This book presents the current state of research in the various subareas of phonetics, and it is also a practical guide to phonetic research. It is written for students and academics who need to become acquainted with current knowledge and methods in phonetic research and its applications. It is introductory in the sense that the material is clearly presented and technical terms are defined, and advanced in that research utilizing a specific methodology or technique is reviewed and discussed. Thus, as the editors explain in the foreword to this volume, ‘[it] will bridge the gap between the introductory textbooks and the more specialist volumes and primary literature’ (1).

The volume presents contributions from leading experts in the field. There is a marked bias toward the UK and the ‘British School’ shown in the selection of contributors and in the chapters on applied phonetics, which, with the exception of the chapter on phonetic technology, describe the state of the art mostly in Britain.

The book comprises fifteen chapters. The initial chapters provide a general overview of current knowledge and research methods in various areas of phonetics (speech perception, speech production, phonetic fieldwork, speech acoustics, speech perception development, voice and phonation, prosody, phonetic universals, and spontaneous speech) and provide useful technical and practical advice. The latter chapters focus on applied phonetics (clinical, forensic, phonetic pedagogy, technology) and new directions in the field.

The introduction offers a useful preview of the book by summarizing the questions examined in each chapter and drawing connections across those questions. BARRY HESELWOOD, ZEKI MAJEED HASSAN, and MARK J. JONES open with a ‘Historical overview of phonetics’. The chapter clearly identifies the origins of fundamental concepts in phonetics—as well as, inter alia, the first modern accounts of vowel and consonant classification, voicing, phonemic systems, and assimilation—contextualized to issues current at the time: prescriptive pronunciation, the description of vernacular languages, spelling reform, universalist approaches, and the physical sciences. The advent of the IPA, sound recording, and acoustic analysis, along with increasing reliance on speech analysis software and modeling, characterize the twentieth century.

RACHAEL ANNE KNIGHT and SARAH HAWKINS, in ‘Research methods in speech perception’, provide guidance and practical advice on designing perceptual experiments. In addition, the chapter illustrates, with reference to published research, various procedures (from identification and discrimination tasks to lexical decision, priming, and gating techniques to neuroimaging and eye-tracking procedures), as well as the linguistic level they are accessing.

In the third chapter, ‘Research methods in speech production’, MARIJA TABAIN presents a clear pedagogical overview of methods and concerns in the study of speech production. Some of the most widely used techniques for examining supralaryngeal and laryngeal articulation are succinctly reviewed (with useful references to papers using the technique), though there are omissions, for example, the nasograph or the velotrace to study velopharyngeal function. Then EPG, EMA, and ultrasound are described in some detail, illustrating the data obtained and the interpretation of the data.

‘Research methods in phonetic fieldwork’, by ANDREW BUTCHER, is a practical guide to phonetic field methods. The very useful suggestions—with a welcome pinch of humor—from an experienced fieldworker will certainly help the researcher avoid many pitfalls. The chapter reviews how phonetic fieldwork has changed in the last few decades and covers its various stages: planning and preparing for the field trip, equipment, audio and visual recording, and gathering articulatory and perceptual data. Butcher gives clear indications as to how different types of techniques (or the data obtained with such techniques) are useful for investigating specific research questions.

In Ch. 5, DOMINIC WATT presents a clear introduction to ‘Research methods in speech acoustics’. Rather than describing different techniques to analyze the speech signal (e.g. waveform, spectral and spectrographic analysis, cepstrum coefficients, etc.) as is customary, it de-
scribes how to approach the study of particular key aspects, such as (i) DURATION (and relative durations) of segments, formant transitions, syllables, the foot, speaking rate, or metrics to quantify the rhythmical characteristics of languages; and (ii) FREQUENCY, variations in fo, tone, stress; formant frequencies in vowels; spectral characteristics of consonants and spectral moments in fricatives. The chapter is also dotted with practical suggestions about, for example, normalization or measuring formant values at multiple points for dynamic changes.1

VALERIE HAZAN, in ‘Speech perception development’, reports current research in infant speech perception and speech learning. She first reviews classic research on infant perception, which indicates that early sound discrimination is related to the capabilities of the auditory system rather than to innate capabilities (a speech mode of perception). She then considers what learning mechanism infants might be using if the ability to decode speech is not innate. She reviews recent work showing that infants can learn phonological categories and words using statistical learning processes (although the ecological validity of this type of work may be questioned) and can extract rules to apply to new material. Finally, large-scale corpora of the speech input that the child receives allow us to assess its role in the child’s developmental speech patterns.

