

Partial blocking*

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1 Introduction

Morphological blocking occurs when one morpheme suppresses the surface appearance of another morpheme, even though the two are semantically compatible. This paper introduces the phenomenon of Partial Blocking, in which a morpheme is suppressed segmentally, but not phonologically. The phonological effects of blocking have been little studied in the literature, and serve as a novel test case for different theories of morphologically-conditioned phonology.

Two competing approaches to morpho-phonology are indexed constraints and cophonology theory. In the theory of indexation, each language has a single global ranking within Optimality Theory, and certain constraints may be indexed to particular morphological contexts (Smith 1997, Alderete 2001, and others). In cophonology theory, the individual morphological constructions of a language are associated with different phonological grammars, each of which may impose its own unique ranking (Inkelas & Zoll forthcoming, and works cited there). I show that the Partial Blocking configurations cannot be handled by a single global ranking of constraints, but require a phonological grammar of their own, in line with the predictions of cophonology theory.

In §2 I introduce the basic idea of Partial Blocking, using data from Barasana. In §3 I introduce a more extended example from Kanuri, which exhibits both Partial and Complete Blocking. I show that the Kanuri data requires that different morphological configurations be associated with cophonologies, and that indexed constraints are not sufficient. In §4 I propose a heuristic for associating particular blocking configurations with a set of cophonologies. §5 concludes.

2 The phenomenon of Partial Blocking: Barasana

This section introduces the phenomenon of Partial Blocking, which is different from the traditional notion of complete blocking. As it is traditionally understood, a blocking morpheme is one which suppresses the appearance of other morphemes, even when the two are semantically compatible. In English, for example, the past-tense morpheme *-ed* blocks the third singular agreement marker *-s*. The two morphemes are semantically compatible because a given verb form can easily have the interpretation of PAST and THIRD SINGULAR at the same time, but only PAST appears overtly on the form (e.g., *she walked* but **walk-s-ed*, **walk-ed-s*).

* For helpful discussion, thanks to Sharon Inkelas, Marc Ettlenger, Nick Fleisher, Lev Blumenfeld, Gaja Jarosz, and CLS 41 audience members. Flaws are mine.

I introduce a related but different kind of blocking that I call Partial Blocking. Barasana (Tukanoan, Columbia) provides a good example (data from Gomez-Imbert 1997, Gomez-Imbert & Kenstowicz 2000). This language has a morpheme *-bi* which indicates a non-third person subject. It also has a morpheme *-ri* which indicates interrogative.

- 1) báá- bǐ ‘I/you/we swim’ (G-I & K 442)
 swim- NONTHIRD
- 2) báa- ri ‘did he/she/they swim?’ (G-I & K 441)
 swim- INTERR

These two morphemes are in a blocking relationship. Even when both morphemes are semantically present on the verb form, the Interrogative blocks the Non-third, such that *-ri* appears on the surface but *-bi* does not.

- 3) báá- rí ‘did I/you/we swim?’ (G-I & K 442)
 swim-INTERR
- 4) *baa-ri-bǐ, *baa-bǐ-ri

Yet the semantic interpretation of the form, as indicated by the gloss, includes both NON-THIRD and INTERROGATIVE.

We can refer to the Interrogative as a blocker, and the Non-third as a blockee. Their blocking relationship is schematized in the following table.

- 5)

baa ‘swim’	-ri INTERR
	-bǐ NONTHIRD

 → báá-rí ‘did I/you/we swim?’

So far, this looks like a case of blocking in the traditional sense.

What interests us about Barasana, however, is that both the blocker morpheme and the blockee morpheme condition certain phonological effects on the tones associated with verb roots. They do this by aligning the tones that are supplied by the root (Pycha in prep). For example, the verb root *baa-* ‘swim’ has a floating HL tone in its lexical representation, indicated by a circled HL.

- 6) Lexical entry:

baa- ‘swim’
ⓂHL

When the Non-third morpheme attaches to the root, it takes this floating HL and aligns it to the rightmost edge of its morphological constituent, [Root Non-third]. In our example, this constituent is [baabi].

