Phonologically conditioned suppletive allomorphy in Haitian as morphological optimization

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Abstract Phonologically conditioned suppletive allomorphy (PCSA) may be phonologically optimizing: allomorph selection complies with the language phonotactics. However this is not always the case. A counterexample often discussed in the literature is Haitian determiner *a/la*. This paper further investigates Haitian by focusing on a PCSA pattern in Northern Haitian that has not yet been discussed in the theoretical literature: third person singular pronoun *i/li*. The paper argues that this pattern can be analyzed as morphologically optimizing: allomorph selection in this case can be understood as a way to facilitate morpheme identification in context. The pattern presents a further interesting property: allomorph selection interacts with a phonologically optimizing process (pronoun reduction from *i* to *y* [j] and from *li* to *l*). This interaction can be straightforwardly modeled in an analysis assuming parallel morphological and phonological optimizations, but not in a serial model where the morphology precedes the phonology and has no access to the output of phonological optimization.

1 Introduction

Phonologically conditioned suppletive allomorphy (PCSA) describes patterns whereby allomorphs that cannot be phonologically derived from a unique underlying form yet have a phonologically conditioned distribution (Inkelas 2014: chap. 9). For instance, in Istanbul Armenian, the definite determiner uses a consonant allomorph [-n] after vowels (1a) and a vowel allomorph [-ə] after consonants (1b). PCSA may be phonologically optimizing: allomorph selection complies with the language phonotactics. This is the case in Istanbul Armenian, since allomorph selection creates final VC and CV sequences and these sequences are more common than VV and CC sequences.

(1)   Phonologically optimizing PCSA in Istanbul Armenian (Inkelas 2014: 283)
        a.   [lezu-n] 'tongue-DEF'   b.   [hat-ə] 'piece-DEF'

   However PCSA is not always phonologically optimizing. An example that is often cited in the literature is Haitian definite determiner *a/la* 'the'. The vowel allomorph [a] is selected after vowel-final words (2a) and the consonant-initial allomorph [la] after consonant-final words (2b). This pattern is not phonologically optimizing, since allomorph selection in this case creates VV and CC sequences and these sequences are less common than VC and CV sequences (Klein 2003).

(2)   Phonologically non-optimizing PCSA in Haitian (Cadely 1995: 23)
        a.   [papa#a] 'father DEF'   b.   [pitit#la] 'the child DEF'

What is the motivation for PCSA patterns that are phonologically non-optimizing? This paper addresses this question by focusing on another PCSA pattern in Haitian that has not been addressed

in the theoretical literature to our knowledge and yet shows some striking similarities with *a/la*: third person pronoun *i/li* (3SG) in Northern Haitian. The paper argues that this pattern can be analyzed as morphologically optimizing: allomorph selection in this case can be understood as a way to facilitate morpheme identification in context. The pattern presents a further property that makes it particularly interesting. Allomorph selection interacts with a phonologically optimizing process, namely pronoun reduction from *i* to *y* [j] and from *li* to *l*. This interaction can be straightforwardly modeled in an analysis assuming parallel morphological and phonological optimizations, but not in a serial model where morphology strictly precedes phonology.

Section 2 provides some background on Haitian pronouns and on pronoun reduction, a regular pattern of phonologically conditioned allomorphy that is phonologically optimizing. Section 3 presents the distribution of *i/li* '3SG' in Northern Haitian based on Valdman et al.'s (2015) corpus study and justifies why this pattern is an instance of phonologically non-optimizing PCSA. Section 4 presents the analysis of this pattern as morphologically optimizing and show that the correct distribution of allomorphs can be derived if morphological optimization (responsible for *i/li*-selection) and phonological optimization (responsible for pronoun reduction) happen in parallel. Section 5 concludes with a brief discussion of some implications of this analysis for theories of morphophonological interactions.

2   Background on Haitian pronouns

Haitian has a relatively complex system of pronouns that is largely inherited from French tonic pronouns but features a number of innovations, in particular the possibility to use reduced forms (Fattier 1995). The pronoun paradigm is shown in Table 1. Standard Haitian (SH) is the variety from the capital Port-au-Prince. Northern Haitian (NH) is the variety spoken in and around Cap-Haïtien.

