Syntactic Constituency Spell-Out through MATCH Constraints

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This paper proposes that MATCH constraints on the relation between syntactic and prosodic constituency above the foot (Selkirk 2009, 2011) be construed as part of phonological Spell-Out in a minimalist grammar, which is tasked with providing "phonological expression" to the abstract morphosyntactic feature and constituent structure of a sentence (à la Chomsky 1995; Uriagereka 1999). The "phonological expression" (or PF) generated by Spell-Out is taken here to be the input phonological representation for the phonology *per se,* which determines –optimality theory-wise-- the optimal output phonological representation for that input, based on a language-particular ranking of properly phonological constraints (Prince and Smolensky 1993, inter alia). The specific proposal is that MATCH constraints translate syntactic constituency at the level of word, phrase and clause into corresponding prosodic (phonological) constituency at the prosodic word (ω), phonological phrase (φ) and intonational phrase (ι) levels in the phonological representation that is input to the phonology. In the phonology *per se* a (novel) set of prosodic faithfulness constraints interact with constraints on phonological prosodic structure markedness to yield the prosodic structure of the optimal phonological output representation (in the spirit of McCarthy and Prince 1995).

On this view, prosodic structure formation is factored into two components in the grammar, an S-P interface component (part of Spell-Out), and a properly phonological component (the phonology *per se*). One prediction of this view is that there are two distinct sources for crosslinguistic variation in prosodic structure formation. A comparison of prosodic structure formation in Xitsonga (Kisseberth 1994, Selkirk 2011, Lee and Selkirk ms.), Irish (Elfner, 2012, 2015, Bennett et al 2016), and other languages provides evidence for these two different grammatical sources of variation.

In addition, the question of which subcomponents of the phonology *per se* may apply as part of a minimalist derivation-by-phase model of syntax (Chomsky 2000) is addressed. It is shown that the surface distribution of phonological phrase (φ) structure in Xitsonga (Selkirk 2011) is consistent with phasal Spell-Out by MATCH and phasal prosodic structure formation by the phonology *per se* in a multiple Spell-Out scenario (Uriagereka op.cit.). But H tone spread and the structure-sensitive constraints NonFinality(φ; H) and CrispEdge(L,φ; H) that govern it may come into play only post-phasally, once the full output prosodic structure representation of the sentence has been determined. This finding raises the question of which sorts of prosodic-structure-sensitive phenomena must be post-phasal, as well as the question whether any prosodic structure formation other than what's contributed by interface Spell-Out-by-MATCH constraints is of necessity phasal.

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Informal statements of MATCH constraints (Selkirk 2011):

(1) **MATCHCLAUSE**
A clause in syntactic representation must be matched in phonological representation by a constituent of a corresponding type, call it ι.

(2) **MATCHPHRASE**
A phrase in syntactic representation must be matched in phonological representation by a constituent of a corresponding type, call it φ.

(3) **MATCHWORD**
A word in syntactic representation must be matched in phonological representation by a constituent of a corresponding type, call it ω.

Hypothesized roles of MATCH constraints in the grammar (Selkirk 2011)

Two functions, not obviously consistent:

(a) **Generative**: MATCH constraints are the original source in phonological representation of prosodic structure constituents above the foot (ι, φ, ω).

(Advantage: No independent stipulatation of the supra-foot constituents of the prosodic hierarchy as part of the theory of phonological representation)

(b) **Evaluative:** MATCH constraints are correspondence theoretic faithfulness constraints on the relation between syntactic structure and the prosodic structure of output phonological representation in OT phonology (à la McCarthy&Prince 1995)

(Advantage: Interact with prosodic markedness constraints in determining prosodic structure of output (surface) phonological representation. Form part of basis for factorial typology of prosodic structure formation.)

Proposal for a reconceptualization of MATCH constraints (Lee & Selkirk 2017 ms)

(a') **Generative:** Expand the concept of Spell-Out in minimalist theory (Chomsky 1995, 2000; Uriagereka 1999) to include the spelling out of syntactic constituency as prosodic constituency-- *Spell-Out-by-MATCH constraints.*

S-P Interface Assumption: The output of phonological Spell-Out is the input phonological representation for the phonology *per se*.