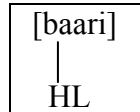
- 7) Rightward alignment,
 in the Non-third phonology

[baabi]
HL

The association rules of the language are such that the H portion of the contour aligns to the rightmost mora and, since contour tones are not permitted, the L is not realized. Leftward spreading of H tones, a general process in the language, accounts for the high tones on the remaining moras and produces the surface form *báábi* ‘I/you/we swam’.

The Interrogative morpheme does something different with the floating HL of the root *baa-*. It aligns the HL onto the leftmost edge of its constituent [Root Interr], which in our example is [baari].

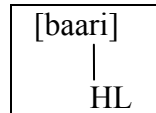
- 8) Leftward alignment,
in the Interrogative phonology



Rightward spreading of L tones, again a general process, accounts for the low tones on the remaining moras, producing the surface form *báari* ‘did he/she they swim?’.

Now notice what happens with tonal alignment in the blocking situation. Even though the Interrogative morpheme is the blocker, the phonology normally associated with the Interrogative does not take place. We see no evidence of leftward alignment of the HL tone in (3). Instead, rightward alignment has taken place, as below.

- 9) Rightward alignment,
in blocking configuration:



Interestingly, the blocker *-ri* fails to trigger its own phonology. Instead, it triggers the phonology of the blockee; that is, it triggers the rightward alignment associated with the Non-third person *-bi*. We can say that the Non-third person morpheme in Barasana undergoes Partial Blocking.

- 10) *Partial Blocking*

The segments of a morpheme are blocked, but its phonology is not.

The phenomenon of Partial Blocking raises the question of what, exactly, it means for a phonological process to be conditioned by a morpheme. In Partial Blocking, the conditioning morpheme is semantically present on the verb, but not segmentally present. The phonology associated with Partial Blocking is thus morphologically conditioned, but not in the traditional sense.

Partial Blocking is not an isolated occurrence. It is attested elsewhere in Barasana, and attested in other languages as well. I turn to an example from Kanuri next.

3 Partial and Complete Blocking: Kanuri

In this section, I present further empirical evidence for Partial Blocking, this time from Kanuri. I use this evidence to support the theoretical position that each morphological configuration in a language must crucially be associated with

an entire phonological grammar of its own. It is not empirically sufficient to invoke a set of indexed constraints within a global ranking.

The essential argument is this. Kanuri has two blocking configurations. In the first configuration, a ranking A >> B is required. In a second configuration, however, a ranking B >> A is required. Indexed constraints have no way to adjudicate between these two rankings. I therefore claim that each configuration must be associated with its own independent phonological grammar -- that is, with a cophonology.

3.1 Background: Tonal alignment in Kanuri auxiliary verbs

Kanuri is a Saharan language of Nigeria, Niger, and Chad. The data in this paper come from Hutchison (1981), with additional examples from Lukas (1937) where noted. I have also drawn upon the description of Cyffer (1998).

Kanuri has underlying H and L tones, and verb roots may have either tone. HL and LH contours can occur when H and L tones come together in word-formation processes (Hutchison 1981: 23). Some Tense-Aspect-Mood (TAM) affixes in the language introduce a polar tone. In our examples, the TAM morpheme *-in* carries a L tone on itself. In addition, it contributes a polar tone, which is high when verb root is L, and low when verb root is H.

Kanuri verbs fall into two classes. Class 1 verbs forms consist straightforwardly of root plus affixes, while Class 2 verb forms also require an Auxiliary verb *n-* ‘say, think’, as shown below.

- 11)

bák ‘beat’	-n AUX	-k 1SG.SUBJ	-in TAM
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 → bāŋgìn ‘I beat’ (H 116)
- 12)

tùs ‘rest’	-n AUX	-k 1SG.SUBJ	-in TAM
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 → tùsǎngìn ‘I rest’ (H 116)

This class “is highly productive and all verbs introduced through innovation or borrowing belong to class 2” (Cyffer 1998: 34).

The Auxiliary *n-* possesses a phonology that will play an important role in the discussion to follow, and the rest of this subsection is devoted to justifying this phonology. Essentially, the Auxiliary contributes an L tone and aligns it leftward. The evidence for this comes from several sources. First, the Auxiliary *n-* ‘say, think’ behaves like a L-toned verb when it occurs independently.

