REVIEW

PETER LADEFOGED, *Vowels and Consonants: An Introduction to the Sounds of Languages*. Malden, MA & Oxford: Blackwell, 2001. Pp. xxii + 191. Pb. £19.99. ISBN 0–631–21412–7.

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This 'book of personal favorites', as it is described in the preface, is the latest addition to Peter Ladefoged's range of excellent and widely-used introductory phonetics textbooks, with which most readers will no doubt already be very familiar. Like the compendious reference *Sounds of the World's Languages* (1996) co-authored with Ian Maddieson, *Vowels and Consonants*' very title omits mention of the terms 'phonetics' and 'phonology', probably a wise move given the crop of current introductory texts with almost interchangeable titles (e.g. Ball & Rahilly 1999, Davenport & Hannahs 1998 or Clark & Yallop 1995, and the clutch of texts on English phonetics and phonology such as Carr 1999, Giegerich 1992 or Roach 1991). Ladefoged's approach to the subject matter itself is equally straightforward: from the opening 'Once upon a time . . .' he maintains an informal, chatty tone, illustrating many points in the first person through anecdote, and addressing the reader in the second person throughout. His avoidance of technical jargon and notational formalism wherever possible (he does not, for instance, use square bracket notation at any point, instead presenting IPA symbols in bold type) and the generous use of illustration should act as a cushion to new students to the field and as an attraction to non-specialist and lay readers with a general interest in speech production and perception. This accessibility does not, however, come at the cost of patronising the reader, nor does the lightweight style prevent Ladefoged from immediately introducing topics which most textbooks tend to leave till late as 'difficult' or 'advanced'. By the fifth page of *Vowels and Consonants* (henceforth V&C), for instance, we are into a discussion of acoustic waveforms, and by page seven have been made familiar with frequency (expressed in Hertz) and amplitude (in decibels). There are few authors in the field who could hope credibly to summarise the first seven sides of a 'from-scratch' textbook with 'This chapter has discussed the principal constraints on the evolution of the sounds of the world's languages, which are ease of articulation, auditory distinctiveness, and gestural economy. It has also discussed the differences between speech and language, and outlined some of the main acoustic distinctions among sounds' (p. 8).

Ladefoged's ability to condense complex and often demanding material and to explain it lucidly to the reader, as demonstrated particularly well in both editions of *Elements of Acoustic Phonetics* (1962, 1996), is very much in evidence here.

The fourteen subsequent chapters provide broad coverage of the principles firstly of acoustic and then articulatory phonetics, with some attention given to speech perception and the rudiments of phonemic phonology. In keeping with developments in teaching curricula and in the field generally, Ladefoged devotes a chapter each to speech synthesis and computer speech recognition. Vowels and consonants, exemplified using an impressive range of languages, are treated separately until the very end of the book (except obliquely in the discussion of diphone synthesis in the 'Talking computers' chapter), and since it is not until the final chapter that the notion of the syllable is mentioned – though left undefined – Ladefoged gives no indication that, *à la* Pike, there might be any overlap between the vocalic and consonantal domains in terms of the syllabic distributions of sound types. Neither is there much detailed discussion on

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how vowels and consonants interact with one another. However, given the modesty of Ladefoged's stated aims – 'I've just tried to give you the flavor of what happens when people talk, explaining most of the well-known sounds, and giving you a glimpse of some of the more obscure sounds that I've found interesting' (p. xix) – and the book's short length, it is perhaps unreasonable to expect too much in these areas.

Although V&C is intended to be read sequentially, the ordering of the chapters themselves is rather unconventional. It is little peculiar, for example, that the first post-introductory chapter of a text otherwise taking such a steadfastly segmental approach is entitled 'Pitch and loudness', with sections on lexical tone (discussion of which, incidentally, is altogether absent from Ladefoged & Maddieson 1996), intonation, and lexical stress. These are by most analyses suprasegmental, after all, and have domains larger than the segment. This chapter is nonetheless a useful introduction to the structure and functions of the larynx, and the photographs of the vocal folds here and later in the book are of high quality. The third chapter, 'Vowel contrasts', is very brief at just five sides, but introduces the concept of the vowel system and demonstrates differences between the systems of General American and British RP English, while chapters 4 ('The sounds of vowels') and 5 ('Charting vowels') take the reader through the principles of vowel acoustics, spectrography, and how vowel systems can be represented using formant plots. In addition to discussing gender-related vowel formant frequency differences, Ladefoged even takes the opportunity here to show differences between various accents of English in terms of (log) F1 and F2 values. It is not until chapter 11, 'Making English vowels', however, that the link between vowel formant frequencies and articulatory factors is revisited and made fully explicit. Much the same approach is taken with consonants in chapters 6 to 10. Chapter 6 deals with the acoustic characteristics of (English) consonants, while chapter 7 ('Acoustic components of speech') sketches the acoustic parameters phoneticians use to describe speech signals, and how these parameters' values can be specified individually so as to synthesise speech. The latter topic is elaborated in chapter 8 ('Talking computers'), and chapter 9 ('Listening computers') introduces the principles of computer speech recognition. Only in chapter 10 do we return to detailed descriptions of the articulations involved in consonant production, though again just for English. V&C is thus probably the only introductory phonetics text which gives the reader competence in reading spectrograms before he or she is familiar with the gross anatomy of the vocal tract, places of articulation, and so on. Again, this may be Ladefoged's way of attempting to dispel the perception common amongst students new to the field that acoustic phonetics is by definition 'harder' than articulatory phonetics, the latter being more amenable to introspective analysis and requiring less in the way of background or aptitude in the scientific and numerate disciplines. Conversely, it is foreseeable that students coming to the subject through V&C from backgrounds in arts and humanities may be deterred by the book's early emphasis on quantifiable aspects of speech production.