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As with other conceptions of phonological Spell-Out, we assume Spell-Out to include Vocabulary Insertion (a DM term), which provides phonological form (in the input phonological representation) for the morphosyntactic feature bundles that constitute morphemes. Our hypothesized amendment to the theory of phonological Spell-Out is that Spell-Out *also* gives phonological expression to certain aspects of syntactic constituent structure; it loops back to a proposal in Selkirk 2006.

(4) **Strong Minimalist Prosodic Spell-Out** (Selkirk 2006):

A syntactic constituent of type Y is spelled out as the corresponding prosodic constituent 'prosodic Y', notated πY: $[\ldots\ldots]_Y \Longrightarrow_{\text{Spell-Out}} (\ldots\ldots)_{\pi Y}$

Specifically, the reconceptualization is that the MATCH constraints (1)-(3) of Selkirk 2011, now understood as part of Spell-Out, translate syntactic constituency at the level of (morpho-)syntactic word, phrase and clause into corresponding prosodic (phonological) constituency at the prosodic word (ω), phonological phrase (φ) and intonational phrase (ι) levels in the input representation for the phonology *per se*.

(b') **Evaluative function is taken over by the phonology *per se*:** Introduce *a set of correspondence theoretic prosodic structure faithfulness constraints* which hold of the Input-Output relation in the phonology *per se,* e.g. MAX(φ), DEP(φ).

Assumption: An optimality theoretic constraint ranking (EVAL) selects an optimal output phonological representation. That language-particular constraint ranking includes phonological markedness constraints on output representation and phonological faithfulness constraints on the I-O and O-I relation (Prince and Smolensky 1993, McCarthy & Prince 1995,1999).

--- One potential consequence of this two-stage, serialist, view of prosodic structure formation is that there are two distinct sources for crosslinguistic variation in prosodic structure formation: Spell-Out-by-MATCH and the language-particular OT ranking of phonological markedness and faithfulness constraints in the phonology *per se.* In Section One we argue that this prediction is correct.

---Another consequence of this marriage of an OT phonology and a minimalist syntactic derivation with Spell-Out is that the sole locus of the S-P interface in grammar is the "Spell-Out component", where morphosyntactic properties of the output syntactic representation are related to prosodic/phonological properties of the input phonological representation. This model predicts, among other things, that constraints of Spell-Out-by-Vocabulary Insertion (which define the phonological expression of morphosyntactic feature bundles) may be sensitive to/depend on the prosodic structure above the foot that is defined by Spell-Out-by-MATCH in the input representation for the phonology. And cases where prosodic structure helps filter out a syntactic output would have to be expressed at this juncture. But cases of phonologically determined linearization of units like Irish pronoun postposing would be part of the phonology *per se* (Bennett et al 2016).

Section One: φ-sensitive H tone spread and φ-structure formation in Xitsonga
(Kisseberth 1994, Selkirk 2011)

1.1 φ-sensitive H tone spread

(5) **H tone spread blocked by NONFINALITY(R, φ; R, H)**

a. Single verb sentences
Toneless SM + toneless verb

ni rho:mba	'I am subdued'	(201307_201_37-06)
ni nyuhe:la	'I grow fat'	(201307_201_37-05)
ni lengale:nga	'I swing'	(201307_201_37-07)

➔ H-tone SM + toneless verb

vá tí:rha	'They work'	(LS16.5.28.-)
vá tsútsú:ma	'They run'	(LS16.5.28.-)
vá nyúhé:la	'They grow fat'	(201307_201_37-13)

Toneless SM + H-tone verb (4^{+} moras long)

na vúlávú:la	'I speak'	(LS16.5.28.-)
na n'únún'ú:ta	'I whisper'	(201307_201_37-04)
na tsémákányí:sa	'I divide (in two)'	(LS16.5.28.-)

b. *Verb plus single-word direct object sentences*
Toneless SM, toneless verb, toneless noun

ni xava nya:ma	'I buy meat'	(K142)
ni kuma xi-hlambetwa:na	'I get a cooking pot'	(K142)
hi tisa xi-hontlovi:la	'We bring a giant'	(K142)

➔H-tone SM, toneless verb, toneless noun

vá xává nyá:ma	'They buy meat'	(K142)
vá kúmá xí-hlámbétwá:na	'They are getting a cooking pot'	(K142)
vá tísá xí-hóntlóví:la	'They bring a giant'	(K142)