- 13)

n AUX	-m 2SG.SUBJ	-na TAM
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 → nǎmmà ‘you have said, thought’ (H 120)

(Unlike other TAM morphemes, *-na* does not contribute a polar tone).

Second, when it occurs as part of a Class 2 verb, Auxiliary *n-* also contributes an L tone. In the example below, this L aligns to the leftmost available TBU, creating contour tones on the root.

- 14)

bák ‘beat’	-n AUX	-k 1SG.SUBJ	-in TAM
---------------	------------------	----------------	------------

 → bāŋgìn ‘I beat’ (H 116)

Some additional examples are *lên̄yìn* ‘I sleep’ (H 166), *nâm̄yìn* ‘I sit down’ (Lukas 1937: 37), and *wû̄yìn* ‘I look at’ (Lukas 1937: 36).

Third, we know that the contour tone in (14) comes from the Auxiliary, and not from a TAM polar tone. The evidence comes from Class 1 verbs, which use identical TAM morphemes but are formed without an Auxiliary. Here, the polar tone contributed by the TAM never creates a contour.

- 15)

bú ‘eat’	-k 1SG.SUBJ	-in TAM
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 → búkìn ‘I eat’ (H 115)
*bûkìn

This is not an effect of syllable type, because CVk syllables can in general take a contour tone in Kanuri, as in the form *bâkshìn* ‘he/she beats me’. The polar tones associated with TAM morphemes thus seem to be passive, in contrast with the L tone contributed by the Auxiliary which gets actively aligned leftward.

Finally, evidence comes from Class 2 verbs with L roots. Here, the polar tone contributed by the TAM morphemes will be H. The TAM attaches last, so the polar H comes in on the right side of the verb form. An additional L is still present, however, visible on the contour of the second syllable in *tùsǎngîn*.

- 16)

tùs ‘rest’	-n AUX	-k 1SG.SUBJ	-in TAM
---------------	-----------	----------------	------------

 → tùsǎngîn ‘I rest’ (H 116)
L LH HL

Here the polar H appears to be associated with two syllables. Schwa-epenthesis creates an extra syllable, and the L of the Auxiliary aligns itself to the left edge of this syllable.

3.2 Complete Blocking in Kanuri

Keeping the leftward tonal alignment of the Auxiliary in mind, let us turn to a blocking example. We saw that Class 2 verbs generally require the Auxiliary. When a third person subject occurs in a Class 2 verb, however, it blocks the segments of the Auxiliary *n-*, as shown below.

- 17)

bák ‘beat’	-s 3SG.SUBJ	-in TAM
	-n AUX	

 → bákcin ‘he/she beats’ (H 116)

Some additional examples are *létcin* ‘he/she sleeps’, *nápcin* ‘he/she sits down’ (Lukas 1937: 37), and *wûjìn* ‘he/she looks at’ (Lukas 1937: 36).

In each of these verb forms, no remnant of the *n-* segment of the Auxiliary occurs in the surface form. This is a blocking effect, and not a local effect of [sn] or [ns] segment combinations. We know this because in general, Kanuri repairs such clusters with either schwa epenthesis or post-nasal voicing.

- 18) General segmental processes in Kanuri (Cyffer 1998)
s + n → s̄n
n + s → n̄z

Also in each of the forms in (17), no HL contour appears on the verb root. Instead we see only a H tone, which suggests that the phonology of leftward L alignment associated with the Auxiliary has not applied. This is a blocking effect, and not an effect of syllable type because contours can appear on CVT syllables (§3.1). Unlike the Barasana example of Partial Blocking, this particular Kanuri example exhibits Complete Blocking of the Auxiliary morpheme.

19) *Complete Blocking*

Both the segments and the phonology of a morpheme are blocked.

In subsequent sections, we will see that the Auxiliary does not always undergo Complete Blocking. It may also undergo Partial Blocking, crucially depending upon the particular morphological configuration in which it is blocked.

A final point about the forms in (17) is that a segmental process of assimilation has occurred, whereby /s/ → [c]. This phonology is triggered only by third person subjects (Cyffer 1998: 35).