	Singular		Plural	
Person	Full form	Reduced form	Full form	Reduced form
1	[mwɛ̃]	[m]	[nu]	[n]
2	[u]	[w]	[nu]	[n]
3	[li] (SH)	[l] (SH)	[jo]	[j]
	[i] (NH)	[j] (NH)		

Table 1: Haitian pronouns (full and reduced forms). The Standard Haitian (SH) form is used in some contexts in Northern Haitian (NH) alongside the native form [i].

Section 2.1 describes the distribution of full and reduced forms in Haitian. Section 2.2 justifies the analysis of this pattern as phonologically optimizing, non-suppletive allomorphy and shows how the basic asymmetry between vocalic and consonantal contexts can be derived with a constraint (C//V) that is independently motivated in the language.

2.1   Pronoun reduction

The distribution of full and reduced allomorphs is by and large governed by morphosyntactic and phonological factors, both in Standard and Northern varieties (Cadely 1995; 2010; Valdman et al. 2015). Two broad classes of contexts may be defined morphosyntactically. Under focus, in dislocations, and in complement position of monosyllabic prepositions, full allomorphs must be used, as shown in (3a), (3b), and (3c), respectively. The acceptability judgments were obtained in fieldwork with two Haitian native speakers in Paris and confirmed by the second author. Valdman et al. (2015: 20) describe these morphosyntactic contexts as featuring what they call morphosyntactically strong

pronouns (glossed as 1SG.STRONG, 2SG.STRONG, etc.). Strong pronouns are always expressed using the full allomorphs.

(3)   Strong pronouns are expressed with the full allomorphs

   a.   Se **li/*l**   ki genyen.   c.   nan/pou **li/*l**.
        it's 3SG.STRONG REL win   in/for   her/him
        'It's her/him who won.'   'in/for her/him'

   b.   **Li/*l**,   l   achte liv   la.
        3SG.STRONG 3SG buy   book DET
        'As for her/him, (s)he bought the book.'

Outside of these morphosyntactic contexts, weak pronouns (Valdman et al. 2015: 20) are used (Cadely 2010: 22 calls them clitics). Following Valdman et al. (2015), weak pronouns will be glossed as 1SG, 2SG, etc. Weak pronouns take on the full or reduced form depending on the surrounding phonological context (Cadely 2010). Both full and reduced allomorphs are available when the pronoun is adjacent to a vowel, as shown in (4a) for the context _#V, in (4b) for the context V#_, in (4c) for the context C#_#V, in (4d) for the context V#_#C, and in (4e) for the context V#_#V. The symbol # marks word boundaries. Although Cadely (2010) describes the full form as unacceptable in these contexts (the relevant examples are indicated as *), both allomorphs were deemed as available in these contexts by our informants and by the second author.

(4)   Pronoun reduction in vocalic contexts

   a.   **Li/l** achte liv   la.   d.   kafe **li/l** bwè a.
        3SG buy   book DET   coffee 3SG drink DET
        '(S)he bought the book.'   'the coffee that (s)he drank.'

   b.   Pòl wè **li/l**.   e.   Yo di **li/l** ale.
        Paul see 3SG   3PL say 3SG go
        'Paul saw her/him.'   'They told him to go/They said he left.'

   c.   Pòl bat **li/l** anko.
        Paul see 3SG
        'Paul saw her/him.'

There is one notable exception to the generalization about reduction in vocalic contexts. *Yo* '3PL' reduces only if *followed* by a vowel, as shown in (5a). If it is preceded by a vowel but no vowel occurs after it, as in (5b), then reduction is categorically blocked (Valdman 1988: 75, Cadely 2010: 108, 116). The judgments were confirmed by our informants and by the second author.

(5)   Exception: blocking of *yo*-reduction non-prevocalically

   a.   **Y** ap   pale.   b.   Pòl wè **yo/*y**.
        3PL PROG speak   Paul see 3PL
        'They are speaking.'   'Paul saw them.'

According to Cadely (2010: 102), reduction does not depend on grammatical function. This is illustrated in (6) for the context V#_#C, where reduction is available whether the pronoun is subject (6a) or complement (6b). These judgments were confirmed by our informants and by the second author. Also, *yo*-reduction would be blocked in both sentences in the absence of following vowel, regardless of grammatical function.

