

What is Phonological Typology?

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“Whatever typology is, it is on a roll at the moment and likely to continue.”
(Nichols 2007: 236)

1. Introduction

The purpose of this paper is to address the question of what phonological typology is, can, or should be. To do so, one has to consider its relationship both to typology and to phonology in general. Such a task is complicated by at least three factors. First, there is no agreement on what typology is, let alone phonological typology. In an article entitled “What, if anything, is typology?”, the current president of the Association for Linguistic Typology writes:

“Typology has the hallmarks of a mature discipline: a society, conferences, journals, books, textbooks, classic works, a founding father [Joseph H. Greenberg], and people who are called and call themselves typologists.” (Nichols 2007: 231)

While most typologists would probably self-identify as studying the similarities vs. differences among languages, Nichols goes on to say that “despite these conspicuous identifying marks”, typology should not be recognized as a subfield of linguistics, but rather as “framework-neutral analysis and theory plus some common applications of such analysis (which include crosslinguistic comparison, geographical mapping, cladistics, and reconstruction)” (p.236). On the other hand, linguists who work in specific formal frameworks may engage in crosslinguistic comparison, but typically self-identify as syntacticians, morphologists, phonologists, etc. as they have less interest in issues of geography, language classification and history.

The second problem in characterizing phonological typology is that phonology is no longer the unified subfield that it once was. The following assessment appears in a recent review of the multivolume *Blackwell Companion to Phonology* (van Oostendorp et al 2011):

“Phonology is changing rapidly... Some phonologists collect the evidence for their theories using introspection, fieldwork and descriptive grammars, while other trust only quantitatively robust experimentation or corpus data. Some test phonological theory computationally... whereas others prefer to compare theories on conceptual grounds...”
(Gouskova 2013: 173)

Gouskova goes on to observe that the diversification within phonology has become so great that “it is becoming harder for for phonologists to talk to each other, for who can be a computer scientist, phonetician, neurolinguist and expert in adjacent fields such as morphology and syntax at the same time as having a command of the extensive literature on phonology-internal argumentation and phonological typology?” (p.173)

Finally, whether typology and phonology are coherent subfields or not, there has been precious little interaction between the two groups of scholars. Most typologists do not work on phonology per se and usually cite phonological examples only en passant, if at all (there is for example no phonology in Whaley's (1997) *Introduction to typology*). For their part, phonologists frequently invoke typology, but without participation in the society, conferences, journals etc. referred to above. While typology is currently centered around cross-linguistic morphosyntax, phonology has been transitioning from a descriptive/analytical to experimental field. Slightly oversimplifying, "traditional" phonology from the time of the phoneme has been concerned with the underlying structures needed to account for the properties of sound systems. The methodology has largely consisted of phonological argumentation on how best to analyze a wide range of cross-linguistic phenomena. Given that phonology is part of grammar, this naturally includes the interfaces of phonology with both morphology and syntax, where the connection to grammatical typology should be even more clear. However, today's phonologist is more likely to be involved in laboratory techniques where the methodologies are instrumental, experimental, statistical and computational. To the extent that the questions focus on how what is produced and how what is in the signal relates to the speaker's mind, ears, and vocal tract, the results may appear even more removed from the morphosyntactic core of the typology movement.

This non-intersection is highly atypical when compared with the interests of the founders of both fields. Joseph Greenberg's foundational work on typology and universals touched on virtually all aspects of phonology, e.g. syllable structure (Greenberg 1962, 1978), distinctive features (Greenberg, Jenkins & Foss 1967), vowel harmony (Greenberg 1963), nasalized vowels (Greenberg 1966), glottalized consonants (Greenberg 1970), word-prosodic systems (Greenberg & Kaschube 1976), and so forth. His historical work on African languages also included phonological reconstruction, e.g. of tone in Proto-Bantu (Greenberg 1948) and labial consonants in Proto-Afro-Asiatic (Greenberg 1958). It is thus striking how few major morphosyntactic typologists show an active engagement with phonology today (but see Evans 1995, Donohue 1997, Haspelmath 2006, Plank 1998, 2013, among others).

