Non-derived Environment Blocking and Variable Rules

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Abstract

In this paper, we discuss the interaction of morphological structure and the application of variable phonological processes. Previous work in this domain usually follows the intuitions of Guy (1991a,b): the deeper embedded an environment for a phonological process is, the more chances that process has to apply, thus the higher the rate of application of that process. We present two cases, Korean /w/-deletion and African American Vernacular English /t/-assibilation, in which the surface rates of application show the opposite trend. We draw a parallel to the categorical phonology phenomenon of Non-derived Environment Blocking and discuss the implementation of the variable version of this phenomenon in the grammar.

1 Introduction

In this paper, we discuss the interaction of morphological structure and the application of variable phonological processes. Previous work in the domain of morphological sensitivity to variable phonology usually follows the intuitions of Guy (1991a,b): the deeper embedded an environment for a phonological process is, the more chances that process has to apply, thus the higher the rate of application of that process. This "Iterative Model" of morphological interaction assumes that a given phonological process is active at multiple different levels. For example, following a stem-word-phrase model of morphologically-stratified phonology, the Iterative Model predicts a higher rate of application of a particular variable process if the environment for the application of that process is available at the stem level than if it is only available at the word level.

Taking an example process in which X becomes Y in environment Z, the schematic in (1) shows the relative surface rates of application assuming the process is active each level at a 50% application rate. In (1), and throughout this paper, the colored bars represent the rate of application due to each level of phonology.

(1) Schematic of Iterative Model

Example Process: $X \rightarrow Y \,/\, \_\ Z$

Example rate: 50% application at each level (stem, word, and phrase)

	Level at which environment is available		
	Stem Level	Word Level	Phrase Level
	$[[[XZ]_{s}]_{\omega}]_{\phi}$	$[[[X]_{s}\ Z]_{\omega}]_{\phi}$	$[[[X]_{s}]_{\omega}\ Z]_{\phi}$
Stem Level Phonology	✓ 50%	—	—
Word Level Phonology	✓ 50%	✓ 50%	—
Phrase Level Phonology	✓ 50%	✓ 50%	✓ 50%
Chances to apply	3x	2x	1x
Surface application rate	87.5%	75%	50%

In the Stem Level case in (1), the sequence XZ is available to the $X \rightarrow Y \,/\, \_\ Z$ process at three different levels: stem, word, and phrase. The process, then, gets three chances to apply. At 50% application at each level, the surface rate of application of X →Y us 87.5%. In comparison, in the Word Level case, the sequence XZ is not available at the stem level, only at the word and phrase levels. In this case, the process has only two chances to apply resulting in a surface rate of 75% for the example application rates. Finally, if the sequence XZ is only available at phrase level, the process only has one chance to apply. To summarize, in this model, the deeper embedded the environment for the variable process, the more chances that process will have to apply and the result will be a higher rate of application on the surface.

The Iterative Model can be used to explain the TD deletion rates in English (Guy 1991a,b). Guy reports that the final /t/ or /d/ shows a higher rate of deletion (38.1%) when that /t/ or /d/ is part of the monomorphemic stem than when it is the regular past tense inflection morpheme

(16.0%).[1] Assuming deletion is active at both the Stem and Word Levels, it has two chances to apply to the TD of the monomorpheme (at both Stem and Word Levels) while only one chance to the regular past tense because that TD is only available at the Word Level in those cases, as shown in (2):

(2) Guy's (1991a,b) Model: TD deletion in English

	Monomorphemic ("mist")	Regular Past ("missed")
	[[mɪst̲]$_{s}$]$_{\omega}$	[[mɪs]$_{s}$ +t̲]$_{\omega}$
Stem Level Phonology	✓ 26.3%	—
Word Level Phonology	✓ 16.0%	✓ 16.0%
Surface Deletion Rate:	38.1%	16.0%

Assuming there is no Phrase Level application of TD deletion, we can use the surface deletion rate of the regular past tense cases as the rate of application of the TD deletion at the Word Level (here, 16%). From there we can calculate the rate of application at the Stem Level based on the surface deletion rate of the monomorphemic cases (38.1%) by assuming that the Word Level rate (16%) of the instances remaining after the Stem Level deletion applies are attributed to the Word Level process. The result is that we can posit a 26.3% application rate of TD deletion at the Stem Level.

