Review of The Blackwell Companion to Phonology, Vol. I-V^{*}

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Phonology is changing rapidly. Whereas in the past, we used the same methodologies and largely agreed on the goals of the field, the nature of evidence, and the assumptions about representations, no such agreement exists today—as the field grows, so does diversity of opinion. Some phonologists collect the evidence for their theories using introspection, fieldwork, and descriptive grammars, while others trust only quantitatively robust experimental or corpus data. Some test phonological theories computationally, aiming to replicate human behavior or sound patterns in an explicit model, whereas others prefer to compare theories on conceptual grounds. Some phonologists believe that there is no meaningful distinction between competence and performance, and that our theories should model both. Others deny the role of substantive grounding, focusing on phonological patterns that are abstract and symbolic. The Blackwell Companion to Phonology reflects the diversity of the field: it is enormous in size and ambition. Its 124 articles span five large volumes, totalling almost 3,200 pages. There are 138 contributors, ranging from famous senior phonologists to graduate students. In including the various viewpoints, the Companion represents the state of the art in 21st century phonology.

As the field grows and diversifies, it is becoming harder for phonologists to talk to each other, for who can be a computer scientist, phonetician, neurolinguist, and an expert in adjacent fields such as morphology and syntax at the same time as commanding the extensive literature on phonologyinternal argumentation and phonological typology? This, too, is reflected in the Companion, where the articles frequently cross-reference each other without engaging in a dialogue. The target audience of some of the articles would have a difficult time understanding the others.

Goals and organization. The editors describe the collection as an "encyclopedia of case studies" that focus on hotly debated topics in the field, with reviews that concentrate on the empirical arguments for various sides. Many of the review articles do just this, but many do not touch on empirical arguments very much. Quite a few of the review articles would be excellent first readings on a topic, but some would be difficult for the uninitiated. The ideal home for this collection is the reference section of a university library. Its volumes are not sold individually, and they are not meant to be read cover to cover: articles within each volume are arranged alphabetically by author, and quite a few papers could easily appear in another volume. Some aspects of the organization are user-friendly (e.g., the table of contents appears at the beginning of each volume), but others make the Companion harder to use as a reference source. This is especially true of the paper edition—I have more to say about the paper and the electronic formats at the end of this review, after discussing its organization and contents.

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The review articles are grouped loosely by theme: general issues/segmental phonology, prosodic phonology, phonological processes, interfaces, and case studies in individual languages or language families. The editors acknowledge that they had to make some arbitrary choices about which articles should go in which volumes. For example, the chapters on first language acquisition of phonology are scattered throughout the volumes on phonological processes and interfaces, whereas learnability is the third article in the volume on general issues. Revithiadou's "The Phonological Word" is in the suprasegmental/prosodic volume, but readers interested in the morphology-phonology interface would want to consult its useful discussion of it. Likewise, Odden's chapter on vowel length appears in the volume on segmental phonology, whereas consonant length is treated in two articles in the prosodic phonology volume (Davis's "Geminates" and Kraehenmann's "Initial Geminates"). Vowel length is often correlated with featural distinctions, as in the English tense/lax short/long contrast [I] vs. [i], and some approaches to consonant length treat it as a featural rather than a prosodic distinction, too. Thus, many articles do not unambiguously belong in one or the other volume. The by-volume groupings might mislead the reader of the paper edition, though not necessarily the online edition.

Volume I: General issues and segmental phonology. This is the biggest volume of the collection, and the only one in which not all of the articles are arranged alphabetically. It kicks off with an article by Cole and Hualde on underlying representations (URs). This is a detailed and learned overview of the history of abstract URs and the notions of the phoneme, archiphoneme, and underspecification, with informative examples. Its presentation of modern alternatives to abstract URs is less detailed: storage of phonetic detail in the lexicon is presented as gaining mainstream acceptance, but Exemplar Theory and Articulatory Phonology are not explained in much detail. Likewise lacking is any in-depth discussion of whether prosodic structure needs to be part of lexical representations. Hall's article on contrast is notable for its coverage of several very different views of contrast, from Modified Contrastive Specification to Dispersion Theory and standard Optimality Theoretic treatments of allophonic distributions. Heinz and Riggle's article on learnability is a fascinating review of machine learning, though I doubted whether most phonologists would understand the computer science terminology and relate it to learnability of phonology. I felt that the article missed the opportunity to engage novice readers in a topic of increasing importance.