(6)   Pronoun reduction is not syntactically conditioned

a. Li necèsè   pou **li/l** manje.   b. Pòl pral wè **li/l** demen.
   3SC necessary COMP 3SG eat   Paul FUT see 3SG tomorrow
   'It is necessary that (s)he eat.'   Paul will see her/him tomorrow.

When pronouns are not adjacent to a vowel, pronoun reduction is more difficult or even blocked (Cadely 2010: 99), as shown in (7a) for the context _#C, in (7b) for C#_#C, and in (7c) for C#_. In the utterance-initial context in (7a), Cadely (2010: 99) reports that reduction is actually possible. However, our informants and the second author found that reduction remains generally difficult in this context and at least less likely/acceptable than in the vocalic contexts shown in (4). This is materialized by the question mark. An exception to the blocking of reduction in consonantal contexts is the pronoun *mwen* '1SG'. This pronoun is likely to reduce even in #_C, as illustrated in (8). The special behavior of *mwen* was also observed by Valdman (1988: 19).

(7)   Blocking of pronoun reduction in consonantal contexts

   a. **li/ʔl** tande bri a.   c. Moun nan reponn **nou/*n**.
      Mary give 3SG book DET   person DET answer 1PL
      'Mary gave her/him the book.'   'The person answered us.'
   b. Mari remèt **li/*l** liv   la.
      Mary give 3SG book DET
      'Mary gave her/him the book.'

(8)   Exception: *mwen* reduces even in consonantal contexts

   a. **Mwen/m** byen.
      1SG   good
      'I am good.'

2.2   Pronoun reduction as phonologically optimizing non-suppletive allomorphy

Pronoun reduction is phonologically optimizing. Indeed, the general asymmetry between vocalic and consonantal contexts that underlies allomorph selection (leaving aside the exceptions of *yo* and *mwen* for the moment) largely correlates with the language phonotactics: the requirement for consonants to be adjacent to vowels also plays a role at the word level in Haitian. This is shown by alternations such as [sabl-e] 'sandy' - [sab] 'sand', where the stem-final [l] inherited from French *sable* [sabl] 'sand' is preserved when followed by a vowel in the same word but deleted otherwise. Also, word-initial sC clusters from French are avoided through vowel epenthesis (e.g. Haitian *espò* 'sports' from French *sport*). Moreover, the distribution of full and reduced forms does not involve suppletion, as the reduced form can be systematically derived from the full one via either vowel deletion or gliding. In other words, pronoun reduction in Haitian can be analyzed as phonologically optimizing, non-suppletive allomorphy.

In OT, the basic distribution of full and reduced allomorphs can be captured by positing three constraints. C//V penalizes consonants that are not adjacent to a vowel. Reduce requires the exponent of a pronoun to consist of a single consonant. This constraint is specific to pronouns, as only pronouns show this kind of reduction in the language. Faith penalizes any change from the input (segment deletion or gliding). Table 2 shows how these constraints can derive (i) a preference for reduction in vocalic contexts (e.g. V#_) and (ii) blocking of reduction in consonantal contexts (e.g. C#_). The full allomorph remains possible in prevocalic contexts, as discussed above. Variation in this context could be captured with a probabilistic grammar where Reduce and Faith have close weights/ranking values. The ranking C//V ≫ Faith also accounts for the general avoidance of consonants in the absence of surrounding vowels.

	V#li	C//V	Reduce	Faith
	V#li		*!	
☞	V#l			*

	C#li	C//V	Reduce	Faith
☞	C#li		*	
	C#l	*!		*

Table 2: Deriving the basic asymmetry between vocalic and consonantal contexts.

Modeling the exceptional behavior of *yo* '3PL' described in (5) requires additional constraints. Here it is assumed that *yo* reduces prevocalically due to an anti-hiatus constraint (*VV) but does not reduce non-prevocalically because a faithfulness constraint Max([-high]) blocks the deletion of a [-high] feature. This constraint does not block the reduction of *nou* [nu] and *li* [li] because these pronouns contain high vowels. However it should block the reduction of *mwen* [mwɛ̃] '1SG'. This might be problematic as *mwen* [mwɛ̃] reduces non-prevocalically after vowels, as pronouns do in general. However, *mwen* [mwɛ̃] is also generally more susceptible to reduction than the other pronouns, as discussed in section 2.1. This means that an additional constraint would be needed anyway to deal specifically with *mwen*-reduction. This constraint could counteract the effect of Max([-high]). However, as *mwen*-reduction will not play any role in what follows, we leave this further complexity aside, focusing instead on the blocking of *yo*-reduction. Table 3 shows how to get *yo*-reduction prevocalically but blocking of reduction non-prevocalically.

	jo#V	*VV	Max([-hi])	Reduce
	jo#V	*!		*
☞	j#V		*	

	V#jo	*VV	Max([-hi])	Reduce
☞	V#jo			*
	V#j		*!	

