In line with other titles in the *Oxford Introductions to Language Study* series, this book consists of four sections: a Survey, providing a broad overview of the subject; some Readings, offering a selection of additional short texts extracted from leading authorities in the field and designed to augment the topics covered in the Survey; an annotated list of References; and a Glossary.

This is a very small book, not just in terms of the number of pages, but also the page size, which is the same as for an ordinary paperback novel and only about two thirds that of most textbooks. Many students will find this small size attractive, as it would allow the book to fit easily into a coat pocket, but the question remains how much sense it is possible to make of as complex an area as phonetics in such a small space. The Survey section, which occupies the bulk of the book, attempts to cover articulation, vowels and consonants, tones in tone languages, rhythm and intonation, acoustics, phonemes and allophones, coarticulation and regional variation, and, inevitably, the information is pared to the minimum. Nevertheless, it is obvious that every word has been chosen with great care, with the result that the text is always clear, even if it is rather terse.

It may be useful to compare the description of one item, the articulation of a glottal stop, with that found in another introductory phonetics textbook. The full explanation (pp. 13–14) states that ‘if we close the vocal folds firmly, we prevent air from escaping. This is often called a **glottal stop**’. And the glossary entry (p. 110) is equally brief, stating that a glottal stop is a plosive consonant with glottal place of articulation. One wonders whether a student new to the subject could understand this. In comparison, Ladefoged (2001: 48) devotes two whole paragraphs to introducing a glottal stop, starting with a cough and then progressing to sequences such as [uʔu] and [iʔi] before considering utterances meaning ‘no’ such as [uʔu] and [iʔi]. Obviously, the novice reader would have a much better chance of comprehending this fuller explanation. At the same time, however, once must admit that the best way to introduce a glottal stop is for someone to demonstrate it, and any amount of written advice can never compete with a simple demonstration. So maybe the very brief explanation in this volume is in fact quite adequate if it is accompanied by appropriate exemplification by a teacher.

This suggests a very important role for this book: as a foundation textbook for a class on phonetics, it would be excellent. Students would have an exceptionally concise summary of the important issues in a broad survey of phonetics, but all the embellishments and illustrations that bring the subject truly alive could be provided by the teacher. We are told the story (p. 27) of a missionary to West Africa who, when he discovered how difficult it was to learn tone languages, decided he must have made a mistake in hearing the word of the Lord, but such endearing tales are rather rare in this book. In most cases, such as the description of all the possible places of articulation (pp. 21–22), the text is hardly more than a list, with all the fascinating, quirky details omitted. However, this would not be a problem if the teacher were to add these details, for example, to explain the difficulties children have in producing an [s] when they lose their front teeth, or maybe to demonstrate the different possibilities of producing interdental fricatives, thereby providing supplementary elaboration while students would still have a basic, clear, concise text to fall back on.
It seems that this kind of central role for a tutor was envisaged in the writing of the book, as some of the questions that follow the passages in the Readings section are clearly designed more as tutorial topics to stimulate discussions than as problems that students could realistically answer without some guidance. For example, it is unlikely that novice readers could really work out how to use broad phonemic and narrow allophonic transcription to capture the pitch variation found in Pike’s tonemes (p. 80), or that they would be able to devise a way to test whether a language was stress-timed or syllable-timed (p. 87), or that they could formulate clear differences between ‘assimilation’ and ‘coarticulation’ (p. 95). But these questions could certainly provide excellent starting points for fascinating tutorial discussions.

Quite often, the text raises further questions which are not quite fully answered. For example, we are told (p. 11) that speech has evolved by using parts of the body designed for some other purpose, as our lungs, tongues, vocal folds and ears all have primary functions apart from speech. Now, it is fairly obvious what function our lungs, tongues and ears have in addition to dealing with speech. But what about vocal folds? Many novice readers might be left mystified here, and would benefit from a pointer to a work such as Aitchison (1997) in order to find out that the primary function of the vocal folds is to close off the lungs while we are eating and to enable us to lift heavy objects, and it is unfortunate that space has not allowed references to works such as this, outside the realm of phonetics. Similarly, although the chapter on acoustics is amply illustrated with spectrograms, it is a pity that space has not allowed the chapter on intonation to include any computer-based pitch plots, so that we could see how the idealised plots of intonation get mapped into fundamental frequency contours in reality.

In conclusion, this book will probably find a very valuable niche as a clear but highly compact foundation textbook for an introductory course in phonetics. It is possible that it will also prove successful for its other stated purpose (p. viii), for non-students who want a succinct introduction to the subject. For some of these latter readers, it may serve as an exceptionally efficient and admirably concise survey of phonetics, though it seems likely that some of these potential readers will find it rather too compact and would prefer something a little more substantial.

