Phonetics Book Notes

Chapter 6

Pulmonic airstream mechanism: air coming out of the lungs
    Plosives: stops that use only an egressive pulmonic airstream
Glottalic airstream mechanism: an upward or downward movement of the closed glottis
    Ejectives: stops made with a glottalic egressive airstream mechanism
    Implosives: stops made with an ingressive glottalic airstream mechanism
Velaric airstream mechanism: movement of the bottom of air in the mouth
    Clicks: stops that use the velaric airstream

Glottis: the space between the vocal folds
Creaky-voiced sounds = laryngealized sounds
Voice onset time (VOT): the interval between the release of a closure and the start of the voicing

Chapter 7

Apical sounds – made with the tip of the tongue
Laminal sounds – made with the blade of the tongue

Chapter 8

Frequency: the number of complete repetitions (cycles) of variations in air pressure occurring in a second
Pitch: when a speech sound goes up in frequency, it also goes up in pitch
    the pitch of a sound may be equated with its fundamental frequency

Voiceless sounds have no vocal fold pulses and therefore no pitch
Voiced stops and fricatives perturb the smooth pitch curve

Intensity: the average size, or amplitude, of the variations in air pressure
When one sound has an intensity 5dB greater than another, then it is approximately twice as loud
The characteristic overtones are called the formants of the vowels, the lower of the two being called the first formant and the higher the second formant

Acoustic correlates of consonantal features:

Voiced	Vertical striations corresponding to the vibrations of the vocal folds
Bilabial	Locus of both second and third formants comparatively low
Alveolar	Locus of second formant about 1,700-1,800 Hz
Velar	Usually high locus of the second formant. Common origin of second and

	third formant transitions.
Retroflex	General lowering of the third and fourth formants.
Stop	Gap in pattern, followed by burst of noise for voiceless stops or sharp beginning of formant structure for voiced stops
Fricative	Random noise pattern, especially in higher frequency regions, but dependent on the place of articulation.
Nasal	Formant structure similar to that of vowels but with nasal formants at about 250, 2,500, and 3,250 Hz.
Lateral	Formant structure similar to that of vowels but with formants in the neighborhood of 250, 1,200, and 2,400 Hz. The higher formants are considerably reduced in intensity.
Approximant	Formant structure similar to that in vowels, usually changing.

Chapter 9

A vowel chart shows the limits of possible vowel quality.

Cardinal vowels: proposed by Daniel Jones, these eight vowels are evenly spaced around the outside of the possible vowel area and are designed to act as fixed reference points for phoneticians. In no case is the quality of a cardinal vowel exactly the same as that of an English vowel.

Two of the cardinal vowels are defined in articulatory terms:

1. Cardinal vowel (1) is produced with the lips spread and the tongue as high and far forward as possible without causing audible friction. Its symbol is [i].
2. Cardinal vowel (5) is made with the lips in a neutral position (neither spread nor rounded) and with the tongue as low and as far back as possible.

Cardinal vowels (2), (3), and (4) are defined as front vowels that form a series of auditorily equidistant steps between numbers (1) and (5). Cardinal vowels (6), (7), and (8) are defined as vowels that continue on from number (5), with the same size steps as in the first part of the series, but that are in the case of these vowels as back as possible.

Cardinal vowels:

1. i
2. e
3. ɛ
4. a
5. ɑ
6. ɔ
7. o
8. u

Problems with cardinal vowels:

1. The values of the cardinal vowels cannot be learned from written descriptions; they should be learned by oral instruction from a teacher who knows them.
2. There has been a great deal of confusion over whether vowels are being described in terms of tongue height or in terms of acoustic properties.

Principle of perceptual separation: the sounds of a language are kept acoustically distinct so as to make it easier for the listener to distinguish one from another.

Advanced Tongue Root (ATR): the root of the tongue is drawn forward and the larynx is lowered, so that the part of the vocal tract in the pharynx is considerably enlarged

Rhotacized vowels: the tongue can be bunched up in the center of the mouth, with the tip down and pulled back from the lower teeth. There is also a slight narrowing in the pharyngeal cavity.

In a rhotacized vowel, there is a marked lowering of the frequency of the third formant.

Vowels are nasalized if the soft palate is lowered to allow part of the airstream to escape through the nose.

Table 9.1: The features of vowel quality

Quality	**Correlates**
height	frequency of formant one
backness	difference between frequencies of formant two and formant one
rounding	lip position
ATR	width of the pharynx
rhotacization	frequency of formant three
nasalization	position of the soft palate

Vocoids: sounds that have no obstruction in the center of the mouth
We can define vowels as syllabic vocoids and semivowels as nonsyllabic vocoids.
Semivowels: vocoids that function as the beginning or end of a syllable

Semivowels in English are [j] and [w], which are like nonsyllabic versions of the English high vowels [i] and [u].

