The importance of typology in explaining recurrent sound patterns

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1. Recurrent sound patterns

A point of consensus in phonology is that numerous sound patterns recur in the world's languages. Recurrent sound patterns are those which recur with greater than chance frequency, and include patterns of contrast, patterns of distribution, and patterns of alternation. Recurrent sound patterns are found in synchronic and diachronic systems, and include the most common segmental and suprasegmental contrasts; the most common types of assimilation, dissimilation, metathesis, lenition, fortition; and recurrent phonotactics (Blevins 2004).

As a concrete example, consider the recurrent case of word-final obstruent devoicing. In many languages, a contrast between /p t k/ and /b d g/ is suspended word-finally, where only /p t k/ occur, and the same neutralization is found as a common sound change. This sound pattern is recurrent and found in unrelated language families around the world, with clear evidence of multigenesis. It appears to occur with greater than chance frequency and contrasts dramatically with word-finally obstruent voicing, which is rare or non-existent (Blevins 2006a).

Recurrent sound patterns are interesting because their existence calls for an explanation. Why are certain sound patterns recurrent while others are rare? Why do similar sound patterns recur in synchronic and diachronic domains? What, logically, are the potential sources of similarity for recurrent sound patterns, and how can these be investigated and assessed? Answers to these questions continue to guide phonological research, with especially promising results found for sound patterns with clear phonetic bases (Blevins to appear). Here, I briefly comment on the important role of typology in attempts to understand and explain the nature of recurrent sound patterns.
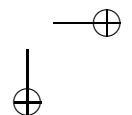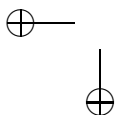
2.   Explaining recurrent sound patterns: Potential sources of similarity

There are at least six potential explanations for why two or more languages may exhibit similar sound patterns. These are listed in (1) for reference.

(1)   Six potential sources of similarity in sound patterns:
         a.   direct inheritance (from mother tongue);
         b.   indirect inheritance (contact, prescriptive norms, literacy);
         c.   phonetic factors (articulatory, aerodynamic, perceptual);
         d.   language-specific factors (lexical, structural, self-organizing);
         e.   cognitive factors (including potential linguistic universals);
         f.   chance.

First, two languages may have similar sound patterns because these sound patterns were directly inherited from a mother tongue. In Australia, many Pama-Nyungan languages display similar medial CC cluster phonotactics; however, it would be incorrect to classify this as a recurrent sound pattern, since it is due to direct inheritance, with similar phonotactics rare outside of the Pama-Nyungan family. Second, two languages may have similar sound patterns due to indirect inheritance, where a sound pattern is the result of language contact, prescriptive norms, literacy, or second-language learning. This source can result in "unnatural" sound patterns, very different from those with other sources (Blevins 2006b). Third, similarities across languages may result from the natural bases of these sound patterns, where natural sound patterns are those grounded in physical aspects of speech articulation and speech perception. Natural recurrent sound patterns, like the word-final obstruent devoicing mentioned above, are well studied, with concrete results for numerous types (Blevins to appear). A fourth possible source of similarity in sound patterns arises due to specific pre-existing properties of the linguistic system that the sound patterns are embedded in. For example, nearly all languages with compensatory lengthening show pre-existing vowel length contrasts, suggesting that a contrast in vowel length facilitates compensatory lengthening sound patterns (Blevins 2004: 153–155). This phenomenon, sometimes referred to as "drift" in the historical literature and "self-organization" in evolution studies, is just beginning to be fully appreciated in phonological modeling (Wedel 2006, to appear; Oudeyer 2006). A fifth potential source of recurrent sound patterns (1e) is general cognitive constraints, which are independent of phonetic factors (1ic) or language-specific factors (1d). These can be quite general, involving categorization strategies and memory constraints, or very specific, like the many phonological markedness constraints proposed in Optimality Theory (Kager 1999, McCarthy 2002). A final possibility is that recurrent sound patterns are purely accidental, due to chance. In this case, though a pattern might appear to be recurrent, it is fundamentally not a recurrence of one pattern, but convergence of distinct patterns

with superficial resemblances. Japanese and Kiribati both have a phonotactic constraint limiting word-final consonants to nasals, though in the former, it is by indirect inheritance, while in the latter, the sound pattern has a phonetic basis (Blevins 2004: 49–50).

