

Introduction to Phonetics I

Fall 2012

Instructor: Karen Steffen Chung 史嘉琳

Associate Professor, Department of Foreign Languages and Literatures

National Taiwan University



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9. The Articulation of Vowel Sounds

I. Outline for today:

1. Discussion of the quiz on compound noun stress, and class notes
2. Hanyu Pinyin
3. *A Course in Phonetics*: Chapter 1: Articulation and Acoustics
4. Discussion of questions raised during break
5. Homework

II. Notes

1. Discussion of the quiz on compound noun stress, and class notes

- a. The quiz on compound noun stress:
 - When the item is a monosyllabic (單音節) word and stressed, you have to circle the whole word
e.g. (X) joke (O) joke
 - Remember to put an asterisk **before** the syllable that receives the tonic stress, in the upper left-hand corner e.g. (X) silly joke* (O) silly *joke
 - Make sure that you identify compound noun stress correctly (there is only one stress in compounds!).

- b. Class notes handed in last week:

- IPA symbols:

(1) Glottal stop: (X) [ʔ] [ʔ̥] [ʔ̜] (O) [ʔ̠]

- Please do not put a line under the glottal stop, or you may confuse people who are reading it.
- The hook bends to the **right**.
- [ʔ̜] (voiced epiglottal fricative); [ʔ̥] (epiglottal plosive)

(2) [ʔ̜] vs. [r]: both can be allophones of /t/, but they have **different pronunciations**, and occur in **different environments**

- [ʔ̜] glottal stop: it is not only an allophone of /t/; it also occurs in other environments in English
 - i. as the initial of an utterance or a word that starts with a vowel
e.g. *Is he coming?* [ʔ̜ɪz hi kʌmɪŋ]; *elephant* [ʔ̜ɛlɪfənt] (cf. Mandarin 意義 [ʔ̜iʔ̜i])
 - ii. between a syllable-final /t/ and a following syllable that begins with a consonant
e.g. *hit me* [hɪʔ̜ mi]; *partly* [ˈpɑːʔ̜li]
 - iii. with nasal plosion (will be taught later in the semester) e.g. *important* [ɪmˈpɔːʔ̜nt]
- [r] tap: between vowels (intervocalic) e.g. *water* [ˈwɑːrə]; *that is* [ðæt̚ɪz]

(3) Unreleased final stop 不除阻詞尾塞音 [ʔ] vs. glottal stop 喉塞音 [ʔ]:

If you say *hit* in isolation, the final /t/ is usually unreleased: [t̚].

In the phrase *hit me*, the /t/ usually becomes a glottal stop, because the next word starts with a consonant: ['hɪʔ mi]. *Oral stops tend to be unreleased when word-final.

- *bottom* vs. *button*: often confused by Taiwan students:

- bottom (X) ['bʌrəʊn] (O) ['bʌrəm]
- button (X) ['bʌʔn̩] (O) ['bʌʔn] ['bʌʔʔn] ['bʌʔʔn]

(1) the vowel: [a] vs. [ʌ]

- [a] is a long vowel, as in *father*; it is also what children in the US are taught is “the short o” (ex.: mop [mʌp], hot [hʌt], sock [sʌk]), as opposed to the “long o” (e.g. code [kɔd], boat [bɔt], low [loʊ]). (note that the KK [o] is written in IPA as [oʊ]!)

- [ʌ] is a short vowel; it is sometimes called “wedge” 楔子 (Taiwan: xièzi, PRC: xiēzi); it is close to [ə] in US English, and closer to [a] in British English – which seems to account for why Taiwan students so often pronounce it as [a] instead of [ʌ]. Some 參考書 teach that [ʌ] sounds like 注音符號「ㄚ」!

(2) the consonants:

i. the final consonant:

bottom ['bʌrəʊ**m**] (closed mouth for [m], or you may confuse your listener)

button ['bʌʔn̩], with syllabic [n̩]

ii. the allophones of /t/: the /t/ in *bottom* is a tap (intervocalic /t/), in *button* it is a glottal stop [ʔ] (due to *nasal plosion* – to be taught later)***About the confusion:**

- Although it seems funny that we would mix up two words with such different meanings, this kind of confusion may also occur in foreign learners' Mandarin, e.g. they will often get the tones wrong.

