Mora stress in Shina as Contrastive Foot Structure

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ABSTRACT
I argue that so-called 'mora stress' in Kohistani Shina (spoken in Northern Pakistan, realized as *falling* vs. *rising accent*) is best analyzed as a difference in the alignment of a LH* pitch accent to two types of feet (moraic vs. syllabic trochees). This paper offers a formalization of the mapping of (intonational) tones to foot structure and argues that independent evidence for a foot-based approach comes from a process of stress advancement, where stem stress predictably shifts to a following suffix when the final mora of the stem is accented; yet it remains on the stem when the stem accent is on a non-final mora. I end by briefly discussing typological and theoretical implications of our analysis, also drawing on a comparison with a similar advancement pattern in Lithuanian (known as *de Saussure's Law*).

1 Introduction

In word-prosodic typology, a central, ongoing debate concerns the question of how to adequately analyze binary tonal oppositions that are restricted to stressed syllables – a common descriptive way to categorize such prosodic systems is to group them with other so-called 'accentual' word-prosodic systems. Should such oppositions be analyzed as having properties of both stress (at the syllable level) and lexical tone (below the syllable level), or should scholars acknowledge that word-level linguistic prominence can lead to metrical contrasts below the level of the syllable? The latter position has been criticized in 'mainstream' prosodic typology, based on the observation that stress as a property appears to be restricted to the syllable level, a view defended in, e.g., Hyman (2009) – this would imply that tonal contrasts within stressed syllables would necessarily have to be relegated to lexical tone. At the same time, however, some scholars claim that at least certain accentual systems should be analyzed in a metrical way. Roughly, we can say that two general strategies have been suggested to approach relevant oppositions metrically: On one hand, some have proposed to mark prominence directly on, e.g., the first or second part of a (bimoraic) stressed syllable with grid marks; this can be regarded as the traditional metrical approach to accentual oppositions within stressed syllables (van der Hulst 2011 for overview). On the other hand, a more recent metrical approach seeks to use insights from research on the foot as a governing principle of word structure and aims to extend its role to cover contrasts within syllables as well. To date, this foot-based approach to accent has mostly been applied to 'European' tone-accent systems, as in, e.g., Morén-Duolljá (2013), Iosad (2016) for North Germanic, Köhnlein (2011, 2016), Hermans (2012), Kehrein (2017) for West Germanic (Franconian), or Morrison (2019) for Scottish Gaelic – yet see, e.g., Köhnlein (2019), Köhnlein and Zhu (2019) for a foot-based analysis of accent in Uspanteko, a Mayan language.

In this paper, I aim to demonstrate how investigating so-called "mora stress" (e.g. Baart 2014) in Shina, a language spoken in Northern Pakistan, can contribute to this debate. Based on data from Kohistani Shina in Schmidt and Kohistani (2008; *from here*: S&K), I argue that mora stress, which is realized as so-called *falling* vs. *rising accent* in stressed syllables, is best analyzed as a difference in the alignment of a LH* pitch accent to two types of feet (moraic vs. syllabic trochees). I furthermore claim that evidence for a foot-based analysis comes from a process of stress advancement: Stem stress predictably shifts to a following suffix when the final mora of the stem is accented but remains on the stem when the stem accent is on a non-final mora. Essentially, I argue that stress advancement occurs only when an underlyingly accented suffix (i.e., a suffix with a foot head in my analysis) would be demoted to a foot dependent, which happens only when two competing foot heads are immediately adjacent.

The paper is organized as follows. §2 offers a formalization of the mapping of (intonational) tones to foot structure on the basis of acoustic data provided in S&K. §3 provides my foot-based analysis of stress advancement. §4 concludes the paper by discussing typological and theoretical implications of the analysis,

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drawing on a comparison with a similar advancement pattern in Lithuanian (*de Saussure's Law*).