3.2.1 Complete Blocking with indexed constraints

Let us examine how the theory of indexed constraints handle our example of Complete Blocking in Kanuri. This will be important for understanding whether such constraints can handle Partial Blocking (§3.3).

In this theory, phonological constraints are indexed to particular morphemes and are active only in relationship to those morphemes. For example, if an epenthesis process were generally active in some language but never affected the past tense morpheme, we might have an indexed constraint DEP_{Past} which would outrank the relevant markedness constraint: $DEP_{Past} \gg MARKEDNESS$.

For Kanuri, the morphemes in question are the Auxiliary and the Third Subject. Recall that when both the Auxiliary and the Third Subject morphemes are present on the verb, we see the phonological effects of the Third Subject only. Very generally speaking, this suggests that in the global ranking of Kanuri the phonological constraints indexed to Third Subject morphemes should outrank those indexed to the Auxiliary, as schematized below.

20) $CONSTRAINT_{3Subject} \gg CONSTRAINT_{Aux}$

Based on the data discussed in §3.2, we can fill in this schematization with concrete constraints. The phonology of the Auxiliary contributes an L tone and aligns it to the left, so its indexed constraint could be formulated as follows¹.

21) $ALIGN-LEFT[L]_{Aux}$

¹ Alderete (2001) and others have claimed that morphological contexts do not differ in markedness constraints, but in faithfulness constraints only. This would suggest that Kanuri aligns L tones leftward as a general strategy, while faithfulness constraints in all morphological contexts except the Auxiliary prevent this alignment from occurring. I have diverged from this idea and modeled the Auxiliary behavior as a markedness constraint because the evidence in §3.1 indicates that the Auxiliary *actively* triggers this process, but the basic argument that I present throughout §3 still holds even if we follow a faith-based approach.

The phonology of the Third Subject triggers an assimilation /s/ → [c] , so its indexed constraint could be as follows.

22) *si >> FAITH[Segments]_{3Subject}

When we fill in this schematic ranking with actual constraints, we arrive at the following.

23) *si >> FAITH[Segments]_{3Subject} >> ALIGN-LEFT[L]_{Aux}

An immediate problem with this ranking is that satisfaction of the higher-ranked Third Subject constraint does not guarantee violation of the Auxiliary constraint. The grammar can easily repair the marked [si] sequence and align L tones leftward at the same time, as shown in the following tableau.

24)		/bák- {THIRD, INTERR}-TAM/ 'he/she beats'	*si	FAITH _{3Subject}	ALIGN-LEFT[L] _{Aux}
	a.	bákcìn		*	*
	b.	bâkcìn		*	

The data demands that the Auxiliary alignment constraint be violated somehow, but the global ranking provides no way to accomplish this.

To remedy the situation, we could propose an additional indexed constraint. This would be a sort of tonal faithfulness constraint, NO-ALIGNMENT, which requires that the L tone contributed by the Auxiliary do nothing.

25) NO-ALIGNMENT_{3Subject} >> ALIGN-LEFT[L]_{Aux}

This would presumably accomplish the desired empirical result, suppressing the phonology triggered by the Auxiliary just in those cases where a third person subject morpheme is also present on the verb.

The formulation of this constraint is somewhat strange, however. Lack of leftward tonal alignment is actually the general or “default” case that we see in most verb forms, not just in third person subjects. But we cannot rank a general, non-indexed NO-ALIGNMENT constraint above the ALIGN-LEFT constraint because this would cause violations of ALIGN-LEFT even when the Auxiliary verb is present, and this is an incorrect empirical result.

For now, the solution sketched in (25) is at least empirically adequate, if not theoretically elegant. When we examine Partial Blocking in Kanuri, however, we will see that it is not empirically adequate either.

3.2.2 Complete Blocking with phonological grammars

Let us examine an alternative viewpoint, and see how we could handle our example of Complete Blocking in Kanuri with complete phonological grammars, or cophonologies. In cophonology theory, individual rankings are associated with individual morphemes. For example, if an epenthesis process were generally active in some language but never affected the past tense morpheme, the past tense cophonology would have the ranking DEP >> MARKEDNESS, while morphemes would have the ranking MARKEDNESS >> DEP.

