

Typological Tendencies in Phonological Conspiracies
 (excerpts from a longer paper)
 Heather Newell, UQAM

1 Introduction

It is well known that phonological operations apply in ways such that optimal outputs emerge either language-internally (Kisseberth 1970) or cross-linguistically (Hyman 2008). One classic example of this kind of phonological conspiracy is demonstrated by the fact that hiatus is often dispreferred, and may be resolved in multiple ways; deletion of one of the two offending vowels (1a), coalescence (1b), gliding (1c), or intervocalic glide/consonant epenthesis (1d). For an overview of hiatus resolution strategies see Casali (2011).

- | | | | | |
|-----|----|-----|--|--|
| (1) | a. | i. | [akwe:m]
akwe:-im
WOMAN-POSS | ‘his wife’

(Ojibwe; Newell & Piggott 2014) |
| | | ii. | $V_1V_2 \rightarrow V_1$ | |
| | b. | i. | [ajdɔ̃:]
ajdo-a
SHAME-ACC.SG | ‘shame (ACC SG)’

(Attic Greek; de Haas
1988) |
| | | ii. | $V_1V_2 \rightarrow V_{12}$ | |
| | c. | i. | [rjorganizar]
re-organizar
RE-ORGANIZE | ‘reorganize’

(Portuguese; Bermúdez-Otero & Luis 2009) |
| | | ii. | $V_1V_2 \rightarrow G_1V_2$ | |
| | d. | i. | [brijas]
bri-as
CRUSH-HIM | ‘crush him’

(Berber; Lahrouchi 2013) |
| | | ii. | $V_1V_2 \rightarrow V_1GV_2$ | |

When a single language contains a conspiratorial pattern (two or more resolution strategies for a single illicit target) the environments within which each repair is effected are not random. They are governed by a, to my knowledge, previously unreported pattern in the literature; what I will call Language-Internal Conspiratorial Persistence (LICP).

(2) *Language-Internal Conspiratorial Persistence*

If the grammar of a language X contains multiple resolution strategies for the same illicit configuration, an inter-cyclic repair in a domain $x+1$ will not be more destructive than an intra-cyclic repair in domain x .

An example of (2) can be seen in the hiatus resolution strategies of the Odawa dialect of Ojibwe (Algonquian). Newell & Piggott (2014) demonstrate that hiatus in this language is resolved through deletion when it emerges within a single phonological cycle (or phase) (3a), and by epenthesis when this hiatus emerges after interpretation of both vowels in separate cycles (3b). See §2 for a more detailed discussion of the derivations in (3) and for the specifics on determining the relevant cyclic domains. Here EP (Event Phrase, roughly equal to vP) and CP are the relevant cycles or phases.

- (3) a. i. mi:dʒimaw ‘eat something belonging to someone’
[mi:dʒi-amaw]_{EP}
EAT-APPLICATIVE
- ii. $V_1V_2 \rightarrow V_1$
- b. i. nigada:gam-ose: ‘He will (probably) walk in snowshoes’
[ni-ga-[a:gam-ose]_{EP}]_{CP}
1-FUT-SNOWSHOE-WALK
- ii. $V_1V_2 \rightarrow V_1CV_2$

What is important to note here for the discussion that follows is that the hiatus resolution strategy in (3a_{ii}) results in a more opaque surface form than that in (3b_{ii}); the resolution strategy applied in the first (or smaller) cycle is more destructive to the underlying form than is the strategy applied in the second cycle. It will be argued here that no grammar may contain multiple resolution strategies that go counter to (2). In other words, there can be no language, Ojibwe-prime, with identical morpho-syntactic structures and cyclic derivations as Ojibwe, where (3b_{ii}) applies intra-cyclically (first cycle), and (3a_{ii}) applies inter-cyclically (second cycle). This pattern will be argued to have consequences for a theory of the possible form of phonological rules. Multiple repair strategies like in (3) are argued herein to necessarily form part of a single phonological rule. The specific sub-clauses of such a multiple-repair strategy rule are tied to phonological structure-building algorithms that apply within an interpretive cycle. More specifically, it will be proposed that the above pattern arises due to the organization of conspiratorial phonological rules (ex. deletion, epenthesis) as affected by structures that inhibit the application of a particular phonological process, akin to the proposal in Honeybone (2005). Honeybone notes that ‘sharing gives strength’, noting that more structural links (say in geminates or place-sharing NC clusters) inhibits the application of lenition. Here, what is noted is that sharing is not necessary to derive strength, but that strength can be related to the presence of any structural link, in comparison to its absence. What this entails is that phonological rules may be organized in the same way as are statements of allomorphy, where rules with more specified environments (more links) will

take precedence over less specific rules (the elsewhere cases), and hence will block certain phonological operations. Whether this particular organization is instantiated in the grammar, or whether its effects can be derived another way is to be determined.