2 Data and Analysis of Tonal Associations

2.1 Basic Facts and Proposed Tonal Mapping

Varieties of Shina contrast *falling* and *rising accent* in bimoraic stressed syllables with long vowels. In this paper, I mark falling tone with an acute accent (H) on the first part of a long vowel (e.g. [áa]) and rising with an acute accent (H) on the second part (e.g. [aá]); an alternative way of indicating the tonal patterns is to mark falling tone as [à] and rising tone as [á]. Two minimal pairs are provided in (1):

(1) a. [báak] 'push' [baák] 'agreement'
b. [móos] 'month' [moós] 'flesh'

The tonal contours and proposed tonal associations for Kohistani Shina are shown in Figure 1 for the minimal pair [báak] (falling accent, left, in the graph given as [bàk]) versus [baák] 'agreement' (rising accent, right, in the graph given as [bák]) in phrase-medial position (the graphs are adopted from *S&K*); rhymes of accented syllables are indicated with red squares (note that this is a rough approximation since no spectrographic data are included in the graphs).

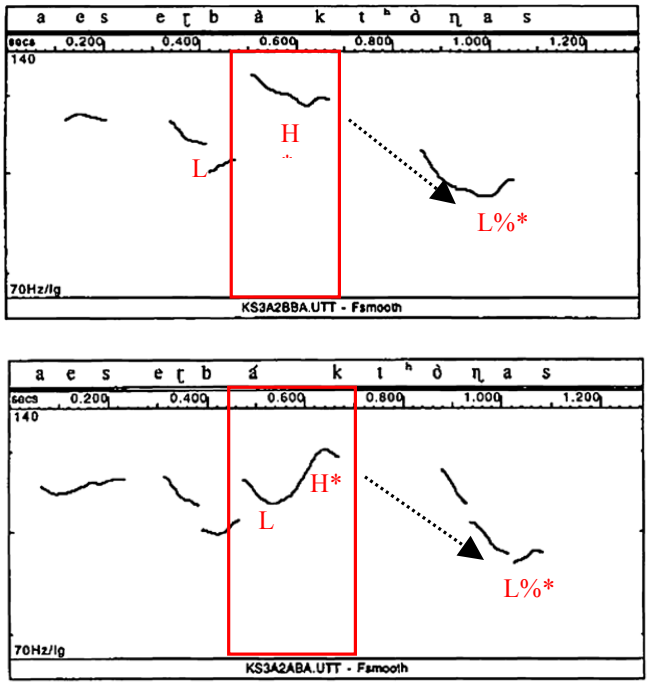


Figure 1. [báak] 'push' (top) versus [baák] (bottom) 'agreement' in phrase-medial position (Kohistani Shina); graphs adopted from S&K (2008: 36)

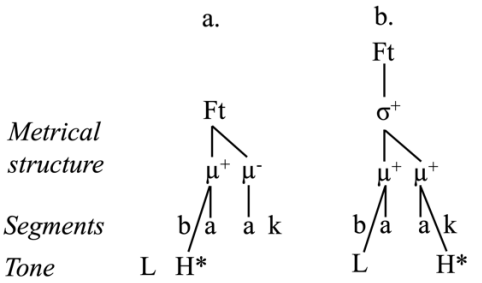
Based on the available data, I propose that both the falling and the rising accent in Kohistani Shina derive from a difference in the alignment of an intonational LH* pitch accent, which is followed by a phrase-final low boundary tone. The tonal melodies and the mapping I suggest in Figure 1 slightly differ from S&K, who represent the accents as HL (falling) and LH (rising), for the following reasons. First, inspection of the acoustic measurements in S&K suggests that the pitch fall for the falling accent is not completed within the accent syllable in phrase-medial position but continues towards the end of the phrase. This appears to suggest interpolation from H* to a low phrase-final boundary tone (L%), as indicated in Figure 1 (top) with

a dashed arrow. Notably, the same general pattern of interpolation from H* to L% can be observed for the rising accent, as shown in Figure 1 (bottom), again illustrated with a dashed arrow. Furthermore, the peak (H*) is preceded by a distinct low pitch target for *both* accents, thus not only for the rising accent. I interpret this target as a leading low tone (L) that precedes the starred high tone in a bitonal LH* pitch accent. The leading L is realized before the stressed syllable in [báak], but at the beginning of the stressed syllable in [baák]. It is important to note, however, that these analytical suggestions are tentative and might certainly be subject to change when more data become available; this particularly concerns data that are known to potentially affect tonal contours in accentual systems, such as interactions with pragmatic function (e.g., declarative vs. interrogative intonation), sentence position (non-final, final) or degree of phrasal prominence.

