth |
Problem # 21. Totonac (Mexico)
The Mesoamerican culture area occupies present-day Guatemala, Belize, part of Honduras, and central Mexico southeast to the Yucatan Peninsula. The most famous Mesoamerican cultures were those of the Maya and the Aztec, but many other groups existed here also, including the Huastec, Lenca, Mixtec, Olmec, Tarascan, Zapotec, Chontal, Chorti, Jicaque, Mixe, Otomi, Totonac, Zacatec, Zoque, and others.

1. ĺapsá̋ He stacks
2. ćilinksá̋ It resounded
3. kasittí̋ Cut it
4. kukű Uncle
5. ḍikakà̋ Peppery
6. miki̋ snow
7. snapapà̋ White
8. stapù̋ Beans
9. jumphi̋ Porcupine
10. taq̣hű You plunged in
11. tihaʃụ̃i̋ He rested
12. tukʃụ̃i̋ It broke

Voiceless vowels [ɨ a ʊ] are in complementary distribution with voiced vowels [i a u] and form three phonemes /i a u/. State the distribution.

Problem # 22. Venda (South Africa)
The diverse groups that became known as the Venda, a Bantu-speaking people, moved southward into northeastern South Africa in the early 1700s and came under control of what was then Transvaal in 1898. The Venda, who number about 800,000 (1995 est.), are mostly farmers. Their religion centers on the worship of ancestral spirits, and the chiefs of the various tribal groups remain important. The former Venda homeland was declared independent by the South African government in 1979 but was reincorporated into post-apartheid South Africa in 1994 as part of Northern Province.

Are [n ɲ] allophones of one phoneme? State your evidence. /z/ is a strongly labialized fricative in contrast with /z/.

<table>
<thead>
<tr>
<th></th>
<th>[ɲ] dental nasal</th>
<th>[n] alveolar nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>haɲű At your place</td>
<td>7 ene He</td>
</tr>
<tr>
<td>2</td>
<td>liɲo Tooth</td>
<td>8 hana childhood</td>
</tr>
<tr>
<td>3</td>
<td>muɲe Master</td>
<td>9 khouno There</td>
</tr>
<tr>
<td>4</td>
<td>ɲari Buffalo</td>
<td>10 uatanu Five</td>
</tr>
<tr>
<td>5</td>
<td>pfheɲe Baboon</td>
<td>11 uonani See!</td>
</tr>
<tr>
<td>6</td>
<td>vaɲa Four</td>
<td>12 zino now</td>
</tr>
</tbody>
</table>
Appendix
Rasgos Distintivos de las Consonantes

1. Sonoridad (voicing)
Sordo versus Sonoro

2. Lugares de articulación (place of articulation)

Articuladores (articators):
Labio inferior - lengua (ápice, lámina, dorso, raíz) - úvula

Puntos o zonas (places):
Labio superior - dientes superiores - zona alveolar - paladar - velo - glotis

3. Modos de Articulación (manner of articulation)

No Resonantes
Oclusivas (explosivas, momentáneas): Sordas (p-t-k) y sonoras (b-d-g)
Interrupciones en el paso del aire y cierre completo de dos órganos articulatorios. Velo del paladar permanece adherido a la pared faríngea.
Rasgos adicionales: aspiradas (English), no-aspiradas, prenasalizadas (Guarani), inconclusas (no explosivas), postlateralizadas, palatalizadas.

Fricativas (constrictivas, continuas): /f/ /s/ /x/
Estrechamiento o constricción de dos órganos articulatorios sin que lleguen a juntarse. Velo del paladar permanece adherido a la pared faríngea. Sonoras y sordas

Africadas (semioclusivas): /tʃ/ /dʒ/ /ð/ /Ø/
Intervienen dos momentos: primero de oclusión y segundo de fricación. Una oclusiva seguida por una fricativa en el mismo lugar de articulación (homorgánica) mismo lugar y por los mismos órganos articulatorios. El velo del paladar permanece adherido a la pared faríngea. Sonoras y sordas

Resonantes (todas son sonoras)
Nasales:
En vez de tocar la pared, el velo baja hacia la faringe. Cierre de los órganos articulatorios de la cavidad bucal. Salida del aire a través de las fosas nasales

Líquidas - Aproximantes
Fisonomía intermedia entre vocales y consonantes. La cavidad bucal presenta una abertura global mayor. En algún lugar se crea un obstáculo a la salida del aire. Velo del paladar permanece adherido a la pared faríngea

Laterales /l/
Aire fonador sale por un estrechamiento a un lado o los dos de la lengua

Vibrantes /ɾ/ /ɹ /
Una o varias interrupciones u oclusiones brevísimas (vibraciones) entre el ápice de la lengua y los alvéolos, durante la salida del aire fonador. Sencilla - múltiple - fricativa - retroflexiva

Semiconsonantes /w/ /j/
Labios redondos o labios estirados
La Sílaba en la Lengua Española

Sílaba: unidad en la cadena hablada, constituida por un sonido o un grupo de sonidos.

Tres fases: inicial, culminante (o central), final
1 sonido = representa las tres fases. 2, 3 o 4 sonidos = se comparten las tres fases

Inicial: margen silábico, explosivo o prenuclear

Central: nuclear (siempre es la vocal) Cumbre silámbica: en otros idiomas no es necesario que sea una vocal

Final: margen silábico, implosivo o postnuclear

Núcleo silábico: máximo de abertura, de intensidad, de sonoridad, de perceptibilidad, de tensión muscular.

Límites silábicos: los mínimos de estos rasgos (disminuyen estas propiedades)

Sílaba abierta: termina en vocal

Sílaba cerrada: termina en consonante (y se refiere a la vocal como trabada)

Quilis, p. 67: 66% de las sílabas en Spanish son abiertas y 34% son cerradas. ¿cómo es en el habla popular del Paraguay?

Sílaba acentuada o tónica
El núcleo silábico recibe la intensidad de la palabra o grupo fónico
CamareRo referRIR maESTro Árbol automóviles

Sílaba inacentuada o átona
El núcleo silábico no posee la misma intensidad que el de las tónicas

División silábica - varía entre idiomas

Estructura Silábica Preferida

En la lengua Española

<table>
<thead>
<tr>
<th>C</th>
<th>V</th>
<th>C</th>
<th>C</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>C</td>
<td>V</td>
<td>C#1</td>
<td></td>
</tr>
<tr>
<td>Labial, velar</td>
<td>líquida</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental vibrante</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pr, pl, br, bl, fr, fl, gr, gl, kr, kl</td>
<td>dr, tr (¿atlas?) Quilis p. 68-69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C#3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semiconsonante [j] [w] alófono de una vocal: prieto, trueno, Biblia, vidrio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C#4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Líquida (no varía tanto).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasal (archifonema /N/).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oclusiva (varía mucho hasta cero)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fricativa (varía mucho hasta cero)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C#5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>/s/</td>
<td>transformar</td>
<td>construir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>obstáculo</td>
<td>obstrucción</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>adscrito</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| C C SC V SV C C = Teóricamente, la sílaba más larga en español. En la práctica, ¿cuáles son las sílabas más largas de la lengua española? ¿cuáles son las sílabas más largas del español popular del Paraguay?