➔toneless SM, H-tone verb, toneless noun

ni lává ngúlú:ve	'I want a pig'	(LS16.5.28.-)
ni vóná xí-hóntlóví:la	'I see a giant'	(K142)
ni dyóndzísá xí-phúkúphú:ku	'I am teaching a fool'	(LS16.5.28.-)

c. Verb plus two single-word object phrases
➔H-tone SM, toneless verb, toneless noun, toneless noun

i. vá$^{/H}$ xávélá mú$^{H\backslash}$nhu tingu:vu
someone clothes 'they are buying clothes for s.o.'

ii. vá$^{/H}$xávélá xíphúkúphú$^{H\backslash}$ku fo:le
fool tobacco 'they're buying tobacco for a fool'

(6) **HTS- RT:** "A H tone spreads [expands its span] to the right."

Assign a violation for any toneless tone-bearing unit (tbu) that is preceded by the Right edge of a H tone span. (cf. Cassimjee and Kisseberth 1998)

* tbu$^{H\backslash}$ … tbu

(7) **NONFINALITY(R, φ;R, H)**

The right edge of a H tone span may not coincide with the final syllable of a phonological phrase (φ).

* …..$^{H\backslash}$)φ

(8) **H tone spread blocked at left edge of a φ by CRISPEDGE(L,φ; H)**

Toneless SM, toneless verb, toneless noun, modifier

ni xava nguluve yá we:↓ná	'I buy your pig' (LS16.5.28.-)
u tisa mbhongolo yi-ntsó:ngó	'You bring a small donkey' (LS16.5.28.-)
hi kuma ti-mhelembe ti-mbi:rhí	'We get two rhinos' (LS16.5.28.-)
ni hlawula hlambeto yá se:si	'I prefer a cooking pot of sister' (LS16.5.28.-)

➔H-tone SM, toneless verb, toneless noun, modifier

vá xává mbhongolo ↓yá we:↓ná	'They buy your donkey' (LS16.5.28.-)
vá tísá nguluve yi-↓ntsó:ngó	'They bring a small pig' (LS16.5.28.-)
vá hláwúlá mhelembe ↓yá kru:ger	'They prefer a rhino of Kruger' (LS16.5.28.-)

➔Toneless SM, H-tone verb, toneless noun, modifier

ni vóná komponi ↓yá we:↓ná	'I see your compound' (K 157)
hi lává hlambeto yi-↓ntsó:ngó	'We want a small cooking pot' (LS16.5.28.-)
ni phásá tuva ↓rá thohoya:ndou	'I catch a dove of Thohoyandou' (LS16.5.28.-)

(9) **CRISPEDGE(L,φ; H)**

A H tone span must not include tone-bearing units that precede and follow the left edge of a phonological phrase φ: * /^{H} … (φ … $^{H\backslash}$

[The CrispEdge(L,φ; H) constraint (14) belongs to the CRISPEDGE family posited by Ito and Mester 1999 and various papers in *Phonology* 32(1). It rules out a representation in which the left edge of a phonological phrase φ falls within a H tone span.]

(10) (i) NONFINALITY(R,φ; R,H) >> HTS-RT

(ii) CRISPEDGE(L,φ; H) >> HTS-RT

1.2 φ-structure formation in Xitsonga

(11) **MATCHPHRASE** (à la Elfner 2015)
Given a phrase XP in a syntactic representation S, where XP dominates all and only the pre-terminal elements {*a, b, c, …n*}, there must be in the phonological representation P corresponding to S a φ phrase which includes all and only the phonological exponents of *a, b, c, …n.*
[…where pre-terminal elements *a, b, c, ..n* are morphosyntactic feature bundles that are given phonological expression by Spell-Out--eos]

(12) $[_{CP}[_{VcP}[_{Vc}\ va^{/H\backslash}\ [_{V}\ tis\text{-}a\ ]_i\ ]\ [_{vP}\ t_i\ [_{VP}\ t_i\ \ [_{NP}[_{N}\ nguluve]\ [_{AP}[_{A}$ yi-ntsó:$^{/H}$ngó$^{H\backslash}$]]]]]]
3pl- -bring-fv pig Cl small
'They bring a small pig'