References


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The phonology of Standard Chinese, or ‘Mandarin phonology’, as it is sometimes referred to, is a field in which consensus has been exceedingly hard to come by. Experts are divided on such basic issues as the number of vowel heights, the phonemic membership of consonantal series, the constituent structure of the syllable and the exact nature of diminutive suffixation.
Faced with such a state of affairs, the author charged with the task of providing a definitive account for the general linguist has a number of choices: (1) provide a literature review surveying the various approaches and their respective strengths and weaknesses, concluding with the observation that there is no current consensus; (2) use the most widely accepted model and discuss criticisms it has received and revisions it has undergone in past years; (3) formulate his or her own theory based on the information available. Duanmu’s *Phonology of Standard Chinese* is an example of the third approach. In this respect, the author does considerably better than any number of recent theses on the subject over the past decade because of its broader range, which encompasses both segmental and non-segmental aspects, so as to provide as complete an account as possible of the language, rather than narrowly focus on a specific issue. This spreading out of resources, however, has meant that some chapters will be stronger than others – Duanmu, in general, is at his best discussing tone, stress, domain and related suprasegmental phenomena, and less proficient in providing phonetic description, typological affiliations, and historical and sociolinguistic background, which is not a big fault considering that the focus of the book is theoretical phonology. In addition, Duanmu is a master of simplification, and this can cut both ways: one could praise him for his genius in making technical material accessible to the general public, or fault him with oversimplifying linguistic concepts and presenting one-sided debates on controversial phonological issues. All in all, this is a book that tackles a divided subject and attempts to be contemporary in its approach and comprehensive in its coverage. Despite mixed results from its efforts, there is no other book currently on the market that sets Mandarin phonology in a post-SPE theoretical framework, and for this reason alone, the work is a bookshelf must for any linguist interested in the sound system of Modern Chinese in the light of modern phonological theory.

The book is divided into twelve chapters, beginning with an overview of the socio-historical setting of the Chinese language and available literature on the subject. The second chapter gives phonetic descriptions that serve as input for discussions of allophonic variation, co-occurrence constraints and syllable structure that are interspersed through chapters 2, 3 and 4 – chapters which contain some of the book’s most original insights. After dealing with segmental phonology, the logical next step would be to proceed to suprasegmentals, but to do so requires definition of Chinese wordhood for use as a domain in metrical phonology, so chapter 5 is devoted to exactly that. Chapter 6 follows with a brilliant thesis on Chinese stress, and chapters 7 and 8 demonstrate via morphology the power of the Chinese stress model built in chapter 6. The model and the author’s formulation of syllable structure in chapter 4 are used to tackle diminutive [r] suffixation in chapter 9, and the representation of Standard Chinese tone in chapter 10. The results of chapter 10 are used to carve out the domain of Mandarin Tone 3 Sandhi in chapter 11, and corpus-related phenomena not covered in the previous chapters are discussed in chapter 12.

The opening chapter is arguably Duanmu’s weakest – a fact that should not deter the reader from reading on, as the author’s strengths lie not in historical linguistics or sociolinguistics, but rather in the areas of tone, stress, syllable structure and morphology (from Chapter 2 onwards), subjects which form the bulk of his doctoral dissertation and publications over the past decade.

The second chapter is a discussion of the ‘sounds’ of Standard Chinese, providing raw data for analyses in later chapters. By ‘sound’, Duanmu refers to, roughly, segment-sized units – the ambiguity in terminology is deliberate – so as to allow the term to encompass units of different traditions and at different levels of analysis.

After introducing the fundamentals of phonemic analysis, Duanmu points out that phonemic economy, often the sole argument given in Chinese phonological analyses, is a concept frequently misused. In traditional analyses, phonemic economy amounts to little more than counting the number of posited underlying segments, but Duanmu believes that features and possible combinations of features and segments are no less important. The argument is used to support the position that positing complex onsets [Cj, Cw, Ci] in Standard Chinese is no less economical than positing only simple onsets of the form C, which are then combined with independent onglides [j], [w] and [q].
He then goes on to discuss features and present the articulator-based feature geometry used for his analysis of Standard Chinese. Most notably, following Duanmu (1994), he rejects the notion of contour segments, and chooses instead to represent affricates as strident stops. He illustrates also how underspecification can account for the variable [front] and [round] values of the Chinese mid vowels [e], [y] and [o], and touches briefly upon vowel length and diphthongs, but leaves technical specifications to chapter 4.

A description of the Standard Chinese segment inventory follows, one that differs from traditional accounts in a number of details. Duanmu treats initial [r] as an approximant rather than a fricative, pointing out that there are no other voiced fricatives in the Mandarin consonantal inventory, and that the sound has little actual friction (Fu 1956, Wang 1979). He also points out that the codas [n] and [ŋ] often have incomplete closure (Wang 1993), that [ɣ] is sometimes [h], and that voiceless unaspirated initials are often voiced in weak syllables. The alveolar series, following Chinese tradition, is labeled ‘dental’, as palatographic studies (Zhou & Wu 1963) suggest that the tongue tip is on the teeth.

Duanmu opts to treat possible CG (C = consonant, G = onglide) combinations here rather than in the following chapter on phonotactics because the analysis contains tools needed for the featural description of the alveopalatal initials. The alveopalatalts occur in complementary distribution with the dentals, the retroflexes and the velars, and a central issue in Chinese phonology has been to decide whether the alveopalatalts should stand alone or be treated as allophones of one of the other consonantal series (Li 1999). Duanmu opts for representing the alveopalatalts as derivatives of the dentals, citing phonetic similarity and the association of the two series in ‘feminine speech’ in Beijing (Cao 1987), but ignoring counterevidence from Mandarin dialects which favors grouping of the series with the velars.

