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PROSODIC DOMAINS AND THE ACQUISITION OF FRENCH PHONOLOGY

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1. Introduction

- Current debate in the analysis of consonant harmony (and metathesis) in the field of acquisition:
  - Non-structural accounts (e.g. Pater 1997; Pater and Werle 2001, 2003).
  - Structural accounts, based on prosodic licensing (e.g. Goad 2000, Rose 2000, 2002a).
- Our argument:
  - Asymmetries in the data found in the data of two French learners require a prosodic account.
    - Word-final consonants are 'special'.
    - French foot is an unbounded, right-headed (iambic) (Halle and Vergnaud 1987, Hayes 1995; cf. Charette 1991, Rose 2000, 2002a).
    - Consonant harmony and metathesis reflect licensing relations at specific levels of prosodic organisation.
  - Our account compatible with data from other languages (e.g., English; see Goad 2000, this conference; Rose 2000, 2002a).

(1) Roadmap of presentation

§1: Introduction
§2: Background
§3: Proposal
§4: Data
§5: Constraints
§6: Tableaux
§7: Discussion

2. Background

2.1 Recent approaches to consonant harmony (and metathesis)

2.1.1 Approach based on constraint AGREE[1]

(2) Pater (1997); Pater and Werle (2001, 2003)

a) Constraints:

i) AGREE-L >> AGREE-R[2]

ii) FAITHLAB, FAITHDOR >> FAITHCOR

b) Predictions:

i) Directionality: Right-to-Left harmony more prominent.

ii) Trigger/target: Coronal is favoured target; Dorsal and Labial are favoured triggers.

c) Issues

i) No unified account of consonant harmony and metathesis.

ii) Variation between children and/or across languages: not addressed. However, it requires deviations to the proposed default rankings in (2a).

iii) Bias in the analysis: R-to-L Dorsal harmony predicted to be more prominent; accounts for most English data available in the literature (e.g. Smith 1973; Pater 1997). But:

(3) Anticipating Clara's and MAS's data:

a) Clara's pattern of Coronal harmony is dominant.

b) MAS's pattern of Dorsal harmony is bidirectional.

(4) Language-specific place feature markedness (Rice and Avery 2004, based on typological survey):

a) All place features can function as unmarked (cf. Kiparsky 1994 and other scholars proposing fixed rankings of constraints predicting fixed markedness relations across place features).

b) Default place specification requires knowledge of language-specific phonological patterns.

2.1.2 Licensing-based account

(5) Rose (2000, 2002a), building on Goad's (2000):

a) Constraints:

i) LICENSE(Place, Foot)

ii) FAITH(Place) rankings = child-specific

b) Predictions

Directionality and trigger/target both depend on:

i) Prosodic representations

ii) Place licensing constraints

c) Unified account of:

i) Consonant harmony and metathesis (supported in our analysis).

ii) Variation across children and languages (supported in our analysis).

d) Consonant harmony involves licensing at the level of the Foot (challenged by our analysis).

1. Pater (1997) utilizes the constraint REPEAT, which is in essence the same as the constraint AGREE.
2. Pater and Werle (2001, 2003) encode Dorsal directly as an argument to the constraint AGREE-L (AGREE-L[Dor]), in order to encode the dominance of R-to-L Dorsal harmony patterns in Trevor's English data.

2.2 The syllabification of word-final consonants

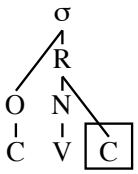
(6) Piggott (1999): Word-final consonants can be syllabified in one of two ways:

a) Codas (rhymal dependents)

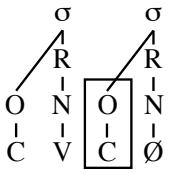
b) Onsets of empty-headed syllables (default option)

(7) Syllabification options for word-final consonants (Piggott 1999):

a) Coda:



b) Onset (DEFAULT):



(8) Support for Piggott (1999):

a) Final consonants in early words behave phonetically as onsets, no matter the target language (e.g. Goad and Brannen 2003; Goad 2003).

b) Word-final consonants and word-medial codas are acquired at different stages (e.g. Rose 2000).

