Introduction

Rob Goedemans, Jeffrey Heinz and Harry van der Hulst

The present volume contains 13 original chapters, each of which is based on a presentation at a three-day conference organized by Rob Goedemans, Jeff Heinz and Harry van der Hulst and held on 15–17 August 2014 at Leiden University. Some chapters are by invited speakers and others by speakers whose abstracts were selected for presentation. All final versions of the chapters were submitted towards the end of 2016, after an anonymous double peer-review procedure. The conference was the fourth in a series of conferences that are part of a large project on establishing a database for word stress systems (StressTyp2).[1] StressTyp2 is a typological database that supplies information about the stress/accent systems of the world's languages. This database is based on two previously designed databases, StressTyp (ST1) and the Stress Pattern Database, while also incorporating information in van der Hulst (1999b) and van der Hulst, Goedemans and van Zanten (2010).[2] The goals of StressTyp2 (ST2) were to improve, verify and enrich the combined datasets in a variety of ways and to develop a web-based interface that makes the information in ST2 easily available to researchers and citizens around the world, and which meets or exceeds professional and scientific standards. The third goal of this project was to adopt (and, where necessary, establish) best practices for the collection, organization, dissemination and presentation of typological data pertaining to sound patterns in natural language. Currently StressTyp2 is available on the Web (http://st2.ullet.net/).

As with the previous volumes, chapters in the present volume are not concerned with the technical details of the StressTyp2 project, but are based on some of the public talks in which more general issues were addressed that

[1] Two previous conferences were held at the University of Connecticut, on 30 April 2010 and 3 December 2011, respectively. A volume based on these conferences appeared in 2014 (van der Hulst 2014c). The third conference was held at the University of Delaware on 29 November to 1 December 2012 (Heinz, Goedemans and van der Hulst 2016).

[2] The project is a broad collaboration between Harry van der Hulst (University of Connecticut), Rob Goedemans (Leiden University), developers of StressTyp1 and Jeffrey Heinz (University of Delaware), developer of the Stress Pattern Database. This project is financed by the National Science Foundation, NSF grants NSF#1123661 (PI H. van der Hulst), NSF# 1123692 (PI J. Heinz).

relate to typologically based theoretical work. In this introductory chapter for the present volume, our goal is to provide summaries of the 13 contributions and to briefly discuss the common threads in these chapters.

The first chapter in the first volume in this series (van der Hulst 2014a) provides a broad introduction to the study of word stress/accent, as well a detailed description of the StressTyp2 project. This chapter discusses the terminological issues that arise in the study of word prominence, in particular regarding usage of the terms 'stress' and 'accent'. While many writers (also in the present volume) use the term 'stress' as a cover term for all word prominence effects that do not involve tonal or, more generally, predominantly pitch exponents (often regarding the term 'accent' as interchangeable), other writers specifically take accent to be an abstract (i.e. phonetics-free) property of one or more syllables (being lexically specified or being the head of a predictable metrical constituent structure), while seeing stress as an exponent of accent (with typical cues such as extra duration, increased intensity and elevated fundamental frequency). This latter view would speak of a *stress-accent* language as being typologically different from a *pitch-accent* language in which the primary exponent of accent is fundamental frequency. Often stress-accent systems differentiate between a primary stress location and secondary or rhythmic stresses which may differ in their precise phonetic exponents, which are usually more clearly detectable for the primary stress.[3]

In the following discussion of the chapters contained in this volume, we will make an effort to clarify how different authors use their terminology. When referring to systems that fall within the stress category, we will sometimes use the expression 'stress/accent' instead of stress-accent because not all authors differentiate these two terms. An even 'vaguer' term such as *word prominence* will also in some cases come in handy.

The chapters in this volume have been grouped under three main themes:

- Phonetic correlates and prominence distinctions
- Typology
- Case studies.

Of course, some chapters, as we will indicate below, address issues that cross this thematic division.