(13) a. Input prosodic structure (output of Spell-Out by MATCHPHRASE, MATCHWORD)[1]

(φ (ω vá$^{/H\backslash}$ (ω tis-a)) (φ (ω nguluve)ω (φ (ω yi-ntsó:$^{/H}$ngó$^{H\backslash}$)ω)φ)φ)φ

b. Output prosodic structure (by phonology *per se*, see (17ii))

(φ (ω vá$^{/H}$ (ω tís-á$^{H\backslash}$)) (φ (ω nguluve)ω (ω yi-ntsó:$^{/H}$ngó$^{H\backslash}$)ω)φ)φ

'They bring a small pig.'

(14) $[_{CP}[_{VcP}[_{Vc}\ va^{/H\backslash}\ [_{Vc}v\ [_{V}\ tis\text{-}a\ ]_i\ ]]\ [_{vP}\ t_i\ [_{VP}\ t_i\ \ [_{NP}[_{N}\ nguluve]\ ]_{NP}]_{VP}]_{vP}]_{VcP}]_{CP}$
3pl- -bring-FV
'They bring a pig.'

(15) a. Input prosodic structure (output of Spell-Out by MATCHPHRASE, MATCHWORD)

(φ (ω vá$^{/H\backslash}$-tis-a)ω (φ (ω nguluve)ω)φ)φ

b. Output prosodic structure (by phonology *per se*, see (17i))

(φ (ω vá$^{/H}$-tísá)ω (ω ngúlú$^{H\backslash}$ve)ω)φ

[1] The derivations of prosodic structure in this section assume a non-phasal single Spell-out at the end of the syntactic derivation of the sentence as a whole.

(16) **MAX(φ)**

a. [Every φ of the input has a correspondent in the output. (à la McC&P95,99)]

b. Every φ of the input with an input terminal string Σ_I has a corresponding φ in the output with a corresponding terminal string Σ_O.

After Spell-Out of the input prosodic structure by MATCH, the phonology *per se* derives output prosodic structure, which may fail to include prosodic constituents from the input.

(17) **The role for BINARITY(φ) in Xitsonga φ-formation:**

i. A mismatch between output φ-structure in (15) and the noun phrase constituency of (14)

INPUT:	(φ(ω vá$^{/H\}$-tis-a) (φ(ω nguluve)))	BINARITY(φ) >> MAX(φ)
OUTPUT:		
a.	(φ(ω vá$^{/H}$-tís-á$^{H\}$) (φ(ω nguluve)))	*!
⇒b.	(φ(ω vá$^{/H}$-tís-á) (ω ngúlú$^{H\}$ve))	*

ii. No mismatch between output φ-structure in (13) and noun phrase constituency of (12)

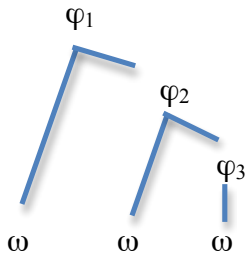
INPUT:
(φ(ωvá$^{/H\}$-tis-a) (φ(ω nguluve) (φ(ω yi-ntsó:$^{/H}$ngó$^{H\}$)))) BINARITY(φ) >> MAX(φ)

OUTPUT:

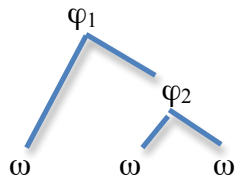
a.	(φ(ωvá$^{/H}$-tís-á$^{H\}$) (φ(ωnguluve)(φ(ωyi-ntsó:$^{/H}$ngó$^{H\}$))))	*!	
⇒b.	(φ(ωvá$^{/H}$-tís-á$^{H\}$) (φ(ωnguluve) (ωyi-ntsó:$^{/H}$ngó$^{H\}$)))		*φ_3
c.	(φ(ωvá$^{/H}$-tís-á) (ωngúlú$^{H\}$ve) (ωyi-ntsó:$^{/H}$ngó$^{H\}$))	*!	*φ_3 *φ_2
d.	(φ(φ(ωvá$^{/H}$-tís-á) (ωngúlú$^{H\}$ve))φ (ωyi-ntsó:$^{/H}$ngó$^{H\}$))		*φ_3 *φ_2

iii.