Chapter 11, mentioned earlier, returns us to the vocalic domain, and with the help of some X-ray photographs and line drawings, explains – via instructions on how to prepare a sheep's tongue for dissection – the musculature of the tongue and lips, and their roles in vowel articulation. We switch again back into a discussion of consonant production at the beginning of the following chapter 'Actions of the larynx', in which voicing types, the VOT continuum, and the glottalic airstream mechanisms are explored. Further 'exotic' speech sounds such as dentals, palatals, retroflexes, uvulars and clicks are presented in chapter 13 ('Consonants around the world'), following a diverting section on phonetic fieldwork and language death. Chapter 14 brings us back again to vowels: here, we are introduced to the use of contrastive lip-rounding, nasalisation, and the additional voice quality types used contrastively in !Xóõ.

In the final chapter, 'Putting vowels and consonants together', we are taken very briefly through some of the problems surrounding the assumption that for the purposes

of analysis speech should be broken down into sequences of segments. 'We should even consider,' Ladefoged advises, 'whether consonants and vowels exist except as devices for writing down words. This may seem an odd thought from someone who is writing a book called *Vowels and Consonants* . . . but I hope to show you that consonants and vowels are largely figments of our good scientific imaginations' (p. 170). Students who have persisted with the book this far might with justification feel they are having the rug pulled from under their feet, but Ladefoged marshals evidence from perceptual experimentation and the development of writing systems in support of the case for syllables as the natural units of speech production and perception, emphasising that despite the possibility that vowels and consonants may be nothing more than 'convenient fictions for use in describing speech', they are nevertheless 'invaluable aids for talking about the sounds of languages' (p. 175). It is for these reasons, presumably, that explicit discussion of the rationale behind the development and use of the International Phonetic Alphabet is left until this late stage. In the last few pages of the book we are hurried through a section called 'Contrasting sounds', which introduces the phonemic principle by name (though until this point in the book the inclusion of vowel and consonant sounds has been tacitly dependent upon their lexical contrastive functions), and one entitled 'Features that matter within a language', concerning distinctive features and problems to do with assigning the same set of features to multiple languages. Ladefoged leaves us at the end of this chapter to ponder the arbitrariness of the ways in which the sound systems of languages are configured and the unpredictability of the directions taken by sound change.

The short but helpful glossary contains definitions of the key terms introduced in the text, including some which are for some reason omitted from the index (e.g. DIPHTHONG, VELUM). Some terms (e.g. ORAL, GLOTTIS, MONOPHTHONG, AIRSTREAM, ASSIMILATION) are missing from both glossary and index, since although these concepts are covered in the text, Ladefoged is clearly committed to lightening the reader's terminological load. The index is occasionally inaccurate: the trachea is mentioned by name first on page 19 rather than page 97, for instance, and it is stated that lip rounding is not discussed until near the end of the book despite the use of the term in Chapter 4. Other than these and some transcription inconsistencies (e.g. [eɪ] as the vowel of *bayed* in General American (p. 27) and BBC English (p. 28) but [e] used in both *bases* (p. 119) and *bed* (pp. 27–28) contradicting [ɛ] in *head* on page 106) and a couple of typographical errors (as in the transcription of *She sells seashells* . . . on page 170), the book is commendably free from formatting problems. Though no bibliography is provided, the useful list of suggested readings points newcomers to the best works in each sub-area.

