

which processing would move both forward and backward on hierarchically organized chunks that would be internally order-free.

The book ends with a brief description by some of the contributors of what is in store for the future of the scientific study of language. A recurrent theme involves bringing the study of language closer to other disciplines, such as neurolinguistics, neurobiology, bio-physics, the science of reasoning under uncertainty and probability theory, computational linguistics, and cognitive robotics. Despite the very different viewpoints developed across the various chapters of the book, a consensus seems to emerge on the need for thinking together and overcoming the still ongoing and unfortunate separation between linguists and psycholinguists through exchanges and books like this.

REFERENCES

- BEVER, THOMAS G. 1970. The cognitive basis for linguistic structures. *Cognition and language development*, ed. by John R. Hayes, 279–362. New York: Wiley & Sons.
- BEVER, THOMAS G., and DAVID POEPEL. 2010. Analysis by synthesis: A (re-)emerging program of research for language and vision. *Biolinguistics* 4.2–3.174–200. Online: <http://www.biolinguistics.eu/index.php/biolinguistics/article/view/162>.
- TOWNSEND, DAVID J., and THOMAS G. BEVER. 2001. *Sentence comprehension: The integration of habits and rules*. Cambridge, MA: MIT Press.

Université de Genève
 Faculté de Psychologie et des Sciences de l'Éducation
 Laboratoire de Psycholinguistique
 42, Boulevard du Pont d'Arve
 1205 Genève, Switzerland
 [julie.franck@unige.ch]

How children learn to write words. By REBECCA TREIMAN and BRETT KESSLER. Oxford: Oxford University Press, 2014. ISBN 9780199907977. \$84 (Hb.)

Reviewed by MONIQUE SÉNÉCHAL, *Carleton University**

In this ambitious book, Treiman and Kessler provide in-depth descriptions of how written scripts capture oral language and how children learn to use them. The diversity of information as well as the abundance of illustrative examples presented will be of interest to educators and researchers alike.

After an introductory chapter, T&K quickly and deeply immerse the reader into the intricacies of writing systems. At forty-two pages, Ch. 2 is the longest and densest chapter in the book. This is not an easy read, but will gratify those who take notes and construct tables. It is here that the authors describe the outer forms of writing scripts and at what level they represent oral language, be it at the word, syllable, or phoneme level. Perhaps the most useful information for educators is found in Chs. 3 and 4. Here we learn that children's perceptual skills and language knowledge can ease the task of becoming literate. T&K argue convincingly that humans are built, from the get-go, to detect patterns. The review of existing models of spelling acquisition in the next chapter sets the ground for the authors' proposed model of learning to spell: the INTEGRATION OF MULTIPLE PATTERNS (IMP). According to the IMP, there are at least two classes of patterns to be learned: patterns regarding the outer forms of letters, and patterns regarding the links between graphic forms and language. To learn about these patterns, children rely on general learning

* The book was discussed during my lab meetings. I thank the following lab members for their insightful comments: Ashley Bildfell, Benjamin Lindsay Clark, Maxime Gingras, Simon Hill, Melissa Malette, Ferdos Taleb Najafabad, and Josée Whissell.

mechanisms as well as formal literacy instruction. Although the IMP is promising, my lab members and I look forward to learning more about the interplay among the mechanisms that underlie experiential change in the perception, extraction, and representation of the different classes of patterns and their linkages.

Ch. 5 describes how very young children acquire knowledge about the outer forms of written language, for instance, that it is two-dimensional, directional, and sequential. In contrast, Ch. 6 covers how young children between the ages of two and five learn about the symbolic nature of written scripts. In these chapters and those that follow, T&K discuss how existing theories and their IMP model account for children's performance. And, whenever appropriate, they present educational implications or recommendations.

The next three chapters focus on abecedaries. In Ch. 7, T&K trace the lineage of modern alphabets. In this wonderfully descriptive chapter, we learn that the order of letters can be traced to an ancient Phoenician abecedy going back to 1300 BC. This order, maintained through centuries, appears to be entirely arbitrary, despite far-fetched efforts to find a rational explanation. Modifications were mostly deletions and insertions to reflect changes in phonology. Indeed, only the Arabic alphabet has been reordered, and this was done to reflect similarities in letter shape. The chapter discusses whether learning the order of letters has any benefit other than enabling the learner to quickly locate information presented alphabetically. In the next chapter, we learn about the principles guiding letter shapes, and how children come to perceive and produce these basic symbols. It is Ch. 9, however, that really captured the attention of members of my lab, most likely because it concerns how children come to understand that letters represent sounds. T&K make a solid case about the value of letter names, at least those that have Latin roots. Educators will be interested in the short but very interesting section on the question of whether children should be taught letter names, to which the authors' answer is yes.