2.2 A Foot-Based Analysis

Based on the foot inventory proposed in Kager (1993), I propose that Shina distinguishes two types of feet, moraic trochees and syllabic trochees. In Kager's approach, feet can be built either on syllables or directly on moras; as suggested by their respective names, the syllabic trochee in our analysis is a foot built on syllables, while the moraic trochee is built on moras. The two foot types are shown in (2) for [báak] 'push' (moraic trochee, (2a)) versus [baák] (syllabic trochee, (2b)). To account for the differences in the association of tones to the two types of feet, I follow my earlier work (e.g., Köhnlein 2011, 2016) and assume that moraic and syllabic feet differ in the metrical 'strength' of their moras, which in turn influences their ability to host tones. Formally, this contrast emerges from the different level of headedness for the two feet: In moraic trochees (2a), the first *mora* in the foot is the head (μ^+) and 'strong' while the second mora (μ^-) is the dependent and 'weak.' In syllabic trochees (2b), the first *syllable* is the head (σ^+); in my approach, the two moras it dominates are licensed by this head and therefore inherit its strength (indicated as '$\mu^+\mu^+$'). If present, a following syllable would be the foot dependent (σ^-). (I use the notions 'strong/weak' and superscripts only for purposes of exposition; they have no relevance for the analysis, since strong and weak positions follow solely from the structure of the metrical tree.)

(2) Metrical representations and tonal mapping for falling accent (a.) and rising accent (b.)



To account the for tonal differences between the falling and the rising accent, I assume that only strong moras (μ^+) can host tones in Kohistani Shina (comparable to, e.g., Cologne in Köhnlein's 2016 analysis of Franconian tonal accent), and that, as is at least very common across languages (if not universal), so-called starred tones of intonational pitch accents have to be linked to a prominent position (*here*: a foot head). Furthermore, tonal contours, i.e., mappings of two tones to one tone-bearing unit (*here*: mora) are dispreferred. Along these lines, the bimoraic foot in (2a), which contains one strong and one weak mora in the stressed syllable, can only host H* on its first, strong mora, deriving falling accent. Since there is only space for H* in the stressed syllable, L must be realized before it (for the purposes of this paper, we can assume that this tone remains floating, which is not unusual for non-starred tones in intonational systems). The syllabic trochee, on the other hand, has two strong moras since these moras are licensed by the syllabic foot head, as shown in (2b); accordingly, it can host both L and H* in the stressed syllable, which then derives the rising accent.

3 Data and Analysis of Stress Advancement

As noted in Baart (2014: 7), stress advancement is a "distinctive feature" of Shina-type languages, which in turn arguably means that understanding this process is critical for understanding the nature of mora stress in Shina in general. Again, we focus on Kohistani Shina for illustration of the general process, which K&S (2008: 49) describe as "phonologically conditioned." As briefly discussed in the introduction, stress only shifts when high-toned stem moras are adjacent to a suffix, as in (3a,b); furthermore, long vowels shorten when unstressed, a cross-linguistically common process.

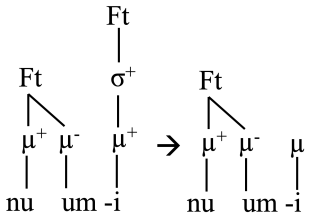
(3) Stress advancement in Shina in singular-plural alternations
Stress advances to suffix in stems with rising accent (H on the final mora)
a. caár car-é 'direction', 'directions'
b. kaál kal-í 'year', 'years'

Stress does not advance to suffix in stems with falling accent (H on a non-final mora)
c. góos góoz-i 'house', 'houses'
d. núum núum-i 'name', 'names'

To capture these patterns, I first assume that stems receive foot structure prior to suffixation, which helps to account for the fact that all items with falling and rising accent appear to behave in a predictable fashion. In a stratified model of the grammar, such as Stratal Optimality Theory (Bermúdez-Otero 2018 for overview), this would imply that foot structure is either stored in the lexicon (which would have to be assumed for at least one of the two accents anyway) or assigned at the stem level before suffixes are attached. Along these lines, we can thus assume that the suffixes in question are attached at the word level, and that the respective suffix feet compete with stem feet for realization.