Under this approach, the Auxiliary and the Third Subject would each have distinct cophonologies.

26) *Cophonologies*

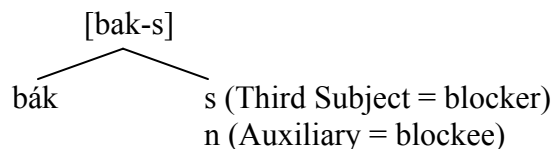
Auxiliary: ALIGN-LEFT[L]

3Subject: *si >> FAITH[Segments]

The formulation of the cophonology is based on the behavior of the associated morpheme when it occurs independently. That is, we know that the Auxiliary independently triggers leftward tonal alignment. Its grammar need not make reference to any segmental processes, because the Auxiliary triggers none. Likewise, we know that the third subject independently triggers segmental assimilation of underlying /si/. Its grammar need not make reference to any tonal processes, because the third subject triggers none.

On its own, cophonology theory does not provide a heuristic for knowing which grammar should apply in a blocking situation. Because both morphemes are semantically present on the verb, either of their grammars could presumably be triggered.

27)



Based on the data in (17), of course, we know exactly which cophonology it ought to apply.

28) Phonology for Complete Blocking = Third Subject phonology

Assuming some heuristic for triggering the Third Subject cophonology in the blocking configuration (see §4 for a proposal), the important point is this. When the Third Subject cophonology applies, the constraint ALIGN-LEFT[L] need not be present as part of the grammar because nothing about the behavior of the Third Subject motivates its existence. We do not, therefore, need to worry about how to violate it.

Even if we maintain that every cophonology must rank the same set of constraints somehow, such that ALIGN-LEFT[L] must be ranked even within the Third Subject cophonology, nothing prevents us from ranking it differently in each cophonology, as in the following.

29) *Cophonologies*

Auxiliary: ALIGN-LEFT[L] >> NO-ALIGNMENT

3Subject: NO-ALIGNMENT >> ALIGN-LEFT[L]

Cophonology theory thus avoids the “crucial violation” problem that indexed constraint theory presents, although it needs a heuristic for selecting a particular cophonology.

3.3 Partial Blocking in Kanuri

Keeping in mind the different theoretical sketches of Complete Blocking that we have entertained above, let us turn to an example in Kanuri that displays both Complete Blocking, as seen in §3.2, and Partial Blocking, as in Barasana.

When a direct object morpheme occurs in a Class 2 verb, it blocks both the Auxiliary and the Third Subject. But these morphemes are blocked in different ways. The Third Subject undergoes Complete Blocking, but the Auxiliary undergoes Partial Blocking. The example below shows this morphological configuration for a first person singular object.

30)

bák 'beat'	-s 3SG.OBJ	-in TAM	→ bákshin	'he/she beats me' (H Appendix)
	-s 3SG.SUBJ			
	-n AUX			

Additional examples with singular objects are *lêshìn* 'he/she touches me' and *wûshìn* 'he/she looks at me' (Lukas 1937: 112). Examples with plural objects are *bûksài*, 'he/she beats us', *lêsài* 'he/she touches us', and *wûsài* 'he/she looks at us' (Lukas 1937: 112).

In these verb forms, we see the pattern of leftward L tone alignment that we associated with the Auxiliary morpheme in §3.1, manifested in the HL contour on the root. Of course, an alternative source for this L alignment could conceivably be the object morphemes themselves, but this is not the case. We can see this by examining the object affixes *s-* and *sa-* in Class 1 verbs, where they are prefixed to the root. They do not contribute L tones to the verb form:

31)

s-	tà	-m	-in	→ sótámìn	'you grab me' (H Appendix)
1SG.OBJ	'grab'	2SG.SUBJ	TAM		
sa-	tà	-m	-in	→ sátámìn	'you grab us' (H Appendix)
1PL.OBJ	'grab'	2SG.SUBJ	TAM		

The pattern of tonal alignment comes from the Auxiliary, and we can say that this morpheme undergoes Partial Blocking. Its segments are blocked, but its phonology is not.

