'Fortition is impossible. But does it occur?'

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Lenition (or 'weakening'), a common type of process in the phonology of the world's languages, involves processes like spirantisation (in which, for example, b, d, g come to be realised as β~v, ð, ɣ) and debuccalisation (in which, for example, fortis fricatives such as f, s or x come to be realised as h). Attempts to make sense of lenition as a phonological phenomenon have provided fertile ground for representational phonological theories, such as element theory (e.g., Harris 1994, Backley 2011). In approaches of this type, phonological processes are only possible if they are motivated by the environment in which they occur (the 'Non-Arbitrariness Principle' - see Balogné Bérces & Honeybone 2020). Thus, in the same way that assimilations are expected in phonology due to the spreading of subsegmental material from a local source, lenitions can be compellingly modelled in such approaches as segmental decomposition/delicensing, which is expected in prosodically 'weak' positions.

It is sometimes argued that 'the opposite of lenition' also occurs in phonology - that is: fortition (or 'strengthening'). For example, Blevins (2015) argues that “while regular sound changes involving strengthening are, overall, less common than weakening ... they ... require a place in any sound change typology”. Although this is phrased as a diachronic claim, 'sound change' is regularly interpreted as 'the addition of a phonological process to a language', so this could also be a claim about synchronic grammars.

For phonological models of the representational type (as discussed above), fortition would need to involve the addition to a segment of subsegmental material with no local source, which would violate the Non-Arbitrariness Principle. Fricatives would need to acquire occlusion from nowhere, for example, or h would need to acquire arbitrary place features. Fortition is thus predicted in such models to be impossible. In this talk, I tackle this issue head on. I consider several cases of phonological phenomena which have been argued to be examples of fortition (such as h becoming realised as ç in Tinrin, h becoming realised as s in Singhi, β becoming realised as b in Spanish, and β, ð, ɣ becoming realised as b, d, g in Germanic) and show that they in fact have better explanations as something else (that is: they only ***look like*** they are cases of fortition, but if we think about them carefully, they do not fit the bill as authentic cases of 'the opposite of lenition'). I argue, therefore, that Blevins' claim cannot be interpreted synchronically: fortition does not occur in phonology, just as element-theory-type representational phonology predicts.

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High vowel devoicing revisited: preferentiality, universality and typology

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Up to now, two approaches have dominated the study of language universals: the Chomskyan generative approach whose aim is to find the innate Universal Grammar that can explain how a child acquires its native tongue with such ease (Chomsky 1965 *et seq.*); and the Greenbergian approach whose typological analysis looks for implicational universals to explain the cross-linguistic diversity (Greenberg 1966 *et seq.*). Recently, these two approaches have been criticized by Evans and Levinson (2009 *et seq.*) for lack of absolute universals and coherent typology.

In this paper, I take a third approach, in which an absolute universal is sought by looking for preferential conditions on universal processes, which in turn predict cross-linguistically what rule configurations are possible and what are not, thus tightly constraining the variation in the typology. Taking hints from what Greenberg (1969) calls dynamic comparison of languages and Foley's (1977) preferential linguistic change, I first analyze vowel devoicing in the nine languages Greenberg presents for evidence of his implicational universal on high vowel devoicing (Table 1). His universal, when restated as a preferential principle, 'the higher the vowel, it is more likely to devoice', predicts that of the eight logically rule configurations, only four (types 1, 2, 3 and 6) are linguistically possible (Table 2). However, this prediction does not hold for some languages because many other factors besides vowel height affect vowel devoicing, e. g. front- or back-ness of the vowel, length, stress and pitch, which raises the question of what really controls it.

A different picture emerges in recent phonetic studies of devoicing. In languages such as Japanese, Modern Greek, and French, the experimental results show that vowel devoicing is typically variable and gradient, so that its preferentiality among vowels manifests as robustness of occurrence, with high vowels in general showing higher rate of devoicing than low vowels. But there are discrepancies: in Tokyo Japanese, for example, /u/ seems to devoice more robustly than the front /i/, contrary to what happens in Korean, Turkish and French.

The overriding question is thus: what is the primitive that governs preferential devoicing? Delving into this question from diverse angles leads to the conclusion that it is vowel sonority, or its acoustic equivalent, resonance, that controls vowel devoicing in languages, even though we are far from calculating it precisely. This is based on the premise that as a phonetic process, the event of vowel devoicing occurs automatically, under the universal condition that the resonance value of the vowel be sufficiently small: $|VR| \leq \delta$. Since unlike consonants the articulatory gestures of vowels often vary from language to language, the VR value will vary accordingly, giving parochially defined resonance hierarchies. In Tokyo Japanese, /u/, as the shortest vowel, will be the lowest on such scale, thus the most likely to devoice, but in Korean, Turkish and French, the ranking will be reversed, with /i/ being lower and more likely to devoice than /u/, *ceteris paribus*.

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Table 1 High vowels and voicelessness (cf. Greenberg 1969: 169)

Language	Voiceless and voiced	Voiced only
Awadhi (Indo-Aryan)	i, u, e	a, o
Campa (Arawakan)	i	o, e, a
Chatino (Otomanguean)	i, u	o, e, a
Dagur (Mongolic)	i, u, e([ə])	o, a
Huichol (Uto-Aztecan)	i, ʌ([ɨ]), e	u, a
Serbo-Croatian (South Slavic)	i, u	o, e, a
Tadjik (Indo-Iranian)	i, u, a	e(:), o(:), ú(:)
Tunica (Amerindian)	u	i, e, ɛ, a, ɔ, o
Uzbek (Turkic)	i, u	e, ɔ, o, a

Table 2: Rule configurations for vowel devoicing (O = devoicing, X = no devoicing)

Configuration type / Vowel height	1	2	3	4	5	6	7	8
high	O	O	O	X	X	X	O	X
mid	X	O	O	O	X	X	X	O
low	X	X	O	O	O	X	O	X