- For example, some learners may mix up the two phrases 我要你 (wǒ yào nǐ, meaning 'I want you') and 我咬你 (wǒ yǎo nǐ, meaning 'I bite you').

→ Such confusion is common in language learning – but it needs to be carefully sorted out and corrected!

Two other pairs to watch out for: sore [sɔɹ] and sour [saʊɹ]; tone [tɔʊn] and tongue [tʌŋ]!

- Canadian “rising”?

(O) raise (transitive verb 及物動詞): Canadians raise their tongues → (O) **Canadian raising**

(X) rise (intransitive verb 不及物動詞): the tongue rises

***Vocabulary: raise and rise**

- In American English, the noun for 加薪 is *raise*; in British English, it is *rise*.

e.g. (AE) I got a **raise**. (BE) I got a **pay rise**.

- American or British English?

Some people seem to be confused when writing about the differences between them. Make sure you follow the guidelines:

- (1) Pay attention to Ms. Chung when she talks about the differences in class.
- (2) There may differences of **spelling, pronunciation, or collocation** 片語. Make sure to clarify each one precisely in your mind.
- (3) If you don't hear something clearly, raise your hand and ask Ms. Chung to repeat it during class, or ask the TAs or Ms. Chung during breaks.

- Rules for the *-s/-es* suffix:

(1) The three situations when we add *-s* or *-es* to a word in English:

- nouns with regular plurals, e.g. *book* → *books*; *bag* → *bags*; *bush* → *bushes*
- third person singular present tense of regular verbs (規則動詞的第三人稱單數現在式)
e.g. *I look, you look, he looks*
- possessive (所有格) e.g. *the book's cover, the bag's handle, the bushes' leaves*

(2) /s/ is a morpheme 語素 with one of the three above meanings, which has three different phonologically-conditioned realizations 呈現, called allomorphs 同位語素:

- voiceless [s]: after voiceless sounds e.g. *books* [bʊks]
- voiced [z]: after voiced sounds e.g. *bags* [bægz], *rows* [rəʊz]
- schwa [ə] + voiced [z]: after sibilants e.g. *bushes* (AE) [bʊʃəz]/(BE) [bʊʃɪz]

→ the schwa [ə] is added in order to make the final [z] clear and audible – this is a kind of dissimilation 異化; otherwise plurals for words such as *bus* “buss” [bʌs-s] would be unclear, because the final [s] or [z] would be too similar to the preceding sound for it to be heard clearly. [z] is used rather than [s] because the preceding sound [ə] is a vowel and thus **voiced**.

(3) We need to learn these rules to speak English correctly, or we may cause confusion or misunderstandings when talking with others.

***The six sibilants in English:**

- sibilants 嘶音 (嘶音 in the PRC)
- /s, z, ʃ, ʒ, tʃ, dʒ/

- Palato-alveolar 顎齶音 vs. alveolo-palatal 齶顎音:

- English – palato-alveolar: [ʃ, ʒ, tʃ, dʒ]
- Mandarin – alveolo-palatal: ㄐ ㄑ ㄒ [tʃ tʃʰ ʃ]

- IPA symbol [z]: (X) [z̄] (O) [z]

→ Do not put a bar on the symbol! If you do anything to the IPA symbol in your handwriting, it may change the value. For example, the mark you add to the symbol may be interpreted as a diacritic.

- Spelling: trill 顫音 vs. trial 審判 vs. thrill 戰慄

***Pronunciation of 「顛」音:**

- ㄓ ㄓˋ zhàn is the standard pronunciation 正讀; in Taiwan
- ㄓˋ ㄓˋ chàn is a variant pronunciation 又讀; common in the PRC


2. Hanyu Pinyin 漢語拼音

*Homework: Write out the first sentence of the parrot story “鸚鵡有人性 被劫傷離情” in Hanyu Pinyin on course webpage 3 (see below for the link).