Within the very same morphological configuration, we also observe Complete Blocking of the Third Subject. Its segments are blocked, and its phonology is too. The pattern of segmental assimilation serves as a diagnostic for this. Recall that the phonology of the Third Subject consists of the assimilation /s/ → [c]. But the data in (30) do not exhibit this process, despite the identical segmental environment. Instead, a general process of /s/ → [sh] takes place. The Third Subject's phonology is blocked, and we can say that this morpheme undergoes Complete Blocking.

A morpho-phonological theory of the Kanuri data must now account for both Complete and Partial blocking in different morphological configurations.

3.3.1 Partial and Complete Blocking with indexed constraints

We already walked through an example of Complete Blocking with indexed constraints (§3.2.1), so let us turn our attention to Partial Blocking. When an Object is present, the Auxiliary is partially blocked. Its segment *n-* does not appear on the surface, but its process of leftward L tone alignment does. Because three potentially competing morphemes (Aux, Object, Third Subject) are semantically present on the verb in this configuration, but only the Auxiliary phonological processes take place, we need the constraints which refer to the Auxiliary morpheme to outrank those which refer to either the Object or Third Subject. This can be schematized as follows.

32) $\text{CONSTRAINT}_{\text{Aux}} \gg \text{CONSTRAINT}_{3\text{Subject}}, \text{CONSTRAINT}_{\text{Object}}$

But this ranking presents a rather serious problem. It directly contradicts the ranking that we need independently for the Complete Blocking examples presented in §3.2, repeated below.

33) $\text{CONSTRAINT}_{3\text{Subject}} \gg \text{CONSTRAINT}_{\text{Aux}}$

Any time that the Third Subject and Auxiliary morphemes are semantically present on the same verb form, both of these rankings should in theory be active, but they cannot both be. We see the same contradiction when we fill in the schematization with concrete constraints:

34) Partial Blocking ranking requirement:
 $\text{ALIGN-LEFT}[L]_{\text{Aux}} \gg \text{NO-ALIGNMENT}_{3\text{Object}}, \text{NO-ALIGNMENT}_{3\text{Subject}}$

35) Complete Blocking ranking requirement:
 $\text{NO-ALIGNMENT}_{3\text{Subject}} \gg \text{ALIGN-LEFT}[L]_{\text{Aux}}$

There is no way to create a single global ranking for Kanuri that can handle both of its blocking configurations.

3.3.2 Partial and Complete Blocking with phonological grammars

The data presented above make clear that the blocking configurations in Kanuri have very different grammatical behaviors. Under cophonology theory, this observation does not present a problem -- in fact, it is predicted. Each blocking configuration can have its own grammar, or cophonology, associated with it. Nothing in the theory requires that these two cophonologies resemble one another. We could therefore associate each blocking configuration with a grammar as follows.

36) Phonology for Complete Blocking = Third Subject phonology

37) Phonology for Partial Blocking = Auxiliary phonology

Of course, we need some heuristic for associating Complete or Partial Blocking with a specific phonology, which I turn to next.

4.0 A heuristic for blocker phonologies

In this section I explore one possible heuristic for triggering phonological processes in blocking configurations. As I have shown above, blocking configurations require the selection of an entire phonological grammar, not just of a set of constraints. The capability to select an entire grammar is thus an obvious desideratum of such a heuristic.

This heuristic must also obey one important empirical restriction, which is that the selected phonology must be associated with either the blocker or one of the blockees. In both Kanuri and Barasana, the selected phonology never appears to be a ‘blend’ of the blocker and blockee phonologies, nor does it appear to be some alien phonology from a totally different part of the grammar. Rather, the triggered phonology comes directly from either the blocker or blockee morphemes. We can formulate this in the following condition.

38) *Blocker Phonology Condition*

The phonology associated with a blocking configuration must be that of either the blocker or a blockee.

The Blocker Phonology Condition relates the phonological effects of blocking with its morphological effects, which is a clear theoretical desideratum.