Part I Phonetic Correlates and Prominence Distinctions

The first four chapters focus on two general areas: the phonetics of stress/accent and the question of which kinds of prominence effects count as stress/accent. Van Heuven offers a thorough overview of the correlates of stress/accent and the way in which listeners do, or do not, use them. In a sense, this is the base to

[3] For a general discussion of 'word stress' see also Gordon and van der Hulst (forthcoming).

which Hyman wants to return. His contribution argues against the significance of using (or quarrelling about) labels such as 'stress', 'stress-accent' or tone- or pitch-accent in favour of analysing the prominence properties that really matter to the language user. Lunden shows that such correlates can play a crucial role in the phonology of stress/accent, even if the presence of these correlates is not actually reflected in metrical representations. What matters, again, is the perception of the listener. Finally, Kuznetsova argues that the distribution of the phonetic correlates forms the basis for the typological classification of the language's word prosody.

1 *Vincent van Heuven: Acoustic Correlates and Perceptual Cues of Word and Sentence Stress: Towards a Cross-linguistic Perspective*

In this chapter the focus of interest is the phonetic realisation of stress at the word and sentence level. While not dealing with the physiological basis of stress (but see van Heuven and Sluijter 1996 for more discussion), it concentrates on the acoustic consequences of increased versus decreased effort and asks (i) what acoustic correlates can be found for the difference between a stressed syllable and its unstressed counterpart, and (ii) what the relative importance is of each acoustic correlate in the marking of stress. At the same time, the author considers the question of which acoustic properties are used by human listeners and to what extent these are used to decide whether or not a syllable is stressed. Van Heuven makes a strict terminological distinction between acoustic correlates of stress (which can be used, for instance, to identify a stressed syllable by some computer algorithm) and the perceptual cues used by the human listener, showing that some acoustic correlates, notably the (peak) intensity of a syllable, allow excellent separation of stressed from unstressed syllables but are hardly used by the human listener.

2 *Larry Hyman: Positional Prominence versus Word Accent: Is There a Difference?*

Hyman addresses one of the major unresolved issues in the study of word-accentual systems, which is determining what exactly counts as accent, a problem which is further complicated in languages with tone or so-called pitch-accent (see the above remarks and the introductory chapter in van der Hulst 2014c for a general discussion of such matters). In this chapter, Hyman analyses three African cases, each of which display diverse positional prominence effects that are clearly word level, reasonably subject to a metrical (accentual) interpretation, but which do not consistently coincide. In Ibibio, a Cross-River language spoken in Nigeria, greater consonant and vowel

contrasts suggest that the initial stem syllable is the accented head of a trochaic foot, whose required shape varies, however, by construction. In Punu, a Bantu language spoken in Gabon, tone suggests that the word-penultimate syllable is accented, while vowel length suggests that both stem-initial and word-penultimate syllables are accented. In Lulamogi, a small, understudied Bantu language spoken in Uganda, vowel length suggests that all stem (versus prefix) and word-penultimate syllables are accented, while tone suggests it is the penult. While some, or all, of these instances of positional prominence resemble what is found in stress-accent systems, Hyman concludes that we should focus more on the specific properties of prominent positions and less on what we call them.

3 Anya Lunden: Explaining Word-Final Stress Lapse

Focusing on rhythmic stress, this chapter proposes and examines evidence for a motivation behind the well-known asymmetrical tolerance for a stress lapse word-initially versus word-finally across languages. While many binary-stress languages tolerate a stress lapse at the right edge of the word, very few tolerate a stress lapse at the left edge (see Gordon 2002; van der Hulst 2014b). Lunden proposes that, in the languages that tolerate a final stress lapse, there is nevertheless a rhythmic alternation present at the right edge of the word, due to the phonetic effect of word-level final lengthening. However, if final lengthening were able to perceptually contribute to a word's rhythm in cases of final lapse, we would expect this to only be possible when stress in the language has duration as a stress correlate. Evidence from two different sources is shown to support the connection between languages' tolerance of final stress lapse and their use of duration in stress. Drawing on a database of stress correlates that the author made for this research project, it is shown that languages which tolerate a final stress lapse are indeed extremely likely to have duration as a stress correlate, whereas no such correlation exists for final lapse and the stress correlates of pitch or intensity. Several perception experiments also support this connection: final lengthening was found to be confusable with stress only if stressed syllables included increased duration. Finally, an account is sketched of how this could be captured in an Optimality Theoretic (OT) analysis.