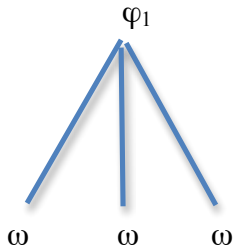
a.



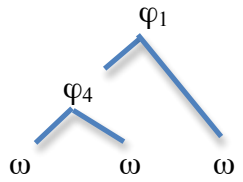
⇒b.



c.



d.



Factorial Typology in φ-formation based on differences in P-constraint ranking:
In Xitsonga: BINARITY(φ) >> MAX(φ). Other languages, like ChiMwiini (Kisseberth 2011), show no such binarity constraint on φ-structure, indicating the opposite ranking: MAX(φ) >> BINARITY(φ)

Excursus: Maintaining the recursive φ structure that MATCHPHRASE creates

(18) **STRONGSTART** (Selkirk 2011)

A prosodic constituent may not begin with a leftmost daughter constituent which is lower in the prosodic hierarchy than the sister constituent that immediately follows:

$* (\pi_n \ \pi_m \ \ldots .), \ n < m$

[π stands for 'prosodic constituent' and the subscript designates its 'level' in the prosodic hierarchy.]

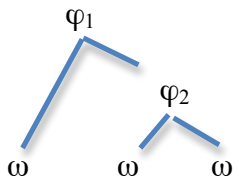
(19) Maintaining right-branching recursive φ structure for V-NP in Xitsonga:

INPUT (φ(ωvá$^{/H\}$-tis-a) (φ(ω nguluve) (φ(ω yi-ntsó:$^{/H}$ngó$^{H\}$)))) BINARITY(φ) >> MAX(φ) >> STRSTART

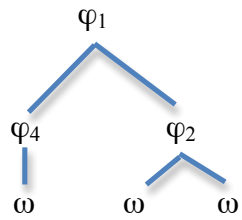
OUTPUT:

⇒a.	(φ(ωvá$^{/H}$-tís-á$^{H\}$) (φ(ωnguluve) (ωyi-ntsó:$^{/H}$ngó$^{H\}$)))		$*_{\varphi_3}$	*
b.	(φ(φ (ωvá$^{/H}$-tís-á$^{H\}$)) (φ(ωnguluve)(ωyi-ntsó:$^{/H}$ngó$^{H\}$)))	*!	$*_{\varphi_3}$	
c.	(φ(φ(ωvá$^{/H}$-tís-á) (ωngúlú$^{H\}$ve))φ (ωyi-ntsó:$^{/H}$ngó$^{H\}$))		$*_{\varphi_3}*_{\varphi_2}$!	
d.	(φ(ωvá$^{/H\}$-tis-a) (φ(ω nguluve) (φ(ω yi-ntsó:$^{/H}$ngó$^{H\}$))))	*!		*

⇒a.



b.



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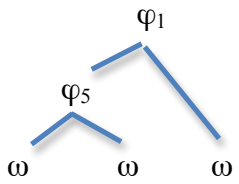
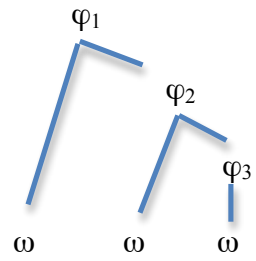


d.



[Recall terminal string-based definition of MAX(φ) in (16)]

(20) (i) BINARITY(φ) >> MAX(φ)
(ii) MAX(φ) >> STRONGSTART

1.3 MATCHPHRASE$_{LEX}$ in Xitsonga: *Selectivity* in Spell-Out-by MATCH

1.3.1 **Evidence for MATCHPHRASE$_{LEX}$:** The noun class marker doesn't lie at L edge of a φ

(21) Class marker before single-noun phrase in Xitsonga

a. ni-lángútá mú-lúngu 'I look at a European' (40-12)
I look.at Cl1-European

b. (φ ni -lá$^{/H}$ngútá mú-lú: $^{H\backslash}$ngu)φ

(22) Class marker before noun plus adjective

i. a. ni-lángútá mú-lungu lo-nkú:lú 'I look at a big European.' (40-13)

b. (φ ni-lá$^{/H}$ngútá mú$^{H\backslash}$ (φ -lungu lo-nkú$^{/H}$lú$^{H\backslash}$)φ)φ
look.at Cl1- European Cl1-big

ii. ni vóná xí-hontlovila xi:-ntshwá 'I see a new giant'
iii. ú xává má-sangu ma-ntsó:ngó 'He buys small sleeping mats'
iv. vá tísá tí-nguluve ti-nkú:lú 'They bring big pigs'