The next sections deal with vowels. Duanmu adopts a 3-height/5-vowel model for Standard Chinese. Especially commendable is his discussion of variation in the manifestation of the mid and low vowels – providing a thorough review of key Chinese studies on the subject previously unavailable to English readers, and in the process disambiguating symbols such as [A] and [E] unique to the Chinese tradition. He chooses to view the apical vowels [z] and [r] as separate phonemes arising from consonantal prolongation, and treats the zero onset as underlyingly empty but filled by [ʔ], [ŋ], [y] or [i] through an obligatory onset constraint at the syllable level.

Which brings us to his discussion of levels of analysis. Duanmu uses three levels of analysis in his treatment of Standard Chinese: underlying, syllabic and phonetic. The underlying level is the level at which the onglides G are treated as individual ‘sounds’, and which is identifiable with the phonemic level in traditional analyses. The syllabic level is where the phonemes are fitted into a syllable template – here initial consonant C and onglide G are squeezed into a single timing slot and considered a single ‘sound’. Rules which produce allophonic variants for the alveopalatal initials and mid vowels are then applied, creating the phonetic level. It then becomes clear what Duanmu means by ‘sound’ at the beginning of the chapter: he is referring to phonemes at the underlying level, segments at the syllabic level, and phones at the surface level. At the end of the chapter, Duanmu lists the number of Standard Chinese phonemes/segments at each level of analysis and gives a table with the underlying phonemes and their feature values, providing data needed for analyses of higher-level processes in later chapters.

Chapter 3 treats an important issue which has never been adequately dealt with before in the Chinese phonological literature – that of gaps in the distribution. In this chapter, the author makes use of syllable structure and optimality theory to provide the most thorough account yet of Standard Chinese segmental distribution, and while there remain some ten gaps that cannot be accounted for using the principles proposed, Duanmu’s thesis comes close to a fully systematic account, and is a huge improvement upon existing studies.

Central to Duanmu’s account of gaps is his transcription of surface forms, which in certain syllables depart from conventional practice: -un is written as [yin] because it rhymes with -in, -un is written as [u´n] because it rhymes with -en, and -ing is written as [iN] to allow it to rhyme with -eng.
According to Duanmu, only 34 out of a possible 120 GVX sequences (syllable less the initial consonant) are allowed in Standard Chinese. This he accounts for using two constraints: Rhyme Harmony and Dissimilation. Rhyme Harmony states that the nucleus and coda cannot have conflicting specifications for [back] or [round] – thus eliminating the rhymes [un], [in], [yu] (conflicting [back] specification), and [ui], [yu], [yi], [iu], [iy] (conflicting [round ] specification). These nine rhymes, together with their possible onglide combinations, account for \(9 \times 4 = 36\) of the 86 gaps.

The other constraint, Dissimilation, states that adjacent palatal specifications [i]–[i] and adjacent round specifications [u]–[u] are disallowed. This further eliminates 40 of the remaining 50 gaps in the GVX distribution, leaving only 10 out of 120 gaps unexplained – a remarkable achievement. The ten finals unaccounted for are [wi], [ju], [jen], [qa], [yn], [qen], [qen], [qen], [ey] and [ay].

In addition to accounting for gaps, Duanmu also treats allophonic variation in this chapter, the most important of which is variant realization of the mid vowel. His optimality-based theory does not improve significantly upon the earlier accounts: his treatment contains cumbersome constraints extremely restrictive in application (e.g. feature agreement between long mid vowels and onglides – why only long mid vowels is anybody’s guess), and apparently ad hoc fixes to problems (e.g. constraint ‘avoid [õ]’), taking away from the naturalness of the model.

At the end of the chapter, Duanmu makes a last ditch effort to account for the Standard Chinese realization of the syllables bo, po, mo and fo as [p[w]o], [p[w]o], [m[w]o] and [f[w]o], with a [w] glide, but ultimately concludes that ‘it is not obvious at this point what the solution should be’ (p. 75). Conspicuously missing from his treatment of allophonic variation, but prominent in competing analyses, is the surfacing of -ian and -uan as [jen] and [uən] in Standard Chinese.

The fourth chapter presents Duanmu’s views on the Chinese syllable – based on Duanmu (1990) but clearer in presentation. This is a model very different from traditional accounts of the Chinese syllable, the main difference being that traditional models allow variable templates, e.g. CV, GV, V, VX, CVX, GVX, CGVX (C = initial consonant, G = onglide, V = nucleus, X = ending [nasal or offglide]), whereas in Duanmu’s formulation the template is fixed: all full syllables are CVX, all weak syllables are CV.

Duanmu achieves this by moving G into the onset as a secondary articulation of the initial consonant C, creating a complex onset \(C\) which occupies only one timing slot. This has a number of advantages. First, it accounts for the fact that all full syllables are roughly equal in length, as are all weak syllables – something one would not expect if templates were variable. Second, it explains the phonetic observation that the onglide G does not bear tone. Third, the characterization of \(C\) together as one unit better explains why the obligatory onset does not surface when glide G is present; it also explains why the simple onset [f] can alternate with complex [h[w]] in speech errors and dialect pronunciations, and why in Beijing word-initial glide [w] can be replaced by [v].

After presenting evidence in favor of his fixed-template syllable structure, Duanmu attempts to address evidence used in support of traditional structures, with less success. The evidence comes in the form of language games in which a syllable is split into two and clamped together with other syllable parts to form two new syllables. The question is, when the split occurs, which half is glide G grouped with? The onset, the rhyme, or both? In the game Na-Ma of Chengdu, Sichuan, G is grouped with the onset; in Mai-Ka of Beijing, G goes into the rhyme; whereas in Mopa of Kunshan, Jiangsu it appears in both onset and rhyme.