In as much as we find cases which match the trend of Guy's TD deletion, the Iterative Model is an important way to think about the interaction of morphological structure and variable processes. However, this model always predicts that a Stem Level case will always have a higher rate of surface application of a given process compared with when the environment for the process is only available at the Word Level or the Phrase Level.

However, this is not always true. We present two case studies below, Korean /w/-deletion and African American Vernacular English (AAVE) /t/-assibilation, which show a trend opposite to that predicted by the Iterative Model. In each case the surface pattern of the relevant process shows a lower rate of application when the environment for the process is available at the Stem Level and a higher rate of application when it is available at the Word Level.

The case studies are given in Section 2. In Section 3, we draw a parallel between the trend found in the case studies and Non-derived Environment Blocking. A discussion of implementation of this phenomenon in the grammar is presented in Section 4.

2 Case Studies

This section presents two case studies in which the surface rate of application of a variable process is lower when the environment for that process is available at both the Stem and Word Levels than when it is only available at the Word Levels.

2.1 Korean /w/-deletion

In Seoul Korean, /w/ is variable deleted in CwV contexts (Silva 1991; Kang 1997; Kwon 2014). There are a variety of conditioning factors for the rates of this deletion (see above references for more details), but we will only deal with the morphological conditioning in this paper. CwV sequences arise in two different morphological situations: (Class A) they may be an underlying part of a stem, or (Class B) they may be fed by the Korean Glide Formation Rule[2] (3) which creates /w/ out of underlying /o/.

(3) Korean Glide Formation Rule: o → w / _ V (obligatory)

As an example of the Class A, in which the CwV sequence is part of stem, we will use the root /swip-/ "easy". As an example of the Class B, in which the CwV sequence is formed later, we will use the root /s'o-/ "shoot, fire". The /o/ of /s'o-/ will become a /w/ through the Glide Formation Rule (3) when the informal polite (word level) suffix /-ayo/ is attached, resulting in /s'wayo/.

Both of these types of /w/s are subject to the variable deletion process, but in the first case (/swip-/) the /w/ is available at both the stem, word, and phrase levels while in the second case (/s'o/ + /ayo/), the /w/ is only available at the word and phrase levels (and not the stem level).

Following the Iterative Model, we would expect Class A words to have a higher rate of deletion than Class B words because the /w/ in Class A words is available at the stem level whereas the /w/ in Class B words is not.

(4) Iterative Model Expected Results for Korean /w/-deletion

	Class A	Class B
Example:	swipta "to be easy"	s'wayo "shoot, fire (inf.pol.)"
	[[[s<u>w</u>ip]$_s$ +ta]$_\omega$]$_\phi$	[[[s'o]$_s$+ayo]$_\omega$]$_\phi$ → [[s'<u>w</u>ayo]$_\omega$]$_\phi$
Stem Level Phonology	✓	—
Word Level Phonology	✓	✓
Phrase Level Phonology	✓	✓
Chances to Apply	3x	2x
Expected Result	higher /w/-deletion	lower /w/-deletion

However, in a study of native Seoul Korean speakers, we find the opposite pattern of /w/-deletion in the speakers 20-40 years old. The data of 1149 tokens were collected from sociolinguistic interviews as well as reading task with 20 speakers, born between 1930 and 2000 and the deletion rate of each speaker is displayed below.[3] The deletion rates of each speaker is given in Table 1 and these rates are averaged by age group in (5).

Table 1: Deletion rate of speakers in study by morphological class

Age	Speaker	Class A (s+ω)	Class B (ω only)	Pattern
15	GH	0.20	0.25	A≈B
15	KH	0.15	0.18	A≈B
18	DS	0.14	0.17	A≈B
21	HK	0.25	0.43	A<B
22	YJ	0.09	0.23	A<B
22	Min	0.24	0.37	A<B
26	HJ	0.39	0.35	A≈B
26	YR	0.22	0.21	A≈B
26	Joon	0.19	0.29	A<B
34	SY	0.37	0.33	A≈B
35	JY	0.40	0.69	A<B
36	NSY	0.47	1.00	A<B
36	YJY	0.31	0.70	A<B
36	JW	0.17	0.35	A<B
41	HS	0.48	0.27	A>B
50	YS	0.37	0.27	A>B
56	JM	0.62	0.57	A>B
82	EB	0.50	0.22	A>B
85	SH	0.40	0.20	A>B