As indicated in §2.2, the stems in (3a, b) have syllabic trochees (= rising accent), and the stems in (3c, d) have moraic trochees (= falling accent). The respective suffixes are stored with a degenerate (trochaic) foot, since they are monosyllabic and monomoraic. This foot could either be a syllabic or a moraic trochee, but this is not of immediate relevance for the analysis; for sake of concreteness, I represent it as a syllabic foot. When stem feet and suffix feet compete for realization, the leftmost (stem) foot wins as a default, and the suffix foot is erased; this is a common pattern in Indo-European accentology and has been termed *Basic Accentuation Principle* (BAP; Kiparsky and Halle 1977, among many others). The workings of this principle are shown in (4) on the basis of the form [núum-i], where the bimoraic stem trochee surfaces and the suffix foot is erased:

(4) Leftmost foot wins for stems with moraic trochees



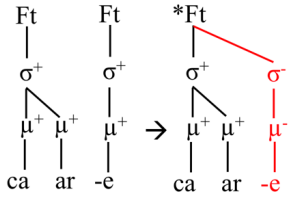
Obviously, however, the principle 'leftmost wins' in (4) fails to account for stress advancement, i.e., for cases where the rightmost, suffixal foot is selected. That is, an additional factor must come into play when stems with syllabic trochees are combined with a suffix foot and where we then find stress advancement, as in [caár] vs. [car-é]. To account for such cases, I propose that the adjacency of the stem foot head and the suffix foot head would lead to an ungrammatical surface structure in case the stem foot would be selected. First of all, I assume, somewhat uncontroversially, that non-final trochaic foot heads have to be binary if they can be binary. In the case at hand, this means that after adding the suffix, the inviolable binarity requirements for non-final foot heads would force the stem foot to include the suffix syllable as a foot dependent. This structure, where the leftmost foot would win, would be in line with the BAP; yet such

forms are ungrammatical in Shina. I argue that this ungrammaticality arises from the fact that parsing the suffix syllable as a dependent would demote that syllable from a foot head to a foot dependent. This type of demotion violates the principle in (5), which I refer to as the HEAD-DEMOTION PRINCIPLE:

(5) HEAD-DEMOTION PRINCIPLE: Do not demote a foot head to a foot dependent

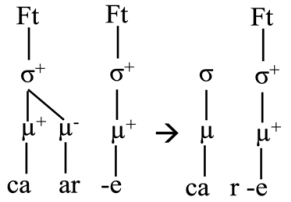
Crucially, the principle only militates against demoting a head to a dependent, but it does not militate against deleting an underlying foot head per se. In that sense, it is fine to remove a foot during computation, as long as what was originally a foot head does not end up as a foot dependent. The structure in (6) thus violates the HEAD-DEMOTION PRINCIPLE since the suffix syllable is demoted from a head to a dependent; this is indicated in red:

(6) Selecting leftmost foot for stems with syllabic trochees violates the HEAD-DEMOTION PRINCIPLE



In order to satisfy the HEAD-DEMOTION PRINCIPLE, the suffix foot is selected since this parsing does not involve the demotion of a foot head to a foot dependent. This is shown in (7): While the stem syllable loses its head status, it does not become a foot dependent but is left unparsed by foot structure, which does not violate the principle in (5).

