

Epenthesis and a Mode of Extension

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1. Introduction

In this paper,* I will show that there is a mode of extension that governs the processes of certain peripheral linguistic phenomena. The mode embodies two sub-types as in the following:

(1) TYPE A

If an item *a* of the category X is in the structure S, then another item *b* of the same category X is in the structure S.

(2) TYPE B

If an item *a* of the category X is in the structure S, then an item *b* of the category X' is in the structure S, where *b* in X' is the counterpart of *a* in X.

In what follows, I will be concerned with the application of these types of formulas to the empirical cases, namely Epenthesis.

2. Facts and a Mode of Extension

Here in this paper, by “Epenthesis,” I mean the phonological process of the cases exemplified in (3):¹

- (3) answer: [ænsə]→[æntsə]
 chance: [tʃæns]→[tʃænts]
 constant: [kɒnstənt]→[kɒntstənt]
 fancy: [fænsi]→[fæntsi]
 Minsk: [mɪnsk]→[mɪntsk]
 minstrel: [mɪnstrəl]→[mɪnstrəl]
 sense: [sens]→[sents]

In the words of (3), [t] can be optionally inserted between [n] and [s]. This [t] is sometimes called Excrement [t] in the literature. The appearance of Excrement [t] is guided by the stress patterns as in (4), and I assume that (4) is optional:²

- (4) [s]→[ts]/<[+stress, V]n___C₀<[-stress, V]X>#

(4) is paraphrased as (5) and (6):

- (5) If the first vowel to the left of the sequence [ns] is stressed and the first vowel after this sequence [ns] is unstressed, then [ns] optionally becomes [nts].
 (6) Otherwise, i.e. if the antecedent of (5) is not satisfied, it is the case that if there is no vowel between [ns] and the right-side word boundary, then [ns] optionally becomes [nts].

(4) correctly explains the epenthetic facts observed in the words below. The phonetic facts in this paper are based on Webster 3 and WNNCD. See at the end of this paper for

the abbreviations. Hereafter, in the words below, *á*, for example, means the vowel with a primary stress on it and *à* the vowel with a secondary stress on it, both of them being [+stress]: if there is no diacritic mark on the vowel, it is [–stress].

The words in (7) do not satisfy the requirement of (4), which means that (4) does not apply to them. So they don't have Excrescent [t], as predicted.

- (7) a. concéit
 b. concéive
 c. consíistent
 d. consúme
 e. constráin
 f. constrúction
 g. constrúe
 h. monsóon (*or* mónsdon)

In (8), there is no sequence of [ns] in the words, but only the sequence of [nz], so, though the stress template requirement of (4) is satisfied, (4) does not apply to these words. There is no Excrescent [t] or [d] in (8), as is predicted.

- (8) a. Káynes
 b. kínsman
 c. léns
 d. Windsor chair

In (9), no Epenthesis is observed since [nz] is not a candidate sequence and, furthermore, the stress template requirement of (4) is not satisfied by the words of (9).

- (9) a. bénzène (*or* benzéne)
 b. Hínsdàle
 c. Lónsdàle

In (10), the rule schema (4) correctly predicts the epenthetic difference in the following pairs: the words on the left satisfy the requirement of (4) and have Excrescent [t], but those on the right do not.

- (10) a. cóncetrâte—concéntric
 b. cònsolátion—consóle (v.), consólatòry
 c. cònspirátion—conspíre
 d. cónstitùte, cònstitútion—constituent
 e. cònsultátion—consúlt

In (11), the stress template requirement of (4) is not met by the words, so the absence of Excrescent [t] is correctly predicted.

- (11) a. cóncèpt
 b. cónsíst (n.)
 c. cónsòle (n.)
 d. cónsòrt (n.)
 e. cónstrùct (n.)
 f. cónsúlt (n.)
 g. pínesàp

(12) and (13) are the cases of (6), so the left-side words of (12) and the words of (13) meet Epenthesis but the right-side words of (12) do not. This is precisely what we predict.