On the other side, the non-involvement of phonologists with the field of typology stands in stark contrast to the fact that phonology has been typological from its very beginning. In fact, the very notion of the phoneme is a typological one, as evidenced in the following oft-cited passage:

... it almost goes without saying that two languages, A and B, may have identical sounds but utterly distinct phone[mic] patterns; or they may have mutually incompatible phonetic systems, from the articulatory and acoustic standpoint, but identical or similar [phonemic] patterns. (Sapir 1925: 43)

The frequent comparison of allophonic aspiration in English with phonemic aspiration in Thai, Korean etc. is inherently typological, a statement about how different sound systems can "phonologize" the same or similar phonetic substance. Ever since the introduction of the phoneme phonologists have been unified in recognizing that phonological representations are distinct from the observed phonetics. In the 1930s the Prague School developed the phonetics-phonology distinction further, emphasizing how phonological systems differ in their structural properties. Trubetzkoy's (1939) *Grundzüge der Phonologie* is both a highly theoretical and a thoroughly typological work. As any textbook in phonology would explain, a specific phonetic

distinction may have a quite different status in different languages. A difference in voicing as in [t] vs. [d] may have a distinctive (paradigmatic) function in distinguishing between morphemes, e.g. *bit* vs. *bid* in English. It may instead have a demarcative (syntagmatic) function helping to determine where one is in the spoken chain. In Basaá there is a single set of underlying stops /P, T, K/, which are realized [p, t, k] in stem-initial position vs. [b, d, g] (~ [β, r, γ]) stem-internally (Hyman 2003: 259). As a result, the prefixed word /6a-Tâ/ ‘fathers’ is pronounced [batâ] while the suffixed word /6áT-â/ ‘gather’ is pronounced [bádâ] (~ [bárâ]). A third possibility is that the voicing difference is non-distinctive or allophonic. A well-known case of this comes from Korean, where /t/ is realized [d] intervocally. Thus, when /su/ ‘water’ and /to/ ‘way’ are compounded, the result is [sudo] ‘waterway, waterworks’. Among the other possibilities are free variation, as when the final /t/ of English *bit* is either released or not and what Trubetzkoy calls the expressive function, where differences indicate such things as social identity or attitude of the speaker, e.g. the “expressive” aspiration in the phrase *je t^h’aime* (Martinet 1960).

Once the phonological contrasts are established, a major component of Trubetzkoy’s *Grundzüge* was to provide a typology of the contrasts found in one vs. another system. He classifies distinctive contrasts in according to three different factors:

(i) Their relationship to the entire system of contrasts. This refers to the number of segments in the set. For example, the set of oral labial stops can be bilateral (/p/ vs. /b/) or multilateral (/p/ vs. /p^h/ vs. /b/), depending on the language. The relationship to the system is said to be proportional, if other segments exhibit a parallel relation, e.g. bilateral /t/ vs. /d/ or multilateral /t/ vs. /t^h/ vs. /d/. On the other hand, a contrast such as /l/ vs. /r/ is said to be isolated, since there is no other pair of phonemes which realizes a parallel contrast.

(ii) The relationship between the contrasting segments, which can be privative, gradual, or equipollent. In a privative contrast one member has a “mark” which is lacking in the other: Thus in a /p^h/ vs. /p/ contrast, /p^h/ has aspiration, while /p/ lacks it. Gradual contrasts refer to scalar features such as the vowel height differences between /i, e, ε, æ/ or the pitch height differences between High, Mid and Low tone. In equipollent contrasts the segments are considered “logically equivalent”. An example is labial /p/ vs. alveolar /t/, where each has a logically equivalent but different upper and lower articulator. Trubetzkoy is careful to distinguish “logically” vs. “actually” privative, gradual and equipollent, since it will depend on the system. While it makes no sense to think of /p/ vs. /t/ as differing on a continuous scale (they involve different articulators), Trubetzkoy might consider the relation to be privative if a language were to have only labial and alveolar places of articulation. In this case /p/ could be said to have a labial mark while /t/ lacks it.¹

(iii) The extent of the contrast. This refers to whether the contrast is realized in all environments or whether there are contexts in which the contrast is neutralized. A well-known example of this is German final devoicing, whereby /rat/ ‘advice’ and /rad/ ‘wheel’ are both realized [rat] in isolation. Another is flapping in American English, e.g. *metal* and *medal*, both pronounced [mɛrl] (cf. etymologically related *metallic* and *medallion* with [t^h] and [d]).