En la lengua inglesa

<table>
<thead>
<tr>
<th>V</th>
<th>I</th>
<th>CV</th>
<th>key</th>
<th>CCV</th>
<th>ski</th>
<th>CCCV</th>
<th>spree</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVC</td>
<td>seek</td>
<td>CCVC</td>
<td>speak</td>
<td>CCCVC</td>
<td>scram</td>
<td>CCCVCC</td>
<td>striped</td>
</tr>
<tr>
<td>VC</td>
<td>an</td>
<td>VCC</td>
<td>ant</td>
<td>VCCC</td>
<td>ants</td>
<td>CVCCC</td>
<td>pants</td>
</tr>
<tr>
<td>CCCVCCC</td>
<td>splints</td>
<td>CCVCCC</td>
<td>stamped</td>
<td>CVCCCCC</td>
<td>worlds</td>
<td>CVCCCCC</td>
<td>firsts</td>
</tr>
</tbody>
</table>
**English Rule Notation**

Definitions of symbols used in formulas for describing phonological rules

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/ / parallel bars symbolise a **phoneme**. Example: “water” /ˈwɔːtər/  

[ ] square brackets symbolise an **allophone** (phone) Example: [ˈwɔːtər]  

This phoneme becomes manifested as...  
This phoneme represents the following allophones...  
This phoneme becomes represented as...  

---

$ _$ following a syllable boundary; at the beginning of a syllable; syllable initial position (s.i.)  

$_-$ preceding a syllable boundary, at the end of a syllable, syllable final position (s.f.)  

# _ following a word boundary; at the beginning of a word; word initial position (w.i.)  

__# preceding a word boundary, at the end of a word, word final position (w.f.)  

[+...] has certain phonetic feature/trait. Ex. [+rounded][+voiced][+front][+fricative]  

[−...] absence of phonetic feature/trait. Ex. [−rounded] [−voiced] [−front] [−fricative]  

C = any consonant  

V = any vowel  

_V= preceding a vowel  

V_= following a vowel  

φ = nothing (null), zero, disappears, no sound (phone) is produced  

Other Cover Symbols: L=liquid, G=glide  

CD = complementary distribution  

FV = free variation  

( ) = optional, elective, possibility (not obligatory)  

s.i. = at the beginning of a syllable (prenuclear, preceding peak of syllable)  

s.m. = in the middle of a syllable (prenuclear, nuclear = peak of syllable, postnuclear)  

s.f. = at the end of a syllable (postnuclear, following peak of syllable)  

w.i. = at the beginning of a word  

w.f. = at the end of a word  

u.i. = at the beginning of an utterance  

u.f. = at the end of an utterance  

Rule Notation  
Example (English)  


[-released] /_#  

[-aspirated]/elsewhere

---

The phoneme /p/ manifests itself as the followingallophones which are all voiceless, bilabial, stops:  
/p/ assumes the trait of aspiration and is represented by an aspirated allophone [pʰ] at the beginning of a syllable, that is following a syllable boundary (s.i.), when preceeding a stressed vowel; /p/ converts to an unreleased allophone [p] in the environment at the end of a word, that is when preceeding a word boundary (s.f.); and /p/ loses its aspiration and becomes an unaspirated allophone [p] in the environment elsewhere (or rather in all other environments not already mentioned).
Spanish Rule Notation
Definición de los Símbolos usados en fórmulas para describir las reglas fonológicas

/ / las barras oblícuas simbolizan un fonema
[ ] los corchetes simbolizan un alófono (o fono)

Este fonema:
Se manifiesta como...

Se convierte en...

\[ \{ ...estos alófonos u otras opciones variantes, alternativas \} \]

/ / en el ambiente fonológico donde...
\[ / \] en el contexto fónico donde....

$ _$ al inicio de una sílaba
$_$ al final de una sílaba
#$ al inicio de una palabra
$_# al final de una palabra

[+] posee cierto rasgo fonético ej. [+redondo] [+sonora] [+fricativa]
[-] no posee cierto rasgo fonético ej. [-redondo] [-sonora] [fricativa]

C = cualquier

V = cualquier vocal \_V = antes de una vocal \V_ = después de una vocal

V_V = entre dos vocales, posición intervocálica

ο = nada (nulo), cero, desaparición, ningún fono

Otros símbolos globales: L= líquidas CD = distribución complementaria VL = variación libre
( ) = optativo, opcional, electivo
i.S. = al inicio de la sílaba (prenuclear)
m.s. = en el medio de la sílaba (prenuclear, nuclear, postnuclear)
f.s. = al final de la sílaba (postnuclear)
i.p. = al inicio de la palabra i.e. = al inicio del enunciado
f.p. = al final de la palabra f.e. = al final del enunciado

Regla Fonológica
Ejemplo (Spanish)

/p/ → [p] /#_

El fonema /p/ se manifiesta como [p] al inicio de una palabra; nada o cualquier consonante al final de una palabra
### Phonetics: Allophones/Phones (Sounds)

**Articulators: bottom lip and tongue (tip, blade, centre, back and root)**

<table>
<thead>
<tr>
<th>Points/Places of Articulation</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiceless</td>
<td>voiced</td>
<td>voiceless</td>
<td>voiceless</td>
<td>voiced</td>
<td>voiceless</td>
<td>voiced</td>
<td>voiceless</td>
</tr>
</tbody>
</table>

#### Stop (plosives)
Complete closure and the air rushes out as soon as the closure is opened.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirated</td>
<td>tʰ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voiced</td>
<td>kʰ</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unreleased</td>
<td>t̰</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voiced</td>
<td>k̰</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Sibilants (Fricatives)
Almost complete closure but the air passes through a slit or a groove producing noise due to friction.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirated</td>
<td>f v θ ð</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unaspirated</td>
<td>s z ʃ ʒ</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Nasals
The air stream is obstructed in the oral cavity. Instead of touching the back wall of the throat, the uvula hangs down towards the pharynx and air passes through nasal cavity.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiced</td>
<td>m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unrounded</td>
<td>n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rounded</td>
<td>η</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Laterals
The tongue touches the roof of the mouth and the sides of the tongue are lowered. The air passes around one or both sides of the tongue.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiced</td>
<td>l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unrounded</td>
<td>ɾ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Flaps (Tap)
Tongue touches the alveolar but not long enough to stop the airflow.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiced</td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Retroflex
The tongue raises towards the alveolar region but instead of touching, it curls backwards towards the palate.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voiced</td>
<td>ɾ̊</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

#### Glides
Semi-Consonants
Tongue moves rapidly in a gliding fashion. These sounds are like vowels but “act” like consonants. They create a slight obstruction and cannot carry the peak of a syllable.