‘Voice and phonation’, by JOHN ESLING, examines airstream mechanisms and states of the larynx for voicing, laryngeal segments, and different phonation types. The comprehensive account of states of the larynx is illustrated with stroboscopic images. While the images clearly illustrate the respective descriptions, a single image captures the state of the glottis at just one moment in time. Lx waveforms illustrating the timing and degree of vocal fold contact over time for different voice types, as well as a description of ways to quantify differences in phonation type (e.g. open quotient), would have been welcome.

In Ch. 8, ‘Prosody’, LLUISA ASTRUC presents an excellent state-of-the-art analysis of the phonetics and phonology of aspects of prosody. She reviews classic and recent studies on stress, rhythm, and intonation and illustrates the interaction between these subsystems and how they make use of the same acoustic parameters (pitch, duration, and intensity). The chapter points out the numerous challenges in doing prosodic analysis (mostly deriving from interdependencies between factors) and alerts the researcher about the need to control for confounding factors. Unfortunately, the chapter contains some typographical errors that may lead to confusion for the novice researcher.2

In Ch. 9, Jones examines ‘Phonetic universals and phonetic variation’, taking an Ohalian perspective. He argues that phonetic universals emerge from physical-biological constraints (aerodynamic, biomechanical, etc.) of the speech production and perception systems. First, he argues for the phone or allophone—rather than phonemes or features—as the phonetic unit of crosslinguistic comparison. This is an interesting claim, which is in agreement, though for independent reasons, with Flege’s (1987) view that the phone is the basic mapping unit in L2 acquisition. Then he reviews some universal patterns emerging from the physics of speech production, while other patterns emerge from circumventing such physical constraints and are therefore actively controlled by the speaker. The third and most extensive section is devoted to sources of variation, such as language-specific variation (e.g. language contrasts, articulatory setting) and physical-biological factors (race, sex, age, altitude). Jones describes and exemplifies by reference to numerous studies how such sources of phonetic variation may explain certain differences in phonetic patterns.

1 A small inaccuracy, however, should be noted. When describing the Scottish vowel length rule, and how it triggers greater lengthening of vowels (e.g. maze vs. mace) than would be found for the voicing effect (VE) alone, he states that ‘[i]n VE-only accents, which are the norm outside Scotland, one would expect to find only SMALL DIFFERENCES, IF ANY between these [duration] ratios [for vowels before voiceless and voiced consonants (e.g. mate-made]’ (83, emphasis added). An extensive body of literature (see references in Solé 2007:315), however, has shown that the magnitude of the voicing effect in English is approximately 1 : 1.3.

2 For example, p. 129: ‘They found substantial shortening of the target vowel in monosyllables compared to disyllables’, where it should be ‘disyllables compared to monosyllables’; p. 130: ‘pitch and fundamental frequency … (the first is an acoustic parameter, the second its perceptual correlate)’, when the opposite is the case; p. 135: ‘three of them stress-timed [languages] (French, Telugu and Yoruba) and three syllable-timed (English, Russian and Arabic)’, where the terms ‘stress-timed’ and ‘syllable-timed’ should be reversed.
The chapter by Adrian P. Simpson on ‘Spontaneous speech’ first reviews ways to elicit conversational speech and the various freely available spontaneous speech corpora. Then a description of reduction processes common in spontaneous speech (weakening of consonants and vowels, elision, fortition) is provided and exemplified, though some of the processes described, such as stop (pre)glottalization (162), seem to be associated with dialectal/social varieties rather than conversational speech. For some unknown reason, assimilation—unquestionably a feature of spontaneous speech—is not included. Simpson then accounts for these reduction processes in terms of Björn Lindblom’s (1990) H & H theory, which is based on the speaker reducing articulatory effort while at the same time maintaining distinctiveness.³ Browman and Goldstein’s (1991) approach to phonetic reduction in terms of gestural reduction and gestural overlap due to temporal compression, however, is not considered. This is surprising because this is possibly the most widely accepted account of reduced speech. The chapter finishes with an interesting overview of ‘talk in interaction’ (or phonetic cues to conversational organization) and disfluencies in spontaneous speech.