On its own, V&C is an attractively produced and formatted introduction to segmental phonetics which, through the clarity of its text, wide-ranging exemplification and the rich and imaginative use of illustration will provide the beginner with a solid grounding in acoustic and articulatory phonetics. One of the chief selling points of the book, however, is the accompanying compact disk which contains over two thousand sound files, dozens of black and white and colour still photographs, and several video clips, and which is readable on both PC and Apple Macintosh computers (note, incidentally, that the sound files for the more expensive *A Course in Phonetics* (Ladefoged 2001), now in its fourth edition, are included gratis). The contents of the 'Vowels and consonants' folder on the disk tie into twelve of V&C's chapters, in the text of which the relevant sound or graphics files on the CD-ROM are flagged such that a particular contrast described in the book can be heard by playing the appropriate sound clip, or a sequence of articulations displayed in video animation on the computer screen. In order to read many of the files, such as those outlining the disk's contents, it is necessary to have *Microsoft Internet Explorer* or *Netscape Communicator* web browsing software already installed on the computer, while for playback of audio files

(most of which are in *.aiff* format, the rest in *.wav* format), the CD-ROM includes a *Netscape* add-on called *theWebPlayer*, a program which apparently will also perform simple acoustic analysis of the sound file in question. For playback of video clips (in *.mov* and *.html* format), a copy of *QuickTime 4* is provided for download onto the computer's hard drive, though the *.html* files can also successfully be viewed using *MS Explorer* or *Netscape*. Installation of *QuickTime* is straightforward, since installation requires nothing more than double-clicking on the installer icon and following the prompts, but the same cannot be said of *theWebPlayer*, installation of which involves modification to the default settings for playback of sound files in whichever web browser is being used. Instructions on how to do this are included, and these are clear enough for the computer literate, but for novices the idea of having to customise the file-to-application path ('For application to use, browse for where you put *theWebPlayer* and then click on the file name. The path to your copy of *WebPlayer* will show up in the bottom box. Go to the end of the path and enter a space, then %1') before being able to hear sound files may be daunting, baffling, or even completely offputting. My own attempts to use *theWebPlayer* for sound playback, let alone acoustic analysis, have been unsuccessful despite my having tried, as instructed, to set it as the default application for *.aiff* files on four different PCs and an Apple iMac.

In spite of these difficulties, however, most of the files on the CD-ROM will work unproblematically if opened in *Netscape* itself (it should be mentioned, however, that two of the PCs I tested the CD-ROM on would open an individual sound playback program window for each sound clip requested, resulting in a workspace which was very quickly cluttered by dozens of windows running the program simultaneously). This alternative is fortunate, since many users of the book will only have access to institutional computers on which user-installation of software is in any case generally prohibited. There is also the option of going to the associated website (*http://hctv.humnet.ucla.edu/departments/linguistics/VowelsandConsonants*), which features the same materials as those to be found on the CD-ROM, and which is updated from time to time.

Once the user has things up and running, however, the CD-ROM complements the text of V&C very well. It would be helpful in subsequent editions, perhaps, to indicate the link between items in the book and sound/graphics files a little more conspicuously – say, by using a CD icon in the page margin - since the numbering system for the CD-ROM files is the same as that for figures, tables and chapter sections, but in general the layout of the files on the disk is clear. The material linked to chapter 1 is in the form of a clickable IPA chart whereby clicking with the mouse on the left-hand side of a consonant symbol plays that consonant followed by [ɑ], while clicking on the symbol's right-hand edge produces the same consonant in an [ɑ_ɑ] frame. Vowels are played in isolation. Recordings of one or two sounds, such as the intervocalic alveolar tap [ɾ] (to my ear more like [ð] or [v]), the rather unnatural-sounding uvular trill [ʀ], or the fricative-like velar approximant [ɯ̟], are perhaps less than ideal, while among the vowels, I confess, I find [ø] and [ɵ] indistinguishable, and [ə] fails to play at all.

A lack of space precludes more detailed discussion of the CD-ROM's contents, which are in the main useful, relevant, and of high quality. There are, unfortunately, a significant number of mistranscriptions which might on their own go unnoticed, but are conspicuous because of their lack of agreement with the corresponding material in the book. They are generally relatively inconsequential (e.g. the vowel of BBC English *bode* given as [oʊ] on the CD-ROM but as [əʊ] in the book; inconsistent use of [e]/[eə] and [ɛ]/[ɛə] in descriptions of English vowel contrasts; Scottish Gaelic *beudach* 'harmful' correctly transcribed ['peːtəx] in the book but ['peːtex] on the disk) though there are proofreading oversights which occasionally verge on the spectacular (the heading 'Accoustic componants of speach' in the file *PhoneticMenu.htm*, for instance). For a subject which demands such fine attention to detail and consistency in the use of

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written symbols, it is a shame that these errors have been allowed to slip through as far as the publication stage.

Such quibbles detract only slightly, though, from the advantages of being able, as one follows the text, to hear samples of natural and synthesised speech, to see high-resolution illustrations in colour, and to watch short films of the speech organs in motion. The combination of the three media (book, CD-ROM, and website) exploited in V&C is to be warmly welcomed in a field that involves sound and movement so centrally, and it is in some ways surprising that authors and publishers take advantage so infrequently of the great potential of linking the printed and electronic media together in this way. In terms of attractiveness of format and the breadth of materials included, the V&C ensemble represents the standard which future introductory phonetics texts will have to meet, and it is hoped that new texts will also attempt to match Ladefoged's enthusiastic and user-friendly approach to a subject that, regrettably, many beginners find dry, unexpectedly technical, and excessively rigorous.

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