Table 3: Deriving the exceptional patterning of *yo*-reduction.

The full allomorph remains possible in prevocalic contexts, as discussed above. Variation in this context could be captured with a probabilistic grammar where *VV and Max([-hi]) have close weights/ranking values.

3 Phonologically conditioned suppletive allomorphy in Northern Haitian

Pronoun reduction is present in both Standard and Northern Haitian varieties. However Northern Haitian presents a further complexity in that it uses both its native pronoun *i/y* [i]/[j] and the pronoun [li]/[l] borrowed from Standard Haitian for '3SG'. The two allomorphs are used under both their full and reduced forms, hence Northern Haitian uses a total of four allomorphs for '3SG': [i], [j], [li], and [l]. Interestingly though, the standard allomorphs [li] and [l] have become dominant only in some very specific contexts. Section 3.1 describes these contexts, based on a detailed sociolinguistic study by Valdman et al. (2015). Section 3.2 motivates the analysis of this distribution as phonologically non-optimizing PCSA.

3.1 Pronoun allomorphs for 3SG in Northern Haitian

Valdman et al. (2015) study the influence of Standard Haitian on Northern Haitian, with a special focus on the borrowing of standard *li/l*. The study is based on interviews with 24 speakers stratified by origin (urban/rural), age (junior/senior), and sex (female/male). Valdman et al. (2015: 24-31) focus separately on pronouns occurring in subject and object positions. The corpus includes a total of 2,658 occurrences of third person weak pronouns (see Tables 8 and 9 in Valdman et al. 2015).

In subject position, Valdman et al. (2015) found a strong effect of the following phonological context on allomorph selection (NH *i/y* vs. SH *li/l*). The results are shown in Table 4. Overall, the non-native form *i/y* was found to be much more likely to be borrowed before vowels (_#V) than before consonants (both glides and non-glides, _#G and _#C), where the native form shows a greater resistance. This effect interacts with the speaker's origin: for urban speakers, the non-native form is much more frequent than the native form before vowels whereas for rural speakers, the native form remains dominant across the board. Moreover, _#V was found to specifically favor the reduced SH allomorph *l* over the full allomorph *li*. In other words, urban NH speakers have largely replaced their native reduced allomorph *y* with the SHC reduced allomorph *l* in subject position before vowels. The context and group of speakers that favor the reduced SH allomorph *l* in NH is shaded in light grey in Table 4.

		Rural variety		Urban variety	
		i/y	*li/l*	*i/y*	*li/l*
Following segment	_#V	89.6	10.4	27.5	72.5
	_#C	97.2	2.8	97.7	2.3
	_#G	96	4	100	0
Preceding segment	V#_	96.8	3.2	85.7	14.3
	C#_	92.1	7.9	84	16
	G#_	97.2	2.8	92.9	7.1

Table 4: Frequency of use of the native form (*i/y*) and the standard form (*li/l*) in subject position in rural and urban Northern Haitian. Based on Table 8 in Valdman et al. (2015).

In object position, Valdman et al. (2015) found a very strong effect of the preceding phonological context on allomorph selection (NH *i/y* vs. SH *li/l*). The results are shown in Table 5. The effect holds for both urban and rural speakers. After vowels, NH speakers almost categorically used their native form *i/y*. After consonants (glides and non-glides), they used almost categorically the SH form *li/l*. In the latter context, they specifically favored the full allomorph *li*. In other words, NH speakers have replaced their native full allomorph *i* with the SH full allomorph *li* in object position after consonants. The contexts that favor the full SH allomorph *li* in NH are shaded in grey in Table 5.

		i/y	*li/l*
Preceding segment	V#_	97.6	3.4
	C#_	3.2	96.8
	G#_	0	100
Following segment	_#V	89.8	10.2
	_#C	92	8
	_#G	91.1	8.9

Table 5: Frequency of use of the native form (*i/y*) and the standard form (*li/l*) in object position in Northern Haitian. Based on Table 10 in Valdman et al. (2015).