3. The importance of typology

A range of recurrent sound patterns have been discovered in the world's languages, with a great deal of phonological research devoted to explaining their existence. Typology plays an important role in this research, since it is only with good typological studies that recurrent sound patterns can continue to be identified and explained. Why is typology important in the study of sound patterns? Three basic reasons are listed in (2), with further discussion in the paragraphs that follow, including contributions to these areas in the pages of *Linguistic Typology*.

(2)   The importance of typology in the study of recurrent sound patterns:
   a.   defining recurrent sound patterns (basic classification, identification);
   b.   guiding analysis (relating parallel sound patterns);
   c.   providing evidence for/against particular hypotheses, like sources in (1).

3.1. *Typology for the purposes of classification, frequency assessment, and finding sound patterns which need to be explained*

Typological studies are important in defining precisely the sound patterns that are common and recurrent across the world's languages. Sound patterns, whether at the level of contrasts, alternations, or phonotactics must be defined, recognized and classified. It must then be determined whether they are areal features, inherited features, or have some other source. This classificatory step is skipped by many analysts, with notions of "common" and "rare" based on idiosyncratic samples of the world's languages, or those sound patterns which are the most likely to be discussed in textbooks. Only with solid definitions of recurrent sound patterns and catalogues of their distribution can we assess the validity of explanations in (1).

In this area, there have been a range of stimulating publications in the pages of this journal. These include: Donohue's (1997) valuable survey of tone systems in New Guinea; Evans' (2000) description of unusual features of the Iwaidjan language family as compared with other Australian languages; Olson & Hajek (2003) on crosslinguistic properties of the labial flap, a somewhat rare phonetic animal; Casali (2003) on relationships between types of [ATR] harmony, and the vowels systems they occur in; and the sketch of Mwotlap by Alexandre (2005). In addition to its unusual consonant inventory, Mwotlap

may, as suggested in Section 3.2, provide an important piece of evidence for the naturalness of a sound change claimed to be especially unnatural.

Donohue (1997) and Casali (2003) lay the groundwork for further investigations into the relationships between tone and vowel-harmony systems, respectively, and other aspects of sound systems of these languages (1d), and the same is true for the rare features of Iwaidjan noted by Evans, provided that contact can be ruled out. Olson & Hajek (2003) provide an extensive crosslinguistic database to support the existence of bilabial and labio-dental flaps, their contrastive status in certain languages, their genetic and areal distributions (1a, b), and their phonetic properties (1c).

3.2.   *Typology as a guide to analysis*

A second use of typological studies is as a guide to linguistic analysis. Once there is a clear and precise classification of occurring patterns, a new pattern may be evaluated with respect to existing ones. In diachronic analysis, where pieces of the puzzle (living speakers, phonetic studies of them, etc.) may often be missing, typological work can be particularly useful in guiding the analysis in one direction over another (e.g., Comrie 2001, reviewed in this journal by Lazard 2004: 402). While a great deal of literature in this area has as its focus the nature of contrastive phoneme inventories, typology can serve a useful purpose in evaluating natural aspects of sound change as well.

As a concrete example, consider Blust's (2005) claim that the sound change in (3) which has occurred independently in the history of at least two Austronesian languages, is unnatural, having no clear phonetic or phonological basis.

(3)   A non-linguistically motivated sound change (Blust 2005):
         *-b/-d/-g > -m/-n/-ŋ in Northern Batak & Berawan.