The above examples not only establish that early modern phonology was heavily steeped in typology, but that the founders had two different ideas of phonological typology, depending

¹ In the UPSID database (Maddieson & Precoda 1992) I have however not found a language which only has the two places of articulation, labial and alveolar. For accessing UPSID I have used Henning Rietz’s online interface: <http://web.phonetik.uni-frankfurt.de/upsid>.

on whether the starting point is substance vs. form. In the first approach one asks how different systems exploit a particular phonetic property. In the examples cited, it was seen that obstruent voicing can be distinctive, demarcative or allophonic. The possibilities can be more extensive, as in the case of nasality. As summarized below, there are at least five possibilities for how nasality may be underlyingly contrastive in a language (cf. Cohn 1993, Clements & Osu 2003):

- | | | | |
|--------|---------------------------|--------------------|--------------|
| (1) a. | on consonants only: | /m, n, ŋ/ | e.g. Korean |
| b. | on vowels and consonants: | /ĩ, ũ, ã, m, n, ŋ/ | e.g. Bambara |
| c. | on vowels only: | /ĩ, ũ, ã/ | e.g. Ikwere |
| d. | on whole morphemes: | /CVC/ ^N | e.g. Desano |
| e. | absent entirely: | ----- | e.g. Doutai |

In addition to the above distinctions, languages may vary in whether they contain voiceless nasals, prenasalized or nasally released consonants, as well in whether the contrasts are found on all nasalizable consonants (e.g. including liquids and glides) and on all vowels. Similar substance-directed typology can be done with virtually any phonetic feature or property, e.g. voicing, aspiration, rounding, and so forth (cf. (2)). Still being substance-directed, a typologist will likely be interested in how one vs. another of these properties is distributed in the languages of the world, whether by genetic affiliation or by geography.

The second approach to phonological typology is form-directed: In this case the analyst explores the logical properties of a specific model. The above examples from Trubetzkoy fall into this category, as he was interested in the logical differences in the nature of the contrasts that his model of phonology recognized. It mattered less that /l/ and /r/ differed in laterality or rhoticity than the fact that they constitute an isolated bilateral contrast in any language which has only these two liquids. This second, form-directed approach finds reincarnation in virtually every model, if not every proposal in phonological theory. Since early generative phonology proposed ordered rules (Chomsky & Halle 1968), it was only natural that a form-directed typology should develop how these rules apply to forms and, in so doing, how they affect each other: A phonological rule could apply to a form left-to-right, right-to-left, simultaneously, and cyclically or non-cyclically. Earlier applying rules could be in feeding, bleeding, counterfeeding, and counterbleeding relationships, creating and/or taking away inputs to which later rules could apply (Kiparsky 1968, Kenstowicz & Kisseberth 1977). More recently, within optimality theory (Prince & Smolensky 1993), all of the possible rankings can be exhaustively computed in a “factorial typology” (cf. Gordon 2007). In short, most any formal property can be “typologized” in terms of its logical parameters.

2. Phonology vs. typology

In both of the above approaches to phonological typology there has been a deep commitment to the idea that phonetics and phonology are distinct from each other. As Buckley (2000: 2) puts it, “... becoming divorced from the phonetics is the very essence of phonology.” The key goal of phonology has been to determine what is a possible phonological system. This has meant both determining the universal properties of sound patterns in languages as well as what’s going on in the heads of speakers with respect to these sound patterns. While these goals are directed towards the quest for universals, the traditional approach has been to seek universals through the study of language particulars, which can be quite diverse. Determining how

languages can vary within such confines has been the central goal of traditional typology, where there has been a distinction (confusion?) between two views of what typology is about. The first is that it concerns the classification of languages into “types”. Thus, Hagege (1992: 7) defines typology as “... a principled way of classifying the languages of the world by the most significant properties which distinguish one from another.” While it is harder to find explicit definitions of phonological typology, Vajda’s (2001) posting coincides with this view: “... it is possible to classify languages according to the phonemes they contain... typology is the study of structural features across languages. Phonological typology involves comparing languages according to the number or type of sounds they contain.” The other view, which I have termed property-driven typology (Hyman 2009: 213, 2012: 371), is that typology is not about the classification of languages but rather the characterization of linguistic properties: “Typology, thus, is not so much about the classification of languages as about the distributions of individual traits—units, categories, constructions, rules of all kinds—across the linguistic universe; these distributions, not languages as such, are the primary objects of comparison” (Plank 2001: 1399). Although I will come back to the issue of distributions as a crucial ingredient of typology, note for now that Greenberg (1974: 14) also explicitly recognizes the above two views: “...all synchronic typologies have this Janus-like nature in that the same data can be utilized either for a typology of linguistic properties or a typology of individual languages.”