The phonological conditioning for *i/li*-selection is very reminiscent of the phonological conditioning for pronoun reduction. In both cases indeed, the nature of adjacent segments as vowels or consonants matters. The fact that the results are very different in subject and object positions in the case of *i/li*-selection (compare Tables 4 and 5) may suggest that grammatical function matters in this case, contrary to pronoun reduction (see section 2.1). However, due to the language's strict SVO order, grammatical function strongly correlates with position within a prosodic domain:

subjects pronouns will typically occur domain-initially (at the beginning of a sentence) and object pronouns will typically occur domain-finally (at the end of a verbal phrase/sentence). A prosodic interpretation of Valdman et al.'s data can help understand (i) why only the *following* phonological context plays a role in allomorph selection for subjects (see Table 4) and (ii) why only the *preceding* phonological context plays a role in allomorph selection for objects (see Table 5). Indeed, if subjects are typically domain-initial prosodically, then it makes sense that allomorph selection is blind to what precedes. In the same way, if objects are typically domain-final prosodically, then it makes sense that allomorph selection is blind to what follows in this case. In other words, *i/li*-selection is likely to be sensitive to the same phonological contexts as pronoun reduction, namely the presence/nature of adjacent phonological segments, without any direct role of grammatical function. This phonological/prosodic interpretation of the conditioning for *i/li*-selection will be assumed throughout the rest of this paper.

Table 6 repeats the results from Tables 4 and 5 but this time with an interpretation of subjects as (mainly) domain-initial contexts (_#C/V) and objects as (mainly) domain-final contexts (C/V#_). Because glides and other consonants behave similarly, they are treated as a single category (C). The first column shows the distribution of *li/l* in the corresponding contexts in Standard Haitian. Contexts where the standard form is favored over the native form in Northern Haitian are shaded in light gray. Contexts where the native form *i/y* is preferred are shaded in dark gray. The choice of full or reduced allomorph follows the generalization described in section 2, with the reduced allomorph appearing in vocalic contexts and the full allomorph appearing in consonantal contexts.

	Phonological context	Standard Haitian	Urban Northern Haitian	Rural Northern Haitian	
a.	_#C	li	i	i	(full allomorph)
b.	_#V	l	l	j	(reduced allomorph)
c.	C#_	li	li	li	(full allomorph)
d.	V#_	l	j	j	(reduced allomorph)

	li/l	(Standard Haitian form)
	i/j	(Northern Haitian native form)

Table 6: The singular third person pronoun (3SG) in three Haitian varieties.

(9) a. **l** ap mache ake **y**
3SG PROG walk with 3SG
'He's walking with him.'

b. Bouki, depi ou pale, **y** ap
Bouki since 2SG talk 3SG PROG
pale
talk.
'Bouki, as soon as you're talking, he's talking.'

c. solèy bat **li**, **i** pa bon
sun beat 3SG 3SG NEG good
'The sun beats it, it's not good.'

The use of the native and standard allomorphs in NH is illustrated in (9). Sentence (9a) illustrates the use of the SH reduced allomorph *l* before a vowel and the native reduced allomorph *y* [j] after a vowel (cf. (i) in Valdman et al. 2015: 21). The use of the allomorphs in this sentence is typical of an urban NH speaker. Rural speakers would prefer *y* [j] over *l* prevocalically, as illustrated in (9b) (cf. (9b) in Valdman et al. 2015). Sentence (9c) illustrates the use of the standard full allomorph *li* after a consonant and the native full allomorph *i* before a consonant (cf. (11a) in Valdman et al. 2015). This distributional pattern is typical of both urban and rural speakers.

3.2   Phonologically non-optimizing PCSA

I/li-selection in Northern Haitian is suppletive because the relevant allomorphs are not derived from a single underlying form and do not follow the synchronic pattern observed for unreduced/reduced allomorphs. Historically, *li* is hypothesized to be related to the French tonic pronoun *lui* whereas *i* to the French clitic pronoun *il* (Fattier 1995). *i* could be analyzed as derived from *li* via consonant deletion synchronically but consonant deletion is not the regular strategy to create reduced pronoun allomorphs in the language. As will be discussed below, *i/li*-selection is actually quite similar to *a/la*-selection, a pattern that is widely analyzed as PCSA, at least synchronically (Inkelas 2014: 284-285).[1]

Although *i/li*-selection is phonologically conditioned (see section 3.1), it is not phonologically optimizing. Both phonemes [l] and [j] are well attested before vowels (e.g. *lak* 'lake' and *yè* 'yesterday') and after vowels (e.g. *mal* 'badly' and *may* 'link') in the Haitian lexicon. Therefore the use of native *y* [j] before vowels in the urban variety of Northern Haitian is not in line with the language phonotactics.