- a semivowel is a kind of approximant

Secondary articulation: an articulation with a lesser degree of closure occurring at the same time as another (primary) articulation

1. palatalization: the addition of a high front tongue position, like that in [i], to another articulation
2. velarization: raising the back of the tongue
3. pharyngealization: the superimposition of a narrowing of the pharynx; retracting of the root of the tongue
    a. there is very little difference between velarized and pharyngealized sounds, and no language distinguishes between the two possibility

   b. Ex. Arabic emphatic consonants: some are velarized, some are pharyngealized
4. labialization: the addition of lip rounding
   a. nearly all kinds of consonants can have added lip rounding

Chapter 10

Suprasegmental features: those aspects of speech that involve more than single consonants or vowels. The principal suprasegmental features are stress, length, tone, and intonation.

Syllables: although nearly everybody can identify syllables, almost nobody can define them.

Two goals in looking for an adequate definition of a syllable:
1. account for the words in which there is agreement on the number of syllables
2. explain why there is disagreement on some other words

Sonority: loudness relative to that of other sounds with the same length, stress, and pitch

The low vowels [ɑ] and [æ] have greater sonority than the high vowels [u] and [i].

The approximant [l] has about the same sonority as the high vowel [i].

The nasals [m, n] have slightly less sonority than [i] but greater sonority than a voiced fricative such as [z].

The voiced stops and all the voiceless sounds have very little sonority.

Syllables are not marked by peaks in sonority but by peaks in prominence. The relative prominence of two sounds depends in part on what their relative sonority would have been if they had had the same length, stress, and pitch; but it also depends in part on their actual stress, length, and pitch.

A sound is prominent because it forms the peak of a syllable; it is syllabic because it is prominent.

A syllable is made up of the onset, nucleus, and coda.

Languages differ considerably in the syllabic structures that they permit.

A stressed syllable is pronounced with a greater amount of energy than an unstressed syllable, and it is more prominent in the flow of speech.

Stressed sounds are those on which the speaker expends more muscular energy. This usually involves pushing out more air from the lungs by contracting the muscles of the rib cage and perhaps increasing the pitch by the use of the laryngeal muscles. The extra activity may result in the sound having greater length.

A stressed syllable is pronounced with a greater amount of energy than an unstressed syllable, and this difference may be manifested simply in the length of the syllable.

Long consonants (or vowels) that can be analyzed as double consonants (or vowels) are called geminates.

The pitch of the voice is determined by several factors. The most important is the tension of the vocal folds. If the vocal folds are stretched, the pitch of the sound will go up.

An increase in the flow of air out of the lungs will also cause an increase in pitch.

Variations in pitch occur in associations with the variations in the position of the vocal folds in different phonation types.

All languages use pitch to mark the boundaries of syntactic units. In nearly all languages, the completion of a grammatical unit such as a normal sentence is signaled by a falling pitch. Incomplete utterances, such as mid-sentence clause breaks where the speaker intends to show that there is something still to come, often have a basically rising intonation.

Pitch variations that affect the meaning of a word are called tones.

Contrastive tones are usually marked over the vowel in a tone language.

Tone languages make two slightly different uses of pitch within a word. Many, if not most, languages use pitch differences to make changes in grammatical (morphological) meaning.

Contour tones involve gliding movements. When making tones of this type, the speaker's aim is to produce a characteristic pitch movement, rather than a single point in the pitch range.

Assimilations occur between tones in much the same way as they do between segments. When a high tone precedes a low tone, then the low tone will usually begin with a downward pitch change.

Changes of tone due to the influence of one tone on another are called tone sandhi.

In most languages there is a downward trend of the pitch over a syntactic unit such as a sentence. This general pitch lowering is known as declination.

Chapter 11

Anticipatory coarticulation: an articulator that is not necessarily involved in a given sound will nearly always start moving toward its position in the next sound in which it is the primary articulator.

Preservative coarticulation: the actions involved in making one sound continue into the next

Motor equivalence: the same sound being produced by different actions

We describe tone and intonation in terms of variations in pitch, not in terms of actions of the larynx and the respiratory mechanisms.

Coordinative structures: physiological systems that act together to produce the required effects

There are only a few cases in which it has been shown that a person can produce the same sound with different vocal tract shapes. When this occurs, the coordinative structures permit what we may call compensatory articulations.

Features form a hierarchy, some dominating other features

See pp. 258-63 for some examples of feature hierarchies.