The preceding nine chapters set the stage for Ch. 10 on early spelling and Ch. 11 on complex spellings. In fact, these two chapters provide the *raison d'être* of the book. In Ch. 10, the authors conduct a fine-grained analysis of how children use the names of letters (at least certain letters) in their initial attempts to spell the sounds they hear in words. Children's attempts are rarely correct orthographically, although they may be phonologically accurate. Without referring to phonological awareness, the authors describe how children discriminate and classify speech sounds and how they might have difficulty analyzing words or parts of words into individual phonemes. This difficulty may lead children to represent larger units in their spelling or omit specific phonemes altogether.

Ch. 11 details the difficulty of spelling words when phonemes are not consistently represented with the same graphemes. Statistical learning is emphasized by considering spelling difficulty as a function of the probability of the occurrence and cooccurrence of letters and letter patterns. In this chapter, T&K frequently leave the world of young children and present findings for older children and adults. Ch. 12 is a short chapter on capitalization and punctuation. The book concludes with a clear and convincing demonstration that the IMP can explain young children's acquisition of spelling. We look forward to seeing how the IMP will be used to make novel predictions about behavior. Importantly, T&K discuss the educational implications of the IMP, presenting some evidence that teaching accurate spellings can facilitate reading.

As a whole, we were impressed with the breadth of knowledge T&K bring to our understanding of written language. To their credit, they tried to be as inclusive as possible, with illustrative examples from twenty-seven different languages. The counterweight to this breadth is a feeling of unevenness in the book, most likely due to differences in the depth of accumulated knowledge across languages, with most information on the development of early writing in Western languages. It is not surprising, therefore, to find the most detailed descriptions or the more frequent examples coming from English, French, Dutch, Spanish, Portuguese, and Italian. Decent accounts are also found for Hebrew, Arabic, Chinese, and Korean.

The authors have taken great care in adopting a pedagogical approach that facilitates navigation: chapters always start with an overview, constructs are defined and illustrated, and the structure of chapters is announced with headers and subheaders. In addition, the comprehensive

subject index will ensure easy returns to the books' content. Finally, the text itself sends the reader to previously introduced or discussed topics.

In our view, the level of discussion and the reflections provoked by T&K's book during our lab meetings are an excellent indication of its value. We wondered, despite all of the anecdotal evidence presented, whether there are qualitative changes in orthographic knowledge as young children gain experience and learn to read. Perhaps children's phonological spelling is more linked to children's reading success than to spelling skill. That is, phonological spelling provides the analytic stance necessary to understand the alphabetic principle. It might be only once children begin to read that they start building precise orthographic representations of words or parts of words. Moreover, we pondered how many exposures to specific patterns would be needed to induce cooccurrences of orthographic patterns. Such problems should motivate researchers.

There are different ways to read a book such as this. There is the traditional linear route—the road my lab members and I took. After completing our reading, however, we all agreed that we would have preferred a nontraditional route. We would have started with children's unconventional spellings in Ch. 10, followed by Ch. 9 on letter names. The descriptions in these chapters then would serve as the backdrop for reading the book sequentially, motivating the nonlinguists to learn more about the phonemic structure of languages, and consequently, to understand more profoundly the book's content.

Department of Psychology
 Carleton University
 1125 Colonel By Drive
 Ottawa, Ontario, Canada
 [monique.senechal@carleton.ca]

Acquiring pragmatics. By SANDRINE ZUFFEREY. London: Routledge, 2015. Pp. 202. ISBN 9780415746441. \$49.95.

Reviewed by ELLY IFANTIDOU, *National and Kapodistrian University of Athens*

Zufferey's book is organized in five parts that cover pragmatics from its theoretical foundations to its mutual influence with language acquisition (Part 1), social skills (Part 2), and cognitive competencies required in acquiring pragmatic skills (Part 3). Pragmatic development in a second language and autism are examined, too (Part 4). Ten chapters, two under each part, discuss topics such as speech acts, the role of social relations and cultural norms in children's pragmatic development, metaphor, irony, scalar implicatures, referring expressions, and connectives. Z focuses on cognitive underpinnings on par with social interaction skills; she sidesteps early communicative abilities observed in conversational turn-taking and preschoolers' situated activities (see Slobin et al. 1996, Matthews 2014). Nevertheless, the book accomplishes the much-awaited unification of the major trends in the pragmatic development of children, that is, the social and the cognitive.

Ch. 1 traces popular topics within pragmatic theory back to their origins, namely speech-act theory and H. Paul Grice. This chapter can be a useful review for students who have had semantics and pragmatics courses and are familiar with the standardization hypothesis, nonliteral language in the Gricean framework, and generalized, particularized, and conventional implicatures. It is surprising that the introductory chapter to developmental pragmatics circumvents research on modality, spatial and evidential concepts (see Papafragou 1998, Matsui & Fitneva 2009, Quinn, Doran, & Papafragou 2011, Johanson & Papafragou 2014), and metaphor (see Vosniadou 1989, Pouscoulous 2011, 2014) by drawing on textbooks instead. Other areas where further qualifications are perhaps needed are Herbert Clark's principle of contrast, intention reading, and cultural learning that have been used to discuss the role of theory of mind (ToM) abilities (e.g. joint