- a. Where do we put the tone mark 調符 when there is more than one vowel in a word?
- Diphthongs: always put the tone mark on the main vowel 主要元音 (元音 is a synonym for 母音 ‘vowel’; 元音 is used more commonly in linguistic scholarship in the PRC)
 - (1) For: ㄞ ai/ㄟ ei/ㄠ ao/ㄡ ou → add the tone mark over the first vowel
 - (2) For all the other diphthongs: e.g. ㄩㄠ liù (cf. ㄩㄠ yòu (see b. (2)), ㄑㄨㄝ quē → add the tone mark over the second vowel.
 - Triphthongs: the main vowel is the one in the middle (consonants that are not glides)
 - ㄨㄞ wai/ㄨㄟ wei/ㄨㄠ yao/ㄨㄡ you e.g. ‘飆’ biāo

b. Some things students may need to be careful about:

(1) When consonants are added before the vowel, the Pinyin for triphthongs will look different.

ㄨㄞ wai → _uai	ㄨㄠ yao → _iao	
ㄨㄟ wei → _ui	ㄨㄡ you → _iu	
w becomes u	y becomes i	

(2) For some triphthongs, the tone mark will shift to the last vowel because Hanyu Pinyin omits one of the vowels.

e.g. 為 wèi → 鬼 guǐ (“e” is omitted); 又 yòu → 六 liù (“o” is omitted)

(3) Similar changes (as mentioned in (1)) are present in 一 yī, ㄨ wu, and ㄩ yu.

e.g. 一 yī → 遍 bi

***yi and wu: the asymmetry in Taiwan Mandarin:**

- When we say phrases like 一個人 (yí gè rén), we have a glottal stop before the yi [ʔi], and it will sound weird if we have a glide /j/ before it [ji] (although a few people will have it in their pronunciation).
 - However, when we say 烏來 (wū lái), such distinction is not the case for wu – both [ʔu] and [wu] are acceptable, which suggests that there is an asymmetry in the phonology of Taiwan Mandarin and that the sound wu is unstable in Taiwan Mandarin. (Discussion will be continued below.)
 - Think about it, and start paying attention to how people in Taiwan say these two sounds.
- (4) Do we use an umlaut ¨ in Hanyu Pinyin?
- In Wade-Giles Romanization 威妥瑪氏羅馬拼音, the umlaut is used for ㄩ. e.g. ‘餘’ yü²
 - In Hanyu Pinyin, we only use an umlaut to make distinctions between words such as 努 nǔ and 女 nǚ, and 爐 lú and 驢 lú. It is only after /l-/ and /n-/ that both /i/ and /y/ can occur.

- We don't use an umlaut with other initials: We don't need an umlaut in 需 xū, because ㄒ is impossible in Mandarin. ㄑ ㄔ ㄒ can be combined with **only two vowels**: 一/i/ and ㄩ/y/ because these three consonants are (alveolo-)palatal sounds.
cf. 出 ㄔ ㄩ and ㄆ ㄨ ㄨ cannot occur before 一/i/ and ㄩ/y/.

*Homework: Read "Romanization III" on course webpage 13 (see below for the link).

3. *A Course in Phonetics: Chapter 1: Articulation and Acoustics* (p. 20)

(Continuing "The articulation of vowel sounds")

- Front vowels:** the vowels in *heed* [i], *hid* [ɪ], *head* [ɛ], *had* [æ] (there are other front vowels which are diphthongs, but we are not discussing these here)
 - The tongue is domed and the highest point is in the front of the mouth; therefore they are classified as front vowels.
 - For [i], the tongue is very close to the roof of the mouth, for [ɪ] a bit lower, even lower for [ɛ], and the lowest for [æ].
 - We can try to use the method that we learned before for consonants to know where the tongue is when making these vowels: sucking in air while holding the target position for the vowels. It works the best for [i] because the articulators are closest to each other here. It doesn't work that well for the vowel in *hid* and most other vowels, since the articulators are too far apart.
 - Take out a mirror to see how your mouth becomes progressively more open when saying these words (from *heed* to *had* = from the highest to the lowest).
→ [i] a high front vowel / [ɪ] a mid-high front vowel/ [ɛ] a mid-low front vowel / [æ] a low front vowel. (Just remember the progression of your mouth when saying these words and you will remember the terms!) (See Figure 1.13 on page 21 of the textbook)
- Back vowels:** the vowels in *father* [ɑ], *good* [ʊ], *food* [u] (there are also other back vowels not discussed here)
 - The tongue is domed and the highest point is in the back of the mouth; therefore they are classified as back vowels.
 - Among the three vowels, the tongue is the lowest for [ɑ], higher for [ʊ], and the highest for [u].
→ [ɑ] a low back vowel/[ʊ] a mid-high back vowel/[u] a high back vowel.
 - Just like what we did for front vowels, we can also try to know where the tongue is when making these vowels by sucking in air while holding the target position for the vowels. We will be able to feel the cool airflow when producing the [u] which is best for this test, since the path for the air is narrow enough.