(5) Results of Korean /w/-deletion study averaged by age group

		Average Deletion Rate				
n	Age	Class A (s+ω)		Class B (ω only)	Pattern	Expected
3	15-20	0.17	≈	0.20	A=B	No
11	21-40	0.28	<	0.45	A<B	No
5	40+	0.47	>	0.31	A>B	Yes

The study shows that the three different age groups behaved differently with respect to the rates of deletion between Class A and Class B. In the 40+ age group, the results are as expected from the Iterative Model: the rate of deletion is higher in the deeper embedded cases of Class A. In the youngest speakers, age 15–19, the rate of deletion is approximately the same between Class A and Class B. Kwon (2014) posits that for these youngest speakers, the /w/-deletion process has been reanalyzed as applying at phrase level only, thus it does not interact with the morphological complexity of the word.[4]

Critically, in the middle age group, age 20–40, the deletion rates are opposite of what is expected from the Iterative Model. That is, in this age group, the average rate of /w/-deletion for Class A words was lower (28%) than that of Class B words (45%). An explanation for this reversal of the Iterative Model is discussed in Section 3 below.

2.2 AAVE /t/-assibilation

In AAVE, there is variable assibilation of /t/ before /s/ (Labov et al. 1968; Labov 1969):

(6) AAVE /t/-assibilation: $t \rightarrow s$ / _ s (variable)

Like the case of Korean /w/-deletion above, there are two morphological conditions in which /t/-assibilation occurs: monomorphemic /ts/ sequences within a stem and polymorphemic sequences of stems ending in /t/ plus the nominal plural or verbal agreement /-s/.

Following the Iterative Model, we expect that monomorphemic cases of /ts/ would have a higher rate of /t/-assibilation because the /ts/ sequence is available at both stem and word levels, while the /ts/ sequence of polymorphemic cases is only available at word level, as shown schematically in (7). Because there is never assibilation between words, we will assume that there is no assibilation at phrase level in AAVE. The interaction, then, is between the Stem and Word Levels.

(7) Expected trend in assibilation rates following Iterative Model

	Monomorphemic	Polymorphemic
	$[\,[\text{ts}]_S\,]_\omega$	$[\,[\text{t}]_S + \text{s}\,]_\omega$
Stem Level Phonology	✓	—
Word Level Phonology	✓	✓
Chances to Apply	2x	1x
Expected:	higher assibilation	lower assibilation

However, in a study of 6th-10th grade AAVE speakers in informal contexts, data from Frank Porter Graham Corpus,[5] we find the opposite result, as shown in (8):

(8) Actual rate of /t/-assibilation in Frank Porter Graham Corpus

	n	/t/-assibilation rate
monomorphemic /ts/	4	0%
/t/ + plural /-s/	36	22%
/t/ + verbal /-s/	7	43%

In our corpus study, we find that the rate of /t/-assibilation in polymorphemic /t+s/ cases is higher than that of monomorphemic /ts/ cases.

It must be noted that instances of monomorphemic /ts/ in English (of any variety) are quite rare. All four instances in the corpus are tokens of *united sta<u>tes</u>* which, while at first appearing to be plural, behaves as singular for grammatical purposes (such as verbal agreement), so we counted it as monomorphemic. Other common /ts/ words such as *pizza* or *blitz* did not appear in the corpus. The intuitions of 2 native AAVE speakers that we asked were that *pizza* and *blitz* were good (or at least better) as [ts] rather than [s], and that they formed minimal pairs with *piece o(f)* and *bliss*. These intuitions should, of course, be cautiously viewed, but they seem to fall along the lines of the data we did find in the corpus.

Another note on this data is that the numbers for verbal /-s/ should be taken cautiously, not just because of the low *n*, but because two of the four tokens are the auxiliary verb *gets* which seems to obligatorily cause assibilation. This perhaps can be explained similarly to the categorical assibilation that occurs with the contracted copula *’s* and the subjects *it*, *that*, and *what* (see Labov et al. 1968 and Shwayder & McLaughlin 2014).

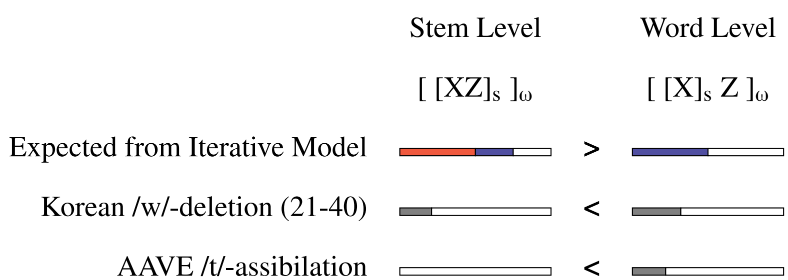
Nevertheless, for the purposes here, the important observation is that the rate of assibilation in polymorphic /t+s/ is higher than with monomorphemic /ts/ sequences (which appear to have no assibilation at all).