As for the use of *li* after consonants, it is even more problematic from the perspective of phono-logical markedness. Indeed, the use of *li* in this context results in an increase of phonological markedness as compared to *i* because it results in a consonant cluster. This pattern is actually parallel to *a/la* selection discussed in section 1, as it shows the same preference for a consonant-initial allomorph after consonants. The two patterns are not identical though, because there is no preference for the vowel allomorph [i] after vowel as in the case of *a/la* (cf. [papa#a] 'the father'). Indeed, after vowel, the preferred allomorph is *y* [j] (see Table 6 and (9a)).

4   Analysis

This section argues that *i/li*-selection in Northern Haitian, if not *phonologically* optimizing, is *morphologically* optimizing. Section 4.1 proposes that [li]-selection after consonants serves as a boundary signal to help parse the pronoun from its host. Section 4.2 proposes that [l]-selection before vowels is a way to avoid homophony with the plural reduced allomorph *y* [j] '3PL'.

4.1   Postconsonantal [li] as a boundary signal

The NH full allomorph [i] starts with a vowel whereas the SH full allomorph [li] starts with a consonant. Using [li] after a consonant results in the formation of a C#C cluster whereas using [i] in this context creates a C#V sequence. Because consonant clusters are much less likely than CV sequences morpheme-internally in Haitian due the language's largely CVCV structure (Valdman et al. 2015: 18), [li] should be easier to segment than [i] in this context. Psycholinguistic evidence for the hypothesis that phoneme sequences with low morpheme-internal probabilities facilitate the segmentation of the linguistic signal into morphemes is provided by Hay (2003: chapter 2) for English. Hay indeed found that English speakers were more likely to posit a morpheme boundary between consonants in low probability clusters (e.g. in nonce word *vipfim*) than between consonants in high probability clusters (e.g. in nonce word *vilfim*). Extending these results to the asymmetry between CC and CV sequences in Haitian (the former are much less frequent than the latter morpheme-internally), one expects a CVC#CV sequence like *bat li* 'beats her/him' to be easier to parse for Haitian listeners in two distinct morphemes than a CVC#V sequence like *bat i* 'beats her/him'.

Klein (2003) proposed a similar morphophonological analysis for Haitian *a/la*-selection. In his analysis, [la] is preferred after consonants because it makes it possible to align word and syllable

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[1] Picard (2003) proposed that [a] originated from [la] through intervocalic [l]-deletion.

	C#{i, li}	C//V	*C#V	Native
	C#i		*!	
	C#j	*!		
☞	C#li			*
	C#l	*!		*

Table 7: Deriving [li]-selection after consonants.

boundaries ([pi.tit#.la]), contrary to [a] ([pi.ti.t#a], where [t] is resyllabified). [a] is chosen after vowel-final words because it is the default allomorph for the determiner. This alignment-based analysis will not be adopted here for two reasons. (i) Obstruent-liquid clusters are generally syllabified as onset clusters in Haitian (e.g. *gonfle* [gɔ̃.fle 'inflate'), and yet obstruent-final words are followed by [la]/[li] and not [a]/[i], despite resyllabification (e.g. *syèk la* [sjɛ.k#la]/*[sjɛ.k#a] 'the century'). (ii) It is unclear why [a] would be the default allomorph.

Instead, we propose morphophonological constraints that assign a greater penalty to morphological junctures that are phonoctatically less marked. For instance, a constraint *C#V penalizes the use of a CV transition as a morpheme boundary (it will penalize the use of [i] and [a] after consonant-final words). This constraint outranks the constraint that favors native allomorphs over borrowed allomorphs, allowing for borrowing as a strategy to solve a morphophonological problem. The constraint favoring native allomorphs is called Native. Reduced allomorphs are blocked after consonant-final words by the phonotactic constraint that bans consonants that are not adjacent to a vowel (C//V). Table 7 shows how this analysis derives [li]-selection after consonants.