One reason why there has been so little interaction between typologists and other linguists has been common misconceptions. Nichols’s (2007: 233-4) debunks the following four misunderstandings about typology, presumably including phonological typology:

1. typology deals with only superficial grammatical phenomena, while formal grammar deals with deeper abstraction
2. typology usually or often uses large surveys of hundreds of languages
3. in typology, explanations or theory are usually functionalist
4. the main theoretical constructs of typology are the implicational correlation and the implicational hierarchy

Concerning the first misconception, Nichols goes on to cite the following, to which I would add her own head- vs. dependent marking typology (Nichols 1986):

“I see no difference in analytic or theoretical profundity or abstraction between generative parameters and original contributions of typology such as direct object vs. primary object (Dryer 1986), verb-framed vs. satellite-framed lexicalization patterns (Talmy 1985, Slobin 2004), various aspects of alignment (e.g., Dixon 1994, Dixon & Aikhenvald (eds.) 2000), differential object marking (Bossong 1998, Aissen 2003), referential density (Bickel 2003), and others.”

Nichols goes on to say that most typologists do not exploit large databases, many (including herself) are not functionalists, and finally, implicational statements are “a convenient format for presenting and testing results... [but not] the be-all and end-all of typology.”

In fact, typologists disagree on a number of issues, including whether typology is a field,

“...what we call typology is not properly a subfield of linguistics but is simply framework-neutral analysis and theory plus some of the common applications of such analysis (which include crosslinguistic comparison, geographical mapping, cladistics, and reconstruction).” (Nichols 2007: 236)

whether it has internal subfields,

“Linguistic typology includes three subdisciplines: qualitative typology, which deals with the issue of comparing languages and within-language variance; quantitative typology, which deals with the distribution of structural patterns in the world’s languages; and theoretical typology, which explains these distributions.” (Wikipedia “Linguistic Typology”)

whether typology necessarily involves the quest for universals (or is about diversity),

“...the goal of typology is to uncover universals of language, most of which are universals of grammatical variation.” (Croft 2003: 200)

and what role of theory should be in typology:

“The hypothesis that typology is of theoretical interest is essentially the hypothesis that the ways in which languages differ from each other are not entirely random, but show various types of dependencies....” (Greenberg 1974: 54)

A traditional typologist might embellish but presumably not object to Evans & Levinson’s (2010: 2740) statement that “... the goal of linguistics is... to explain why languages have the properties they do” (vs. the goal of linguistics is to explain how a speaker with a finite and limited exposure can produce an infinite number of news sentences, how a child by the age of two can do such-and-such etc.). Be this as it may, let me return to the view that typology is something which phonologists do all the time (Hyman 2007). As I pointed out above via the quote from Sapir (1925), phonology has always been explicitly cross-linguistic. Thus, both phonological theory and phonological typology are concerned with how languages encode the same phonetic substance into structured sound systems:

“Phonological typology is a classification of linguistic systems based on phonological properties. There are four basic kinds of typology: ‘areal’ or ‘genetic’ typologies; typologies based on ‘surface phonological properties’; typologies based on some ‘underlying phonological property’; and ‘parametric’ typologies.... In addition, phonological typology can refer to the classification of the elements that make up a phonological system. For example, articulatory descriptors like ‘velar’ and ‘labial’ form part of a typology of speech sounds.” (Hammond 2006: 523)

The inseparability of phonology and typology continues unbroken right up to current optimality theory:

“One of the most compelling features of OT, in my view, is the way that it unites description of individual languages with explanation of language typology. As a phonologist, I have always been impressed and sometimes overwhelmed by how the complexity and idiosyncrasy of each language’s phonology is juxtaposed with the clarity and abundance of solid typological generalizations. Even though this is arguably the central research problem of phonology and of linguistic theory in general, progress in consolidating description and explanation has at best been halting and occasionally retrograde.” (McCarthy 2002: 1)

“The fundamental assumption of OT that constraint ranking varies from language to language has provided fertile ground for typological research in phonology.” (Gordon 2007: 750)

Concerning the relation to phonetics, phonological analysis has always been concerned with levels of representation, specifically with establishing the nature of underlying representations and how these are brought to the surface (by rules, input/output conditions etc.). While some take a single-level inventory approach to phonological typology, a meaningful PHONOLOGICAL typology must also be concerned with input-output relations and the notion of structural contrast. Typologies such as those found in Trubetzkoy (1939) or Hockett (1955) could not otherwise be possible.