(7) Rightmost foot is selected for stems with syllabic trochees since this structure does not violate the HEAD-DEMOTION PRINCIPLE



As shown in this section, my metrical analysis successfully accounts for patterns of stress advancement, which are restricted to adjacent accented units. It deserves noting, however, that in Kohistani Shina, only some stems with short (rather than long) vowels in stem-final syllables show stress advancement, while some other stems retain the accent on the stem. This is briefly mentioned in S&K (2008: fn. 6); in other dialects, the rule also applies to stems with short vowels. S&K give two examples of short vowels with and without stress advancement; these are provided in (8):

(8) Only some stems ending in short vowels show stress advancement in Kohistani Shina
   a. [don] [dód-i] 'tooth', teeth'
   b. [don] [don-í] 'flock', 'flocks'

All else being equal, the short-vowel stems in question could lend themselves to stress advancement since the stem moras are stem-final and thus adjacent to the suffix mora; yet there seems to be some property of short-vowel foot heads that can, at least in some cases, protect the stem accent in Kohistani Shina. From a technical perspective, there are various avenues that could be pursued to incorporate this pattern from Kohistani Shina into the analysis. Since the limited amount of data available makes it difficult to weigh different options, I will not discuss the short-vowel patterns in detail here. I will, however, briefly hint at a

few analytical possibilities.

For instance, one might want to capitalize on the observation that syllabic trochees with long vowels would span three moras, while syllabic trochees in syllables with a monomoraic stem vowel would only span two moras – such a foot would be preferable with regard to common binarity preferences in metrical structure, and might thus have a better chance to survive the derivation in some cases. Another way to look at these patterns would be to consider the option that monomoraic stem-final syllables could be footed as either (degenerate) syllabic or moraic trochees – there is no reason to assume that the surface forms in isolation would differ, as they could both only host one tone, H*. This in turn could then lead to a different treatment of the respective feet when combined with a suffix. Yet another option would be to relegate the short-vowel patterns to morphology, which would be the most straightforward solution, but which would also appear to be the 'easy way out,' avoiding the question why short-vowel stems in particular should be governed by morphological factors? Independent of what the 'correct' approach to these Kohistani-Shina specific patterns is, however, the issue exists independent of any given analysis and therefore arguably present a challenge to any approach that aims to beyond listing correspondences as paradigmatic alternations.

4 Typological Relevance and Theoretical Implications

4.1 Typological Relevance

As pointed out in Baart (2014), Lithuanian accentuation displays a comparable stress advancement process for lexically accented stems, commonly referred to as *de Saussure's Law* (de Saussure 1894). Like Shina, Lithuanian has an accentual distinction between two accents on bimoraic units, traditionally described as an acute accent (falling tone in the accented syllable) versus a circumflex accent (rising/level tone in the accented syllable, with a fall on a subsequent syllable). Two relevant examples are provided in (9), taken from Lehfeldt (1993). In these examples, the nominative suffix *-as* is neutral (that is, it never receives stress/accent), while the locative suffix *-e* is accent-attracting (that is, it is accented unless overridden by a stem accent). For consistency, I again use accent marks to indicate the location of a high target (note that this representation differs from traditional notations).

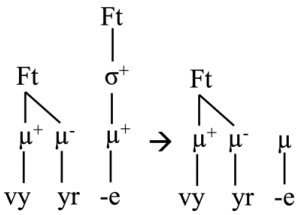
(9) Stress advancement for accented stems in Lithuanian
Stress advances to suffix in stems with circumflex tone (H on the final mora)
a. píšt-as piršt-é 'finger-nom.', 'finger-loc.'

Stress does not advance to suffix in stems with acute accent (H on a non-final mora)
b. výyr-as výyr-e 'man-nom.', 'man-loc.'

I believe that the Lithuanian alternations in question can be analyzed in the same way as the Shina patterns, which emphasizes the typological relevance of my proposal: The acute accent corresponds to a moraic trochee spanning two moras in the accent syllable; the circumflex accent, on the other hand, corresponds to a syllabic trochee. Interpreting the accentual differences as consequences of an opposition between moraic and syllabic trochees is perfectly in line with claims by Dogil (1999). Based on a phonetic investigation of accentual properties, Dogil views the acute accent as a moraic accent (accentual prominence only on the first mora of a bimoraic syllable) and the circumflex accent as a syllabic accent (accentual prominence on a whole bimoraic syllable). While Dogil's accent specifications are diacritic in nature and do not incorporate constituency, his observations and theoretical proposal can easily be translated into my foot-based approach to accent.