<table>
<thead>
<tr>
<th>Articulators</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rounded</td>
<td>w</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unrounded</td>
<td>j</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
## Fonética de la Lengua Española: Alófonos

**Articuladores: labio inferior y lengua: ápice, dardo (pre & post) y raíz**

### Las Consonantes de la Lengua Española

#### Lugares de Articulación (zonas de articular)

<table>
<thead>
<tr>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Dental</th>
<th>Alveolar</th>
<th>Palaletal</th>
<th>Volar</th>
<th>Glotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
<td>Sorda</td>
</tr>
<tr>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
<td>Sonora</td>
</tr>
</tbody>
</table>

#### Oclusivas (ni aspiradas, ni prenasalizadas)

<table>
<thead>
<tr>
<th>B</th>
<th>p</th>
<th>b</th>
<th>t</th>
<th>d</th>
<th>k</th>
<th>g</th>
</tr>
</thead>
</table>

#### Fricativas

<table>
<thead>
<tr>
<th>B</th>
<th>p</th>
<th>b</th>
<th>f</th>
<th>v</th>
<th>θ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(España)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Sibilantes

<table>
<thead>
<tr>
<th>B</th>
<th>s</th>
<th>h</th>
</tr>
</thead>
</table>

#### Africadas (una oclusiva y una fricativa en el mismo lugar: homorgánica)

<table>
<thead>
<tr>
<th>B</th>
<th>tʃ</th>
<th>dʒ</th>
</tr>
</thead>
</table>

#### Nasales (En vez de tocar la pared, el velo baja hacia la faringe.)

<table>
<thead>
<tr>
<th>B</th>
<th>m</th>
<th>n</th>
</tr>
</thead>
</table>

#### Laterales (aproximantes)

<table>
<thead>
<tr>
<th>B</th>
<th>l</th>
<th>l</th>
<th>l</th>
</tr>
</thead>
</table>

#### Vibrantes

- **Simple**
  - r

- **Múltiple**
  - ř

#### Fricativa

<table>
<thead>
<tr>
<th>B</th>
<th>j</th>
</tr>
</thead>
</table>

#### Continua sin fricción

<table>
<thead>
<tr>
<th>B</th>
<th>w</th>
</tr>
</thead>
</table>

#### Semivocales

- **Semiconsonantes (aproximantes)**
  - Labios redondos: w
  - Labios estirados: j

- **Labios redondos**
  - j

- **Labios estirados**
  - i
### Phonemics: Phonemes (Phonology)

<table>
<thead>
<tr>
<th>MANNER OF ARTICULATION</th>
<th>Points/Places of Articulation (areas/zones)</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSONANTS OF THE ENGLISH LANGUAGE</strong></td>
<td></td>
<td>Voiceless</td>
<td>Voiceless</td>
<td>Voiceless</td>
<td>Voiceless</td>
<td>Voiceless</td>
<td>Voiceless</td>
<td>Voiceless</td>
</tr>
<tr>
<td>Stops (plosives)</td>
<td></td>
<td>p</td>
<td>b</td>
<td>t</td>
<td>d</td>
<td>k</td>
<td>g</td>
<td></td>
</tr>
<tr>
<td>Fricatives (Spirants)</td>
<td></td>
<td>f</td>
<td>v</td>
<td>θ</td>
<td>δ</td>
<td></td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>Affricates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>tʃ</td>
<td>dʒ</td>
</tr>
<tr>
<td>Nasals</td>
<td></td>
<td>m</td>
<td></td>
<td>n</td>
<td></td>
<td></td>
<td>η</td>
<td></td>
</tr>
<tr>
<td>Laterals</td>
<td></td>
<td>l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flaps</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>r</td>
<td></td>
</tr>
<tr>
<td>Retroflex</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>w</td>
</tr>
<tr>
<td>Semi-Consonants</td>
<td>Rounded lips</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>j</td>
</tr>
<tr>
<td></td>
<td>Unrounded lips</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
## Fonología de la Lengua Española: Los Fonemas

<table>
<thead>
<tr>
<th>Manera de Articulación</th>
<th>Lugar de Articulación</th>
</tr>
</thead>
<tbody>
<tr>
<td>Las Consonantes de la Lengua Spanisha</td>
<td>Bilabial</td>
</tr>
<tr>
<td></td>
<td>Sorda</td>
</tr>
<tr>
<td>Oclusivas</td>
<td>p</td>
</tr>
<tr>
<td>Fricativas</td>
<td>f</td>
</tr>
<tr>
<td>Africadas</td>
<td>tʃ</td>
</tr>
<tr>
<td>Nasales (archifonema)</td>
<td>m</td>
</tr>
<tr>
<td>Laterales (aproximantes)</td>
<td>l</td>
</tr>
<tr>
<td>Simple</td>
<td>r</td>
</tr>
<tr>
<td>Múltiple</td>
<td>ř</td>
</tr>
<tr>
<td>Archifonema</td>
<td>R</td>
</tr>
<tr>
<td>Semivocales</td>
<td></td>
</tr>
<tr>
<td>Semiconsonantes (aproximantes)</td>
<td></td>
</tr>
</tbody>
</table>
Transcriptions

Kinds of transcriptions
There is no such thing as the transcription of a word. Strictly speaking, you can only transcribe how, for example, Kevin Russell uttered that word cat at 12:58:03 p.m. on January 15, 1997. You can transcribe that utterance as exactly as possible, within the limits of your hearing and the conventions provided by the IPA.

If you want to go beyond that, to try to describe how Kevin Russell pronounces the word in general, or further still to how English speakers pronounce it in general, then you have to start making abstractions -- you have to decide which details to include and which details to ignore. It's common to distinguish between two kinds of transcription, based on how many details the transcribers decide to ignore:

- **Narrow transcription**: captures as many aspects of a specific pronunciation as possible and ignores as few details as possible. Using the diacritics provided in the IPA, it is possible to make very subtle distinctions between sounds.

- **Broad transcription** (or phonemic transcription): ignores as many details as possible, capturing only enough aspects of a pronunciation to show how that word differs from other words in the language.

Suggestions/tricks for improving transcriptions
Here are a few suggestions which some people have found helpful for getting more accurate broad transcriptions of English.

- Pretend you're someone who can't spell (e.g., an advertising executive). How would you misspell this word if you wanted to deliberately misspell it? For example, you might misspell knight as night or nite -- which gives you some clues about which sounds are really there and which aren't.

- Compare the word to other words whose transcriptions you're more certain of. If two words are homonyms, their transcriptions should be identical. If two words rhyme, their transcriptions should end the same way.

- Decide how many sounds the word has and what the sounds sound like before you worry about which symbols to use for the sounds.

- We read left to right -- there's no law you have to write that way. Don't feel you have to get the symbol for one sound perfect before you move to the next. If you know the first consonant and the last consonant but aren't sure of the vowel in the middle, get the consonants down on paper and worry about the vowel later.

- When you're unsure of an individual sound, consider other words where that sound occurs. For example, if you're not sure what symbol to use for a vowel, what word would you get if you put that vowel between h_d or b_t?

- Read your transcription back out loud. Make sure it says what you think it says.

- When you read your transcription back out loud, pretend you're a very stupid computer who can't do anything more than play little sound clips one after the other. If the only thing that sounds strange about your reading is the pauses ([d --α-- g]), then your transcription is probably right. If it sounds like the computer is trying to say a different word or a nonsense word ([d -- o -- g]), you'd better try again.
• Pay attention to what you're doing with your body. Often phoneticians who are trying to transcribe an unfamiliar sound will imitate the sound as closely as they can and then choose the symbol more on the basis of what they're doing with their vocal tract during the imitation than on what it sounds like. If it doesn't feel like an [n], if your tongue body is touching your soft palate rather than your tongue tip touching just behind your teeth, then it's not an [n].

• Practise. Practise. Practise.
  • Do the exercises in the manual. Get more textbooks. Do their exercises too.
  • Do the exercises on the web page:
    http://www.umanitoba.ca/faculties/arts/linguistics/russell/138/notes.htm
  • Transcribe words in your head while waiting for the bus. Write your grocery lists in IPA.
  • Write your diary in IPA. Read stories in IPA whenever you have insomnia.