2.3 Summary of Case Studies and Generalization

In both case studies, we see that the rate of application of a variable phonological process is lower in deeper embedded environments. This is the opposite trend than what is predicted by the Iterative Model. That is, we expect the rate of application of the process to be higher when the environment for application is available at the monomorphemic or stem level and lower when that environment is only available at the polymorphemic or word level.

(9) Summary of trends in Iterative Model and case studies

Example Process: $X \rightarrow Y \,/\, \_\ Z$



Since the data in the case studies does not follow the Iterative Model, we must ask: what is the mechanism which causes the trend seen above?

3 Non-derived Environments

We make the observation that the environments under investigation in the case studies above are precisely those that are in play for the standard (non-variable) phonology phenomenon called Non-Derived Environment Blocking (NDEB; Kiparsky 1993; Burzio 2009). The generalization made with these phenomena is that a phonological rule may only apply if it makes use of new phonological material from a given cycle or derivational stratum.

A classic example of this effect is Finnish /t/-assibilation, as presented by Kiparsky (1993). In Finnish, /t/ becomes /s/ before /i/ but only if that /i/ is somehow "new material", such as an affix or the result of another phonological process. For example, in (10c) the root *vete* “water” in the nominative singular (a null suffix) undergoes final /e/-raising (10b). The resulting /i/ triggers /t/-assibilation (10a) resulting in the surface form *vesi*. However, when the /ti/ sequence is underlying, such as in *äiti* “mother”, the assibilation does not apply (**äisi*).

(10) Example of Non-derived Environment Blocking

a. Finnish /t/-assibilation: /t/ → [s] / _ i

b. Finnish final /e/-raising: /e/ → [i] / _ #

c. Finnish examples:

	UR	Essive Sg. /-nä/	Nom. Sg. -∅
"water"	/vete/	vete-nä	vesi
"mother"	/äiti/	äiti-nä	äiti

The trend in rate of application in the Korean and AAVE case studies is similar in that underlying sequences undergo the relevant process at a lower rate compared to derived sequences. That is, instead of the complete blocking of the process, as in standard NDEB cases, we see a degraded rate of application with these variable rules.

We propose that variable rules are subject to something like the NDEB, which we dub “non-derived environment degrading” (NDE Degrading), through which the rate of application of a variable process is lowered when the environment for application of that process does not make use of new phonological material.

(11) **NDE Degrading**: The rate of application of a variable process is lower when the environment for application of that process does not make use of new phonological material.

Schematically, NDE Degrading will occur any time there is a rule is active at Word Level whose environment exists within the stem of a word. If the rule is variably active at both Stem and Word Levels, there is a chance for it to apply at Stem Level before NDE Degrading is in effect.

(12) Schematic of NDE Degrading at stem and word levels

Example Process: XY → Z

	Stem Level	Word Level
	$[\,[XY]_S\,]_\omega$	$[\,[X]_S\ Y\,]_\omega$
Stem Level Phonology	✓	—
Word Level Phonology	NDE Degrading	✓

Note that when a rule is active at both levels, the relative surface rate of application between Stem Level environments and Word Level environments will be dependent on the relative rates of application at Stem and Word Levels of phonology. That is, there are three possibilities for the relative rates: the rates of application at Stem and Word Level could be equal, the rate of Stem Level application could be higher than that of Word Level, or the rate of Word Level application could be higher than that of Stem Level. These possibilities are schematized in (13), with the checked pattern being used to represent possible NDE Degrading.