The following four chapters examine applied domains of phonetics and speech science. ‘Clinical phonetics’, by Tom Starr-Marshall, Susanna Martin, and Knight, presents the basic procedures in the assessment and clinical intervention of child speech disorders. It describes and gives practical advice on assessment procedures (eliciting and transcribing speech samples) and types of analysis (the sounds the child can produce, the position where he or she can produce them, and categorizing the types of errors), as well as useful information about published assessment tests. The results of the analyses are then compared with normative data from children to diagnose the nature of the speech error. Finally, a variety of classification systems used to categorize child speech disorders are described and compared.

Peter French and Louisa Stevens, in ‘Forensic speech science’, introduce the reader to the type of work carried out in forensic phonetics and explore current areas of contention with respect to analysis methods and the proper formulation of conclusions. They mainly focus on current approaches to speaker comparison, whereby the voice in a criminal recording is compared with that of a suspect. The methods of analysis may be grouped into two main categories: (i) analysis by automatic speech recognition (ASR, with or without human assistance) and (ii) auditory and/or acoustic analysis. An overview of the advantages and limitations of each method is provided. The chapter ends with a discussion of how findings should be interpreted and conclusions formulated. It suggests that the ‘frequentist’ framework for expressing conclusions (expressing the frequency verbally on a scale) is being replaced by the Bayesian likelihood ratio, a numerical output expressing the likelihood of a match between recording and suspect.

Patricia Ashby and Michael Ashby explore the sparsely researched area of ‘Phonetic pedagogy’. They make a distinction between the teaching of phonetics and the teaching of pronunciation, where phonetics is taught to facilitate perception and production in the target language. In the teaching of phonetics they note two major changes in the last two decades. First, the growth of multimedia resources and the increased use of laptops in the classroom allow teachers to show images, play audio and video files, and edit sound files, thus integrating the classroom study of articulatory, acoustic, and auditory phonetics. Second, they document (and regret) a decline in the training of practical skills in sound production and identification, a trademark of the British School of phonetics. With regard to the teaching of pronunciation (for speech and language therapists and EFL teachers), they note the need for teachers to have the ability to analyze the pronunciation and perception difficulties of students, set priorities in pronunciation work, and be aware of the implications of using certain pronunciation models. The chapter provides an interesting summary of the state of the art in the teaching of phonetics in different contexts, mostly in Britain.

In ‘An introduction to phonetic technology’, Mark Huckvale outlines the knowledge underlying speech technologies, focusing on the nature of the phonetic representations these technolo-

³ H & H theory suggests that speech production is adaptive. Speakers move along the dimension of HYPER-(when listener-oriented constraints dominate) and HYPOSPEECH (when system constraints dominate), hence the lack of invariance in the speech signal.
gies utilize and how these representations are processed. He examines transformations used to convert between different levels of representation of the speech signal—acoustic signals, features, phones, segments, and utterances—both for speech synthesis and speech recognition. To this end he describes recent techniques for transforming between signals and features (e.g. DFT, LP, cepstral coefficients), features and phones (HMM, GMM), phones and segments (e.g. phone-in-context models, data-driven approaches), segments and words (dictionaries of word forms, letter-to-sound rules), and words and utterances, to predict phonetic duration or pitch contours from position in the utterance (CART, Hiroya Fujisaki’s model). This is followed by an outline of some examples of technological phonetic applications (TTS synthesis, speech recognition, speaker verification, and voice conversion). Inevitably, parts of the chapter require a certain prior knowledge of signal processing, but the chapter constitutes an excellent, up-to-date introduction to speech technology.

The final two chapters explore future directions of phonetics. Rachel Smith, in ‘New directions in speech perception’, addresses psycholinguistic and neurobiological research in this area. First, sources of phonetic variability in the speech signal (coarticulation, prosodic environment, speech rate and style, social and interactional factors, among others) are reviewed, along with evidence that listeners are sensitive to and use this information to process speech. Second, the psychological and neural mechanisms involved in processing variable speech signals are discussed, along with how they might be represented in the brain. Such well-known effects as the perceptual magnet effect and the role of expectations in speech perception are reviewed in the context of probabilistic processing (Bayesian inference and phonetic categorization). Finally, a welcome overview of research in the neurobiology of speech perception (investigating, for example, the parts of the brain involved in sound-to-meaning mapping and sound-to-motor mapping or the types of information integrated by the two hemispheres) will help the reader understand the complex processes involved.