Previous authors have conceded that different dialects may have different designations for G (Yip 1982, Bao 1990), or that language game rules do not necessarily reflect phonological structure (Manaster-Ramer 1995). Duanmu rejects both explanations and aims for the stronger claim that all Chinese dialects have the same syllable structure, which all language games reflect (p. 90). In doing so, he sets himself up for an explanation of three different behaviors of G, for which he stipulates a process of ‘feature recycling’, which in some dialects is later cancelled by ‘onset simplification’ – in the reviewer’s view unnecessary and greatly sabotaging the simplicity of his original model.
Chapter 5 departs from phonology and sidesteps into morphology to look at criteria for determining Chinese wordhood, the reason for this being that a distinction between word and phrase is needed for foot formation in chapter 6, on stress. Stress, in turn, is needed in Duanmu’s solution’s to the word length problem (chapter 7) and the word order problem (chapter 8), and both word length and stress play a part in the author’s treatment of Standard Chinese tonal phenomena (chapters 10 and 11), most notably Tone 3 Sandhi (chapter 11).

Following Duanmu (1998), the chapter rejects the traditional view that Chinese has no concept of word, and examines eleven linguistic criteria for distinguishing ‘word’ and ‘phrase’. Of these eleven criteria, one is a general principle that applies to all, three are rejected as unsatisfactory, four are adopted, and the remaining three are ‘adopted with limitations’ (p. 115). The general principle cited is the Lexical Integrity Hypothesis, which states that ‘[n]o phrase-level rule may affect a proper subpart of a word’ (p. 98). However, Duanmu believes that it is of little practical use, as in Chinese it is difficult to determine which rules are phrasal and which are morphological.

Chapter 6 is devoted to a description of Chinese word stress (the author does not go into phrasal stress or emphatic stress). After a long overview of the fundamentals of metrical phonology, Duanmu discusses two previous approaches to Chinese stress, the first of which he labels the ‘no-stress theory’ (p. 134), namely, that Chinese has no word stress. He explains at the end of the chapter that this common misconception is due to the fact that Chinese is unable to use pitch as a stress marker, due to the presence of lexical tones. Where Chinese stress is perceivable by native speakers, it is in weak syllables, which are accompanied by atonality and shorter duration. According to Duanmu, it is not that Chinese does not have stress, but that the resources normally used for the representation of stress (e.g. pitch and duration) have been diverted for other purposes, and are intertwined in their application.

His simple formulation appears to accurately predict the possible locations of weak syllables (neutral tones) within a word or phrase, which other approaches fail to do. Of course, the main arguments for this metrical model are word length, word order and Tone 3 Sandhi, which are given full treatment in subsequent chapters.

Chapter 7 is a treatment of what Duanmu calls ‘the word length problem’ (p. 145), better described as the choice between monosyllabic and disyllabic alternatives of a Chinese word. The choice between the two is anything but arbitrary, but Duanmu is the only author to date ever to have explored the issue in any depth (cf. Duanmu 1999 and the present volume). He uses the assignment of stress developed in the previous chapter to predict precisely where monosyllabic and disyllabic words should appear. The analysis is Duanmu at his best, and is considered by the reviewer to be one of the highlights of this book.

The chapter begins with the observation, backed by corpus data, that disyllabic words are on the increase in Modern Standard Chinese. The author then reviews prior attempts to address this issue from the point of view of speech tempo, semantic differences and grammaticalization, and presents counterexamples to their claims. Of the three approaches, Duanmu reserves his harshest criticism for the common-sensical ‘homophone avoidance’ theory (Lü 1963: 440). After treating flexible word length and its sensitivity to syntax and meter, Duanmu tackles the issue of why the majority of disyllabic words appeared only in the twentieth century. His explanation is that the new vocabulary consists mainly of loan transliterations and calques from western languages. Duanmu notes also that some 70% of the loans have come through Japanese.

Chapter 8 predicts the order of multiple noun modifiers in [M₁ M₂ N] compounds according to syllable numbers and stress. Though a highly original analysis on a morphological topic of some import, the chapter is probably better suited for inclusion in the author’s collected works than in a volume devoted to core Mandarin phonology. Duanmu returns to the phonology of the syllable in chapter 9 as he explores diminutive [r] suffixation – the most visible morphophonological processes in Standard Chinese.

In Chapters 10 and 11, Duanmu presents what is arguably the most comprehensive and current survey of research on Mandarin tonal phenomena from the mid-twentieth century to the
He begins by devoting much space to the phonetic groundwork for his phonological representation of Standard Chinese tone. He opts for a model similar to the twin sister-node, binary register/pitch representation of Yip (1980), but his formulation differs from Yip in that register and pitch are not two arbitrarily extracted values, both dependent upon the single physical dimension F0; rather, register is taken to be a manifestation of phonetic voicing or ‘murmur’ (p. 213), and pitch corresponds to fundamental frequency. The physical grounding of the register and pitch dimensions allows Duanmu, on the one hand, to explain F0 overlaps between upper and lower registers and, on the other hand, to account for the historical development of tonal registers from voicing contrasts. Furthermore, the interaction between voicing and pitch leads him to claim status for tone as a segmental feature alongside standard consonant and vowel features such as [voice] and [high], thereby abandoning the traditional view that tone is suprasegmental and linked to larger units such as the syllable or the mora. He further exploits the connection between tonal values and segment to account for tonal phenomena, among them the interaction between F0 and properties such as vowel height and consonantal voicing and aspiration.