Some common mistakes
Square brackets
Always use square brackets around your transcriptions in order to distinguish them from ordinary text.

Silent letters
There's no such thing as an unpronounced symbol in a phonetic transcription.

[c]
The IPA symbol [c] represents the sound you make with your tongue body hitting your hard palate. English doesn't use this sound. If you're ever tempted to use [c] in transcribing the speech of a normal English speaker, you're almost certainly wrong.

ng, nk
The sound usually spelled ng has the symbol [ŋ]. You should not add a [g] unless there is actually a [g] pronounced -- does it sound more like singer or like finger? Clusters spelled nk (and often nc) also usually have this sound: [ŋk].

J
Remember: y is [j] and j is [dʒ].

The A's
Be careful not to confuse [ə] with [ʌ], [æ], [a:] or [o], switching one for the other can change the meaning of a word: [hæt] [hot] [hæt]

Capital letters
Don't use capital letters where English spelling conventions do. The waiter Bill and the bill he brings you are pronounced identically and must have the same transcription. In IPA, smaller versions of the capital letters are often used for completely different sounds. Calling someone [BIl] is generally considered rude.

Unstressed vowels
If an unstressed syllable has a neutral vowel, don't transcribe it with a full vowel because it's spelled that way, use a schwa [ə] instead.
 Connected Speech
Notice how the consonant sounds are linked to the vowel sounds that follow:
He must have eaten all of Ann's oranges.
She can't have asked Al's aunt

I. Mark the linked words in these sentences
1. She must have eaten the cheese
2. You can't have seen him
3. He can't have arrived early
4. He might have gone out for a cup of coffee
5. She might have been angry
6. They can't have been in love
7. They might have written it down
8. He must have been to Africa

II. Say the sentences in phonetic script aloud. Notice the linked words
1. /hiː kud əv ɡɛn əbrɔːd/
2. /ðeɪ mɔrt əv iːtən ɪt ɔ: l/
Transcription of English Sentences

1. That ad is odd
2. The cop had an interesting cap
3. It's too hot for a hat
4. Take a stock out of the stack
5. She sang a real old song
6. Almost all countries don't have enough oil
7. Roy would've eaten it raw
8. Did he say jaw or joy?
9. It's supposed to fall on the foil
10. She's gonna be leaving at seven
11. There'll probably be no class tonight
12. Holly's not feeling well today
13. I'm just sick of it
14. I don't think she'll make it
15. They left for Washington at five
16. She's going to the dance tomorrow
17. He jumped into the pool with his boots on
18. We hope it doesn't take so long
19. What's it all about?
20. Why does it affect them so much?
21. When did you go?

22. Who's coming, please?
23. Do you like it?
24. How much does it cost?
25. Can't he understand that?
26. Would you like vegetables for lunch?
27. Please take a look at Luke
28. That fool is never full
29. Should a horse be shoed?
30. Did you pull him into the pool?
31. She stood and stewed in the kitchen
32. He just caught the cat
33. The duck swam up to the dock
34. The cat slept on the cot
35. Get out of here now!
36. I need a break!
37. What do you want?
38. Well, stop it this instant!
39. I said, come here. I meant right now
40. Give me five pounds. Got any grapefruit

Transcription Exercises - Spanish

1. Las aguas frías siguen creciendo y han cubierto toda la zona baja
2. Por eso falté tanto a clase
3. Él es un sinvergüenza
4. El avión salió a las tres
5. Nos fuimos a despedirle al aeropuerto
6. Muchos no vinieron por la lluvia
7. Salí de acá rápido
8. Cuando tengas tiempo, pasá por casa
9. Esta noche juega la selección contra Brasil
10. No es que no quiera, pero no puedo
11. Mira un poco ese caballo
12. ¿para qué te vas a ir?
13. acompañame al centro, por favor
14. ahora estoy estudiando
15. ¿de dónde saliste con ese chisme?
16. le dije luego que no venga
17. ¿por qué no me dijiste antes?
18. ayer estuve enferma, por eso no vine
19. está lloviendo torrencialmente en todo el Chaco
20. ¿a qué hora va a llegar el avión?
21. Ella está muy influenciada por ese ambiente
22. ¿me podés llevar a la facultad?
23. me estás metiendo en un gran lio
24. el viaje en ómnibus es muy cansador
25. yo creí que eso era recién mañana
26. salió un rato a la calle
27. eso no tiene nada que ver
28. ¿vas a estar en tu casa esta noche?
29. dame un fósforo por favor
30. ¿viste lo que pasó?
31. salí de aquí, rápidamente
32. ¿se fueron Uds. para visitar a Alicia e Inés?
33. el Chaco y la Represa Itaipú proveerán un gran futuro para los paraguayos
34. ¿cómo es que llegaste a elegir esta carrera de inglés?
35. cuando podés, pasá para salir con nosotros
36. ¿vas a estar estudiando todo el día mañana?
37. piensan viajar por Argentina y Chile
38. Asunción es la capital del Paraguay
39. Francia salió campeón en el mundial
40. Todavía no sabemos nada nuevo sobre los otros
<table>
<thead>
<tr>
<th></th>
<th>Blabial</th>
<th>Labiodental</th>
<th>Interdental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sops</strong></td>
<td>![p/b]</td>
<td>![t/a]</td>
<td>![k/g]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fricatives</strong></td>
<td>![f/v]</td>
<td>![s/z]</td>
<td>![h]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Affricates</strong></td>
<td>![tʃ/dʒ]</td>
<td></td>
<td>![h]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nasals</strong></td>
<td>![m]</td>
<td>![n]</td>
<td>![ŋ]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Laterals</strong></td>
<td>![l]</td>
<td>![l]</td>
<td>![l]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Retroflex</strong></td>
<td>![r]</td>
<td>![r]</td>
<td>![r]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Glides</strong></td>
<td>![j]</td>
<td>![j]</td>
<td>![j]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Helpful Hints

Journals
You can submit late journal until October 15\textsuperscript{th}. After that, I will not be getting them anymore.

Homework
You need to submit homework on the day assigned. I do not admit such things as “turning in late homework”

Mini Research Project
The following criteria will be taken into account for your mini research project presentation:

<table>
<thead>
<tr>
<th>Evaluation criteria for the oral presentation of the Mini-Research Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECTION I: INTRODUCTION (Suggested Time: 1 to 2 minutes)</strong></td>
</tr>
<tr>
<td>1. What is the topic (language, sound, context)?</td>
</tr>
<tr>
<td>2. Why did you select this topic? Why was this topic</td>
</tr>
<tr>
<td>sufficiently interesting or significant to be studied?</td>
</tr>
<tr>
<td>3. What is the potential usefulness of researching this topic?</td>
</tr>
<tr>
<td>4. For which research questions are you trying to find an answer?</td>
</tr>
<tr>
<td><strong>SECTION II: METHODOLOGY (suggested Time: 2 to 3 minutes)</strong></td>
</tr>
<tr>
<td>5. Where? Describe the location, environment and place</td>
</tr>
<tr>
<td>6. Who? Describe the subjects of this study: age, sex, grade</td>
</tr>
<tr>
<td>at school, socio-economic level, rural/urban, etc.</td>
</tr>
<tr>
<td>7. How? Explain the steps which you followed in carrying out this study.</td>
</tr>
<tr>
<td>Explain how you gathered your data and how you went about analysing</td>
</tr>
<tr>
<td>the data</td>
</tr>
<tr>
<td><strong>SECTION III: RESULTS (Suggested Time: 6 to 8 minutes)</strong></td>
</tr>
<tr>
<td>8. Play one or more parts of the tape recording</td>
</tr>
<tr>
<td>9. Have a poster with the phonemic/phonetic transcriptions and</td>
</tr>
<tr>
<td>distribute a one-page handout to the class.</td>
</tr>
<tr>
<td>10. Identify the allophonic variations related to the topic which</td>
</tr>
<tr>
<td>were observed in these transcriptions.</td>
</tr>
<tr>
<td>11. Explain the factors (phonological and sociological) which</td>
</tr>
<tr>
<td>you think may have influenced these allophonic manifestations</td>
</tr>
<tr>
<td><strong>SECTION IV: CONCLUSION (suggested Time: 1 to 2 minutes)</strong></td>
</tr>
<tr>
<td>12. Briefly explain the most significant aspect of your results</td>
</tr>
<tr>
<td>13. What answers did you find to your research question?</td>
</tr>
<tr>
<td>14. How can this information help you in teaching English to</td>
</tr>
<tr>
<td>Spanish-speaking students?</td>
</tr>
<tr>
<td><strong>OTHER ASPECTS</strong></td>
</tr>
<tr>
<td>15. Were there visual aids to accompany the presentation?</td>
</tr>
<tr>
<td>16. Did the presentation take between 10 and 15 minutes?</td>
</tr>
<tr>
<td>17. Was the presentation explained (and not read)?</td>
</tr>
<tr>
<td>18. Did the presentation follow the above order?</td>
</tr>
<tr>
<td>19. Was the presentation well organised and prepared?</td>
</tr>
<tr>
<td>20. Did the presenters demonstrate an application of phonological</td>
</tr>
<tr>
<td>concepts? Did they describe rather than prescribe?</td>
</tr>
</tbody>
</table>
Vowel sounds
A vowel is a sound made by the vocal cords. Vowels are always voiced sounds. When we make vowels, the vocal cords are always vibrating; if they were not vibrating, we would not hear anything because no noise is made in the mouth. Remember to put your hand on your throat; you should always be able to feel the vibration when you make a vowel.

Remember that for /i:/ the tongue is high and to the front, for /ɪ/ the tongue is not so high and not so near the front, but it is still high and to the front of the mouth.

Front Vowels:

<table>
<thead>
<tr>
<th>/i:/</th>
<th>/ɪ/</th>
<th>/e/</th>
<th>/æ/</th>
</tr>
</thead>
<tbody>
<tr>
<td>meet</td>
<td>Mighty</td>
<td>mitt</td>
<td>met</td>
</tr>
</tbody>
</table>

Central Vowels:

<table>
<thead>
<tr>
<th>/ə/</th>
<th>/ɜː:/</th>
<th>/ɒ/ Brit</th>
<th>/ɑ/ Am</th>
<th>/ɑː:/</th>
</tr>
</thead>
<tbody>
<tr>
<td>away</td>
<td>Early</td>
<td>lock</td>
<td>lock</td>
<td>heart</td>
</tr>
</tbody>
</table>

Back Vowels:

<table>
<thead>
<tr>
<th>/uː:/</th>
<th>/u/</th>
<th>/ʊ/</th>
<th>/oː:/</th>
<th>/ʌ/</th>
</tr>
</thead>
<tbody>
<tr>
<td>blue</td>
<td>situation</td>
<td>should</td>
<td>short</td>
<td>blood</td>
</tr>
</tbody>
</table>

Diphthongs are made up of two vowels pronounced one after the other, in the same syllable. When you say the two vowel sounds of the diphthong they must be said very closely together and with a smooth movement between them. This movement is called a ‘glide’.

Interesting Facts!

Uvular R
In linguistics, uvular R (also guttural R, throaty R or French R) refers to pronunciation of the phoneme R as a uvular consonant. These consonants are usually found as a uvular trill (IPA /r/), a voiced uvular fricative (IPA /ʁ/), or a voiceless uvular fricative (IPA /χ/). Speakers of some languages regard alveolar and uvular /r/ to be alternative pronunciations of the same phoneme. This is remarkable in light of how different these sounds are in terms of their articulation.

French
The French language is perhaps the most well-known example of a uvular R language, to the extent that this pronunciation is widely stereotyped. In the standard dialect of Paris, it is pronounced as a trill (IPA /r/), while in most of the rest of France it is pronounced as a voiced (IPA /ʁ/) or voiceless (IPA /χ/) uvular fricative. However, in much of southern France /r/ remains non-uvular, possibly under Provencal influence.

The nearby Breton language in Bretagne, which is not a Romance language but is heavily influenced by French, retains an alveolar R.
Portuguese

Portuguese has three distinct pronunciations for "r". One of these is uvular, the other two being voiced alveolar tap and alveolar trill. All three sounds are widely used. The uvular R occurs when a word starts with "r", like "rato" (mouse; IPA /ʁatu/). It is also applied in the middle of a word, written has "rr", such as, "carro" (car; IPA /kaʁu/).

Arabic

While most dialects of Arabic retain the Classical pronunciation of ٍ rā as an alveolar trill (IPA /r/) or flap in some cases (IPA /ɾ/), several dialects convert it to a uvular trill (IPA /ʁ/). These include: Mosul dialect, in Iraq; The Christian dialect in Baghdad; The Jewish dialect in Algiers.

Hebrew

In Hebrew, the classical pronunciation of the consonant " ר " (rê) was an alveolar flap (IPA /ɾ/), and was grammatically treated as an ungeminable phoneme of the language. In most dialects of Hebrew among the Jewish Diaspora, it remained a flap or a trill (IPA /ɾ/). However, the Ashkenazi dialects as preserved among Jews in northern Europe carried a uvular R, either as a trill (IPA /ʁ/) or fricative (IPA /ʁ/). This was because their native dialects of Yiddish were spoken that way, and their liturgical Hebrew carried the same pronunciation.

Israeli Hebrew

Many Jewish immigrants to Israel spoke Arabic in their countries of origin, and pronounced Hebrew R as an alveolar trill identical to Arabic ٍ rā. Under pressure to integrate, many of them compensated by pronouncing their Hebrew R as Arabic غ ġayn, which is itself usually pronounced as a voiced uvular fricative.

Definitions

Linguists divide the study of spoken language into two categories—phonology and grammar. Phonology is the study of sounds. Grammar is how the sounds are used to make sense.

Phonology

The smallest unit of sound that can be altered to change the meaning of a word is called a phoneme. In English, for example, the words gin, kin, pin, sin, tin, and win all have different meaning due to the fact that the initial sound, or phoneme, is different. Phonemes do not have meaning by themselves. The sounds represented by the g, k, p, s, t, and w in the words above are meaningless alone but they can change the meaning of words.

Different languages may use somewhat different sets of phonemes. For instance, Polynesian languages usually use about 15 phonemes and generally favour vowel clusters rather than consonant clusters in words. This pattern can be observed in the Polynesian words Kauai, Maui, and Samoa. In contrast, English uses 40 phonemes and often combine consonants into clusters. This can be heard in the English words schedule, months, and. The San languages of Southwest Africa (spoken by the Ju people and others) use some sounds that are not found in English or most other languages elsewhere. These are click sounds that serve as consonants. The Ju/'hoansi language has four distinct kinds of clicks that are produced by sharply pulling the tongue away from different locations in the mouth.