4 Natalia Kuznetsova: What Danish and Estonian Can Show to a Modern Word-Prosodic Typology

The typology of word prosody is still a subject of hot debate (see van der Hulst 2014a). Kuznetsova asserts that tone and stress-accent remain the central units of classification, but shows that there is no established consensus about

a definition of these notions. In this chapter, she focuses on two specific word-prosodic units with a non-pitch-based primary phonetic exponent: prosodic quantity in Standard Estonian and prosodic laryngealization in Copenhagen Danish. Kuznetsova summarizes their main phonetic and functional features. She also compares these prosodic units with functionally similar cases of pitch-based word prosody in other languages within what she calls the framework of mainstream word-prosodic typology. Both cases are challenging for the typology, as they do not qualify either as tone or as stress. In the end, she proposes a view on the word-prosodic typology which incorporates a clear separation between the variable of location and ways in which the location is realized or cued (see also van der Hulst 1999a, 2010, 2014). At the word level, we find three logically possible LOCATION values: (i) 'no prosody at the word level', (ii) 'prosodic marks on some syllables of a word', (iii) 'prosodic marks on every syllable of a word'. Case (i) would imply that no phonetic cues have phonological relevance at the word level, the tentative term for this could be 'non-accentual prosody'. This is the case, for example, in French, where all prosody can be defined at the post-lexical levels. Case (iii) is what is prototypically called 'tone'. Case (ii) is what Hulst (2011) proposes to call 'accent'. She concludes that an extensive typology of all the accent varieties should be based on accurate descriptions of the word prosody of particular languages.

Part II Typology

Clearly, both preceding chapters (3 and 4) deal not only with both phonetic exponents but also typological issues. The following two chapters also address typological issues, both in different ways. Chapter 5 addresses the long-standing debate about foot typology (see van der Hulst 1999a, 2010), adding a new type of foot to the inventory. Issues of foot typology are also taken up in Chapters 7, 8 and 9. Chapter 6 is typological in a different way in that it focuses on correlations between phonological structure and syntactic structure; this line of work falls within the class of so-called holistic typological studies (see van der Hulst 2017).

5 *René Kager and Violeta Martínez-Paricio: Mora and Syllable Accentuation: Typology and Representation*

This chapter has two goals. First, the authors argue that metrical feet can immediately dominate morae. This situation occurs only under duress of metrical foot form constraints, which impose strict requirements on the number of morae in the head and dependent positions in metrical feet. The authors propose to encode this situation in terms of the internally layered (IL) foot, a minimally recursive metrical foot (Martínez-Paricio 2012, 2013,

Martínez-Paricio and Kager 2015). They support this claim with data from Gilbertese, which exhibits a metrical distribution of high pitch and stress that disrespects syllable integrity. They show that this pattern can be analysed straightforwardly using IL feet. A second goal of this chapter is to show that IL feet offer an insightful account of 'mora-counting' metrical patterns in which prominence is located on the syllable that contains the antepenultimate mora, in particular in Tokyo Japanese loanword accentuation and Dihovo Macedonian stress. These patterns pose serious problems for a standard moraic trochee analysis, due to the fact that the weight sequences . . . LH# and . . . HL# behave similarly as trimoraic units in locating prominence on the penultimate syllable. Using IL feet, Kager and Martínez-Paricio propose analysing these systems as 'mixed binary/ternary': IL feet occur in sequences ending in light syllables, non-IL feet elsewhere. Additional evidence for this analysis comes from an innovative pattern of loanword accentuation of Tokyo Japanese, which differs from the conservative pattern in shifting the accent to the antepenultimate syllable precisely in . . . LH# sequences. On this analysis, this pattern has IL feet in all forms. The fact that Tokyo loanword accentuation shows signs of accentual instability and is moving in the direction of the Latin stress pattern can be interpreted as movement towards consistency in foot parsing.

6 Hisao Tokizaki: Word Stress, Pitch Accent, and Word Order Typology with Special Reference to Altaic

It has been claimed that in some languages the location of word stress correlates with the word order of a syntactic head and its complement – for example, a verb and its object (Donegan and Stamp 1983, Plank 1988) – that is, languages with left-hand stress have head-final order while languages with right-hand stress have head-initial order. Based on an analysis of the data in Haspelmath and Dryer (2005), Tokizaki shows that this correlation generally holds in the world's languages. However, potential counterexamples to this generalization are Altaic languages, a large number of which have been reported to have right-hand stress and head-final order (see Goedemans, Heinz and van der Hulst 2014 and data in Haspelmath et al. 2005). It is argued in this chapter that Altaic languages in fact have word-initial stress as well as right-hand pitch accent. Thus, the general correlation between stress and word order also holds for Altaic languages.