(13) Relative surface outputs for relative rates of Stem and Word Level processes

Example Process: $X \rightarrow Y \,/\, \_\ Z$

a. Stem Rate (50%) = Word Rate (50%)

	Stem Level		Word Level
	$[\,[XZ]_S\,]_\omega$		$[\,[X]_S\ Z\,]_\omega$
Stem Level Phonology	✓ 50%		—
Word Level Phonology	NDE Degrading: <50%		✓ 50%
Surface Application Rate:	50%–75%	≥	50%

b. Stem Rate (50%) > Word Rate (30%)

	Stem Level		Word Level
	$[\,[XZ]_S\,]_\omega$		$[\,[X]_S\ Z\,]_\omega$
Stem Level Phonology	✓ 50%		—
Word Level Phonology	NDE Degrading: <30%		✓ 30%
Surface Application Rate:	50%–65%	>	30%

c. Stem Rate (30%) < Word Rate (50%)

	Stem Level $[\,[XZ]_S\,]_\omega$		Word Level $[\,[X]_S\,Z\,]_\omega$
Stem Level Phonology	✓ 30%		—
Word Level Phonology	NDE Degrading: <50%		✓ 50%
Surface Application Rate:	30%–65%	<,>	50%

In the case where the rates of application of a process are equal at Stem and Word Levels (13a), the surface pattern will show the output of Stem Level cases greater than or equal to those of Word Level cases. This is because if the the rate of application in the NDE Degrading situation is lowered to 0% the result will be the base Stem Level (which is equal to the Word Level in this situation). Otherwise any application of the process at the Word Level will result in the rate in the Stem Level case being higher than the Word Level case. Similarly, if the rate of application of the process is higher at Stem Level than Word Level (13b), the surface output will always show higher application in the Stem Level Case. However, if the rate of application of the process is lower at Stem Level than at Word Level (13c), this opens the possibility for a reversal of the surface application trend. In this case, NDE Degrading reduces the rate of application at the Word Level from 50% to below 28.6%, the Stem Level cases will show lower surface application than the Word Level cases.

In the situation where the Stem Level rate of application is lower than that of the Word Level rate of application, NDE Degrading provides an explanation for why there is a reversal in the trend seen in the Iterative Model.

4 Discussion

4.1 Implementations in the Grammar

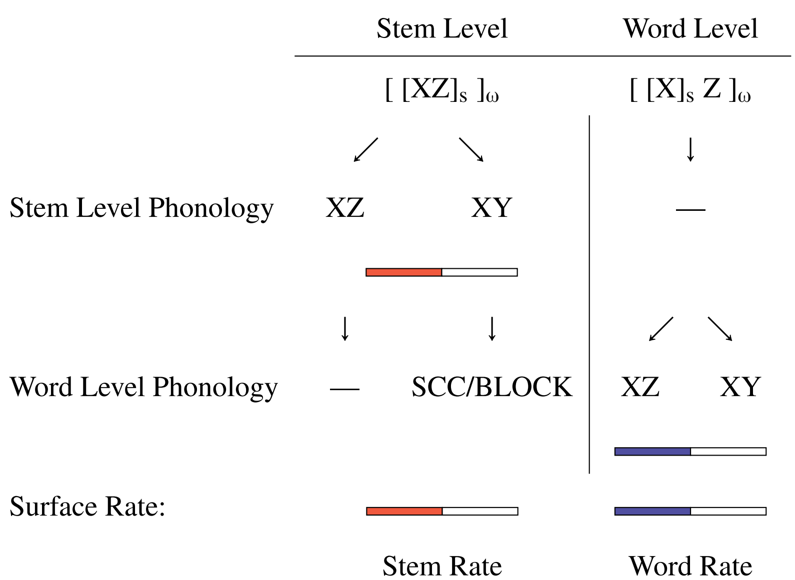
In the non-variationist phonology literature, one of the popular implementation of NDEB is the Strict Cyclicity Condition (SCC; Kean 1974; Mascaró 1976; Kiparsky 1982). In this implementation, the effect seen in NDEB is a result the phonological system not having access to "inactive" material from the previous cycle (see Embick 2013 for discussion of what "inactive" might mean). If SCC is the implementation of NDEB, the inaccessibility of phonological material seems like a fact about the structure of grammar and is not something that should be variable.

However, if we accept the explanation that NDEB effects are, in fact, the result of SCC and "inactive" phonological material, we would predict that this material should be "inactive" for variable phonological processes as well as categorical processes. If this is the case, the grammar prohibits the application of a rule to the same environment at multiple levels of the morphological structure. That is, a process may never apply (to the same segments) at both Stem and Word Levels because, if the environment for application exists at Stem Level, it is in an NDEB/SCC environment and is blocked from applying at Word Level. This SCC model is schematized in (14):

(14) Schematic of SCC Blocking Model

Example Process: $X \rightarrow Y \,/\, \_\, Z$

Example rate: 50% application at each level (stem, word, and phrase)



When the environment (XZ) is available at the Stem Level, the X →Y process first applies variably at the stem level. If the process does not apply, it cannot apply later (at the Word Level) because it is blocked by the SCC. The result is that the surface rate of application of the process is identical to that of the Stem Level by itself. When the environment (XZ) is available only at the Word Level, the X →Y process only applies at the Word Level, resulting in the surface rate being identical to that of the Word Level by itself. Thus, the SCC model predicts that no process can ever apply at both stem and word in same derivation. To the extent we do see Iterative Model patterns, in which we would like to attribute the surface rate to a combination of Stem and Word Level rates, this seems odd.