Compare this sound change with a synchronic alternation described by Alexandre (2005) for Mwotlap in (4). The Mwotlap consonant inventory includes the oral and nasal stops: /kpʷ t k ᵐb ⁿd ŋmʷ m n ŋ/.

(4)   A synchronic alternation in Mwotlap (Alexandre 2005):
         ᵐb, ⁿd _ m, n / _. (syllable-finally).

Blust's (2005) argument for (3) as an unnatural sound change is that (i) there is no phonetic basis for the change and (ii) there is no intermediate step that would be likely to result in a natural progression of voiced stops to final nasals. However, the Mwotlap data suggest a natural explanation. If pre-nasalized allophones of final voiced stops in Northern Batak and Berawan existed prior to the sound change, one need only posit the same lack of velic raising seen in Mwotlap in syllable-final position. This is just one example of how detailed

typological data continues to guide phonological analysis, sometimes in unexpected ways.

3.3.   *Typology as evidence for, or against, a particular hypothesis*

Typology is best known in the context of proposed universals. A pattern, correlation, or tendency is posited for all languages, and representative surveys of the world's languages are used to evaluate whether or not the pattern, correlation, or tendency is valid.

In the study of sound patterns, there are few exceptionless universals, but many strong tendencies. The majority of these tendencies appear to follow from the articulatory and perceptual bases of speech (Blevins 2004, to appear). However, researchers have also suggested that sound systems may co-vary in systematic ways with morphological and syntactic systems. A thorough review of this topic can be found in Plank's (1998) paper in this journal, with three subsequent articles devoted to case studies of different types. Trudgill's (2004) target article explores possible social factors (size of community, type of social network, and degree of contact with speakers of other languages) on the size of phoneme inventories. Bybee (2005) provides a crosslinguistic study exploring whether inflectional affixes tend to used a restricted set of phonemes corresponding to "unmarked" sounds. A final study of cross-system correlations is Shosted (2006). Shosted formalizes the "negative correlation hypothesis" (that if one component of a language is simple another will be complex) and subjects it to statistical analysis, focusing on potential correlations between complexity in syllable structure and morphological complexity.

In various ways, all of these studies have negative results. Though Trudgill (2004) argues for a positive correlation between social factors and phoneme inventory, the replies to his paper suggest that when the empirical basis of his claims are carefully reviewed or extended, no such positive correlations exist. Bybee (2005) finds only a weak trend in the restrictions on the use of phonemes in inflexional affixes, and suggests that this trend may itself be the result of an interaction of complex factors, including phonological reduction in grammaticization, and the re-use of old affixes. Shosted (2006) finds a slightly positive correlation between complexity in syllable structure and morphology, but one that is statistically insignificant. Again, there is no positive evidence for an inverse relation between these two factors. These studies highlight potential problems with the cross-system co-variables they are meant to test, and also point to the difficulties one faces in controlling multiple variables where natural language data is the object of study.

Though the negative results of these studies might suggest that Plank's (1998) hopeful history was overly optimistic, at least one positive finding in this area has been published elsewhere. Crosslinguistically rare phonological contrasts

are strongly associated with a morphological contrast of a very specific type, where the phonological contrast is the sole exponent of a morphological paradigmatic contrast. In these systems, where common neutralizing instances of sound change are expected, the maintenance of paradigmatic contrast appears to slow or inhibit sound change (Blevins 2004: 204–209).

It is much harder to point to typological studies in *Linguistic Typology* which argue FOR a particular hypothesis regarding recurrent (or rare) sound patterns on the basis of typological findings. Perhaps this is because there are many other publication venues for work of this kind, or because authors with typological support for particular hypotheses tend to send their work to more theoretically-oriented journals. Whatever the reasons, *Linguistic Typology* might seek more balance in its coverage of phonetics and phonology by encouraging more submissions in this area.

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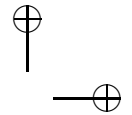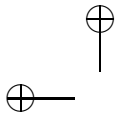
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