As discussed in section 3.2, *a/la*-selection and *i/li*-selection are not entirely parallel: vowel-final words favor the vowel allomorph in the case of *a/la* (*papa a* 'the father') but they favor the consonant-initial reduced allomorph *y* [j] in the case of *i/li* (*ake y* 'with her/him'). This asymmetry between the determiner and the pronoun can be derived if the grammar does not treat all morpheme boundaries equally. Formally, this can be implemented using morphologically indexed constraints (Pater 2007). The ranking *V#C$_{\text{DET}}$ ≫ *VV will license hiatus formation to signal a morphological boundary involving a determiner whereas the ranking *VV ≫ *V#C$_{\text{PRO}}$ will ban hiatus formation to signal a morphological boundary involving a pronoun. For reasons of space, a fully formalized comparison of the two PCSA patterns is left for future work.

4.2 Prevocalic [l] as homophony avoidance

In Northern Haitian, reduced allomorphs for *i/y* [i]/[j] '3SG' and *yo/y* [jo]/[j] '3PL' are homophonous. In other words, in reduction contexts, the singular-plural distinction is lost in the signal. However, because *yo* reduces only prevocalically (see section 2.1), the prevocalic context is the only context with singular-plural homophony in Northern Haitian. The fact that the standard reduced allomorph [l] happens to have become dominant only in this context in urban Northern Haitian makes sense from the perspective of homophony avoidance. In the absence of *yo*-reduction in V#_, there is no need to borrow the standard allomorph [l] in V#_, even though V#_ is generally a reduction context in the language. In other words, urban Northern speakers have extended the standard allomorph in the only context where their native form was problematic for homophony reasons.

Table 8 shows the paradigms for 3SG and 3PL in the three Haitian varieties under discussion. Rural Northern Haitian speakers tolerate the homophony of 3SG and 3PL in _#V (see (b)). However this homophony was eliminated by the borrowing of standard [l] in the speech of urban NH speakers. In V#_, *yo* [jo] does not reduce and therefore there is no homophony in any of the three Haitian varieties (see (d)).

	Phonological context	Standard Haitian		Urban Northern Haitian		Rural Northern Haitian	
		3SG	3PL	3SG	3PL	3SG	3PL
a.	_#C	li	jo	i	jo	i	jo
b.	_#V	l	j	l	j	j	j
c.	C#_	li	jo	li	jo	li	jo
d.	V#_	l	jo	j	jo	j	jo

li/l '3SG', jo/j '3PL'   (Standard Haitian native forms)
i /j '3SG', jo/j '3PL'   (Northern Haitian native forms)

Table 8: Singular and plural third person pronouns (3SG, 3PL) in three Haitian varieties: patterns of phonologically conditioned allomorphy.

Homophony avoidance has been argued to play a role in many other languages (e.g. Kenstowicz 2005; Storme 2021 among others) and has been found to act as a bias in language learning (Yin & White 2018). In this paper, homophony avoidance is modeled with a constraint *Homophony: this constraint penalizes homophonous exponents for 3SG and 3PL. Homophony avoidance requires a global evaluation of the input-output mappings for 3SG and 3PL, as illustrated in Table 9. The violations of the other constraints are summed across all input-output pairs. This type of global evaluation is discussed from a formal perspective in Magri & Storme (2021). There are eight pairs of allomorphs to consider in each of the four phonological contexts illustrated in Table 8, corresponding to a total of $8^4 = 4096$ possible contextual paradigms. The eight pairs of allomorphs correspond to all the possible combinations of the four allomorphs for 3SG ([li, l, i, j]) and the two variants for 3PL ([jo, j]). To explain why homophony may be avoided via borrowing, *Homophony must outrank the constraint favoring native allomorphs (Native). To explain why [l]-selection is limited to prevocalic contexts, *Homophony must interact with the constraints that drive pronoun reduction, and in particular with the constraints that block *yo*-reduction non-prevocalically.