- (4) *VV
- (i)
$$\begin{array}{ccc} V & V & \rightarrow & V & C & V \\ | & | & & | & | & | \\ v & v & & v & c & v \end{array}$$
- (ii) $vv \rightarrow v$

The phonological rule, or statement of ‘*allophony*’, in (4) and the details of how to determine the relative specificity of environments will be taken up in §5. In (4i) the linking of ‘v’ to ‘V’ indicates a segment that has been linked to the timing tier, where in (4b) ‘v’ indicates an as yet un-linked vocalic segment. What will become clear is that the sub-statements that make up the rule in (4) must be applied in the order indicated within each cycle, offering an explanation for the pattern of relative destructiveness of phonological rules as seen in (3) as well as in the cross-linguistic data to follow.

...

3.2 Why lightning doesn’t strike the same place twice

In this section I would like to examine the question of *why* a particular rule might apply only within a specific phonological cycle. The goal of this section is to give further insight into how phonological rule application reacts to the phonological structure building operations inherent to phonological interpretation. This reaction calls to mind the saying ‘lightning never strikes the same place twice’. We know that this saying is geographically false. Lightning may strike the same place multiple times – in fact it is likely to do so (consider the function of lightning rods). Yet, part of the saying is undoubtedly true. After a place x is struck by lightning, that place is altered, hence x no longer exists. This is what I will argue is occurring when rules appear to not strike the same place twice. It is an illusion. The ‘same place’, or rather, the target of a particular phonological rule, no longer exists after phonological interpretation has occurred.

Bermúdez-Otero (2011) notes that phonological rules may apply either throughout the derivation (ex. English flapping or any other across-the board rule), or in a subset of cyclic domains (ex. the English Main Stress Rule (stem-level)), but that once the rule has been inactivated, it will not be re-activated. This is akin to the continuous domain restriction in Mohanan (1982). In other words, there are no phonological rules that apply at the stem level, are inactive at the word level, but then are re-activated at the phrase level. Bermúdez-Otero codifies this as the Russian Doll Theorem (RDT).

(12) Russian Doll Theorem

Let there be the nested cyclic domains $\gamma[\dots \beta[\dots \alpha[\dots] \dots] \dots]$. If a phonological process p is opaque in β because its domain is α , then p is opaque in γ .

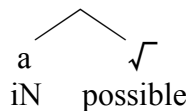
(Bermúdez-Otero 2011)

I argue here that this inability to reactivate in an outer domain is a direct consequence of the interaction of phonological rules with phonological structure-building. Consider English prefixal nasal assimilation.

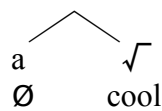
- (13) a. i[mp]ossible, i[ŋk]ongruous, i[nt]olerable, i[lɪ]licit, i[rr]eversible
 b. u[np]repared, u[nk]ool, u[nt]oward, u[nl]awful, u[nr]eal

The above pattern, where the nasal in *in-* assimilates in place features to the following consonant, but the nasal in *un-* does not, has been long noted in the literature. Booij & Rubach (1987) proposes this to be due to the independent prosodic word status of *un-*, while *in-* is part of the PWD of the base to which it attaches. Newell (2005) argues that this separate PWD status derives from *un-*'s status as a syntactic adjunct, in comparison to *in-*'s status as an adjectival category-defining head. What Newell's analysis entails is that *in-* will be interpreted in a structural position that includes the following consonant as part of its complement, while *un-* will be interpreted phonologically prior to its merger.¹

- (14) a. a = phase → iNpossible → i[mp]ossible

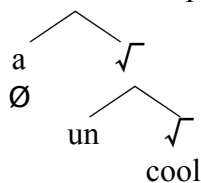


- (15) a. a = phase → [k]ool



- b. uN = phase → un

- c. a = phase → u[n]+[k]ool → u[nk]ool



If we assume that nasals in English are underspecified for place (N), and that coronal is the default place feature (both fairly uncontroversial, if one accepts underspecification), then the above derivations fall out. The assimilation rule is one of feature-filling.