Another possible explanation of the difference between the Iterative Model and NDE Degrading cases is that the determination of what phonological material is "active"' or "accessible" is different for variable rules than categorical rules. That is, we can posit that the SCC is the implementation of NDEB but that variable processes are subject to a different form of activeness than categorical phenomena.

Perhaps the activity of a variable process at one level makes environment for that rule "active" for the next level. This could fall out of some sort of neural/psychological activation in which the use of a variable rule boosts the probability that it will be used again (along the lines of Tamminga 2014, albeit in a different dimension — morphological stratification rather than temporal production). This would mean that if the environment for a process is available at Stem Level, but the process was inactive, this environment is subject to SCC blocking effects when the Word Level (or Phrase Level) process tries to affect it. However, if the variable process is active at Stem Level then it will also active at Word Level. In this case we would either see no application of the process (if the Stem Level process is not active) resulting in NDEB effects, or repeated application of the process (if the Stem Level process is active) resulting in Iterative Model effects.

This provides a nice explanation for the difference between two of the age groups in the Korean /w/-deletion case, the 40+ year olds and the 21–40 year olds. While the 40+ year olds show the Iterative Model trend, the 21–40 year olds show the reversal. The explanation given by this "Activity" model is that the main difference between these groups is whether they have the /w/-deletion process active at Stem Level or not.

(15) Schematic of "Activity" Model for two Korean age groups

Korean /w/-deletion rate

	$[[\,[\text{CwV}]_s\,]_\omega]_\phi$	$[\,[[\text{Co}]_s\ \text{V}]_\omega\,]_\phi$
Age 40+	0.47	0.31
Activity:	$\text{s} \rightarrow \omega, \phi$	ω, ϕ
Number of applications	3	2
Age 21-40	0.28	0.45
Activity:	$\boxed{\text{s}} \not\rightarrow \cancel{\omega}, \phi$	ω, ϕ
Number of applications	2	1

As schematized in (15), for the 40+ year olds, the activity of the /w/-deletion process at the Stem Level causes the activity of the process at the Word Level as well. This results in the final outcome for this group being in the direction predicted by the Iterative Model: the Stem Level environment shows higher deletion than the Word Level environment. However, the 21–40 year old group, by hypothesis, does not have the /w/-deletion process active at the Stem Level. This causes the application of the process at Word Level for this environment to be blocked by SCC or NDEB. The result is that the only deletion seen in the Stem Level case must be attributed to the Phrase Level deletion process. In the case of the Word Level environment, however, there is no blocking, so we see application of deletion at both Word and Phrase Levels. This results in the Word Level environment showing higher rates of deletion than the Stem Level environment for this age group.

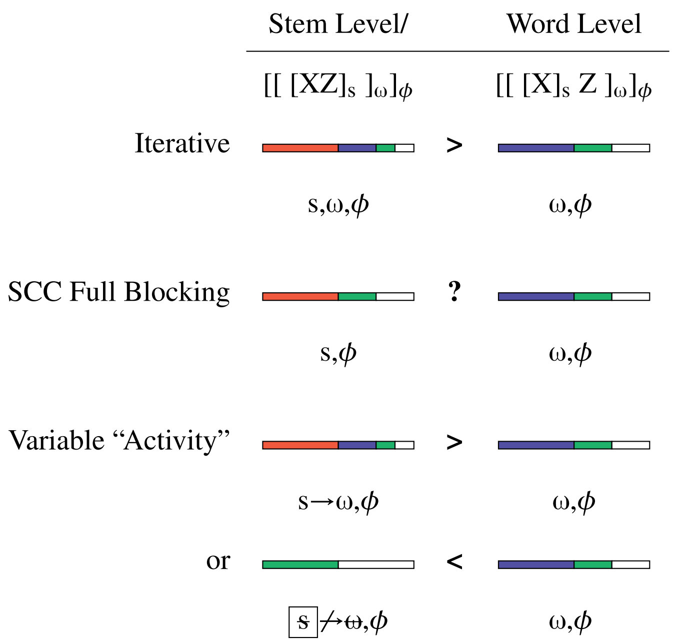
4.1.1 Comparison of Models

The predictions of the relative rates of application between Stem Level and Word Level environments for all the models discussed above are summarized in (16):