4.1 The Double Life of Blockers

As we saw in both the Barasana and Kanuri examples, a blocking morpheme has two ways of attaching to a stem. It may attach as a plain old affix, or it may attach as a blocker. These two ways of attaching are quite different.

When the morpheme attaches as a plain old affix, nothing special happens. The semantic meaning of the form corresponds roughly to some composition of the stem and surface affixes. For example, when the Interrogative morpheme *-ri* in Barasana attaches to a verb root as a plain old affix, we get a straightforward semantic interpretation that is a composition of the root plus a non-declarative meaning: *báa-ri* ‘did he/she/they swim?’

When the same morpheme attaches as a blocker, however, something special happens. The semantic meaning of the form does not correspond to a composition of the stem and surface affixes, because there is a hidden, or blocked, morpheme that does not appear on the surface but still contributes semantic meaning. For example, when the Interrogative *-ri* attaches to a verb root as a blocker, we get the extra semantic interpretation of the blocked morpheme (here, the non-third person morpheme): *báá-rí* ‘did I/you/we swim?’

Plain old affixation and blocking are thus two totally different ways of behaving morphologically. As I have shown in this paper, they are also two totally different ways of behaving phonologically. So what is the nature of morphological blocking, exactly? Answering this question may allow us to better understand the phonological processes that concern us here.

Inkelas (1993) has proposed that the nature of morphological blocking can best be explained as “level-straddling” or shifting. Under this proposal, a blocking

morpheme is one which attaches at one level, but creates a morphological constituent at the next level.

39) Blocker morphemes (Inkelas 1993)

0	...	N	N + 1
Root		Blocker	
			Blockee

Here the unique property of the blocker is that it shifts from level N to level N+1.

This property of blockers stands in contrast to the properties of non-blockers, which occupy just a single level.

40) Plain old morphemes

0	...	N	N + 1
Root		Morpheme	Morpheme

Plain old morphemes do not shift, they just occupy one level.

Inkelas's (1993) proposal about the nature of blocking was intended to account for morphological behavior. By straddling multiple slots, a blocker shifts from its own slot to the slot of the blockee. Such a representation accounts for the generalization that blockers suppress adjacent affixes. Inkelas showed this generalization for Nimboran, and we saw it in both Barasana and Kanuri as well. For example, in Kanuri the Third Subject blocks the Auxiliary. When the Auxiliary does appear, however (e.g. with first and second person subjects), it occupies the same slot as the Third Subject does. The Third Subject is thus adjacent to the Auxiliary blockee.

If we take level-straddling to be a viable proposal for morphological blocking behavior, then, we can ask if straddling reveals something to us about phonological blocking behavior as well. I claim here that it does. We already know that when a morpheme attaches as a plain old affix, it triggers its own phonological process. When it attaches as a blocker, however, it triggers a phonological process associated not with the morpheme itself, but with the level-shifting operation. Therefore, I hypothesize that any given blocker leads a double life.

41) *The Double Life of Blockers Hypothesis*

A blocking morpheme may behave in one of two different ways phonologically:

- a). As a plain old morpheme, it triggers the phonology associated with itself.
- b). As a blocking morpheme, it triggers the phonology associated with level-shifting $N \rightarrow N+1, N+2, \dots$ or $N + x$.

4.2 Applying the Double Life Hypothesis

Before examining the theoretical status of the Double Life Hypothesis further, let's examine how it could be applied to the empirical data we have seen so far. Recall that the Kanuri Auxiliary morpheme undergoes Complete Blocking

when a Third Subject is present on a Class 2 verb (§3.2). That is, both the segments and the phonology of the Auxiliary are blocked from appearing on the surface. Under the Dual Life Hypothesis, the Third Subject should be therefore be associated with a level-shifting phonology, because it is a blocker.

To see what level-shifting would look like here, suppose that the Third Subject occupies two levels while the Auxiliary occupies just one.

42)

1	2	3	4	5
bák 'beat'	...	-s 3SG.SUBJ		-in TAM
			-n AUX	

→ bákcin 'he/she beats'

The Third Subject occupies levels 3 and 4 (the blank level 2 just indicates that other morphemes can occur between the root and the subject). This representation accounts for its blocking behavior with respect to the adjacent Auxiliary morpheme, which occupies level 4.