In ‘New directions in speech production’, Jonathan Harrington, Phil Hoole, and Marianne Poulplier raise some central issues in speech production, such as the need for an explicit modeling of the dynamics of speech in different languages, how dynamic articulatory movements come to be integrated as segmental categories, and how speech dynamics can be phonologized (in particular, how synchronic variation in speech is related to diachronic sound change). Their approach differs radically from traditional generative and psycholinguistic approaches, which maintain that phonological information is preexistent and is mapped onto a phonetic implementation component. They focus on the production and perception of gestural overlap in coarticulation, assimilation, and consonant clusters in order to throw light on how speech dynamics can become part of the phonology, as well as review how different theoretical approaches have accounted for these phenomena.

In summary, this is an excellent book, giving an overview of key areas and topics in phonetics, as well as technical and practical guidance for research in the area. It also offers an up-to-date account of current research and new directions in the field. At times, the chapters are slightly uneven in scope, but they form a remarkably coherent whole with no significant redundancy. The book covers most of the relevant areas of phonetic research. Three areas that are not covered (and have seen significant advances in the last few decades) are the aerodynamic component of speech, the respiratory function, and second-language speech acquisition. Nonetheless, this quibble about what the volume does not contain should not overshadow the great value of what it does contain.

REFERENCES


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This book, which is a revised and extended version of the author’s doctoral thesis, represents a state-of-the-art work, a milestone, on the syntax and semantics of Chinese-style classifiers. The aim of the book (see next paragraph) is clearly stated and broken down into incremental steps with well-formulated research questions and a rigorous set-up of empirical evidence. The author incorporates valuable insights from publications in Chinese not easily accessible to a worldwide audience. The integrated syntactic/semantic analysis is a departure from the prevalent cognitive/ontological paradigm characteristic of most works in the past fifty years. There are, however, certain inconsistencies in the semantic analysis that I highlight below.

The author argues against a grammatical basis for dividing Chinese nouns or Chinese classifiers into subcategories at the word level (e.g. count versus mass nouns, or sortal versus mensural classifiers). Instead, he proposes a division of classifiers at the phrasal level, into count classifier phrases versus measure classifier phrases. This underlying idea is reminiscent of the (in)alienable property that, similarly, is not a feature of words but of phrases. (In)alienability is the (im)possibility of separating the possessee from the possessor (Chappell & McGregor 1996).1

The author reviews empirical evidence for distinguishing between count and mass nouns, and between sortal and mensural classifiers. There is a ‘signature property’ (Chierchia 2010) that divides nouns into those that can be directly modified by numerals (count nouns) and those that cannot (mass nouns). Since all Chinese nouns carry the signature of mass nouns, the distinction of count versus mass nouns cannot be made at a grammatical level, only at an ontological level. Bare nouns, which the author investigates in a separate chapter, are underspecified between a kind-level reading and a (count/mass) object-level reading (Križka 1995). The author deploys two tests that demonstrate this ambiguity. First, bare nouns can take kind-level predicates like juezhong ‘extinct’ or become kind-level predicates after the copula. Second, bare nouns that are objects of opaque verbs like zha ‘seek’ are ambiguous between a kind-level reading and a definite object-level reading.

Moreover, the author discounts any evidence that would allow drawing a grammatical distinction between sortal and mensural classifiers that in turn could be used to differentiate between count and mass nouns. He argues against three pieces of evidence that Cheng and Sybesma (1998) advanced in support of a distinction between sortal and mensural classifiers. First, it is not always the case that sortal classifiers are denominal morphemes and mensural classifiers nominal morphemes. Some sortal classifiers, for example, are grammaticalized from verbs (gua ‘hang’) and adjectives (wan ‘curved’), while some mensural classifiers cannot be used as nouns that take classifiers. Second, not all sortal classifiers disallow modification by the adjectives da ‘big’/xiao ‘small’. (Mensural classifiers, by contrast, can take size adjectives.) The author quotes Lu (1987),

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1 Chappell and McGregor (1996:3) distinguish between my liver (inalienable) and my liver that I am going to eat (alienable). Languages may or may not mark the feature of inalienability in the grammar.