(9) Rose (2003; cf. Rose 2000, 2002b):

a) Both syllabification options can be default, depending on segmental place specification:

i) Place-specified consonants are syllabified as onsets

ii) Placeless consonants are syllabified as codas

b) Default options can be superseded by positive evidence (after Chomsky 1981):
In languages like Spanish, coronals can be analysed as codas by the learner, based on distributional evidence (word-final position restricted to coronals).

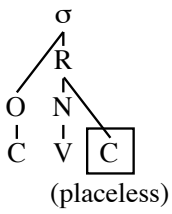
c) Predicts variation between learners:

i) In Spanish-type languages:
• Learner's analysis based on coronality of final consonants → onset
• Learner's analysis based on distributional evidence → coda

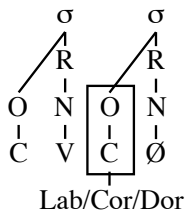
ii) In other languages:
Learner's analysis depends on his/her featural specification for consonants
(e.g. Clara versus Théo's acquisition of word-final /ʁ/ discussed in Rose 2000, 2003).

(10) Default syllabification of word-final consonants (Rose 2003; cf. Piggott 1999):

a) Placeless consonants:



b) Place-specified consonants:



3. Proposal

(11) Approach:

a) Consonant harmony and metathesis must be approached in a unified fashion.

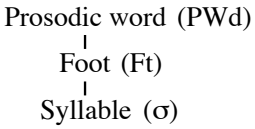
b) Prosodic licensing plays a central role in the realization of these processes (Goad 2000; Rose 2000, 2002a; cf. Pater 1997; Pater and Werle 2001, 2003 as well as all non-OT approaches to consonant harmony).

c) Licensing is conditioned by either Foot or Prosodic Word domains (cf. Rose 2000, 2002a).

d) Each aspect of segmental representations (e.g. features, organizing nodes) can be arguments of faithfulness and licensing constraints.

3.1 Representations and prosodic licensing

(12) Prosodic hierarchy (e.g. Selkirk 1980a,b, McCarthy and Prince 1986):



(13) PROSODIC LICENSING (Itô 1986):

a) The distribution of melodic material is constrained by prosodic positions.

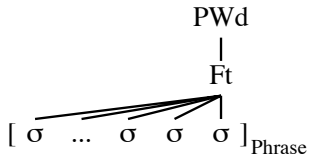
b) Strong prosodic positions can license more phonological information than weak prosodic positions.

(14) PROSODIC LOCALITY (inspired from Itô 1986):
A licensing relation is bound within the domain of the highest category to which it refers.

3.1.1 Prediction: Languages with non-binary, right-headed feet (such as French)

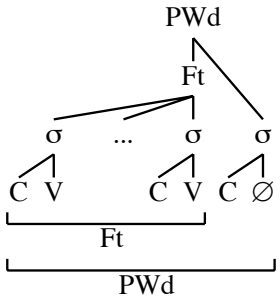
(15) Prosodic domains in French

a) French foot: left-branching foot defined by the phonological phrase (example has no word-final C):

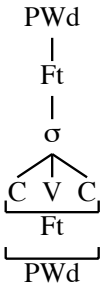


(Halle and Vergnaud 1987, Hayes 1995; cf. Charette 1991; Rose 2000)

b) PWd and Foot domains (assuming (10b)):



c) CVC forms with wd-final codas:

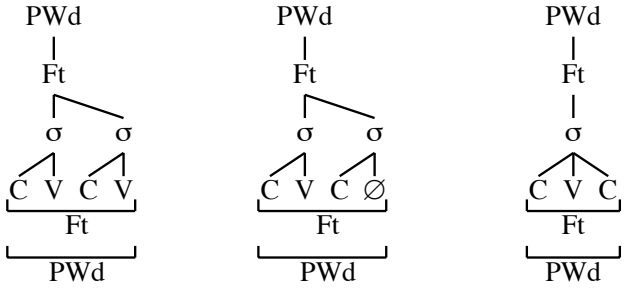


- Word-final place-specified consonants will display asymmetrical behaviours in Clara's and MAS's grammars: they will not be constrained by Foot licensing relations.
- This will support the status of word-final consonants as onsets of empty-headed syllables in (10b).

3.1.2 Comparison with languages with binary trochaic feet

(16) Prosodic representations and licensing domains in trochaic forms:

a) CVCV forms: b) CVC forms (assuming (10b)): c) CVC forms (assuming word-final codas):



- Word-final consonants should behave like non-final consonants (under all analyses, final and non-final consonants belong to the same licensing domains).