Under the Dual Life Hypothesis, there exists a phonology associated with shifting from level 3 to level 4. Under the Blocker Phonology Condition, this phonology must come from either the blocker or the blockee. In our example, then, it must come from either the Third Subject or the Auxiliary. In fact, the data we examined in §3.2 shows that the source of the phonology is the Third Subject.

43) 3 → 4 shifting phonology = Third Subject phonology

This association of the 3 → 4 shifting phonology with the Third Subject phonology predicts the surface effects of this blocking configuration: namely, s → [c] assimilation and no tonal alignment.

Crucially, notice that the level-straddling representation essentially predicts the Blocker Phonology Condition. The blocker occupies levels 3 and 4, and may therefore associate with a phonology from any of the affixes at levels 3 and 4 -- that is, from the blocker or the blockee. It may not associate with a phonology from any morpheme outside of these levels.

The same ideas could be applied to Partial Blocking in Kanuri (§3.3). Recall that when an Object is present on a Class 2 verb, the Auxiliary undergoes Partial Blocking and the Third Subject undergoes Complete Blocking. This calls for a slightly more complex representation of level-straddling.

44)

1	2	3	4	5
bák 'beat'		-s 1SG.OBJ		-in TAM
		-s 3SG.SUBJ		
			-n AUX	

→ bákshin 'he/she beats me'

Under the Dual Life Hypothesis, the Object morpheme should be associated with a level-shifting phonology when it acts as a blocker. In this case,

the Object actually shifts not one but two levels, from 2 → 4. This representation again predicts that the level-shifting phonology must come from a morpheme at levels 2, 3, or 4 (Blocker Phonology Condition). As the data discussed in §3.3 shows, the phonology comes from the Auxiliary, at level 4.

45) 2 → 4 shifting phonology = Auxiliary phonology

4.3 Theoretical status of Double Lives

The proposed heuristic for associating a phonology with a blocking configuration is not total. It does not, for example, tell us *which* morpheme at levels 2, 3, or 4 should provide the phonology for level-shifting. Invoking morpheme exponence would be one means to narrow in on a single phonology, but this makes incorrect predictions for Complete Blocking. Just because a blockee morpheme has a phonology associated with it does not guarantee that this phonology will surface as a morpheme exponent.

The current heuristic still accomplishes several important empirical tasks. It correctly narrows the range of available phonologies down to those which are attested for blocking configurations (that is, blocker or blockee only). Furthermore, it does so in a way that is directly related to the morphological phenomenon of blocking itself, by using a representation that captures the adjacency of blocker and blockee.

This heuristic also permits totally different phonologies to be arbitrarily associated with different level shifts. As we have seen, this is precisely what the data require. In Kanuri, our two blocking examples trigger totally different phonologies, even though the blocking configurations resemble one another rather strongly (i.e., the Auxiliary is blocked in both cases). If phonologies are associated with different level shifts, this empirical observation poses no problem. We can associate different phonologies with 3 → 4 shifting versus 2 → 4 shifting. The same set of considerations apply to the Barasana data.

As a final point, I consider the theoretical status of level-shifting. What does it mean to say that there is a phonological process associated with the shift from level $N \rightarrow N+1$? I would like to suggest that level-shifting is a type of ‘zero inflection’. Just as ‘zero derivation’ can create a new derivational category without the overt addition of an affix, level-shifting can add a new inflectional category without overt addition an affix. In this sense, level-shifting is a form of zero inflection. Textbook morphology examples make clear that zero derivation can be explicitly associated with phonologies, such as the phonology of stress shift in English noun-to-verb derivation (*per.mit* → *per.'mit*). This paper has shown that zero inflection can also be explicitly associated with phonologies.

5 Conclusion

Empirically, this paper has introduced the phenomenon of Partial Blocking, in which segments and phonologies diverge with respect to blocking behavior. Theoretically, I have argued that blocking configurations require

association with an entire phonological grammar, and not just with a set of indexed constraints. I have also shown that a level-straddling account of morphological blocking effects makes correct predictions for the novel examples of phonological blocking effects presented here.

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