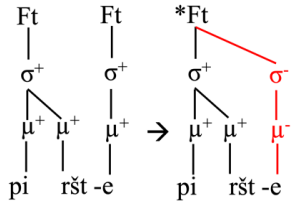
With regard to the analysis of stress advancement, the relevant derivations are shown below on the basis of the locative forms provided in (9); the HEAD-DEMOTION PRINCIPLE applies in the same way as in Shina. To begin, for stems with moraic trochees (10), the leftmost (stem) foot wins as a default, in line with the Basic Accentuation Principle:

(10) Leftmost foot wins for stems with moraic trochees



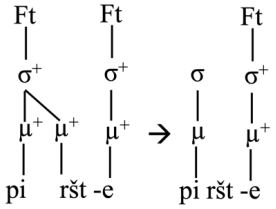
For items with stem-final syllabic trochees, the hypothetical surface form in (11) is ill-formed because the syllable with the underlying suffix foot head would be demoted to a foot dependent:

(11) Selecting leftmost foot for stems with syllabic trochees violates the HEAD-DEMOTION PRINCIPLE



The attested surface form with stress advancement in (12) avoids this problem since the syllable with the underlying stem foot head is not demoted to a dependent position but remains unparsed:

(12) Rightmost foot is selected for stems with syllabic trochees since this structure does not violate the HEAD-DEMOTION PRINCIPLE



4.2 Theoretical Implications

As indicated in the introduction, my metrical approach to stress advancement in Shina is in line with work that analyzes certain tonal contrasts within stressed syllables as foot-based. Such proposals challenge the current mainstream view in prosodic typology where it is assumed that lexically contrastive prominence below the syllable must be attributed to lexical tone (e.g. Hyman 2009). The motivation for providing a foot-based analysis to accentual patterns can differ between languages since different types of independent evidence might be available, much in the same way that the correlates of foot structure can differ across languages (e.g., Bennett 2012, Köhnlein et al. 2019 for discussion).

With regard to the Shina (and Lithuanian) data discussed in this paper, I believe that an approach with binary metrical constituents (*here*: feet) is promising since, to the best of my knowledge, it is the only currently available framework that offers a possible answer to the question *why* only adjacent mora stresses lead to stress advancement, rather than merely restating the relevant environments ion formal language. For this reason, I argue that it is preferable to alternative approaches, such as analyses with lexical tone or grid marks. I illustrate my argument based on a hypothetical rule-based analysis using grid marks, which could easily be replaced with high tones for a lexical-tone analysis. In such an approach, the patterns could

certainly be captured with the following two rules (accented moras are represented with grid marks, and 'μ_1' should be read as 'one or more moras without grid marks separating two moras with grid marks'):

(13) Hypothetical rules to account for stress advancement in an approach with grid marks
  a. $\mu^*\mu_1\mu^* \rightarrow \mu^*\mu\mu$ (= Leftmost wins when grid marks are non-adjacent)
  b. $\mu^*\mu^* \rightarrow \mu\mu^*$ (= Rightmost wins when grid marks are adjacent)

This certainly is a straightforward way to capture the data, but, again, it arguably does not do more than restate the data using a formal notation. That is, the two rules in (13) do not address the question why only adjacency violates the 'leftmost wins' rule, or why we would find such patterns with opposing directionality to begin with. I am not aware of any process of positionally restricted stress advancement that is not somehow related to adjacency, which, if true, indicates that these patterns are not coincidental. Accordingly, adjacency should ideally be derived from an independent property, rather than merely restated. This is what, in my view, is a crucial difference between an analysis that approaches the issue without assuming constituency (such as approaches with grid marks or lexical tone) and one that utilizes independently motivated binary windows to account for the adjacency restrictions (such as my foot-based approach).

Acknowledgements

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References

Baart, Joan L. G. 2014. Tone and stress in North-West Indo-Aryan: A survey. In J. Caspers, Y. Chen, W. Heeren, Jos Pacilly, N. O. Schiller and E. van Zanten, eds., *Above and beyond the segments*, pages 1–13. Amsterdam: John Benjamins Publishing Company.