(23) Class marker before noun plus associative (poss) phrase

i. vá xávísá tí-nguvu t-á vo:ná 'they are selling their clothes' (K 1994:157)
ii. vá lúlámísá vá-nandza v-á mu:ne 'They correct four servants'
iii. ú tísá tí-nyama t-á-mbongo:lo 'He brings lots of donkey meat'
iv. ni lángútá má-sangu m-á ndzulami:so 'I look at sleeping mats of Ndzulamiso'

(24) **The noun class marker is sister to the NP in Xitsonga** (Herbert 1992)

[$_{ClP}$va- [$_{NP}$ [nhwana] [va- [khume]]]$_{NP}$]$_{ClP}$ '10 girls'
cl2- girl cl2- ten

(25) Class marker before noun plus numeral

a. [$_{VcP}$ [$_{Vc}$ ni lá$^{/H\backslash}$nguta] [$_{ClP}$ va- [$_{NP}$[$_{N}$lungu [va- [$_{Num}$ mbirhí$^{/H\backslash}$]]]]
I look.at cl2- European cl2- two

b. (φ(ω ni-lá$^{/H}$ngútá)ω vá$^{H\backslash}$ (φ lungu va-mbi:rhí$^{/H\backslash}$))
'I look at two Europeans'

(26) **MATCHPHRASE$_{LEX}$** (provisional)
Given a phrase XP in a syntactic representation S, where (i) XP is a projection of one of the set of lexical categories {N, V, A}, and where (ii) XP dominates all and only the pre-terminal elements {*a, b, c, …n*}, there must be in the phonological representation P corresponding to S a φ phrase which includes all and only the phonological exponents of *a, b, c, …n.*

(27) φ-structure for the (non-prefixal) class marker supplied by MATCHPHRASE$_{LEX}$

	INPUT: (φ(ω ni-lá$^{/H}$ngútá)ω vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H})φ)φ	BINARITY (φ)	MAX (φ)	STRONG START
	a. (φ(ω ni-lá$^{/H}$ngútá) vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H}))	*!		
☞	b. (φ(ω(ωni-lá$^{/H}$ngútá)ω vá$^{H\backslash}$)ω (φ lungu va-mbi:rhí^{H}))			*
	c. (φ(ω ni-lá$^{/H}$ngútá) (φ vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H})))			*!*

(28) Incorrect output (∗) if input φ-structure is supplied by MATCHPHRASE

	(φ(ω ni-lá$^{/H}$ngútá)ω (φ vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H})φ)φ)φ	BINARITY (φ)	MAX (φ)	STRONG START
	a. (φ(ω ni-lá$^{/H}$ngútá) vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H})))	*!	*	
	b. (φ(ω(ωni-lá$^{/H}$ngútá)ω vá$^{H\backslash}$)ω (φ lungu va-mbi:rhí^{H}))		*!	*
∗	c. (φ(ω ni-lá$^{/H}$ngútá) (φ vá$^{H\backslash}$ (φ lungu va-mbi:rhí^{H})))			**

1.3.2 **Further evidence for MATCHPHRASE$_{LEX}$ in Xitsonga:** The double objects of a verb, dominated by *v*P and VP, do not form a φ. [The verb is raised up out of VP and *v*P.]