- (12) a. expéctance—expéctancy
 b. rélevance—rélevancy
- (13) a. éntrance
 b. inference

It appears that if you only observe the words above, you might think that Epenthesis is a rule that affects only the sequence of [ns]. But that is not true. It is notable that Excrescent [t] is observed not solely in the sequence of [ns], but also in other sequences that are somehow related to [ns]. Nakazawa (1983) assumed that the entire phenomenon of Epenthesis could be contained in a single rule schema or in a very small number of rules or schemata. But now I assume that the entire phenomenon of Epenthesis is a result of multiple extensions from the core cases to the peripheral cases. Now I turn to this topic.

The fricative [ʃ] is a palatalized version of [s]. If we follow the wording of (1), one of the extensions we are interested in is (14):

- (14) If a voiceless coronal fricative [s] is in the process of Epenthesis, then another voiceless coronal fricative [ʃ] is in the process of Epenthesis.

Phonetically speaking, [s] and [ʃ] are “neighbors,” so they share most of the phonetic or distinctive features with each other. Epenthesis appears to be extended from the sequence of [ns] to the sequence of [nʃ], and this is in fact the case, as you can see in the words below:

- (15) a. convéntion
 b. declénsion
 c. Hínshelwòod
- (16) a. Ánshán
 b. kínsìp
 c. móonshine
 d. wínes hòp
- (17) a. chámionship
 b. Dévonshire
 c. spórtsmanship

Our rule schema (4), with [s] replaced by [ʃ], correctly predicts the epenthetic sequence [ntʃ] in (15)³ and correctly excludes Epenthesis in (16) and (17).

The next extension is (18):

- (18) If a voiceless coronal fricative [s] is in the process of Epenthesis, then another voiceless coronal fricative [θ] is in the process of Epenthesis.

This prediction is borne out by the following facts:

- (19) a. Córinth
 b. nínth
 c. mónth
 d. mónthly

- e. ténth
 (20) a. bénthic—benthónic, bénthòs
 b. epénthesis—epenthétic
 c. méntholàted—ménthòl
 d. sýnthesis—synthétic

In the words of (19), the epenthetic sequence of [ntθ] is possible, as predicted. In (20), the sequence of [ntθ] is possible in the words on the left, but it is not in the words on the right, which is again what our schema (4), with [s] replaced by [θ], predicts.

Following the wording of (2), a third case of our extension looks like (21) below:

- (21) If an alveolar nasal consonant [n] is in the process of Epenthesis, then an alveolar liquid consonant [l] is in the process of Epenthesis.

Though the consonant [n] is a nasal and the consonant [l] is a liquid, they have a striking similarity: they are both alveolar consonants. Observe the epenthetic behavior in the words below:

- (22) a. élse
 b. fálse
 c. fálsify
 d. fúlsome
 e. whólesome
 (23) a. állspice
 b. Alsátian
 c. whólesàle
 (24) a. Míles
 b. sálesman
 c. Wélls
 (25) a. fóolscàp
 b. Sálisbùry
 (26) a. Wélsh (cf. the variant spelling “Welch”)
 b. wélsh (cf. the variant spelling “welch”)
 c. wélsher (cf. the variant spelling “welcher”)
 (27) a. fílth
 b. héalth
 c. stéalth
 d. tílth
 e. wéalth

In (22), Epenthesis is possible, so we see [lts] in the words of (22).⁴ In (23) through (25), Epenthesis is impossible, so we have no [lts] in those words. In (26) and (27), we have [ltʃ] and [ltθ], respectively. All of this is predicted by the rule schemata (28), which are extensions from (4) with the consonant [n] in the environment replaced by [l].

- (28) a. [s]→[ts]/<[+stress, V]l___C₀<[-stress, V]X>#
 b. [ʃ]→[tʃ]/<[+stress, V]l___C₀<[-stress, V]X>#
 c. [θ]→[tθ]/<[+stress, V]l___C₀<[-stress, V]X>#

Therefore, Epenthesis is the outcome of the processes of extension from the core cases, such as the intrusion of [t] into [ns], to the peripheral cases, where [t] intrudes into the sequences of [nf], [nθ], [ls], [lf], and [lθ]. And these extensions are guided by the mode identified in Section 1.

In Nakazawa (1983), the author took pains to look for ways to generalize the consonants [n] and [l] in the environment of Epenthesis, for you cannot uniquely identify [n] and [l] and at the same time exclude any other consonants by using the feature composition matrix, as for example in Chomsky and Halle (1968: 177). In other words, [n] and [l] do not make a natural class. But now we have a new perspective such that Epenthesis is not a monolithic phenomenon that can be described by a single rule schema, but rather it is a states-composite obtained through a number of derivative processes guided by the mode of extension given in Section 1.