(16) Predictions of each model

Example Process: $X \rightarrow Y\ /\ \_\ Z$

Example rate: 50% application at each level (stem, word, and phrase)



While the Iterative Model predicts that the Stem Level cases should always have a higher rate of application than Word Level cases, the other models predict that the relative rates are dependent on other factors. For the SCC Full Blocking model, the relative surface rate depends solely on the rate at the Stem Level versus that at the Word Level because neither can apply to the same derivation. For the Variable "Activity" model, the rate of application is predicted to be higher for Stem Level cases exactly when the phonological process is active at the stem Level. In these cases, the model makes the same prediction as the Iterative Model. However, if the process is not active at Stem Level, the Variable "Activity" model predicts that there will be a higher rate of application of the process in Word Level environments because in these cases there is some sort of SCC-like blocking applied.

4.2 What is Varying?

Another aspect of the interaction of morphological structure and variation that needs to be considered is what, exactly, is varying when we see variation in the data. That is, there are several places in the grammar that could account for variation. First, it is possible that speakers have variable analyses of the consituency of units into Stem and Word Levels. That is, it is possible for a speaker to sometimes analyze something as being a stem and sometimes as a complex unit. This sort of variation would cause changes in the morphological analysis in the minds of speakers and thus it would variably affect the phonological output. This, however, does not seem to be the case in the case studies above, at least, not in the case of Korean /w/-deletion. It seems unlikely that a speaker would analyze $\sqrt{\text{SWIP}}$ as anything other than a root. Nevertheless, this possible location of variation should be kept in consideration for future case studies.

Another place where variation is possible in the grammar is variation in the application of rules itself and variation in the activeness of rules in different domains. As discussed above, a rule may have different rates of application at Stem and Word Levels, and there could be differences in the rate of application at any given level between speakers or within a speaker between different registers. Nevertheless, the Iterative Model predicts a monotonic increase in the rate of application of a process as it is applied at more morphological levels.

Finally, another possible location for variation is in the application of NDEB. That is, depending on the implementation of NDEB effects in the grammar, it could be possible to have variable rates of "freezing" or "inaccessibility" of the phonological material. While this is, by hypothesis, not available in the SCC implementation, which holds that material which is inaccessible remains inaccessible, it is possible that there is another explanation of NDEB that could be variable.

5 Conclusions

In this paper we presented two case studies in which the pattern of application of a variable phonological process ran counter to what was predicted by the Iterative Model. Specifically, in Korean /w/-deletion among 20-40 year olds and in AAVE /t/-assibilation, the monomorphemic environments for application showed a lower rate of application than the polymorphemic environments.

We observed that the morphological structure that this data appears in is the same as that of the phenomenon of Non-derived Environment Blocking. We posited that there is some relationship between the degraded rate of application seen in the case studies and the blocking which occurs in categorical phonology in this environment. We discussed two approaches to the implementation of these effects in the grammar: SCC Blocking and the Variable Activity

Model. Because the Variable Activity Model seems to account for two of the Korean age groups with a single change (whether the Stem Level deletion process is active), it seems preferable given this data.

The overarching theme is that in cases of variable rules and morphological structure, while there is some importance to the notion of repeated application, it is not necessarily the one associated with the Iterative Model.

Notes

[1]We will be ignoring the case of the semiweak past tense, for which, see Fruehwald 2012; Tamminga & Fruehwald 2013.

[2]There are a few other processes in Korean which create /w/ out of other segments. For the purposes of simplicity, we will only use the /o/ →[w] process here. See Kwon (2014) for more details on the other processes.

[3]Of all tokens, those with /w/ in a domain initial position were excluded since the deletion is significantly disfavored in this environment.

[4]Kwon (2014) also notes that the youngest speakers have expanded the environment of the deletion process, evidenced by the deletion of /w/ without a preceding consonant.

[5]Thanks to the Frank Porter Graham institute, North Carolina State University, and Walt Wolfram for use of the Frank Porter Graham corpus.

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