Part III Case Studies

In this part, Chapter 10 is unique in discussing focus prosody, going beyond the word unit and including phrasal phonology. While focusing on the analysis of

specific word-prosodic systems, all other chapters in this part raise specific issues with respect to the role of lexical marking of stress/accent, as well as of morphological structure.

7 Keren Rice: Persistence and Change in Stem Prominence in Dene (Athabaskan) Languages

The stem has long been identified as a domain of prominence in Dene (Athabaskan) languages. Given this, one might ask if, in addition to the importance of morphology in the placement of prominence, phonological factors also play a role. In this chapter, Rice examines the role of morphology and of phonological constraints in a number of Dene languages, addressing the pathways of change that can be identified in this family. Overall, she notes that there is conservatism in the prominence systems reported for Athabaskan languages, with the root attracting prominence, all other things being equal. The phonological factor that plays a role is the placement of a trochaic foot. While the core of the reconstructed system is maintained, the trochee may shift from syllabic to moraic, with different factors involved in determining weight. Word-level prominence may be either left or right oriented. Prefixes may involve trochees as well. What is overall resistant to change is the domain of root.

8 Iggy Roca: Spanish Word Stress: An Updated Multidimensional Account

Generative Phonology research output on Spanish word stress spans just over half a century at the time of writing (1965–2016) and is substantial. However, no unanimity of analysis has as yet been achieved. This chapter provides both a précis of the historical peaks of the still ongoing endeavour and a proposal further elaborating the lines in Roca's (2006, 2014, 2016) recent contributions. For reasons of space, Roca's analysis is restricted to non-verbs. The proposed grammar uses OT as an analytical tool. It hinges on interactions between foot shape and size, on the one hand, and alignment relations between the metrical and morphological structures, on the other. The account is multidimensional in as much as it provides (i) a full formalisation of Spanish (non-verb) stress, (ii) a typology of its various materialisations, (iii) a historical justification for their emergence, (iv) an evaluation of some previous alternatives and (v) a conclusion bringing together the various strands.

9 Björn Köhnlein: Metrically Conditioned Pitch Accent in Uspanteko

Uspanteko, a Mayan language spoken in Guatemala, shows a remarkably rich interaction between the location of stress, vowel quality, syllable weight and

pitch accent. Commonly, it is assumed that the language has privative lexical tone. Counter to previous analyses of the facts, this chapter proposes that both tonal contrasts and other relevant interactions can be derived from an opposition between trochaic and iambic feet. No tonal information is stored in the lexicon. While improving the empirical coverage of previous analyses with lexical tone, the current analysis adds little additional machinery, since the general distinction between trochees and iambs in Uspanteko has already been motivated on independent grounds. From a broader theoretical perspective, the chapter contributes to ongoing discussions on the phonological nature of tone-accent systems, one of the key issues in debates on prosodic typology.

10 Haruo Kubozono: Focus Prosody in Kagoshima Japanese

This chapter discusses focus prosody in Kagoshima Japanese, a dialect spoken in the south of Japan with a lexical prosodic system remarkably distinct from that of standard Tokyo Japanese. Starting with the phenomenon of question particle incorporation in direct (matrix) Wh-questions, Kubozono considers several apparently different phenomena involving the incorporation of sentence-final particles into the sentence-final prosodic phrase. He proposes that all these phenomena can be generalized as manifestations of focus prosody whereby sentential particles are incorporated into the domain of prosodic phrase in post-focal positions. This process can be attributed to the Obligatory Contour Principle (OCP) whereby sequences of High tones are avoided by a dissimilatory process of H tone deletion and a subsequent process of prosodic rephrasing. This analysis nicely explains why particle incorporation fails to occur in a particular accent class of words as well as in yes/no questions and other syntactic constructions. The chapter also argues that post-focal prosodic incorporation is not an isolated phenomenon in Kagoshima Japanese, but rather, that similar prosodic (re)phrasing phenomena are found in other dialects and languages such as standard Tokyo Japanese, Fukuoka Japanese and the south Kyungsang dialect of Korean.