Tonal change and variant manifestations of each tone are also discussed. Much space is devoted to explaining the most complex and controversial of all Mandarin tonal realizations and changes – that of the third tone. This includes the realization of T3 as a low tone in non-final positions and as a dipping tone in utterance-final positions, and also the tendency for a sequence of two consecutive third tones T3–T3 to become T2–T3, better known as Tone 3 Sandhi (T3S). Regarding weak syllables, Duanmu opts for an analysis that treats the ‘neutral tone’ as unspecified for tone, rather than the traditional representation of the neutral tone as low. Towards the end of the chapter, the author asks ‘Is tone a prosodic feature?’ and provides interesting insights while answering in the negative.

Chapter 11 is devoted to a more detailed study of Tone 3 Sandhi, the most important tonal phenomenon in Standard Chinese. Notably, Duanmu makes no attempt to account for the activation of Tone 3 Sandhi, but instead focuses on describing its application domain. The final chapter gives a roundup of phonological phenomena gleaned from corpus data, most notably the author’s work on a corpus of Taiwanese-accented Standard Chinese for the Linguistic Data Consortium. He lists segmental differences cited in the literature (e.g. Kubler 1985) but goes further in providing acute observations in the areas of stress, tone, and syllable reduction. It is noted, for example, that [n] and [ŋ] have full closure in [an] and [ŋŋ], and that Taiwanese speakers use a low pitch L at phrase boundaries. Evidence from Taiwanese-accented Mandarin is used extensively in earlier chapters, especially in discussions of the representation of tone and underlying vowels. A syllabary of Modern Standard Chinese with pinyin, character, underlying and surface representations, and gloss, is given in the appendix.

All in all, Duanmu’s volume breaks new ground in Mandarin phonology by casting a critical eye to accepted wisdom and incorporating new advances in metrical phonology, feature geometry and optimality theory. While some of the issues raised remain undecided pending further research, the argumentation and breadth of the book surpasses that of any other work on the subject and constitutes an inestimable contribution to Chinese linguistics.

References


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For students of the phonetics of British English, Gimson’s *Introduction to the Pronunciation of English* has had the authority of the classics over the last forty years. Under Gimson it went through three editions (1962, 1970, 1980) and, after his death, a fourth edition (1989) was undertaken by Susan Ramsaran. The fifth (1994) and current editions are under the stewardship of Alan Cruttenden, with the new title. Many readers of this journal will need little introduction to the work, but those who have studied other accents of English will not necessarily be familiar with it. This review will, therefore, spend some time in describing the topics covered; however, of equal interest will be those aspects of the 6th edition that have changed since the 5th and changes between the pre- and post-Crutttenden editions.

Over all six editions, the book has been divided into three parts (‘Speech and Language’, ‘The Sounds of English’ and ‘Words and Connected Speech’), although the number of chapters in each section has altered between editions. Section I is a good brief introduction to phonetics and phonology, having a better breadth of coverage (if not the depth) than is found in many a textbook claiming to be a course in phonetics. The chapters deal with communication in general (including the difference between speech and writing, and various levels of linguistic
analysis); speech production (a survey of articulatory aspects of phonetics); and the sounds of speech (mainly acoustic aspects of speech, but there is also a brief account of hearing).

This chapter also deals with some suprasegmental aspects of speech such as duration, and loudness. Cruttenden continues, as in the 5th edition, to exclude the term ‘stress’ from the book, using instead ‘prominence’, ‘sonority’ and ‘accent’ to refer to the components believed to make up ‘stress’. This was a logical step, as previous editions were never very clear on the notion of stress. Chapter 4 is perhaps the most important in Part I in terms of the material in the rest of the volume. This chapter deals with the description and classification of vowels and consonants, including information on airstream mechanisms; phonation; place, manner and strength of articulation; cardinal vowels; and orality versus nasality. The final chapter of this part looks at sounds in language. This term covers a somewhat disparate subject matter, as the chapter deals with basic phonological concepts (phonemics and distinctive features; thankfully, the author does not tie himself exclusively to traditional binary systems); transcription issues; syllables and syllable structures (a new development for this edition is the inclusion of syllable constituency trees); and prosodic and paralinguistic features.

Part II deals with the sounds of English, with chapters on the historical background of English, contemporary standard and regional accents (a new chapter for the 5th edition, updated for the 6th), the RP English vowels and the RP English consonants. These last two chapters are the meat of the book for many students as they supply in-depth descriptions of all the contrastive sounds of English, with allophonic variants, spellings, historical sources and advice to learners of English.