“There is no clear division between phonological typology and phonological theory. Given their shared concern with the nature of phonological systems, one can’t do insightful typology without addressing the same analytical issues that confront phonological theory. Throughout the history of phonology, the two have been inseparable both in principle and in practice.” (Hyman 2007: 265)

In (1) above I provided a typology of the underlying representations nasality can have in different phonological systems. Similarly, (2) shows how different languages underlyingly systematize or “structure” Front and Round “color” contrasts:

- (2) a. on vowels and consonants /i, e, u, o, a/, /k, k^y, k^w/ etc.
- b. on vowels only /i, e, u, o, a/, /k/ etc.
- c. on consonants only /i, ə, a/, /k, k^y, k^w/ etc.
- d. on some vowels only /i, e, u, o, a, ɪ, A/
- e. on whole morphemes /...^y, /...^w

The systems in (2a,b) have triangular vowel systems with underlying front unrounded and back rounded vowels, while (2c) represents a vertical central vowel system with front and round features restricted to consonants (to which the centralized vowels typically assimilate). (2d) represents a vowel harmony system where some vowels are specified, others unspecified for Front and Round. Finally, as in the case of nasality, Front and Round can be prosodies on whole morphemes or words. Recall from (1) that some languages lack nasality entirely. The situation is different concerning Front and Round: While two languages (Qawasar and Yessan-Mayo) out of the 451 languages in the UPSID database (Maddieson & Precoda 1990, Maddieson 1991) lack a front vowel, both have the palatal glide /y/. Of the four languages

(Jaqaru, Alawa, Nunggubuyu and Nimboran) which lack a round vowel, only Nimboran also lacks the labiovelar glide /w/ and hence does not exploit the feature Round at all. (It is likely that a language will turn up that in parallel fashion does not exploit the feature Front.) No language has thus far been cited which fails to phonologize both Front and Round.

This does not necessarily mean that there will be a total lack of nasality, palatality or rounding in phonetic outputs. Examples such as (1) and (2) illustrate that phonological typology cannot be about surface outputs alone (for which we might distinguish PHONETIC typology). One has to make a choice of level, which is particularly problematic in the case of tone systems. For example, Ik (Heine 1993) and Kom (Hyman 2005) both have underlying /H, L/ but a third [M] (mid tone) on the surface which they derive by the following rules:

- (3) a. Ik L → M / ___ H
 b. Kom H → M / L ___

Since the trigger H may drop out after conditioning L tone raising in Ik, and similarly, the trigger L can drop out after triggering H tone lowering in Kom, these languages have two underlying-contrastive tone heights /H, L/, but three surface-contrastive tone heights [H, M, L]. Are these 2- or 3-height systems? The only adequate approach is to typologize on the basis of the relation between underlying and surface contrastive elements, i.e. both Ik and Kom have a 2→3 tone-height system.

3. Property-driven phonological typology

In this section I want to present the arguments in favor of basing phonological typology on properties rather than (whole) languages. There are at least four reasons to resist the temptation to taxonomize languages into “types” (Hyman 2012, in press). First, this gives the impression that the labels are mutually exclusive. A good example is the stress- vs. tone language distinction, about which van der Hulst (2011: 12) writes: “Hyman [2009] ... reduc[es] the typology of word prosodic systems to tone languages and stress languages.” Although the work in question recognizes two independent properties Tone and Stress-Accent, which produce four situations, as in (4), what van der Hulst really meant to say is that I do not recognize a third prosodic property called “pitch-accent”.