11 Björn Köhnlein and Marc van Oostendorp : Where is the Dutch Stress System? Some New Data

There is an extensive body of theoretical work on the Dutch stress system, which is, however, mostly built on inspection of existing, sometimes rather exotic, words as found, for example, in dictionaries. In this chapter, Köhnlein and van Oostendorp confront these theories with new data from two online experiments in which participants had to indicate the most likely location for

stress in biblical names or nonsense words respectively. The results partially confirm the claims already gathered in earlier work: there is a strong preference for stress on penultimate syllables and quantity plays a role in establishing the preferred location of stress. On the other hand, the way in which quantity works out is slightly different from what previous literature suggests. Furthermore, the authors report that they have not found strong evidence for the so-called three-syllable window.

12 *Nicholas Rolle and Marine Vuillermet: Morphologically Assigned Accent and an Initial Three-Syllable Window in Ese'eja*

In this chapter, Rolle and Vuillermet argue that Ese'eja demonstrates an unusual initial three-syllable window within which primary prominence must fall, a typologically rare type. Using a corpus of 2,000 elicited verb forms (Vuillermet 2012), the authors show that the position of prominence depends on syllable count and the type of morphologically assigned accent. They posit four types of this morphological accent: inherent transitive accent, dominant indexical accent, recessive accent with one set of tense/mood suffixes and rightmost-preserving accent with another. Further, tense/mood suffixes trigger the creation of iterative trochaic or iambic feet, which the authors capture using cophonology theory employing common OT constraints (Inkelas and Zoll 2007). The authors posit that iterative footing occurs with a leftmost constraint, resulting in primary accent falling on the first, second or third syllable, which is realized with primary prominence. Additionally, because iterative footing occurs prior to primary accent delegation, Ese'eja constitutes a true 'count system' challenging the Primary Accent First model (van der Hulst 1996, 1997, 2012). Finally, they argue that when morphological accent in Ese'eja is assigned outside the metrical window, the position of primary prominence falls on a rhythmically dependent position, termed 'rhythmic repair'. The authors contrast this to Kager's (2012) typology, showing that under these circumstances primary prominence surfaces on a default position within the metrical window, termed 'default repair'.

13 *Alexandre Vaxman: A Scales-and-Parameters Approach to Morpheme-Specific Exceptions in Accent Assignment*

This chapter addresses the long-standing problem of morphologically conditioned exceptions in accent assignment. Vaxman introduces a new approach, called the Scales-and-Parameters (S&P) theory, a new parametric, non-metrical theory of word accent, which takes as a point of departure the PAF theory of van der Hulst (1996, 1997, 2012, inter alia). The S&P theory is

shown to uniformly capture regular and exceptional accent locations both within a given system and across different types of systems in terms of a single accentual grammar. As the author claims, the proposed grammar accurately derives accent location in lexical accent systems with dominant suffixes and in phonological weight-sensitive systems in which certain morphemes violate the accent rule. A core proposal of the theory is to extend the notion of 'weight' to morphemes by treating their accent-attracting ability as 'diacritic weight' (rather than lexical accent). Vaxman shows that since weight is a scalar variable, it allows for novel types of weight scales, that is, those containing diacritic and/or phonological weight. Reference to such scales allows the S&P parameter system to correctly assign word accent and to account for morpheme-specific exceptions, as illustrated here with detailed case studies of Central Selkup and Eastern Literary Mari.

We hope to have shown that the chapters in this volume cover a range of typological and theoretical issues in the study of stress/accent. On the typological side, various authors are concerned with the array of word-prosodic types and their distinguishing phonetic properties. Of specific theoretical concern is the question of foot structure and how it is manifested in different ways in different systems. In addition, several chapters explicitly discuss the role of morphological structure, as well as of lexical marking of accent. The 13 chapters collected here present a lively testimony of a field of inquiry that shows progress, while also identifying questions of ongoing concern.

The ST2 Book Series

Volume 1: Hulst, H. G. van der. (ed.) 2014. *Word Stress: Typological and Theoretical Issues*. Cambridge University Press.

Volume 2: Heinz, Jeffrey, Rob Goedemans and Harry van der Hulst. 2017. *Dimensions of Phonological Stress*. Cambridge University Press.

Volume 3: Goedemans, Rob, Jeffrey Heinz and Harry van der Hulst. (eds.) 2018. *The Study of Word Stress and Accent: Theories, Methods and Data*. Cambridge University Press.

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Goedemans, R., J. Heinz and H. van der Hulst. (2014). StressTyp2. http://st2.ullet.net.