Part III covers words and connected speech. Chapter 10 deals with words, including accent patterns of various word types, and accent changes; pronunciation variability in specific words; and a large section on phonotactics. I was disappointed to see that the decision of the 5th edition to remove the detailed phonotactic tables from the book has not been reversed. Prior to the 5th edition, phonotactic tables covered not only consonant clusters, but also the complete set of consonant and vowel combination possibilities in word-initial and word-final positions. I understand that this may appear too detailed for students of English phonetics but, on the other hand, if this material is not kept in print in a source book such as this, where do more advanced students access it readily? Chapter 11 deals with prominence, accent and rhythm and the strong-weak form contrast in function words; intonation (this constitutes the bulk of the chapter and is a thorough exposition as we would expect from the author); and hesitations and voice quality. The topic of chapter 12 is the word in connected speech, and describes phenomena such as allophonic similitudes and juxtapositional assimilation, elision, liaison and juncture. The final chapter was promoted in the 5th edition from an appendix, and deals with the teaching of English pronunciation to speakers of other languages.

We have noted some of the innovations in this and the previous editions, however, there are others we haven’t touched on. For example, there has been an update of the spectrograms used to illustrate consonants and vowels, and F1–F2 vowel plots for male and female speakers in both citation and connected speech forms. These latter clearly show the ‘laxing’ effect of connected speech and are a very useful visual reminder of this for students. The other major change of note is the rewritten sections in the chapter on standard and regional accents. Aspects of London Regional RP (or ‘Estuary English’) are described along with the progress of sound changes reported for RP as a whole: nearly complete changes (e.g. /eə/ to /ɛ/), well-established changes (e.g. open quality to /æ/), recent innovations (e.g. unrounding and fronting of high back vowels, and rising pitch in certain declarative sentences) and innovations on the verge of RP (e.g. vocalization of dark l). This section, too, has been completely rewritten since the 5th edition.

There were a fair number of small typographical errors (few of which involved phonetic symbols) which we must hope will be cleared up in future impressions of this edition. The most serious of these is found on p. 151, where the third line of examples of intervocalic stop contrasts (‘bitter–bidder – bicker–bigger’) should be shifted one cell to the right.
This updated edition of Gimson’s classic will maintain its status as the foremost description of British varieties of English pronunciation. What we now need is something with the same format, the same depth and the same up-to-date authority which describes pronunciation on the western side of the Atlantic.

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This Festschrift includes six papers on speech synthesis, two on automatic speech recognition and four of a general character. L. C. W. Pols’ ‘Even better synthesis’ is a personal tribute to Wolfgang Hess, emphasizing his contribution to speech synthesis as well as to other areas of speech technology. Hess’s publications are listed at the close of the volume.

Two papers address the problem of including emotion in synthetic speech. F. Burkhardt and W. F. Sendlmeier (‘Verification of acoustical correlates of emotional speech using formant synthesis’) begin with an extensive analysis of ten different parameters of the speech signal (such as mean pitch, speech rate, phonation type, etc.) in search for their correlations with pre-selected emotions and then, using perceptual tests, show how successfully such emotions can be emulated by manipulating these parameters in synthetic speech. M. Kienast & W. F. Sendlmeier (‘acoustic analysis of spectral and temporal changes in emotional speech’) investigate the effect of specified emotional states, viz. anger, happiness, fear, boredom and sadness on the dynamic spectrum of speech (German, as produced by actors), especially on vowel formants and the ‘spectral balance’ of fricatives.

Continuing the theme of injecting personality into synthetic speech, two papers deal with voice: K. Fellbaum & B. Ketzmerick present preliminary results of ongoing experiments that are intended to throw some new light ‘On the suitability of voices for speech synthesis’. Since the parameters varied by the authors so far relate only to fundamental frequency and the frequencies of F1, F2 and F3, their results are somewhat modest. This may be off to a good start, but it has long been suggested (though not extensively tested) that personal voice characteristics tend more to reside in other speech parameters such as the frequencies of F4 and F5 and the spectral tilt of glottal excitation. A. Ni Chasaide & C. Gobl show how ‘Voice quality variation’, including the influence of affect, can be described in terms of four mathematically defined parameters. This method is tested by perception experiments.

Three papers focus on the size of the unit used in synthesis and recognition: B. Möbius presents the principles of his ‘Corpus-based speech synthesis (methods and challenges)’. This is a novel approach to concatenative synthesis, which until recently depended mainly on one type of signal unit, for example, diphones or demisyllables. The author proposes a multiple choice of the elements to be concatenated, based on a quantitative analysis of the text in search of different units extending over a single phone up to a sentence, depending on the extent of variability of such elements in the text. It is postulated that this approach is more parsimonious, especially in terms of the necessary store size, for the purpose of unrestricted output from synthesis systems. The ‘Dresden Speech Synthesis System DresS’ is described by R. Hoffman, with results of its testing. The system concatenates units of the extension of an allophone, a diphone, a syllable, a ‘multiphone’, a word, a nonsense word (called logatome
T. Pfau, M. Behm, W. Reichel & G. Ruske (‘Creating large subword units for speech recognition’) use what they call ‘macro-demisyllables’, which are selected using a criterion of trainability. Such sub-word units were tested in Verbmobil, a multilingual speech-to-speech translation system co-ordinated in Germany.

There are two contributions dealing with the evaluation of output. G. R. Sonntag (‘Evaluation of speech synthesis systems’) revises previous criteria for the evaluation of synthetic speech and submits a revolutionary proposal – the abandonment of intelligibility tests. His new evaluation method consists in (a) removing from the signal all lexical information (‘delexicalization’) by low-passing it, thus preserving most of the prosodic information, especially intonation, and (b) performing perceptual experiments with subjects listening to the distorted signal, who now have an opportunity to attend exclusively to the varying pitch.