3. Exceptions and the Logic of Extension

Considering all those data given in the previous section, it appears that the mode of extension shown in (1) and (2), with (4) and the related rule schemata supplemented, will go a long way to covering the entire phenomenon. But the analysis, as it stands, makes wrong predictions.

I have assumed that (4) is optional. And (1) and (2) dictate that if there is Epenthesis in [ns], there should be Epenthesis in [nf], [nθ], [ls], [lf], and [lθ], too. But the fact is we have a few exceptions. See below:

- (29) a. compúlsive
- b. compúlsory
- c. úlcer
- (30) a. expúlse—expúlsion
- b. impúlse—impúlsion
- c. repúlse—repúlsion
- (31) a. fílthy
- b. héálthy
- c. wéálthy

Although the words in (29) all conform to the stress template of the rule schemata (28), they do not have Excrescent [t]. In other words, the sequence of [lts] is impossible in the words of (29). In (30), the left-side words invoke Epenthesis, but the right-side words do not, for all their observance of the stress template requirement of (28). The words in (31) have the stress pattern eligible for Epenthesis, but they fail to undergo the process. This is particularly interesting because the derivational bases for these words, i.e. *filth*, *health*, and *wealth*, have all undergone the process and obtained the sequence of [ltθ], as we saw in (27).

When I said at the beginning of Section 2 that the rule schema (4) is optional, I had in mind the cases where (4) is applicable but does not apply. Cases (29)–(31) are the serious cases of such exceptionality.⁵

The problem is how we could incorporate the notion 'optional' into the mode of extension presented in Section 1. The solution to this problem is suggested in Nakazawa (1997).

Nakazawa (1997) has proposed that the linguistic description for the phenomenon P should be an accumulation of the necessary conditions for P. If so, formally speaking, (1) and (2) should be rewritten as (32) and (33), respectively:

(32) TYPE A

If an item *b* of the category X is in the structure S, then an item *a* of the same category X is in the structure S.

(33) TYPE B

If an item *b* of the category X' is in the structure S, then an item *a* of the category X is in the structure S, where *b* in X' is the counterpart of *a* in X.

To put this mode of extension into the more informal terms, if peripheral Epenthesis is observed in the sequences of [nf], [nθ], [ls], [lf], and [lθ], there should be the basic case of Epenthesis in the sequence of [ns]. The latter is the basic case of [t] intrusion because (i) [n] and [t] have the same point of articulation, i.e. they are both alveolar consonants, (ii) among the coronal consonants of [s], [f], and [θ], [s] is the closest to [t], and finally (iii) [n] and [t] share the feature [-continuant], which gives easy way to the description of Epenthesis as a type of assimilation.⁶ In order to understand the notion "optional," (32) and (33) can be reformulated in the more intelligible fashion. They are (33) and (34), respectively:

(34) TYPE A

If an item *a* of the category X is in the structure S, then another item *b* of the same category X is *possible* in the structure S.

(35) TYPE B

If an item *a* of the category X is in the structure S, then an item *b* of the category X' is *possible* in the structure S, where *b* in X' is the counterpart of *a* in X.

The crucial term in characterizing the notion "optional" is *possible*. On the abstract level, (34) and (35) are of the form (36):

(36) If V, then W is possible.

(36) is in reality a collapsed statement of (37a) and (37b):

(37) a. If V, then W.

b. If V, then NOT W.

From a set-theoretical point of view, W is properly included in V. Thus, it should be clear that V is the necessary condition for W.

4. Conclusion

Epenthesis is not a unitary, monolithic, static phenomenon that can be described by a single rule schema or by a very small number of rule schemata. Rather it is a result of cumulative processes of extension from the core cases to the peripheral ones.