4. The data

- Focus: implications of word-final onset syllabification in French, an iambic Romance language.

(17) Empirical base:

a) Developmental data from two learners of French:

i) Clara: Québec French learner.
ii) MAS: European French learner.

b) Patterns of consonant harmony and metathesis found in their early word productions.

4.1 Clara's data

- Patterns of consonant harmony and metathesis observed between 1;01.08 and 1;09.29.
- Two distinct stages observed (cf. one-stage characterization in Rose 2000, 2002a).
- Focus on interaction between Coronal and Dorsal.[3]

3. Clara also displays a Labial harmony in CVCV [Cor…Lab] and [Dor…Lab] forms. [Lab…Cor] and [Cor…Lab] CVC forms are target-like. No CVC forms involving Labial and Dorsal were found in the corpus. Following the analysis to be presented in §6, these data require a high ranking of IDENT(Labial) and a relatively low ranking of LICENSE(Labial, Foot); see Rose 2000 for details.

4.1.1 Stage 1: 1;01.08 to 1;07.06

(18) [Dor…Cor] CVCV forms:

	Orthography	Target form	Child output	Age	Gloss
a) Coronal H	*Kathleen*	[kat.liːn]	[tæˈtɪ]	1;01.08	‘Kathleen’
10/18 (56%)	*couleur*	[kulœʁ]	[tʊˈl̃œ̃ᵘ]	1;04.15	‘colour’
	Caillou	[kaju]	[daˈjæ]	1;05.05	‘Caillou’
	caché	[kaʃe]	[dəˈd͡ʒɪ]	1;06.22	‘hidden’
b) Dorsal deletion	*Caillou*	[kaju]	[əˈjæ]	1;05.05	‘Caillou’
4/18 (22%)	*crayon*	[kʁɛjɔ̃]	[iˈjæ̆]	1;06.22	‘pencil’
	couteau	[kuto]	[.to]	1;06.22	‘knife’
c) Dorsal harmony	*Kathleen*	[kat.liːn]	[kæˈkiː]	1;01.08	‘Kathleen’
3/18 (17%)	*cogner*	[kɔɲe]	[gəˈge]	1;03.16	‘to hit’
	casse-tête	[kɑstajt]	[kɛˈkæ]	1;05.05	‘puzzle’
d) Target-like	*cassette*	[kasɛt]	[gəˈlɛtʰ]	1;06.22	‘tape’
1/18 (6%)					

- In almost all cases (17/18 examples), Dorsal cannot appear in the unstressed syllable without also appearing in the stressed syllable.
- Consonant harmony is the preferred strategy; faithfulness to the place feature of the stressed syllable in the input is important (15/18 examples).
- (Unfortunately: no data are available on CVC [Dor…Cor] forms.)

(19) [Cor…Dor] CVCV forms: Dorsal harmony (2/2 examples):

Orthography	Target form	Child output	Age	Gloss
du caca	[d͡ʒukaka]	[gɐkeˈkæ]	1;05.18	‘(the) poop’
c’est du caca	[sed͡ʒykaka]	[ˈkɐgjɔgɐˈkæ]	1;05.18	‘it is (the) poop’

(20) [Cor…Dor] CVC form: Metathesis (1/1 example):

Orthography	Target form	Child output	Age	Gloss
dans sac	[dɑ̃sak]	[ɜˈkaç]	1;05.05	‘in (the) bag’

- CVCV and CVC do not pattern in the same way.

4.2 Stage 2: 1;07.27 to 1;09.01

(21) [Dor…Cor] CVCV forms:

	Orthography	Target form	Child output	Age	Gloss
a) Coronal H	*gâteau*	[gɑto]	[tæˈto]	1;07.27	‘cake’
9/18 (50%)	*canard*	[kanɑʁ]	[næˈnæː]	1;07.27	‘duck’
	culotte	[kylɔt]	[tʌˈdɔtʰ]	1;09.01	‘pants’
	grelot	[gʁəlo]	[tɔˈlo]	1;09.01	‘little bell’
b) Target-like	*cochon*	[kɔʃɔ̃]	[kɜˈjɔː]	1;07.27	‘pig’
6/18 (33%)	*crayon*	[kʁɛjɔ̃]	[kœˈjɔ]	1;07.27	‘pencil’
	Cachou	[kaʃu]	[kæjˈt͡ʃu]	1;09.01	‘Cachou’
	Caillou	[kaju]	[kaˈju]	1;09.01	‘Caillou’
c) Dorsal subst.	*culotte*	[kylɔt]	[pɵˈjɛt]	1;07.27	‘pants’
3/18 (17%)	*couteau*	[kuto]	[peˈtʊ]	1;07.27	‘knife’
	chocolat	[ʃɔkɔla]	[.ʔʏˈlæ]	1;07.27	‘chocolate’