*Long and short vowels in American English: (also see p.5 of Unit 4 handout)

- **Long** vowels by definition can occur in **both open** and **closed syllables**; they include [i] [æ] [u] [ɔ] [ɑ]
 - **Short** vowels can occur **only in closed syllables**; they include [ɪ] [ɛ] [ʌ] [ʊ]
- (we are only talking about the monophthongs here)

- c. **Lip gestures:** While your tongue is making different gestures for different vowels, your lips are also doing something. Pronounce the vowels mentioned above and watch your the movements of your lips in a mirror.
- Start from the front vowels. Going from [i] to [æ] you will see your lips go from very spread to more relaxed.
 - Next try the back vowels. For [ɑ], your lips are still wide open, though so less than for [æ]; they are more relaxed. For [u] and [ʊ], you will notice your lips are rounded. → **In general, lip-rounding 圓唇 is typical for back vowels.**
- Another way to classify vowels: rounded or unrounded.

***Rounded back vowels:**

- It is very normal that many languages have rounded back vowels. For example, in Mandarin, we also have rounded back vowels: [u] in ‘儲’ [tʂʰu], [ʊ] in ‘純’ [tʂʰʊn], [oʊ] in ‘歐’ [oʊ], and [ɔ] in ‘紅’ [hɔŋ]. (This will be discussed next semester)
 - Unrounded back vowels are more marked (有標記、突出的). e.g. [ɯ] in some varieties of Southern Min (豬, 箸[tɯ]) and [ɤ] Mandarin ‘餓’ (Beijing dialect)
 - Rounded front vowels are also marked. e.g. [y] in French, German, Swedish, Mandarin, Cantonese, Tibetan, and many other languages ([y] is much more common than [ɤ])
- d. Summary of this section: three parameters when describing vowel gestures:
- (1) Height of the body of the tongue → high/low vowels (first formant/F1)
 - (2) Front-back position of the tongue → front/back vowels (second formant/F2)
 - (3) Degree of lip-rounding → rounded/unrounded vowels (third formant/F3)

4. Discussion of questions raised during break:

- a. Distinction between [ʒ] and [dʒ]:
- The manners of articulation are different: [ʒ] – fricative (擦音) vs. [dʒ] – affricate (塞擦音)
 - [ʒ] is a continuant (連續音, in which the sound quality doesn’t change in the process of articulation) while [dʒ] is not because it has the stop component [t], which features three stages in the articulatory process – approach, hold, and release. We can use a waveform to see the difference more clearly.
 - To pronounce [dʒ], we can simply compare the sound with the consonant in the word ‘這’, which is also an affricate [tʂ]. It is sounds more similar to [dʒ] especially in Taiwan Mandarin because we use the retroflex (捲舌音) less than people who speak the Beijing dialect. e.g. **judge** [dʒʌdʒ]
 - To pronounce [ʒ], just make the [ʃ] sound (as in *she*) first and then add voicing.
e.g. **usually** [ˈjuːʒjuəli]; **genre** [ˈʒɑːnɹe]; **beige** [beɪʒ] (米色的)

***Continuants in English:**

- include vowels, nasals, and fricatives

***Homework: Read the CET article No. 7 “Stop at stops” (see below for link).**

b. Continuing the discussion on 一 *yi* and ㄨ *wu*:

- *yi*: (A) /Øi/, (B) [ʔi], or (C) *[ji]? → (A) and (B) sound acceptable to Taiwan Mandarin native speakers, but the third sounds weird and is marked among Taiwanese.