The volume also includes several general reviews of features and their organization: the atoms of phonological representations, distinctive features, the organization of features. There are also dedicated articles for most features and natural classes: laterals, rhotics, affricates, fricatives, pharyngeals, clicks, glides, partially nasal segments, coronals, vowel height, and sonorants each get their own chapters. Readers familiar with the history of the field will recognize that some of these topics were hotly debated in the 1980's and early 1990's, but less so in recent decades. For example, the representation of affricates, discussed in Lin's enjoyable article, has not received that much attention in the 2000's, even though the issue was never conclusively settled. The same can be said of other debates about segmental phonology, as many contributions make clear.

The volume covers some additional topics that phonologists should be familiar with but sometimes sadly neglect. There are three excellent and informative articles on sign language phonology, and there are also some less expected topics, such as Wedel's article on self-organization in phonology. The latter is a thought-provoking survey of biological/evolutionary explanations in phonology, though it is thin on concrete phonological examples.

Volume II: Suprasegmental and prosodic phonology is about prosody: the rhythmic and tonal properties of speech. There are several papers on tone and intonation, units of the prosodic hierarchy such as feet and syllables, and timing contrasts. Also covered are sonority and the phonology of syllabically defined positions such as the onset.

Quite a few contributions to this volume are excellent reviews. Gordon's article on phonetic and phonotactic evidence for stress is well written and referenced, and its summary of the current state of the field would serve as a good springboard for new research. Bosch's article on the internal structure of syllables is notable for being not only comprehensive but also compact: in just 15 pages, it manages to cover most of the major theoretical and experimental developments in research on the syllable. Bosch's justified skepticism comes through in the assessment of the experimental evidence for syllables. On the other hand, Hammond's article "The Foot" devotes too much space to proposals that have not withstood the test of time, which would make it a poor choice for a reading assignment in a forward-oriented phonology course. Topintzi's chapter "Onsets" does a fine job of arguing that onset-sensitive stress exists, but for a discussion of other constraints on onsets, the reader should look elsewhere (such as Casali's "Hiatus Resolution" in Vol. III, Goad's "The Representation of sC clusters" in Vol. II, or Jun's "Positional Effects in Consonant Clusters", also in II).

More so than other volumes, Volume II highlights the interconnectedness of phonological topics. In order to get a good sense of an area, the reader would want to consult several articles in the Companion. Prosodic phonology is closely connected to both segmental phonology and morphology. Someone interested in learning more about tone (and more generally F0) would have to consult all five volumes of the set. The distribution of tone is sometimes restricted by the nature of the consonants and vowels that bear it, which is discussed in Kingston's article on tonogenesis in Vol. IV. The autosegmental representation of tone has been fruitfully extended to other segmental features, as discussed in Leben's article on autosegments (Vol. I). There is significant overlap between that paper and Hyman's "The Representation of Tone" (Vol. II). Several contributions to Volume V specifically discuss tone in Chinese and Bantu. A reader interested in constraints on tone should check out Kisseberth's "Conspiracies" in Vol. III, which discusses a number of tone rules that are functionally united. Downstep is covered in Vol. II, along with accentual systems and intonation though there is an article on English intonation in Vol. V, as well.

Volume III: Phonological processes contains articles about rules: metathesis, dissimilation, vowel epenthesis, nasal harmony, lenition, vowel harmony, final devoicing, compensatory lengthening, and so on. There are also chapters on topics that are less obvious candidates for inclusion in a volume on "processes": constraint conjunction, emergence of the unmarked, structure preservation, and markedness and faithfulness constraints. The decision to focus on processes is perhaps understandable: it is usually easy to describe mappings and the changes they introduce, but it is not always clear exactly why alternations happen, what might be triggering or blocking them, and whether they even happen for a reason. Indeed, Kisseberth's chapter on conspiracies brings this into focus, and to this day there are at least two schools of thought about phonological processes: in one view, phonology should capture rules that occur in human languages, perhaps using maximally restrictive representations; in another view, the goal of phonology should be to explain not just what happens but why it happens, and why certain types of patterns do not occur or occur very rarely. If you take the latter stand, you may find Vol. III unsatisfying.