¹ For the morpho-syntactic motivations for this distinction see the references cited. But, consider that all words prefixed with *in-* are adjectives, while *un-* may prefix to any lexical part of speech (unhappy, undo, “a very merry unbirthday” (Caroll 1969), “The un-Britney” (The Economist 2008)). The phono-syntactic isolability of adjuncts is well known (Uriagereka 1999, Johnson 2004). In fact, I would contend that the lion's share of the arguments for phono-syntactic non-isomorphism (the prime motivation for the Prosodic Hierarchy) in Nespor & Vogel (1986) have missed the mark in that they involve adjunction structures. The derivational account of words like ‘uncool’ in (14) can be straightforwardly applied to explain supposed mismatches in derivations that involve adjuncts. See §4.2.1.

(16) $N \rightarrow [\alpha_{\text{place}}] / \text{ ___ } C [\alpha_{\text{place}}]$

In (14) the placeless nasal is linearly adjacent to a following C at the point of its phonological interpretation, allowing place sharing. In (15b), however, *un-* is interpreted independently of its base. Here, no assimilation may occur, as there is no following C. Default place features are assigned, and N becomes coronal [n]. When this prefix is affixed to its base, it is too late for (16) to apply. The lighting strike of phonological computation (here feature-filling) has already occurred, and has bled the environment of (16).

This type of interaction between phonological computation and rule application is generally attributed to particular rules (or constraints) belonging to certain phonological domains or levels (also cycles, strata). Classically, the above analysis would either (i) make reference to the PWD ($N \rightarrow [\alpha_{\text{place}}] / [\dots \text{ ___ } C [\alpha_{\text{place}}] \dots]_{\text{PWD}}$) or (ii) make reference to a particular level ($N \rightarrow [\alpha_{\text{place}}] / [\dots \text{ ___ } C [\alpha_{\text{place}}] \dots]$ applies at the level ‘Stem’). Either of these types of account differ from the underspecification account in two crucial ways. First, they make no link between phonological structure and the point in the derivation at which a rule can apply. It could easily have been the case that nasal assimilation applies at the word or phrase level (in addition to or instead of at the stem level). Second, this type of Russian Doll/Continuous domain account critically holds that there are different phonologies at different levels within a particular language; stem phonology consists of a group of rules/constraint rankings *A*, while the word level (for example) consists of a group of rules/constraint rankings *B*. There is no prediction in these types of theoretical frameworks with regards to which particular rules/rankings are available at each level/cycle. See §5 for further discussion of this point.

When examining data like that in (14)-(15), where a phonological rule is inactivated at a certain point in the derivation, one can advance arguments for either a ‘single phonology with underspecification’ account or a ‘multiple phonologies’ account. What is argued below, however, is that in grammars where a rule does not become inactive, but rather its effects are altered during the course of the derivation, a single phonology account is the only one that can account for the intra- or inter-linguistic patterns.

The data to be discussed: Each of the following languages present a language-internal conspiracy, whereby the same type of sequence is repaired one way in the first cycle of interpretation (phase) and in another way in the second. (see also Ojibwe, above)

Tachelhit Berber (Afroasiatic) : Hiatus resolution: Glide formation vs Glide Epenthesis (Lahrouchi 2013)

- (25) a. gru ‘Collect!’
 b. bri ‘Crush!’

- (26) a. **brijas** ‘Crush him!’
 bri-as
 crush-him

- b. **grujas** 'Collect him!'
 gru-as
 collect-him
- (27) a. **agraw** 'gathering'
- a
 / \
 VCCVC
 || |
 gr u
 gru-nominalizer
- b. **abraj** 'act of crushing seeds'
- a
 / \
 VCCVC
 || |
 br i
 bri-nominalizer

Malagasy (Austronesian) : NC clusters: Coalescence vs Prenasalization+strengthening (L.Travis: fieldwork)

- (32) **mamatra** 'y measures x'
 m-an-fatra
 T.E-cause-measure²
- (33) **ma^mpamatra** 'z makes y measure x'
 m-an-f-an-fatra
 T.E-cause-E-cause-measure