***Footnote on the marks:**

- Ø: zero-initial 零聲母, meaning there is nothing there. It is **NOT** an IPA symbol, but it is used in phonological studies on Chinese.
- *: meaning the item is not used or common in the system being discussed
- *wu*: (A) /Øu/, (B) [ʔu], or (C) [wu]? → They all sound ok for Taiwanese although Ms. Chung is more used to using (C), perhaps under the influence of English. Children who live in the same neighborhood with Ms. Chung (in 烏來) seem to say (B) more often.
(The (A) and (C) for *wu* sound similar, but there is more lip-rounding when we say [wu].)
- Try to say the six sounds on your own and see which one you like the best.
→ For *yi*, most people in the class liked (A); for *wu*, there was no certain agreement.
- What about the *wu* in the word for *service* in Mandarin 服務?
→ Ms. Chung's daughter, who was born and grew up in Taiwan, uses mainly (B); a lot of students she has met also tend to use (B) more.
- Linguists haven't figured it out yet, and there is still a lot of discussion about this. Someone should collect data and do a rigorous study on this topic!

*Homework: Observe which sound people around you and you yourself use.


- You may jump to conclusions based on vague impressions if you don't pay enough attention to how people actually say things. Pronunciation varies, especially among young people.

e.g. Some people may say [ʎ] when they mean to say [zʎ] for '熱' in the phrase 外面好熱; some people may say [loʊ] for 肉 in 我要吃肉. (Pronunciation in Taiwan Mandarin is changing, and it is very possible that the [z] sound will eventually become [l].)

- Sometimes what you think you are doing and what you are really doing are different – if you are not paying close attention.

e.g. A lot of Americans may claim they never use contractions, saying "I *don't* use contractions!"

5. Homework

- Exercises for Chapter One (will be gone over next class)
- Write out the first sentence of the parrot story “鸚鵡有人性 被劫傷離情” in Hanyu Pinyin on course webpage **3** <http://homepage.ntu.edu.tw/~karchung/intro%20page3e.htm> 

- Read “Romanization III” on course webpage **13**

<http://homepage.ntu.edu.tw/~karchung/intro%20page%2013.htm>




d. Read the **CET article No. 7 “Stop at stops”**

http://homepage.ntu.edu.tw/~karchung/pubs/75_hello_et.pdf 

e. Read **the rest of the CET articles** that have been assigned, and read ahead in the textbook.

f. Start observing how people pronounce 一 yi and ㄨ wu in Taiwan.

Pronunciation corrections:

framed syllables are stressed; * = tonic stress 

bottom	['bɑrən]	→ ['bɑrəm] (close your mouth for [m])
button	['bʌtən]	→ ['bʌʔŋ] (the vowel; the /t/ allophone)
letter G	[dʒy] (like ‘居’)	→ [dʒi] (there is labialization 唇化, but do not round your lips too much!)
tongue	[tʌŋ]	→ [tʌŋ] (consonant)
fairly	['fɛəli]	→ ['fɛ.ɹli] (the [ɹ] was missing)
the	[lə]	→ [ðə] (stick out your tongue tip)
heed	[hɪd]	→ [hid] (vowel)
this is so_by...	rush through	→ pause before prepositions
holding	['hou_dɪŋ]	→ ['holdɪŋ] (the [l] was missing)
position, position	[pə'sɪʃən], [pə'ziʃən]	→ [pə'ziʃən] (consonant; vowel) Start to look out for words in which the non-final s is pronounced as [z] and commit to memory!
most	[məʊst]	→ [moust] (system: (BE) [məʊst] – be consistent!)
this	[lɪs]	→ [ðɪs] (stick out your tongue tip)
the articulator	[li]	→ [ði] (stick out your tongue tip)
articulator	[ɑ:'tɪkjuleɪrə]	→ [ɑ:'tɪkjuleɪrə] (the [ɹ] was missing)
are	[ɑ:]	→ [ɑ] (the [ɹ] was missing)
head	[hæd]	→ [hɛd] (the vowel was a little bit lower than [ɛ]; don't lower your jaw too much)
these four words,	flat	→ continuation rise before comma
becomes	[brɪ'kʌmz]	→ [brɪ'kʌmz] (close your mouth for [m])
remains	[ɹi'meɪnz]	→ [ɹi'meɪnz] (vowel)
as	[əz]	→ [æz] (vowel); “as” is sometimes but not always reduced to [əz]
called	[kɔld]	→ [kɔld] (vowel)
mid	[mɪd]	→ [mɪd] (vowel)
in	[ɪn]	→ [ɪn] (vowel)
	mid- high vowel	→ mid - high vowel (<i>mid</i> and <i>high</i> are both important in the adjective; <i>vowel</i> is repeated)
vowels	['vaʊwəls]	→ ['vaʊwəlz] (consonant; the plural s is after a voiced [l])

