BOOK REVIEW

Acoustic & Auditory Phonetics, By Keith Johnson. (the 1st Edition. Great Britain: Blackwell Publishers Inc., 1997. Pp. viii + 169; and the 3rd Edition Malaysia: Blackwell Publishers Ltd., 2012. Pp. ix + 222.)

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Phonetics is one of the major fields in linguistics. Basically, it is the study of all sounds that human can make. Phonetics is essential to language learners, as, at the beginning of the language acquisition, learners have to learn how to perceive and produce the sounds of the languages they speak, starting from their native language to their second, foreign, and/ or other languages. Learning phonetics helps learners to understand the human speech sounds better. This book titled "Acoustic and Auditory Phonetics" by Keith Johnson is a great resource for learners to have a more advanced and deepened knowledge in phonetics.

Keith Johnson, the author, has developed this book from the 1st edition in 1997 and the 2nd edition in 2002 to the latest or the 3rd edition in 2012. The 1st and 3rd editions are similar in that both editions contain contents in basic acoustics and segmental units (consonants and vowels). However, in the 3rd edition, the contents in chapters were rearranged, and the book was clearly divided into two main parts: Part I: Fundamentals and Part II:

Speech Analysis, with an additional chapter for speech perception. Table 1 below shows the chapters and contents of the 1st and 3rd versions in comparison.

Table 1. "Acoustic and auditory phonetics" the 1st and 3rd editions

The 1st Edition (1997)		**The 3rd Edition (2012)**		
Chapters	**Title of the Chapter**	**Chapters**	**Title of the Chapter**	**Part**
1	Basic Acoustics and Acoustic Filters	1	Basic Acoustics and Acoustic Filters	Part I. Fundamentals
2	Digital Signal Processing	2	The Acoustic Theory of Speech Production: Deriving Schwa	
3	Basic Audition	3	Digital Signal Processing	
4	The Acoustic Theory of Speech Production: Deriving Schwa	4	Basic Audition	
-		5	Speech Perception (New)	
5	Vowels	6	Vowels	Part II. Speech Analysis
6	Fricatives	7	Fricatives	
7	Stops and Affricates	8	Stops and Affricates	
8	Nasals and Laterals	9	Nasals and Laterals	

Table 1 above summarizes the chapters and contents of the 1st and 3rd editions of "Acoustic and Auditory Phonetics" in comparison. In Table 1, it can be seen that the structure of the book (Johnson 2012) covers the general background of speech acoustics and perception in **Part I**: **Fundamentals** and the details of segments such as consonants and vowels in **Part II: Speech Analysis**.

Part I: **Fundamentals** of this book has five chapters (Chapters 1-5). In *Chapter 1 Basic Acoustics and Acoustic Filters,* it explains the sensation, the propagation, types of sounds, which include simple periodic, complex periodic, and aperiodic waves, and acoustic filters. *Chapter 2 The Acoustic Theory of Speech Production: Deriving Schwa* extends the knowledge of sound waves in Chapter 1 to the speech sounds, in terms of voicing, fundamental frequency, harmonics, voicing quanta, vocal tract filtering, pendulums, standing waves, vowel formants, and nodes and antinodes in an acoustic tube. In *Chapter 3 Digital Signal Processing*, first, it compares the continuous versus discrete signals and analog-to-digital conversion and moves on to the signal analysis methods such as RMS amplitude, fast Fourier transform (FFT), audio-correlation pitch tracking, digital filters, linear predictive coding (LPC), and spectra and spectrograms. *Chapter 4 Basic Audition* reviews the anatomy of the peripheral auditory system, the auditory sensation of loudness, frequency response of the auditory system, saturation and masking, and auditory representations. In *Chapter 5 Speech Perception*, it describes the auditory ability, phonetic knowledge, and linguistic knowledge which shape speech perception, together with the perceptual similarity.

Following Part I, **Part II**: **Speech Analysis** has the last four chapters (Chapters 6-9)**.** *Chapter 6 Vowels* includes the tube models of vowel production, perturbation theory, preferred vowels-quantal theory and adaptive dispersion, vowel formants and the acoustic vowel space, the auditory and acoustic representations of vowels, and cross-linguistic vowel perception. In *Chapter 7 Fricatives*, it shows the turbulence of fricatives, place of articulation in fricatives, quantal theory and fricatives, fricative auditory spectra, and dimensions of fricative perception. *Chapter 8 Stops and Affricates* explains the source

functions for stops and affricates, vocal tract filter functions in stops, affricates, auditory properties of stops, and stop perception in different vowel contexts. In the last chapter (*Chapter 9 Nasals and Laterals)*, it covers the bandwidth, nasal stops, laterals, nasalization, and nasal consonant perception.

In general, this book *"Acoustic and Auditory Phonetics*" gives a thorough background and clear concepts of the acoustic and auditory phonetics. The organization of the book, especially the 3rd Edition, helps readers to absorb the contents of the book in a good order. In other words, readers, first learn the basic acoustics in Part I and can apply the knowledge gained from Part I to the contents of the vowels and consonants in Part II.

In the 3rd Edition, each chapter has the sub-topics which are related to the title of the chapter. For example, *Chapter 1 Basic Acoustics and Acoustic Filters* begins with the sensation, propagation, and types of sounds, which are in the basic acoustics. The contents are scientific, but the author explains each topic clearly and illustrates each important point such as periodic and aperiodic waves with some figures. These figures give the clearer view of the sound waves to learners. The figures displayed in the Part I, first, explain the basic principles of speech production and can be used in Part II to help explain further contents of human speech sounds. For example, Figure 2.3 (Johnson 2012: 27) tells the differences between the three modes of vibration of a plucked string, and this concept can be applied to the locations of standing wave antinodes and nodes of the actual human speech, as in Figure 6.7 (Johnson 2012: 139). Moreover, extra information is provided in the gray boxes in each chapter, and further reading is listed at the end of each chapter, along with the exercises that learners can practice. All together, this

textbook is an excellent textbook for individuals who wish to truly gain the phonetic knowledge in width and depth by self learning, as learners can grab the information from the texts and grasp the understanding from the figures and extra explanations in the gray boxes.

As said before, phonetics is one of the major fields in linguistics, and language learners, primarily, absorb the sounds of the language they are acquiring at the beginning of their language acquisition, no matter whether it is their native, second, and/ or foreign languages. Thus, this book, indirectly, is a great source for learners to have a deep interest in phonetics and sounds of languages they speak.

It is recommended that learners who concentrate on the English sound system and suprasegmentals, or who learn English as a foreign language (EFL) should read the book titled "A Course in Phonetics" (Ladefoged and Johnson 2011) before this book "Acoustic & Auditory Phonetics" (Johnson 2012). This is because the contents of the former book (Ladefoged and Johnson 2011) cover the fundamental knowledge of speech organs, articulatory and acoustic phonetics, and segmental and suprasegmentals. With the background gained from the former book, learners will truly understand the contents of the latter book (Johnson 2012) and are able to apply the full contents in phonetics to their SLA/ EFL language and linguistic pedagogy in the future.

References

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