In ‘Some guidelines for the evaluation of approaches to automatic speech recognition’, E. Paulus proposes that ASR systems should not be evaluated as used in particular applications but, instead, according to what the author calls ‘operating characteristics’. Two such characteristics, complexity related to the number of parameters used and word lattice density, are investigated.

For the purposes of both speech synthesis and speech recognition, E. Keller, B. Zellner-Keller & J. Local (‘A Serial Prediction Component for speech timing’) propose that segmental duration should be related to the properties of syllables and defined in terms of sequences rather than individually.

The volume thus presents many new perspectives and methods. However, the text has not enjoyed sufficient editorial attention. For instance, in one paragraph of just over eleven lines (p. 71), the following oddities have been found: ‘hard difficulties’, ‘profounded description’ and ‘pitch gaps are worth to be evaluated’. Though its contents are of interest to all phoneticians, its significance will be particularly appreciated by those involved in speech technology.

This book aims to present a broad survey of phonology in a fashion that can be accessible to beginners and, at the same time, goes into some depth to provide an authoritative and up-to-date overview of the field without adhering to any particular theoretical model.

There are three main parts. The first deals with segmental issues, including the description and classification of vowels and consonants, the basic theory of distinctive features, and a substantial introduction to autosegmental phonology. The second part deals with suprasegmental issues, such as stress, rhythm and intonation, with much of the text devoted to metrical phonology and the location of stress in English and other languages. The third part introduces more advanced topics, including the cyclic and non-cyclic domains of lexical phonology, issues such as feeding and bleeding associated with rule ordering, and the constraint-based model of Optimality Theory. Finally, there is a chapter entitled ‘Looking back
and moving on’, which surveys some of the controversies that have existed in phonology over
the past few decades and provides extensive references and suggestions for further reading.

Huge effort has obviously gone into the careful elaboration of all of the material, including
the meticulous presentation of examples from a wide variety of languages, and this results in
an impressive clarity and attractive layout of the text. In fact, the goal of ensuring that the text
is maximally reader-friendly occasionally results in repetition that is perhaps unnecessary.
For example, one wonders if it is really essential for the vowel quadrilateral to be repeated
for each and every secondary cardinal vowel (pp. 132–136), and the five main constraints
on co-occurrence of features in vowels are repeated in full (p. 589) even though they have
already been shown in exactly the same way just four pages earlier. But certainly this careful,
methodical, gradual presentation of the material will be welcome to many readers trying to
grapple with the complexities of the subject, even if it does result in the book being rather
large.

Inevitably, even in such a large book, where so many different models of phonology are
presented, it is not possible for a comprehensive elaboration of any one theoretical framework
to be achieved. Thus, though the metrical theory of stress placement is carefully introduced
in some detail, the complexities of the model cannot really be covered. For example, the
concept of extrametricality is introduced in at least two places (pp. 424, 428), but in the
end, the coverage really only scratches the surface of the issue. Furthermore, rather obvious
questions remain unanswered, as for example, with the introduction of extrasyllabicity for
the final consonant of a word. If the concept of the rime is founded on words such as pat
and cat rhyming (p. 244), and if the final consonant of a word such as lamp is extrasyllabic
and therefore not part of the rime (p. 603), surely this would mean that lamp would rhyme
with ham? In reality, of course, concepts such as extrametricality and extrasyllabicity are
well-founded in phonological theory, but it is just not possible to do full justice to all their
complexities in an introductory textbook like this one, and some readers are likely to end up
agreeing with the comment of Carr (1993: 213) that it is ‘all too easy for recalcitrant segments
to be classified, ad hoc, as extrasyllabic’.

Despite the overall clarity in the presentation of the various theories of phonology, there
are paradoxically some places where the elaboration is rather brief. The theory of Radical
Underspecification is explained very carefully, step by step, but then the logic of the last stage,
where one vowel is left completely unspecified (p. 514), is not fully justified. But maybe this
is deliberate, to ensure that the reader does some work and is not provided with all the answers
on a plate. Indeed, this is consistent with one attractive feature of the book, that the elaboration
of phonological theory is interspersed with questions set apart in grey boxes, which not only
provide some variety by breaking up the text but also encourage readers to figure some of it
out for themselves.

A number of other instances of rather brief, almost cursory, coverage of difficult topics
occur. For example, though the basic idea of H and L tones is introduced quite gently, one
wonders how much sense a novice reader will be able to make of the whole of the rest of
the ToBI system of intonation, including the occurrence of the various word tones, phrase
tones and boundary tones, which is covered in just two pages (pp. 391–393) as this is really
quite insufficient to do any justice at all to such an intricate model (cf. Ladd 1996). In another
example, the proposal that aims to represent all vowels in terms of the three vowel primitives
[a], [u] and [i] is discussed in just one and a half pages (pp. 219–220), and this seems more of
a tempting encouragement to investigate the matter further than a serious attempt to provide a
substantial introduction to the model. Finally, the Stratum Contiguity Hypothesis is mentioned
(p. 578) without any examples being given. In fact, this hypothesis would really seem to make
more sense when there are multiple strata, such as in the model of Mohanan (1986: 46–47),
rather than the model with just three blocks of rules, cyclic, non-cyclic and post-lexical, that
is adopted in this book, and it is noticeable that McMahon (2000), who also proposes a model
with the same three levels of rules, makes no mention of the Stratum Contiguity Hypothesis.
The only way that the constraints of this hypothesis could be violated in a three-block model
is for one rule to apply in both the cyclic and post-lexical blocks, and illustration of the non-
occurrence of this kind of violation would have been welcome instead of being left to the
reader in a grey-box question.