Bennett, Ryan T. 2012. *Foot-conditioned phonotactics and prosodic constituency*. Diss. UC Santa Cruz.

Bermúdez-Otero, Ricardo. 2018. Stratal Phonology. In S. J. Hannahs & A. R. K. Bosch, eds., *The Routledge handbook of phonological theory*, pages 100-134. Abingdon: Routledge.

Dogil, Grzegorz. 1999. The phonetic manifestation of word stress in Lithuanian, Polis, German, and Spanish. In H. van der Hulst, ed., *Word prosodic systems in the languages of Europe.* Berlin: Mouton de Gruyter, 273-310.

Hermans, Ben. 2012. The phonological representation of the Limburgian tonal accents. In B. Botma and R. Noske, eds., *Phonological Explorations: Empirical, Theoretical and Diachronic Issues*, pages 227-244. Berlin: Mouton de Gruyter.

Hulst, Harry van der. 2011. Pitch Accent Systems. In M. van Oostendorp, C. J. Ewen, E. Hume & K. Rice, eds., *The Blackwell Companion to Phonology*, pages 1003-1026. Hoboken: Wiley Blackwell.

Hyman, Larry. M. 2009. How (not) to do phonological typology: The case of pitch-accent. *Language Sciences* (31):213-238.

Iosad, Pavel. 2016. Tonal stability and tonogenesis in North Germanic. In I. Giles, C. Laura, & C. Cooijmans, Ryan Foster and B. Tesio, eds., *Beyond Borealism: New perspectives on the North,* 80-97. London: Norvik Press.

Kager, René (1993). Alternatives to the iambic-trochaic law. *NLLT* 11(3):381-432.

Kehrein, Wolfgang. 2017. There's no tone in Cologne: against tone segment interactions in Franconian. In W. Kehrein, B. Köhnlein, P. Boersma and M. van Oostendorp, eds., *Segmental structure and tone*, pages 147-194. Berlin: Walter de Gruyter.

Kiparsky, Paul and Halle, Morris. 1977. Towards a Reconstruction of the Indo-European Accent. In L. Hyman, ed., *Studies in Stress and Accent. Southern California Occasional Papers in Linguistics Vol. 4*, pages 209–238. Department of Linguistics, University of Southern California, Los Angeles.

Köhnlein, Björn. 2011. *Rule reversal revisited: Synchrony and diachrony of tone and prosodic structure in the Franconian dialect of Arzbach*. Diss. Leiden University.

Köhnlein, Björn. 2016. Contrastive foot structure in Franconian tone accent dialects. *Phonology* 33(1):87-123.

Köhnlein, Björn. 2019. Metrically conditioned pitch accent in Uspanteko. In R. Goedemans, J. Heinz and H. van der Hulst, eds., *The study of word stress and accent: theories, methods and data*, pages 293-322. Cambridge: Cambridge University Press.

Köhnlein, Björn and Zhu, Yuhong (2019): Restricting the Power of Cophonologies: A Representational Solution to Stem Allomorphy in Uspanteko. *Proceedings of the 2018 Annual Meeting on Phonology*. San Diego.

Köhnlein, Björn, Carly Dickerson, James Leow and Paloma Pinillos Chávez. 2019.: Lexical tone or foot structure in Hong Kong English? A response to Lian-Hee Wee. *Language 95(3)*:e394-e405.

Lehfeldt, Werner. 1993. *Einführung in die morphologische Konzeption der slavischen Akzentologie*. München: Verlag Otto Sagner.

Morén-Duolljá, Bruce. 2013. The prosody of Swedish underived nouns: No lexical tones required. *Nordlyd 40(1)*:196-248.

Morrison, Donald Alasdair. 2019. Metrical structure in Scottish Gaelic: Tonal accent, glottalisation and overlength. *Phonology 36(3)*:391-432.

Saussure, Ferdinand D. 1894. A propos de l'accentuation lituanienne. *Mémoires de la Société de Linguistique* 8:425-446.

Schmidt, Ruth L. and Razwal Kohistani. 2008. *A grammar of the Shina language of Indus Kohistan*. Wiesbaden: Harrassowitz Verlag.