(29) A radical S-P mismatch in the case of the double object construction

Surface syntax:

a. $_{CP}[_{VcP}[_{Vc}$ *vá$^{/H\backslash}$* $[_{Vi}$ *xavela*$]$ $]$ $[_{vP}$ t_i $[_{VP}$ *xi*-$[_{NP}$ $[_{N}$ *phukuphuku*$]$ $[_{V'}$ t_i $[_{NP}[_{N}$ *fo:le*$]]]]]]]$
3p buy Cl7 fool tobacco

Surface phonological representation (P-output):

b. (ι (φ (φ (ω (ω vá$^{/H}$-(ω xávélá))ω xí)ω (ω phúkúphú$^{H\backslash}$ku)ω)φ (ω fo:le)ω)φ)ι
'They're buying tobacco for a fool'

So why do the syntactic constituents that dominate the two objects-- namely *v*P and VP (and possibly also FncP)-- not get spelled out as a φ in Xitsonga? MATCHPHRASE$_{LEX}$, earlier formulated as (26), is actually formulated as in (30):

(30) **MATCHPHRASE$_{LEX}$** [final version]
Given a phrase XP in a syntactic representation S, where (i) XP is a projection of a head belonging to one of the set of lexical categories {N, V, A} *and that lexical head is phonologically overt*, and where (ii) XP dominates all and only the pre-terminal elements {*a, b, c, …n*}, there must be in the phonological representation P corresponding to S a φ phrase which includes all and only the phonological exponents of *a, b, c, …n.*

(31) Verb plus two objects:

Syntax:

$_{CP}[_{VcP}[_{Vc}\ \underline{v\acute{a}}^{/H\backslash}\ [_{V}\ xavela]_i\ ]\ [_{vP}\ t_i\ [_{VP}\ xi\text{-}[_{NP}\ [_{N}\ phukuphuku]\ [_{V'}\ t_i\ [_{NP}[_{N}\ fole]]]]]]]$

3p buy Cl7 fool tobacco

Spell-Out-by-MATCHPHRASE$_{LEX}$

P-input:

(i) (ι(φ (ω vá$^{/H\backslash}$-(ω xavela)ω)ω xi- (φ(ω phukuphuku)ω)φ (φ(ω fole)ω)φ)φ)ι

Phonology *per se*:

P-output

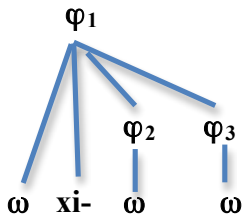
(ii) (ι(φ (φ(ω(ω vá$^{/H}$-(ω xávélá)ω)ω xí)ω (ω phúkúphú$^{H\backslash}$ku)ω)φ (ω fo:le)ω)φ)ι

'They're buying tobacco for a fool'

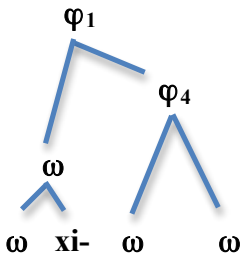
(32) S-P mismatch in the Xitsonga double object construction is the consequence of Spell-Out-by-MATCHPHRASE$_{LEX}$ together with the phonology *per se*

	(φ (ωvá$^{/H}$-xavela) xi-(φ(ωphukuphuku))φ (φ(ωfo:le))φ)φ	BINARITY (φ)	MAX (φ)	STRONG START
	a. (φ (ωvá$^{/H}$-xavela) xi- (φ(ωphukuphuku)) (φ(ωfo:le)))φ	*!**		
	b. (φ (ω(ωvá$^{/H}$-xavela)-xi) (φ (ωphukuphuku) (ωfo:le))φ)φ		*φ_2*φ_3	*!
⇒	c. (φ (φ (ω(ωvá$^{/H}$-xavela)-xi) (ωphukuphuku))φ (ωfo:le))φ		*φ_2*φ_3	

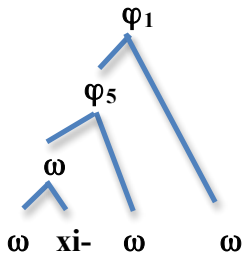
a.



b.



c. ⇒



1.4 MATCHPHRASE IN IRISH

Elfner 2012, 2015 has shown that in the Connemara variety of Modern Irish, a MATCHPHRASE constraint that is entirely general in scope calls on syntactic phrases, whether lexically headed or not, to correspond to a φ in phonological representation. The investigation in these works of the intonational contours of sentences with widely varying syntactic structures supports the hypothesis that the distribution and type of tonal accents within all-new pragmatically neutral sentences Irish is a straightforward function of the φ-structure of the sentence, and moreover depends on recursion in that φ-structure:

(33) **Distribution of LH and HL accents in Connemara Irish** [ω-level stress is initial]

a. A tonal accent with a HL falling contour is associated with the main stress of a prosodic word (ω) that is final in a φ: (φ ….. (ω syl^{HL}…)ω)φ

b. A tonal accent with a LH rising contour is associated with the main stress of a prosodic word (ω) that is initial in a non-minimal φ:
(φ$_{non\text{-}min}$ (φ (ω syl^{LH}…)ω…)φ …)φ *or* (φ$_{non\text{-}min}$ (ω syl^{LH}…)ω (φ …)φ …)φ

[Def. A φ which is *non-minimal* is a φ that dominates another φ; a *minimal* φ dominates no other φ (Ito and Mester 2007, 2013; Elfner 2012, 2015)].

(34) **MATCHPHRASE** (Elfner 2015)
Given a maximal projection XP in a syntactic representation S where XP dominates all and only the terminal elements {*a, b, c, ...n*}, there must be in the phonological representation P corresponding to S a φ phrase which includes all and only the phonological exponents of *a, b, c, ...n.*

(35) VSO sentences—assuming the two stage model of prosodic structure formation

a. **LH**Díolfaidh **LH**leabharlannaí **HL**dathúil blathanna **HL**áille
sell.fut librarian handsome flowers beautiful
'The handsome librarian will sell beautiful flowers.'

b. Output of the syntactic derivation:

[$_{\Sigma P}$ *verb*$_i$ [$_{TP}$ [$_{DP}$ [$_{NP}$ *noun adj*]]$_j$ [*t*$_i$ [$_{vP}$ t$_j$ t$_i$ [$_{VP}$ t$_i$ [$_{DP}$ [$_{NP}$ *noun adj*]]]]]]

b. Spell-Out produces input to the phonology *per se*

(φ verb (φ (φ noun adj) (φ noun adj)))

c. Output phonological representation retains input prosodic structure, adds tones.

(φ$_{non\text{-}min}$ **LH**verb (φ$_{non\text{-}min}$ (φ **LH**noun **HL**adj) (φ noun **HL**adj)))

(36) VSOO sentences

a. $[_{\Sigma P}\ verb_i\ [_{TP}[_{DP}[_{NP}noun\ adj]]]_j\ [t_i\ [_{vP}\ t_j\ t_i\ [_{VP}[_{DP}[_{NP}noun\ adj]]\ t_i\ [_{PP}\ prep\ [noun\ adj\ ]]]]]]$

b. $(\varphi_{non\text{-}min}$ **LH**verb $(\varphi_{non\text{-}min}\ (\varphi$ **LH**noun **HL**adj) $(\varphi_{non\text{-}min}\ (\varphi$**LH**noun **HL**adj) $(\varphi$ prep#noun **HL**adj))))

c. **LH**Díolfaidh **LH**rúnaí **HL**dathúil **LH**blathanna **HL**áille le daoine **HL**anamúla
sell.FUT secretary handsome flowers beautiful.PL to people animated.PL
'A handsome secretary will sell beautiful flowers to animated people.

Concluding Hypothesis: Language-particularity in Spell-Out-by-MATCH

- MATCHPHRASE$_{LEX}$ *and* MATCHPHRASE are *both* in UG. Languages differ in which version is chosen for the language-particular Spell-Out-by-MATCH. These versions of MATCHPHRASE differ in how selective they are, in that they differ in whether requirements are placed on the head of the phrase—requirements on the head's status as a lexical category item and and on whether the head is phonologically overt. Apparently, the grammar of a language will include *either* the general MATCHPHRASE *or* the selective MATCHPHRASE$_{LEX}$ in the set of constraints of the phonological Spell-Out component.
- It remains to be seen, but seems quite probable, that languages show similarly selective versions of MATCHCLAUSE and MATCHWORD which depend on the morphosyntactic properties of the heads of these constituents.
- These all are definitely questions for future research.

Broader question for future research:

In what *other* ways might grammars exploit the S-P representational interface between the output of the syntactic derivation (whether phasal or not) and the input to the phonology *per se*, assuming that phonological input representation has a prosodic constituent structure? What sorts of phenomena are insightfully characterized at this juncture in the derivation of the phonological form of the sentence. What exactly gets defined at this minimalist interface between syntax and phonology?