One of the consequences of the focus on processes is that many articles enumerate examples of the rule in question and mention some approaches to it over the years, but they do not necessarily identify interesting questions about the phenomenon for future work. For example, Buckley's chapter on metathesis is rich with examples of the rule and discusses its historical origins, but one would not learn from it that metathesis is a major example of the "too many solutions" problem in Optimality Theory (Steriade 2001), or which solutions have been proposed to this problem (such as McCarthy 2006). Another inevitable consequence is that a few famous constraints are not covered in dedicated articles. One noticeable omission is the Obligatory Contour Principle (Leben 1973, McCarthy 1986). It is mentioned in the dissimilation chapter, as well as chapters on tone and autosegments, but someone interested in the constraint would have to look outside of this collection for a compact overview. It may not be immediately obvious that the OCP and dissimilation are different topics, but they are. On the one hand, dissimilation can be triggered by constraints other than the OCP, as has been argued for vowel reduction (Crosswhite 1999). On the other hand, phenomena other than dissimilation rules have been attributed to the OCP: allomorph selection, antigemination, and so on. Another topic that I was surprised not to find even in the index is lexical stress, of the kind found in Russian and Greek (Halle 1973 et seq.). Japanese accent is covered in Kubozono's contribution to Volume V, but that article does not discuss any theoretical approaches to such systems. Several papers in Vol. II touch on related issues, but there is no in-depth discussion. I think the collection would benefit from an article that specifically discusses the "too many solutions" problem—enough work has accumulated on this problem in the past decade that it is a good candidate for a hotly debated topic, and one of considerable interest to many phonologists.

Volume IV: Phonological interfaces. Most of the contributions to this volume discuss the interfaces of phonology with phonetics and with morphosyntax. More than half of the articles are about the morphology-phonology interface: paradigms, morpheme structure constraints, allomorphy, rootaffix asymmetries, phonological patterns that are determined by syntactic categories, exceptionality, and root-and-pattern morphology. On the phonetics side, there are articles about speech perception, tonogenesis, and gradience and categoriality (including incomplete neutralization). Gafos and Dye's article about vowel harmony discusses the articulatory theory of the phenomenon at length (and which is presumably why it ended up in this volume and not in Vol. III, with consonant harmony and nasal harmony). Several articles deal with the phonological organization of the lexicon, both from the perspective of psycholinguistics and linguistic theory.

Many of these articles would work as either a starting point for novice researchers or a refresher course for more seasoned phonologists. Kang's article on loanword phonology offers a compact and informative synthesis of the controversial field. It would be an excellent review for someone interested in learning more about the area—I realized in reading it that my knowledge about the topic was lopsided. Wolf's review of exceptionality thoroughly covers both rule-based approaches and more recent approaches in OT (co-phonologies and indexation) and listing/allomorphy approaches. He also touches upon the experimental investigations of the issue. Moreover, it does something that many other contributions to this collection do not do: it critiques the various approaches fairly and identifies questions about the phenomenon that remain open. This is an article I would come back to repeatedly to look up references. Nevins's discussion of phonologically conditioned allomorphy is another excellent review: it is organized around empirical generalizations and theoretical questions, not just one or the other. While some of the examples are a bit too brief to understand, they are sufficiently referenced for further inquiry. A few open questions are clearly defined—ideal for someone looking for new research topics.

Volume V: Phonology across languages. This volume does not easily fit in with the rest of the collection, since it shifts focus from analytical issues to specific languages. The selection of languages is necessarily limited, and in this volume it is heavily biased toward European languages (out of 18 articles, 10 are on languages and language families spoken in Europe).

Some of the entries here are more useful to the uninitiated than others. I rather enjoyed de Jong's article about English flapping—it cover the history of the phenomenon, studies of its articulatory and acoustic properties, and phonological approaches from a variety of perspectives. I only

think about flapping when I teach introductory courses, and reading this article made me realize there is a lot more to the phenomenon. Other articles are less successful, primarily because they do not discuss the languages in a way that is accessible to non-specialists. For example, a few papers do not consistently use the IPA or use another transcription system without explanation. Scheer's article on Slavic yers and Rubach's Slavic palatalization present data either in orthographies (Polish, Slovak) or in pseudo-orthographic representations (e.g., the Russian $uo\phi \ddot{e}p$ [saf^jor] 'driver' is "šof'or", using the traditional Slavicist apostrophe to indicate palatalization (although he does also give an IPA representation of the palatalized consonant). S.J. Hannahs' chapter on Celtic mutations also uses the far-from-transparent orthographies of Celtic languages in several places instead of transcriptions. The chapter is still valuable for its discussion of the theoretical implications of the phenomenon, but for a clear sense of the pattern, an interested reader would have to consult additional sources.