If your language does not have some of the sounds of another language, it is usually difficult for you to hear the differences and to pronounce them correctly. For this reason, the r and l sounds
in English are difficult to distinguish for native Japanese speakers. Try making these two sounds and think about the shape of your mouth and of the placement of your tongue. They are quite similar for both sounds. Native English speakers rarely have difficulty in distinguishing the r and l sounds because they have been familiar with them from early childhood. They are experts at hearing the difference. However, English speakers have difficulty with unfamiliar sounds in other languages, such as the San language clicks mentioned above and the v and b sounds in some Spanish dialects.

Learning and using the sounds of a language can be significantly complicated by the writing system. English has more than 1100 combinations of letters that are used to produce the 40 sounds of the spoken language. It becomes a problem when words share the same phoneme but spell it differently. This occurs with the "e" sound in me, tea, tree, key, country, piece, and reprise. In addition, many English words have the same letter combination but are not pronounced the same. This is the case with mint and pint, clove and love, as well as cough and bough. By comparison, the 33 sounds used in Italian are spelled with only 25 letter combinations. Italian words are spelled just as they are pronounced. Consequently, Italians rarely have to ask each other "how do you spell your name" It is not surprising that English is a far more difficult language to learn. It is also much more difficult for people who are dyslexics.

Perhaps, the most complicated writing system is used in Japan today. It combines symbol elements from several different writing systems, sometimes in the same sentence—kanji, katakana, hiragana, and the Latin script that is used in the written form of most European languages. Kanji is a variant of the Chinese writing system. Katakana is a derivative of Kanji that is used for words borrowed from other languages and for special purposes, such as telegrams. Hiragana originated as a cursive form of katakana. Use of the Latin script is complicated by the fact that there usually are several different ways of spelling the same word. All of these various symbol elements may be written from left to right, right to left, or top to bottom. Adding further confusion is the fact that the kanji symbols sometimes have several different meanings. Educated Japanese are expected to know about 2000 kanji character symbols. Complicating the matter is the fact that Japanese writing is rapidly changing as it adapts to the massive influx of new words and concepts from the Western World. As a result, older people in Japan, who were educated several decades ago, usually have difficulty reading popular newspapers and magazines targeted at teenagers and young adults.

Grammar

Grammar is divided into two categories for analysis—morphology and syntax. Morphology is concerned with how the sounds (that is, phonemes) are combined by language into larger units called morphemes. These latter are the smallest combination of sounds that have meaning and cannot be broken into smaller meaningful units. Words can be one or more morphemes. For example, the English word cow is one morpheme while cowboy is composed of two (cow and boy). Some morphemes have meaning but can not stand alone in standard English like cow. The prefix dis in the word dislike is an example of such a bound morpheme.

Morphemes in the form of words are combined into larger utterances in normal speech. These larger groupings are phrases and sentences. Syntax refers to the standardised set of rules that determine how words should be combined to make sense to speakers of a language. All native speakers of a language learn the basic rules of syntax as they grow up. Even before entering formal schooling, people acquire these rules from their family and friends. In school, they are taught to modify and augment them to coincide with patterns more acceptable to the society.
Different languages are unintelligible not only because the vocabulary is alien but also because the syntax rules are different. In English, word order is particularly critical to changing meaning. For example the words you, are, and there can be combined in three different ways to alter meaning:

There you are. You are there. Are you there?

In Latin derived languages, such as Spanish, French, and Italian, the word order is not usually as important. Meaning is primarily determined by the endings of words (that is suffixes). In a very different kind of language, Mandarin Chinese, meaning is primarily changed by tone. The same word can mean radically different things depending on how it is pronounced. For instance, the word ma can have four distinct tones:

<table>
<thead>
<tr>
<th>tone:</th>
<th>high</th>
<th>Rising</th>
<th>Falling then rising</th>
<th>falling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandarin:</td>
<td>má</td>
<td>má</td>
<td>má</td>
<td>mà</td>
</tr>
<tr>
<td>English:</td>
<td>mother</td>
<td>linen, hemp</td>
<td>horse</td>
<td>scolding, to scold</td>
</tr>
</tbody>
</table>

Mandarin Chinese is not the only tonal language in the world. There are others in Asia and Africa.

Native speakers do not have to memorise all possible sentences that can be created. Instead, they learn the rules (that is, syntax) for creating and understanding all possible sentences. This is much easier. All languages have logical rules. Also, there frequently are exceptions to rules such as the English past tense of eat being ate rather than eated. However, such irregularities are generally few in number.

**Glossary**

**Phonology**
Phonology is the study of how sounds are organised and used in natural languages. The phonological system of a language includes:

- an inventory of sounds and their features, and
- rules which specify how sounds interact with each other.

Phonology is just one of several aspects of language. It is related to other aspects such as phonetics, morphology, syntax, and pragmatics.

Here is a table that compares phonetics and phonology:

<table>
<thead>
<tr>
<th>Phonetics…</th>
<th>Phonology…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the basis for phonological analysis.</td>
<td>Is the basis for further work in morphology, syntax, discourse, and orthography design.</td>
</tr>
</tbody>
</table>
| Analyses the production of all human speech sounds, regardless of language. | Analyses the sound patterns of a particular language by
  - determining which phonetic sounds are significant, and
  - explaining how these sounds are interpreted by the native speaker. |
Phonetics
Phonetics is the study of human speech sounds.
Phonetics is divided into three branches:

- **Articulatory phonetics**
  The study of how speech sounds are produced by the human vocal apparatus.

- **Acoustic phonetics**
  The study of the sound waves made by the human vocal organs for communication.

- **Auditory phonetics**
  The study of how speech sounds are perceived by the ear, auditory nerve, and brain.

Allophone
An allophone is a phonetic variant of a phoneme in a particular language.
Here are some examples of allophones in English:
- [p] and [pʰ] are allophones of the phoneme /p/.
- [t] and [tʰ] are allophones of the phoneme /t/.

Here are some examples of allophones in Spanish:
- [b] and [b] are allophones of the phoneme /b/.
- [d] and [ð] are allophones of the phoneme /d/.

Phoneme
A phoneme is the smallest contrastive unit in the sound system of a language.
Phonologists have differing views of the phoneme. Following are the two major views considered here:

- In the American structuralist tradition, a phoneme is defined according to its allophones and environments.
- In the generative tradition, a phoneme is defined as a set of distinctive features.

Example (Minimal pair: English)
Here is an example of the phonemes /ɹ/ and /ɻ/ occurring in a minimal pair.

- rip
- lip

The phones [ɹ] and [ɻ] contrast in identical environments and are considered to be separate phonemes. The phonemes /ɹ/ and /ɻ/ serve to distinguish the word rip from the word lip.