figure	['fɪgjə]	→ ['fɪgjə] (vowel)
for	[fɔ:]	→ [fɔ:] (the [ɹ] was missing)
In all three, close (n.)	In * all three, [klaʊz]	→ In all * three , (tonic stress and continuation rise) → [klaʊz] (the vowel before the voiceless sound shouldn't be too long) cf. close (v.) [klaʊz]
surface back vowel	['sɜfəs] back * vowel	→ ['sɜ-fəs] (r-coloring in AE) cf. (BE) ['sɜ:fəs] → * back vowel (<i>back</i> contrasts with <i>front</i> , <i>vowel</i> is repeated)
food vowel high front_vowel	[fʊd] ['vaʊwə_] no pause	→ [fud] (vowel) → ['vaʊwəl] (the [l] was missing) → glottal stop between final <i>t</i> and words that start with a consonant: stop at stops
of the rush of air when... breathe (v.)	[ɒf] flat [brɛθ]	→ [əv] (vowel; consonant) → continuation rise + pause before relative pronouns → [brɪð] (vowel; consonant) vs. breath (n.) [brɛθ] e.g. Breathe easy! (放鬆) vs. a breath of fresh air
together	[tu'gɛdʒə]	→ [tə'gɛdʒə] (the unstressed o is a schwa here; stick out your tongue tip for <i>th</i>) e.g. the, this, these
in_a, in_addition	no linking	→ linking (when a final consonant is followed by a vowel) Try to say “[ɪ] 呢”, and you may get it right faster.
mirror that_occurs	[mɪɹə] [ðæ? ʌ'kɜ-z]	→ [mɪɹə] (vowel) → [ðæɹʌ'kɜ-z] (/t/ between two vowels → tap); a glottal stop is now becoming very common in this position in UK English – this used to be stigmatized
lip who'd	[lɪp] [hʊd]	→ [lɪp] (vowel) cf. leap [lɪp] (跳躍) → [hʊd] (vowel) cf. hood [hʊd]

*Choosing the variety of English you wish to speak and cultivate:







- In RP, post-vocalic “r” is dropped (unless before vowels), and the [ɒ] is pronounced as [əʊ].
- Choose the variety of English you wish to learn and try be consistent.

*Force of habit:

- Some of our pronunciation habits have become so deeply ingrained that it is hard to change them in a short period of time. It is easier to pronounce words correctly when they are read in isolation, but in connected speech, we tend to make the same mistakes over and over.
- We have to stop and think about the pronunciation of the words we're about to read **before** we read them. After doing it for a while, the new pronunciation will be automatic and you don't have to take extra time to consciously think about it.
- Some words are so common and short (such as *the, for, in*), that we may think it's not that necessary to pronounce them carefully, but it *is* important! Regardless of how short and common a word is, it should be

pronounced **correctly**. Think of how odd it sounds when foreigners get the tones wrong in Chinese. They are probably also thinking – we don't use tones in English, so they can't be that important. It shouldn't matter if I get them wrong sometimes. But you will notice **every** time, and sometimes it will confuse you!

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7	<p>http://homepage.e.ntu.edu.tw/~karchung/intro%20page%2013.htm</p>		<p>National Taiwan University/Karen Steffen Chung 史嘉琳 This work is licensed by Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Taiwan</p>
8	<p>http://homepage.e.ntu.edu.tw/~karchung/pubs/75_hello_et.pdf</p>		<p>Caves Educational Training Co., Ltd / <i>Hello! E.T.</i> Issue No. 75, January/February 2013, p. 12-14 http://www.cet-taiwan.com/drcet/type.asp?title_type=Hello%20E.T. This work is licensed by <i>Caves Educational Training Co., Ltd</i> for the use of OCW ONLY. The copyright belongs to the above mentioned creator(s).</p>
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