Malayalam (Austronesian) : CC and VV sequences: Coalescence vs Epenthesis
 (Michaels 2009, Mohanan 1983)

- (36) Lexical causative
- a. **aat** 'Y shakes X'
 aat+ikk
 SHAKE+CAUSE
- b. **nanakk** 'Y waters X'
 nana+ikk
 WATER+CAUSE
- (37) Syntactic causative
- a. **paatjikk** 'Y makes X sing'

² T.E. = The Event marker in the domain of Tense.

paat+ikk
SING+CAUSE

- b. kaɹajikk 'Y makes X cry'
kaɹa+ikk
CRY+CAUSE

Acholi (Nilotic) : Cluster resolution : Assimilation vs. Deletion (Dobler 2008)

(39) a. badda 'my arm/leg (alienable)'
bad-na
arm-my
[[bad]_{nP} -na]_{DP}

- b. bukka 'my book'
buk-na
book-my
[[buk]_{nP} -na]_{DP}

(40) a. bada 'my arm (inalienable)'
bad-na
arm-my

- b. tixa 'my chin'
tik-na
chin-my

European Portuguese (Romance) : Hiatus Resolution : Gliding vs Deletion (Bermúdez-Otero & Luis 2009)

(45) rjorganizar 'reorganize'
re-organizar
re-organize

(46) a. dassunto 'of matter'
de assunto
of matter

- b. i. djassunto ii. *rorganizar

...

5.3 Repair strategies and the relative brutality of phonological rules

It is necessary to separate the pattern above from general restrictions on particular phonological rules applying in particular cycles, and from the choice a language makes

regarding a particular repair strategy for an illicit sequence. It is not the case that deletion is a repair strategy restricted to the initial cycle of interpretation. Is it equally not the case that a repair strategy such as epenthesis must be restricted to a non-initial cycle. Some languages may contain a single rule applied in all contexts. Washo, for example, has a single hiatus resolution strategy; epenthesis of [j] (Midtlyng 2005).³

What is important to note here is that the specifics of a particular resolution strategy chosen by a language within a particular cycle are not predictable. We saw above that a language may delete a segment in an initial cycle (Ojibwe, Acholi, European Portuguese, Malayalam), or it may opt for glide formation (Tachelhit Berber), or coalescence (Malagasy, Malayalam). In a second cycle a language may opt for epenthesis (Ojibwe, Tachelhit Berber, Malayalam), gliding (European Portuguese), prenasalization (Malagasy), or gemination (Acholi). In every case, the relative destructive nature of the rules within a language is constant and in line with later rules being sensitive to phonological structure building and the preservation of said structure.

- (69)
- | | | |
|----|----------------------|-----------------------------------|
| a. | Ojibwe: | deletion > epenthesis > no repair |
| b. | Tachelhit Berber: | glide formation > epenthesis |
| c. | Acholi: | deletion > gemination |
| d. | Malagasy: | coalescence > prenasalization |
| e. | Malayalam: (VV) | deletion > epenthesis |
| | (C(v)C) | coalescence > no repair |
| f. | European Portuguese: | deletion > glide formation |

What this entails is that while the particular form of the rules at each cycle are language specific (note that in (69) gliding may occur in either cycle), the order of any pair of rules is cross-linguistically predictable. This pattern is only possible if rules may be linked, as in the case of the allophonological rules subject to the Elsewhere Principle. This is argued here to be the only way to capture the (at least somewhat) random identity of the conspiratorial rules in the grammar of a particular language while at the same time restricting their distribution in line with LICP.⁴ All of the above patterns are captured with rules of the following format. These rules are part of a single phonological grammar that applies across cycles within any given language.

(70) Constraint

- Repair Strategy (i) = Specific case
 Repair Strategy (ii) = Elsewhere case

The above rule format, in concert with a theory of structure-building upon phonological interpretation, predicts the attested cross-cyclic restrictions on the relative brutality of conspiratorial phonological rules.

³ On the surface Washo also appears to employ coalescence in certain cases. This has been argued to be the case only when the vowels involved are defective. Staroverov (2015) analyses these as floating vocalic features. They are therefore not equivalent to full vowels and their behaviour does not constitute hiatus resolution.

⁴ Note that Output-Output correspondence accounts, in addition to being theoretically suspect, would need additional machinery along the lines of the constraints on reranking referred to in the previous section.