<table>
<thead>
<tr>
<th>A(n allo)phone is…</th>
<th>A phoneme is…</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of many possible sounds in the languages of the world.</td>
<td>A contrastive unit in the sound system of a particular language.</td>
</tr>
<tr>
<td>The smallest identifiable unit found in a stream of speech.</td>
<td>A minimal unit that serves to distinguish between meanings of words.</td>
</tr>
<tr>
<td>Pronounced in a defined way.</td>
<td>Pronounced in one or more ways, depending on the number of allophones.</td>
</tr>
<tr>
<td>Represented between brackets by convention.</td>
<td>Represented between slashes by convention.</td>
</tr>
<tr>
<td><strong>Example:</strong> [b], [j], [ɔ]</td>
<td><strong>Example:</strong> /b/, /j/, /ɔ/</td>
</tr>
</tbody>
</table>
Minimal Pair
A minimal pair is two words that differ in only one sound.
Here is an example of a minimal pair in English:
Sounds which differ: /p/ and /b/
- [læp] 'lap'
- [læb] 'lab'
Here is an example of a minimal pair in Cashinahua:
Sounds which differ: /t/ and /d/
- [taka] 'liver'
- [daka] 'to rest'

Transcriptions
Transcription is the representation of the source script of a language in the target script in a manner that reflects the pronunciation of the original, often ignoring graphemic (character-to-character) correspondence. This can be a phonetic transcription, which uses a phonetic alphabet such as IPA to represent the actual speech sounds of the source language (including allophones), or a phonemic transcription, which uses scientific or conventional orthography to represents the phonemes of the source language (ignoring allophones), such as in the romanization of Arabic or Japanese.

Using our example of Bin Ladin, in Arabic this is actually pronounced [bin ladin], and the transcription Bin Ladin reflects this rather accurately, whereas such variants as Bin Laden and Ben Laden do not. As is well known, Arabic is normally written without vowel signs and thus there is no direct way to know the vowels associated with each consonant. With the vowel signs, Bin Ladin is written as follows:


You should notice several diacritics above and below some letters which indicate vowels. For example, under the letter dal (د) there is a diagonal line that indicates that the consonant + vowel combination is pronounced [di]. As can be seen, phonemic transcription, which represents the phonemes of the source language, is extremely difficult to achieve in Arabic because the vowel information is missing in normal unwowed Arabic

Difference between phonetics and phonology
Phonetics simply describes the Articulatory and acoustic properties of phones (speech sounds). Phonology studies how sounds interact as a system in a particular language. Stated another way, phonetics studies which sounds are present in a language; phonology studies how these sounds combine and how they change in combination, as well as which sounds can contrast to produce differences in meaning (phonology describes the phones as allophones of phonemes).

Redundant and contrastive features
Every language consists of speech sounds called phones. These different sounds do not all have the same status in the system of English phonology. The occurrence of certain phonetic features is entirely predictable, as is the case in English with voicing in sonorants, nasality of vowels, or length in vowels. Features whose presence is entirely predictable based on the phonetic environment are called redundant phonetic features: give example of the three English p's. Contrasts involving a redundant feature cannot be used to signal a change in
meaning. Adding or removing a redundant, predictable feature results merely in a mispronunciation, not in a new meaning: cf. interchanging the different p’s of English. In a broad phonetic transcription, redundant features can be ignored, and only the elements of pronunciation that are important for distinguishing meaning listed.

The occurrence of other sounds and features in a particular language is not predictable based on phonetic context. In English, for example, voicing in obstruents is never predictable: *pat/bat* /tip/dip/ /girl/curl; the contrast between fricatives and stops is also not predictable: *send/tend*. Or the difference between central and lateral in liquids: *red/led; ball/bar*. Such features are called distinctive, or contrastive, phonetic features. Phonetic features whose presence or absence can alter meaning are called phonemic features. The presence of a phonemic feature is not predictable according to phonetic context. Adding or subtracting a phonemic feature normally results in a change of meaning as well as in a change in pronunciation.

**Complementary and contrastive distribution**

Phonetic features that are redundant in one language can be phonemic in the other. The two phones [ɾ] and [ɻ] are present in English and Korean but play an entirely different phonological role in each language. They are phonemically different in English, always signalling a difference in meaning: *list/wrist* *war/wall*. In Korean, [ɾ] is word initial and [ɻ] is syllable final: "rupi" = *ruby*; "mul" = *water*. The two sounds never contrast to produce a difference in meaning. In English the two sounds are in contrastive distribution; in Korean they are in complementary distribution. Similarly, features that are redundant in English may be phonemic in another language: aspiration in English and Mandarin Chinese: kʰaːn (to see) vs. kaːn (trunk, stem); tʰa (pagoda) vs. tə (beat, strike); pʰǐng (a sound) vs. pǐng (soldiers, army).

**Phonemic analysis**

How does a linguist determine which phonetic features in a given language are phonemic and which are not?

First, a phonetic inventory of speech sounds must be carried out. One needs to determine which speech sounds are present in a particular language in the first place. A linguist studying English for the first time, for instance, will soon discover that English has *aspirated* p, *unaspirated* p and *non-released* p, but no *glottalized* p, *implosive* p, or *pharyngealized* p. The first stage of phonological analysis simply involves an exhaustive phonetic analysis.

Second, having determined which speech sounds occur in a particular language, the linguist must determine whether or not the phonetic difference between these sounds is redundant or phonemic. Phonology is concerned with determining which speech sounds contrast with one another to produce differences in meaning and which speech sounds are in complementary distribution and never produce meaningful contrasts. To find which sounds are redundant and which are phonemic, linguists usually try to find a pair of words with different meanings that differ formally by only a single sound. A pair of words which are distinguished by a difference in only one sound is called a minimal pair: *pit/sit* *cat/cought*; *law/raw*. In the case of a minimal pair, the two contrasting sounds are obviously capable of distinguishing meaning, so the difference between them is phonemic. The linguist will find that some speech sounds in a given language help form many minimal pairs, others only a few. The number of minimal pairs involving a particular sound is called the functional yield of that sound. There are 429 minimal pairs
involving English sound [d] and only 32 involving [o]. Some sounds contrast directly with one another in only a few minimal pairs: ether/either, thigh/thy, dilution/delusion, Confucian/confusion.

A third phase of phonological analysis is to try to remove from consideration all redundant phonetic features and focus only on the distinctive, phonemic features. The most widely employed means of accomplishing this is to group together all the sounds that actually occur in a language into contrastive sets called phonemes. For example, sounds which are in complementary distribution, such as the English sounds p, ph, non-released p, are treated as a single phonological unit, or phoneme, their redundant phonetic differences ignored. The actual phones that act as positional variants of one and the same phoneme are called allophones of that phoneme; thus, the three English p's are allophones of a single phoneme. The phoneme is an abstract unit. We don't hear or pronounce the phonemes of a language; we hear and pronounce their allophones.

The question then arises as to how to symbolise such an abstraction as the phoneme that is manifested as the three English p's. Since there are two ways of looking at the sound system of language: one phonetic and the other phonemic, there are also two types of transcriptions. The one we have been using up till now is a narrow transcription intended to portray as much phonetic information as possible. This type is called phonetic transcription and is enclosed in square brackets. The same IPA symbols can be used in phonetic transcription to transcribe any language of the world. Thus the phonetic symbol [l] represents the same sound in English and Korean.

The other type of transcription is called phonemic transcription and is enclosed in slanted brackets. Phonemic transcription ignores any redundant phonetic detail in a language and only portrays the distinctive and meaningful phonetic differences. Phonemic transcription represents phonemes, not the sounds as they are actually spoken.