One suspects that this brief presentation of some material without full elaboration is
intended to encourage readers not just to figure it out for themselves but also to access
additional material. In connection with this goal of encouraging further reading, sometimes
varying terminology is introduced, e.g. the Elsewhere Condition is given its alternative name,
Panini’s Theorem (p. 603), within the framework of Optimality Theory. Although this ad-
ditional terminology increases the demands on students, it will certainly serve to facilitate their
comprehension of more advanced works on phonology. Indeed, the effort to provide a foun-
dation for accessing other works is probably rather successful, as students who work diligently
through this book will be prepared exceptionally well for consulting a wide range of ma-
terials from the realm of phonology. However, one problem is that all references are relegated
to the final chapter, which rather breaks the immediate link between encouraging readers to
access further materials and actually providing the means to achieve this. The aim is clearly
to prevent references from cluttering up the text, and it is certainly true that an impressive
clarity and attractiveness of the main text has been achieved. It is also true that the ‘Looking
back and moving on’ chapter provides a very comprehensive list of resources, which may be
seen as all the clearer for being presented as a block. But when we spend so much of our time
trying to persuade students to get referencing right, is this separation of references from the
main body of the text setting a good example? And although the data from a wide range of
languages are always presented clearly, is it appropriate that the data may be separated from
acknowledgement of the sources by several hundred pages? It would seem that a better option
might be to follow the practice of many other textbooks and have a ‘Further reading’ section
at the end of each chapter.

Despite care taken to explain theories clearly, there are a few places where some students
might be left mystified, quite apart from the need to read additional materials. One quite
pervasive instance of this is the assumption that readers are familiar with the basics of
Chomsky’s model of language. Most obviously, this occurs when allusions to X-bar Theory are
made, but at least this link with Chomskyan theory is indicated clearly (p. 249), and readers not
familiar with this model are advised not to worry. More problematic is the assumption through-
out chapter 12 and elsewhere that readers will understand the basics of the Principles and
Parameters model of language, and those who are not familiar with it are likely to be
rather bewildered by some of the material, including the grey-box question ‘Why should
multiple settings of the same parameter in a single language be objectionable?’ (p. 323).
The introduction of the term PARAMETER (p. 65) and also its entry in the glossary (p. 696)
as ‘a criterion for classification’ would not prove very helpful in this respect. Surely, the
information that a parameter can have more than one setting and that differences in setting can
help to explain phonological variation across languages (Radford 1997: 520) would have been
helpful?

One further issue that merits comment is the occasional adoption of non-IPA symbols.
As one of the very first examples of a phonological process, the assimilation of the /p/ in
cupful to a labiodental plosive is considered in some detail, and an invented symbol [\(\mathbb{P}\)] is
adopted, together with [\(\mathbb{B}\)] for the voiced counterpart (p. 32). The IPA, of course, is based on
the principle of only providing symbols for distinctive sounds that can change the meaning of
words (IPA 1999: 27), and as there is no phonemic contrast between bilabial and labiodental
plosives, the IPA recommends a dental diacritic to show a labiodental plosive, but in this book
a distinct symbol is used in order to make the example clearer. While this insistence on the
maximum clarity of the elaboration is admirable, it is a pity that implied criticism of the IPA
occurs so early. A second instance of departure from the IPA is the adoption of [æ] for cardinal
vowel no. 4, in order that [a] can be used for a central low vowel. This step is taken ‘reluctantly’
(p. 128), and it certainly helps to enhance the clarity of the presentation when much of the
subsequent analysis of vowel phonology is based on the five vowels, [i, e, a, o, u], and the
third of these can now unambiguously be identified as the central low vowel. It is not entirely clear why [ə] could not be used for this vowel, but certainly it is true that the widespread use in the literature of [a] for a central low vowel can lead to confusion when this symbol also represents cardinal vowel no. 4.

Finally, from the point of view of someone living outside Europe, it is a little irritating that French and German are described as ‘languages with which readers are likely to be reasonably familiar’ (p. 131). Indeed, knowledge of French is sometimes assumed, for example when one is invited to consider the pronunciation of the French words si and chou (p. 126), and the assumption that the reader is sitting firmly in the UK often emerges, as German is described as ‘closer to home’ than the ‘exotic’ Turkish (p. 160), while in turn Turkish is ‘a bit closer to home’ than Vietnamese (p. 136). Furthermore, the whole of chapter 7, which describes detailed variation in Yorkshire, Scotland and London, might be of limited interest to anyone not familiar with these accents. Some of the outlook does, thus, seem rather anglocentric.

In conclusion, the meticulous care and exceptionally readable manner in which this broadly-based survey of phonology is presented will almost certainly ensure it becomes a highly successful introduction to the field, though perhaps more in Britain than elsewhere. The constant asking of questions and encouragement for readers to figure things out for themselves is a very welcome approach, even if occasionally some students may not be able to provide the answers. Finally the foundation provided about a wide range of models and the tempting snippets about more advanced topics in phonology should both enable and encourage students to read further, even though it is a pity that the references for such reading are separated from the relevant material.

References