(4)

	<i>stress-accent</i>	<i>no stress-accent</i>
<i>tone</i>	Mayá, Usarufa, Fasu, Serbo-Croatian, Swedish-Norwegian, Ayutla Mixtec	Yoruba, Igbo, Kuki-Thaadow, Skou, Tokyo Japanese, Somali, W. Basque
<i>no tone</i>	English, Russian, Turkish, Finnish, Arabic	Bella Coola, French, Tamazight, Seoul Korean, Indonesian

A second reason to avoid labeling language types is that this gives the impression that there is a unique taxonomy. Consider the following hypothetical exchange over whether German should be classified with English vs. French on the basis of its vowel system. To illustrate, consider the hypothetical exchange in (5):

- (5) Typologist #1: German should be classified with English as a “tense-lax vowel language”, since both contrast /i, u/ vs. /ɪ, ʊ/ (etc.), as opposed to French.
 Typologist #2: No! German should be classified with French as a “front-rounded vowel language”, since both have /ü, ø/, as opposed to English.
 Typologist #3 (e.g. me): No! You’re both wrong. A property-driven typology would look like the following table, which allows us to also add Spanish:

	<i>lax high vowels</i>	<i>no lax high vowels</i>
<i>front-rounded vowels</i>	German	French
<i>no front-rounded vowels</i>	English	Spanish

An example of such an unproductive controversy arises in Beckman & Venditti who ask “Is typology needed?” (2010: 641) and argue against typologizing prosodic systems solely by function (e.g. tone vs. stress-accent) because Mandarin tonal L+H is allegedly like English intonational L+H*:

[That one is a toneme and the other intonational] “does not change the fact that these two languages are far more like each other in many other respects than either is to a language such as Japanese.” (Beckman & Venditti 2011: 531)

While Beckman & Venditti find the Mandarin and English L+H similarities significant, compare the more usual view of Gussenhoven’s (2007: 256) concerning the similar H+L in Japanese and English:

“While phonologically comparable, the pitch accents of Japanese and English have very different morphological statuses. In Japanese, they form part of the underlying phonological specification of morphemes, along with the vowels and consonants. Intonational pitch accents are morphemically independent of the words they come with, and are chiefly used to express the information status of the expression. The fact that the English example... seems to have an accentuation similar to the Japanese example... *is entirely accidental.*” (my italics; cf. Hyman 2012)

Related to this is the third argument: assigning a name to a system can give the false impression that something has been accomplished. On numerous occasions I have been approached with the comment, “I think my language may have pitch-accent, not tone.” Upon probing such pronouncements further I find that this often means nothing more than the feeling that the tonal contrasts are more sparse in this language than in certain other languages which contrast tone on every syllable.

This brings us to the fourth reason to avoid whole taxonomies: the labels are often unclear. An “X language” can mean at least the following: (i) a language that has X, e.g. a “tone language” has tone, a “click language” has clicks; (ii) a language that lacks X, e.g. an “open syllable language” lacks closed syllables, an “intonation language” lacks tone or stress:

“intonation language *n.* A language which is neither a **tone language** nor a **pitch language**; a language in which the universally present intonation constitutes the only linguistic use of pitch.” (Trask 1996: 184)

(iii) a language that marks X more than certain other languages, e.g. “tone language” vs. “pitch-accent language”, “syllable language” vs. “word language”:

“A pitch-accent system is one in which pitch is the primary correlate of prominence and there are significant constraints on the pitch patterns for words...” (Bybee et al 1998:277).

“A syllable language is one which dominantly refers to the syllable, a word language is one which dominantly refers to the phonological word in its phonological make-up.” (Auer 1993: 91)

(iv) a language which combines a specific set of linked properties into a “holistic” typology (see especially Plank 1998):

“... there are obvious links between phonology and morphology; for example, it has been argued—most probably correctly—that vowel harmony is a phenomenon of agglutinating languages, or that fusional languages have more morphophonological rules than isolating ones. There may also be links between phonology and syntax, e.g. between head/modifier (operator/operand) serialization and the location of (sentence or word) stress.” (Auer 1993: 1-2)

“Vowel harmony is a phonological process relating to the morphological word in syllable-timed languages, whereas vowel reduction is a phonological process relating to the phonological word in stress-timed languages.” (Auer 1993: 8) (cf. Donegan & Stampe 1983)

Such multi-property typologies invariably run into exceptions, and hence proposals of prototypes. A potentially useful deductive strategy is the canonical approach to typology:

“The canonical approach means that I take definitions to their logical end point, enabling me to build theoretical spaces of possibilities. Unlike classical typology, only then does one ask how this space is populated with real instances. The canonical instances, that is, *the best, clearest, indisputable* (the ones closely matching the canon) are unlikely to be frequent.... Nevertheless, the convergence of criteria fixes a canonical point from which the phenomena actually found can be calibrated, following which there can be illuminating investigation of frequency distributions.” (Corbett 2007: 9; my italics—LMH]

In prosody, canonical systems combine properties to meet a basic function (Hyman 2012). In Prague School terms, the definitional function of stress-accent is *syntagmatic*: It should unambiguously identify and mark off major category words within utterances. To best do this, canonical stress-accent therefore should be:

- (6) a. obligatory : all words have a primary stress
- b. culminative : no word should have more than one primary stress
- c. predictable : stress should be predictable by rule (“fixed”)
- d. autonomous : stress should be predictable without grammatical information
- e. demarcative : stress should be calculated from the word edge
- f. edge-adjacent : stress should be edge-adjacent (initial, final)
- g. non-moraic : stress should be weight-insensitive
- h. privative : there should be no secondary stresses
- i. audible : there should be phonetic cues of the primary stress

In other words, stress should be “biunique”: One should be able to predict the stress from the word boundaries and the word boundaries from the stress. Stress is thus highly syntagmatic.

This contrasts with the definitional function of tone which, like segmental features, is to distinguish morphemes. Thus, for a two-height [H, L] system to best realize this function, the properties of the canonical system should be:

- (7) a. bivalence : both H and L are phonologically activated
- b. omniprosodicity : every tone-bearing unit (TBU) has a H or L
- c. unrestrictedness : all combinations of H and L occur
- d. faithfulness : every /H/ or /L/ is realized on its underlying morpheme and TBU
- e. lexical : /H/ and /L/ should contrast on lexical morphemes (> grammatical morphemes)
- f. contours : HL and LH contours should be possible on a single TBU
- g. floating tones : H and L tonal morphemes and lexical floating tones should be possible

In contrast with the above, there is no canonical function for so-called “pitch-accent” systems. Each of the following possibilities either fails to provide a distinct function from that of stress-accent or represents an arbitrary criterion:

- (8) a. a language which has an obligatory (but not necessarily culminative) H tone per word?
- b. a language which has a culminative (but not necessarily obligatory) H tone? (Hualde, in press)
- c. a language which has either a culminative OR an obligatory H tone? (van der Hulst 2011)
- d. a language which has privative H tones (/H/ vs. Ø)? (Clark 1988)
- e. a language which limits tonal contrasts to the stressed syllable?
- f. a language which restricts its tones in whatever way?
- g. a language which has only two tone heights (H, L)?

“... if we push the use of accents to its limits (at the expense of using tones), this implies allowing unaccented words (violating obligatoriness) and multiple accents (violating culminativity). In this liberal view on accent, only languages that have more than a binary pitch contrast are *necessarily* tonal....” (van der Hulst 2011: 13)

If systems can be as “liberally” typologized as in the van der Hulst entertains, then something is clearly wrong. I suggest it is the misguided notion that the goal of phonological typology is taxonomize languages into pre-determined named “types”. If we instead focus on the properties, rather than classifying languages or their subsystems, we will better be able to appreciate the richness of the variation found in the world’s languages.

4. Where phonology and typology part company?

So why should we distinguish phonological typology from phonology property? After all, phonology has always been typological, developing its models on the basis of extensive cross-linguistic data (Chomsky & Halle 1968 cite over 100 languages, for instance). However, there are aspects of typology in which most phonologists have expressed little interest, e.g. mapping out phonological properties by geography, language family or historical contact. (Some have little interest in linguistic reconstruction and language history as well.) Diverging from the traditional view of typology that I have been discussing is the typological distribution perspective “What’s where why?”:

“In the past century, typology was mostly used as an alternative method of pursuing one of the same goals as generative grammar: to determine the limits of possible human languages and, thereby, to contribute to a universal theory of grammar... that would rule out as linguistically impossible what would seem logically imaginable, e.g., a language with a gender distinction exclusively in the 1st person singular. Over the past decade, typology has begun to emancipate itself from this goal and to turn from a method into a full-fledged discipline, with its own research agenda, its own theories, its own problems. What has reached center-stage is a fresh appreciation of linguistic diversity in its own right, and the new goal of typology is the development of theories that explain why linguistic diversity is the way it is—a goal first made explicit by Nichols’s (1992) call for a science of population typology, parallel to population biology. Instead of asking “what’s possible?”, more and more typologists ask “what’s where why?”. (Bickel’s 2007: 239)