Choosing phonemic symbols
What symbol is chosen from among the phonetic symbols for the individual allophones is up to the linguist performing the phonological analysis and depends on several factors. Some phonemes have the same or nearly the same pronunciation in every phonetic environment, as is true of English [s], [m]. In such cases, the symbol for the phone can also be used as the symbol for the phoneme. If there is only one surface manifestation of a phoneme, then the phonetic symbol for that sound becomes the phonemic symbol, as well. If a phoneme is composed of several phonetically distinct allophones, however, then any of the following may be done:

a.) diacritics are removed from allophone symbols, simplifying the sound.
b.) the phonetic symbol for one of the allophones may be co-opted to stand for all the allophones (caret instead of schwa, or ə instead of o)
c.) the most common letter of the alphabet is chosen (t/ð)
d.) some compromise letter is chosen, perhaps not even a symbol from the phonetic alphabet (capital R for l/r in Korean). Although now we have this symbol /ɹ/ to represent the l/r sound in Korean.

Obviously, the process of choosing a phonemic symbol is somewhat arbitrary and up to whatever linguist is performing the analysis. Phonemic symbols are a type of phonetic
shorthand that with specific value for one and only a single language; they are not universal like the symbols of the phonetic alphabet.

Thus, the value of symbols used in phonemic transcription is idiosyncratic and differs from language to language. Phonemic transcription depends upon the interrelationship of sounds in each particular language, whereas phonetic transcription depends simply on the pronunciation of each individual sound regardless of its function in the sound system of the given language. A phonetic symbol stands for one and the same sound regardless of language, but a phonemic symbol often stands for any one of several actual sounds. For example, the phonetic symbol [l] stands for the same sound in the phonetic transcription of English and Korean. A phonemic symbol such as /l/ usually stands for quite different collections of sounds in different languages.

English, for example, has a phoneme that could be represented as /l/ with two different separate surface manifestation: velarized or non-velarized l; In phonetic transcription these two l-sounds would be written each with their own separate symbol. In phonemic transcription they would both be written with the same symbol /l/.

In Korean the phonemic symbol /l/ would represent the allophones [ɾ] and [l]. Remember that phonetic transcription, enclosed in square brackets, attempts to express as much phonetic detail as possible, redundant or otherwise; phonemic transcription does not mark redundant features, but rather is intended to represent only those phonetic details of a given language that are distinctive. Phonemic transcription, therefore, uses phonetic symbols in a way unique to each particular language. The phonemic symbols chosen in your handout are essentially the same sounds used in phonetic transcription minus the diacritical marks.

SYLLABLES, VOWELS, AND SYLLABIC CONSONANTS

One of the definitions of the vowel specifies that it is the "nucleus of the syllable." That means that a vowel is the one essential element of the syllable. In other words, however many consonants a syllable may have (from zero to n) it will have one, and only one, vowel.

- Some syllables have only one vowel (diphthong) sound: OWE [ɔu]
- Some have the structure CV: PAY [pʰɹi]
- Some have the structure CCVC: CLOSE [kʰɹoʊz] etc.

Listen to the second syllable, however, in a word like DAYTON or CERTAIN. Each has two syllables, but in normal (moderate or fast speech) pronunciation, the exact nature of the vowel in the second syllable is unclear--it doesn't actually seem to exist. Both syllables sound like *[tn]. But we just said that the vowel is the nucleus of every syllable; so a vowel has to be present in some form.

One solution is to allow for certain consonants to function as "syllabic consonants." A syllabic consonant is a consonant which functions like a vowel in that it can be the nucleus of a syllable. One way of understanding this is to imagine that a vowel has been reduced past the point of being a "schwa" to where it has no independent identity at all. It has been blended with or swallowed up by the consonant after it. This is true of the second syllable in DAYTON.
It is possible to articulate the word slowly and actually say [dɛɾtən], where the [t] is released into the [ə] which is followed by the [n]. But in normal pronunciation, there is no "space" between the [t] and the [n]. We show this when we make the [n] a syllabic consonant, represented as [n̥]. The very small line under the phonetic symbol represents the vowel which is a part of the syllabic consonant.

Here are the four syllabic consonants, with a few examples of their use:

- syllabic [m̥] as in MADAME [mædm̥] or COLUMN [kolm̥]
- syllabic [n̥] as in CERTAIN [sɑrtn̥] or LEMON [lemn̥]
- syllabic [l̥] as in LITTLE [lɪtl̥] or CAVALRY [kævl̥i]
- syllabic [j̥] as in EAGER [iːɡə] or PERNICIOUS [pɜrniʃəs]

Remember that there are only these four syllabic consonants, and that each represents a reduced vowel followed by the consonant. Because this is true, an alternative representation of each would be schwa plus the consonant. In other words:

- [m̥] is the same as [əm]
- [n̥] is the same as [ən]
- [l̥] is the same as [əl], and
- [j̥] is the same as [ə]

Suprasegmental features (Length [duration], tone, intonation, pitch, juncture, stress)

Word Stress

Mark the word stress to highlight the difference in meaning from the following lexical items.

Example:

Pervert (noun) → /ˈpɜːvər/ → my neighbour is a pervert
Pervert (verb) → /pɜːˈvɜːr/ → don’t pervert the idea
Record (n) → /re kɔːd/ → I bought a new record
Record (v) → /rɪ kɔːd/ → He recorded more than 150 cds
Subject (n) → /səb dʒekt/ → let's change the subject
Subject (v) → /səb dʒekt/ → he'll subject us to criticism
Produce (n) → /prə dʒuːs/ → It says on the bottle 'produce of France'
Produce (v) → /prə dʒuːs/ → America has produced more cars than ever this year
Desert (n) → /də zət/ → Somalia is mostly desert
Desert (v) → /dɪ zət/ → He deserted his wife and went abroad
Process (n) → /ˈprɛs/ → We’re in the process of selling our house
Process (v) → /prə sə/ → The priests processed slowly through the Cathedral
**STRESS**

In English, stress affects the way we pronounce words, and therefore must be taken into account in any phonetic transcription system. The main effect (for our purposes) will be on vowels, an effect known as "vowel reduction."

**Words of one syllable, as far as we are concerned, will all have primary stress.** (In real speech there is a broad class of exceptions, but we will ignore the exceptions for now.) So each one-syllable word will be transcribed simply as pronounced. For example,

- **CAST** [kʰæst]
- **SINCE** [sɪns]

In words of two or more syllables, however, we will have only one syllable with primary stress, and one (or more) unstressed syllables. Other syllables may have some stress, but not as much as the primary-stressed syllable; this is called secondary stress. **Syllables with primary or secondary stress will all contain full vowels,** as in the words above. But vowels in an unstressed syllable may undergo "vowel reduction." The result is the **reduced vowel,** for which we use the phonetic symbol "schwa" [ə]. For example,

- **AGÁIN** [ægėn]
- **MÁGNIFY** [mægnəfər]
- **TÚNDRA** [tʰəndə]
- **SUPPÓSE** [səpɔsə]

Notice that in the first syllable of "tundra" we use the "caret" [\] to symbolise the **full vowel** in mid central lax position, while the similar-sounding but shorter "schwa" [ə] is used in the second syllable to symbolise the **reduced vowel.**

Not all unstressed vowels are necessarily reduced. In words like "ÓNLY" [ənli] and in most compound words ("mixup") an unstressed vowel is still full. But **MOST OF THE TIME, THE UNSTRESSED VOWEL WILL REDUCE TO SCHWA.** When I give you words of two or more syllables to transcribe, I will indicate stress.

**Practice**

Transcribe the following words. Make sure you give them normal pronunciation:

- AMÚSE
- COMMÁND
- PÁLACE
- FACÁDE
- PÚNISH
- CÓTTAGE
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