So, if one wishes Epenthesis to be a single phenomenon, he has to collapse the consonants in the environment, i.e. [n] and [l], and he is destined to fail because [n] and [l] don't make a natural class. But if we take Epenthesis to be a set of states arrived at through a series of processes guided by the mode of Section 1, then it is natural to assume that some of the resultant states may be mutually inconsistent with each other in certain minor respects. That is to say, though [n] is the assimilatory inducer of Epenthesis, [l] is the non-assimilatory inducer of Epenthesis. See note 6. Furthermore, it is notable that the more basic the phenomenon is, the more instances we have, and that the more derivative the phenomenon is, the fewer instances we have. Thus we have the largest number of epenthetic instances in the sequences of [ns] and [nʃ], and we have the smallest number of them in the sequences of [lʃ] and [lθ]. This is reflected in the number of sample words of Epenthesis in our paper. Another notable point is that when the phenomenon is more basic, the rule for the process is purely optional, but when the phenomenon is more derivative, the rule for Epenthesis is sometimes prohibited. Recall the cases of (29)–(31). All of these are some of the typical features of Grammatical Dynamism.

It should be noted that the mode embodied in Section 1 can be understood as one of the possible interpretations of the theory format of Grammatical Dynamism put forth by Kajita (2002).

- (38) If the grammar of a language L at stage i, G(L, i), has property P, then the grammar of the language at the next stage, G(L, i + 1), may have property P'.
(Kajita 2002: 161)

Therefore, if the arguments so far are on the right track, Epenthesis, together with its extension analysis, will prove to be against the output-oriented approach and will be in accordance with the process-oriented approach, one of the principles of which is (38).

Abbreviations

Webster 3: *Webster's Third New International Dictionary of the English Language*, G. & C. Merriam, Springfield, MA.

WNNCD: *Webster's Ninth New Collegiate Dictionary*, Merriam-Webster, Springfield, MA.

Notes

* Thanks go to Peter Robinson for giving me stylistic suggestions. I am solely responsible for the errors that may remain.

¹ The facts and analysis provided in this paper are in part due to Nakazawa (1983).

² The rule schema "⟨A⟩ B ⟨C⟩" is an abbreviation of the two rules "ABC" and "B" that apply in this order. V represents a vowel. C_x means the sequence of consonants the number of which is x at most and is y at least. So, C₀ represents no consonant, or any number of consonants. X is a variable. # is the word boundary.

Nakazawa (1983)'s original proposal is (i), using Chomsky and Halle (1968: 177)'s classification and organization of phonological features as in (ii).

- (i) [+coronal, -voice] → [-continuant] / ⟨ [+stress, V] ⟩ n ____ C₀ ⟨ [-stress, V] X ⟩ #

(ii) Table of Feature Composition Matrix for English Consonants

	r	l	p	b	f	v	m	t	d	θ	ð	n	s	z	c	ç	j	š	ž	k	g	x	ŋ	h	k ^w	g ^w	x ^w
vocalic	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+
high	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	-	+	+	+
back	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	+	+
low	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
anterior	-	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
coronal	+	+	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
round																									+	+	+
tense																											
voice	+	+	-	+	-	+	+	-	+	-	+	+	-	+	-	-	+	-	+	-	+	-	+	-	-	+	-
continuant	+	+	-	-	+	+	-	-	+	+	-	+	+	-	-	-	+	+	-	-	+	-	+	-	+	-	+
nasal	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
strident	-	-	-	-	+	+	-	-	-	-	-	-	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-

(Chomsky and Halle 1968: 177)

The most significant difference between (4) and (i) is that (4) assumes that Epenthesis is a process of addition of a segment, whereas (i) assumes that Epenthesis is a process of change of a feature on a segment. So, (i) correctly predicts that it is a process of assimilation since the segment before the segment affected is [n], which is [-continuant], and the segment affected becomes [-continuant]. In the text, I talk of Epenthesis as an addition of [t] for the expository purposes.

- ³ Notice that Webster 3 says that the slang for *conscientious objector* is either *conshy*, *conchie*, or *conchy*. The spelling of the latter two tells a lot about Epenthesis.
- ⁴ Observe the witty title of Ballmer (1980). I am indebted to Norio Hirota, who pointed out to me the latter article.
- ⁵ A milder case is, for example, the one where *fancy* is pronounced either [fænsi] or [fæntsi], as is described by Webster 3 and WNNCD.
- ⁶ So, [l] is rather a marked environment for the intrusion of [t], since [l] is [+continuant] and [t] is of course [-continuant].

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