To the theoretical phonologist it matters little that retroflex or ejective consonants cluster geographically in certain areas or occur only in certain language families. Instead, phonologists, like other formal linguists, have mostly been interested in the question of what is a possible phonology:

“Most theoretical linguists, from whatever camp, consider that it is a central goal of theoretical work on grammar to distinguish possible grammatical processes from impossible ones and—for the former—to explain why some possible processes seem more common [probable] than others.” (Newmeyer 2005: 27)

Concerning this growing conception of typology, my impression is that traditional phonology has been less concerned with the “where” than the “how” (as in “how should we analyze this system?”). In this connection, what is the difference between a phonological typologist and a formal phonologist who works on languages? Is it a matter of goals (“research agenda”),

emphasis, or initial assumptions? The following characterizations from Croft's (2007: 87) are reminiscent of the distinction I made between substance vs. form as the starting point in comparing phonological systems:

“... the structuralist and generative method assumes the same formal theoretical entities to exist across languages, and then looks for constructions with distribution patterns that appear to distinguish those formal theoretical entities in the language.”

“Typological analysis proceeds very differently. A typologist uses a functional definition of a situation type, such as the Keenan-Comrie functional definition of relative clauses, and compares the different grammatical constructions used for that function across languages, and seeks relationships among the constructions (or grammatical properties of the constructions).”

While such a distinction may be recognizable to many linguists, structural and generative phonologists who have done cross-linguistic studies and surveys differ in the degree to which they are concerned about geographic and genetic distributions. Thus, comparing the various cross-linguistic studies of stress-accent, compare the different weighting given to the “what” vs. “where” in Hyman (1977) and van der Hulst et al (2010) vs. Halle & Vergnaud (1987) and Hayes (1995). These studies may even differ in how they answer the “why”. (For an explicitly distributional typology of phonological properties conducted by two generative-structuralist phonologists, see Clements & Rialland 2008.)

This brings us to the role of historical explanation and the question of how to reconcile universals vs. diversity in phonological systems, which Kiparsky (2008: 52) addresses as follows:

“An increasingly popular research program seeks the causes of typological generalizations in recurrent historical processes, or even claims that all principled explanations for universals reside in diachrony. Structural and generative grammar has more commonly pursued the reverse direction of explanation, which grounds the way language changes in its structural properties. The two programs can coexist without contradiction or circularity as long as we can make a principled separation between true universals, which constrain both synchronic grammars and language change, and typological generalizations, which are simply the results of typical paths of change.”

I think this sums up the non-contradiction in the fact that most phonologists both seek to determine what is universal AND at the same time appreciate the diversity that we find in the sound systems of the world's languages. In a rare article reflecting on the nature of phonological typology, Dressler (1979) applies Seiler's (1979) inductive vs. deductive typology to phonology:

“Work in the typology of process phonology is usually inductive.... The usual method of research is the sampling of similar phonological processes in different languages, the enumeration of frequent, general or exceptionless properties, of their clustering, of probable hierarchies and implications, and attempts at explanation by reference to phonetic data.... Much less frequent are deductive process phonological typologies,

although they are of primary importance, if typology should be based on language universals research...” (p.261)

He goes on to point out the following apparently contradictory observations concerning phonological typology:

“Deductive research is easier in phonology than in grammar, since we simply know more about the phonologies of the languages of the world than about their grammars; on the other hand less deductive typology has been done in phonology than in grammar.” (p.262)

Of course this all depends on what one counts as “phonological typology”. The original title of the workshop was “What is phonological typology—and why does it matter?” As a brief answer: we need to do phonological typology for the same reason we do general phonology: in order to understand why phonologies are the way they are. However, in the ever expanding, diverse field of phonology, we have the opportunity to incorporate the “What, where, why?” in a way that is harder in other subfields of linguistics. Phonologists can and should be involved in (i) looking at phenomena both in breadth (quantitatively) and in depth (qualitatively), (ii) identifying the geographical and genetic distributions of the phenomena, and (iii) considering a wide range of potential explanatory sources in addressing the “why?” It is only in so doing that we will attain a complete picture of what phonology can vs. cannot do and why.

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