Format and usability. The collection is being released in hard copy as a five-volume set, as well as an electronic edition. The hardcover volumes are handsomely bound and typeset, the papers look good, and there are very few typos.¹ Each volume starts with a table of contents that lists all of the chapters in all five volumes; this is quite convenient, since the papers cross-reference each other by chapter number only. The references for each chapter appear at the end of the chapter rather than at the end of the volume, which is a plus. The electronic edition is in HTML—there is no e-reader (e.g., Kindle) version. In order to read papers offline, you have to either keep open tabs in your browser, save the page as HTML, or save it to PDF. PDF files identical to the print edition are not available, and the table of contents does not list page numbers. Wiley-Blackwell recommends citing the papers by the URL on Blackwell Reference Online, and one can only hope that this will satisfy all editors. The table of contents cannot be viewed without a subscription on the Companion's website or in Wiley-Blackwell's online catalog.

The online edition is searchable, although not entirely: numbered examples and tables are included as image captures from the print edition, so your search would not find anything that is not part of the HTML source code. While functional, the online edition is not beautiful, and the translation to HTML has introduced some errors. Footnotes are normally links, except for those that are embedded in examples (which are images). In-text transcribed examples were converted to HTML rather than imported as images, so they sometimes appear with errors and confusing typos (e.g., the Dutch word [lambda:] 'lambda' in Booij's chapter is misspelled both times as [labad:] in the online edition but not in the paper edition). The references also have some typesetting errors. Since an online edition has the virtue of being easy to correct, I hope that these errors will eventually be fixed. The editors' preface suggests that there may be a plan to expand the online edition in the future, which also makes it potentially more attractive than the paper edition.

Returning to the paper edition, I was disappointed to find that the index appears only in the fifth volume. Moreover, the index leaves a lot to be desired. There are many entries in it that are not consolidated; it seems that each author contributed some keywords, and they were included in the final index without any additional processing. For example, on the topic of vowel

¹There are errors in data presentation, such as in the descriptions of Russian. Topintzi's chapter "Onsets" asserts that word-initial preconsonantal sonorants in Russian are syllabic, giving [rtut] 'mercury' as an example. No citations are given for this claim, and it is not true of any Russian dialects that I know of. Russian sonorant consonants can never bear stress, and in poetry, sonorant-initial clusters do not metrify as syllabic (all of the occurrences of [rtut³] in the poetics subcorpus of http://ruscorpora.ru scan as monosyllabic). Paradis and LaCharité's article cites some examples of loanword adaptation into Russian, including [sviŋ] 'swing', with [sviŋk] given as an alternative pronunciation— neither is possible, since Russian lacks a velar nasal even in assimilation contexts. Such mistakes could be avoided by asking other contributors, some of whom are native speakers of Russian or experts on the language, to check the descriptions.

deletion, there are five entries that are not cross-referenced: syncope, vowel drop, vowel elision, vowel-zero alternations, and vowel deletion. An experienced phonologist might know to look up all five, but a beginning student—a more likely reader of a volume like this—would not necessarily find all these entries. Likewise, several languages with alternate names are listed but not cross-referenced (Tswana/Setswana, Nootka/Nuu-chah-nulth). Since the index takes up dozens of pages, it is understandable that room had to be saved in the paper edition, but a more organized index would be both more compact and more useful. One could argue that an index is not as crucial as it once was, since there is also a web edition. This is true as long as the reader knows which terms to search for—e.g., look up "vowel drop" in addition to "vowel deletion". A well-organized index is educational in itself, and the scant attention given to this part of the book makes it less useful as a research tool.

Neither edition of the collection is priced for individuals. The list price for the hardcover edition is \$995,² and individuals cannot subscribe to the online edition, which requires an institutional subscription. NYU's library informs me that the list price for institutions is \$1939, though the pricing is adjusted upward or downward depending on the size of the university. The prices of Wiley-Blackwell's books have shot up exponentially in the last decade, which does not set it apart from other academic publishers; it is unfortunate, however, that they are pricing out graduate students, unaffiliated researchers, and faculty without generous research accounts.

Should you recommend this collection to your library? On balance, I would say yes, and you should probably go with the online edition, which should improve in the future. Even with all of its organizational shortcomings, the Blackwell Companion to Phonology comes so close to being a comprehensive encyclopedia of all things phonology that any phonologist should find something of interest here.

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²Phonologists can take comfort in the knowledge that Blackwell's 2006 Companion to Syntax retails at \$1400.