The OT tableaux in Table 9 present the final analysis of urban Northern Haitian. Constraint violations are marked with numbers instead of asteriks for reasons of space. The tableaux include all the constraints that are necessary to derive both *i/li*-selection (morphological optimization) and pronoun reduction (phonological optimization). The pair of allomorphs predicted to occur in each context are shaded in gray, using the same color scheme as in Table 8. The pattern found in rural Northern Haitian can be derived with the same constraint set if *Homophony is ranked below Native. The pattern found in Standard Haitian can be derived by just assuming that only [li] and [l] are available as allomorphs for 3SG in this variety.

5   Conclusion

Several analyses of PCSA (e.g. Kalin 2020; Stanton to appear) have argued for the necessity to distinguish two serially organized components for morphology and phonology, with PCSA happening in the morphological module and regular, phonologically optimizing allomorphy taking place in the phonological module. In this paper, Northern Haitian *i/li*-selection was argued to be ultimately morphologically motivated: [li]/[l] is used to increase the mophological parsability of the linguistic signal (along the syntagmatic axis) or to avoid homophony (along the paradigmatic axis). In this sense, the present analysis is close to morphological analyses of PCSA. However, it was crucial in the analysis that homophony avoidance be sensitive to the output of phonological optimization (pronoun reduction) to account for the contrast between prevocalic and non-prevocalic contexts: the standard reduced allomorph [l] is dominant only in the context where the phonology predicts reduction of both singular and plural pronouns. It is not impossible to derive the distribution

{i,li}#C	jo#C	*Homophony	C/V	*VV	Max([-high])	Reduce	*C#V_PRO	Native
li#C	jo#C					2		1
li#C	j#C		1	1	1			1
l#C	jo#C		1			1		1
l#C	j#C		2	1				1
i#C	jo#C					2		
i#C	j#C		1	1	1			
j#C	jo#C		1			1		
j#C	j#C	1	2	1				

{i,li}#V	jo#V	*Homophony	C/V	*VV	Max([-high])	Reduce	*C#V_PRO	Native
li#V	jo#V			2		2		1
li#V	j#V		1	1	1	1		1
l#V	jo#V		1		1	1		1
l#V	j#V			1		2		1
i#V	jo#V			2		2		
i#V	j#V		1	1	1	1		
j#V	jo#V		1		1	1		
j#V	j#V	1		1		2		

C#{i,li}	C#jo	*Homophony	C/V	*VV	Max([-high])	Reduce	*C#V_PRO	Native
C#li	C#jo					2		1
C#li	C#j		1	1	1			1
C#l	C#jo		1			1		1
C#l	C#j		2	1				1
C#i	C#jo					2	1	
C#i	C#j		1	1	1	1		
C#j	C#jo		1			1		
C#j	C#j	1	2	1				

V#{i,li}	V#jo	*Homophony	C/V	*VV	Max([-high])	Reduce	*C#V_PRO	Native
V#li	V#jo					2		1
V#li	V#j				1	1		1
V#l	V#jo					1		1
V#l	V#j				1			1
V#i	V#jo		1			2		
V#i	V#j		1		1	1		
V#j	V#jo					1		
V#j	V#j	1			1			

Table 9: Deriving the 3SG and 3PL paradigms in urban Northern Haitian.

in a model with distinct modules for morphological optimization and phonological optimization. The morphology would select the full allomorphs in the four relevant contexts, as shown in the column 'Morphology' in Table 10. Then the phonology would reduce pronouns only in vocalic contexts, resulting in the distribution attested in urban Northern Haitian, as shown in the column 'Phonology' in Table 10. However the reason why different allomorphs are used in _#V and in V#_ ([li] vs. [i], respectively) remains unexplained under this account. Under the analysis assuming joint morphological and phonological optimizations, the choice of the standard allomorph is limited to _#V among the two vocalic contexts because it is the only vocalic context where pronoun reduction results in homophony.

	Morphology	Phonology
Context	*i/li*-selection	Reduction
_#C	i	i
_#V	li	l
C#_	li	li
V#_	i	j

Table 10: Serial analysis (morphology → phonology) of allomorph selection in urban Northern Haitian.

Another interesting feature of Northern Haitian *i/li*-selection is the fact that homophony is avoided through borrowing and not via the typical strategy attested in the literature, i.e. inhibited sound change (e.g. Blevins & Wedel 2009). If the analysis presented here is correct, then models of homophony avoidance must be able to accomodate this strategy as well. The present

paper has shown that it is possible to do so if borrowed allomorphs are allowed to enter the morphophonological evaluation and compete with native allomorphs.

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