(22) [Cor…Dor] CVCV forms: target (1/1 example):[a]

Orthography	Target form	Child output	Age	Gloss
le coquin	[ləkɔkɛ̃]	[jekeˈkɛ̃]	1;07.27	‘the scamp’

a. No [Cor…Dor] CVCV forms were found in the corpus.

(23) [Cor…Dor] CVC forms: metathesis (2/2 examples):

Orthography	Target form	Child output	Age	Gloss
tigre	[t͡sɪg]	[kɪːn̥]	1;09.01	‘tiger’
sac	[sak]	[kæːt]	1;09.01	‘bag’

4.3 Clara at stages 1 and 2: Summary

- Faithfulness to input place feature in stressed syllable is very strong, except in metathesis cases, a strategy which aims at preserving the two input place features.
  - Contradicts data on English acquisition (trigger versus target place feature; CVCV versus CVC word shapes; e.g. Smith 1973, Pater 1997).
  - Does not generalise to all French children (see MAS’s data in (24)).
  - Conclusion: grammar-specific positional faithfulness effects.
- CVCV and CVC do not pattern in the same way, across both stages.
  - Contradicts data on English acquisition (e.g. Smith 1973, Pater 1997).

4.4 Preliminary data from MAS (period covered: 1;11.13 to 2;00.25)

(24) CVCV forms:

	Orthography	Target form	Child output	Age(s)	Gloss
a) [Lab…Cor]	*partout*	[paʁˈtu]	[paˈtu]	2;00.25	‘everywhere’
	petit	[pəˈti]	[peˈti]	1;11.28-2;00.25	‘little’
b) [Lab…Dor]	*beaucoup*	[boˈku]	[boˈku]	1;11.13	‘lots’
c) [Dor…Lab]	*Gaspard*	[ɡasˈpɑʁ]	[paˈka]	2;00.12-2;00.25	‘Gaspard’
	couper	[kuˈpe]	[peˈke]	1;11.13-2;00.25	‘(to) cut’
d) [Cor…Lab]	No data				
e) [Cor…Dor]	No data				
f) [Dor…Cor]	*gâteau*	[ɡɑˈto]	[kaˈko]	1;11.13-2;00.25	‘cake’
	cadeau	[kaˈdo]	[kaˈko]	1;11.13-2;00.12	‘gift’

- Only Labial is allowed in unstressed syllables without being present in stressed syllable as well.
- Dorsal must be realised in stressed syllable in order to be realised in unstressed syllable as well:
  - Dorsal harmony in [Dor…Cor] words; Place metathesis in [Dor…Lab] words.

(25) CVC forms:

	Orthography	Target form	Child output	Age(s)	Gloss
a) [Lab…Cor]	*patte*	[pat]	[pat^{h}]	1;11.13	‘pasta’
	botte	[bɔt]	[bɔt^{h}t^{h}t^{h}]	1;11.13-2;00.12	‘boot’
b) [Lab…Dor]	*berk*	[bɛʁk]	[bɛk^{h}k^{h}]	1;11.13	‘yuck’
	vague	[vag]	[ak^{h}k^{h}]	1;11.13	‘wave’
c) [Dor…Lab]	*coupe*	[kup]	[kup]	2;00.25	‘(I) cut’
	otoscope	[otosˈkɔp]	[kɔp]	2;00.12	‘otoscope’
d) [Cor…Lab]	*écharpe*	[eˈʃaʁp]	[tap]	2;00.12	‘scarf’
e) [Cor…Dor]	*sac*	[sak]	[kak]	1;11.28	‘bag’
	toc	[tɔk]	[kɔk]	2;00.12	‘knock!’
f) [Dor…Cor]	*quatre*	[katʁ]	[kak]	1;11.28-2;00.12	‘four’
	basquette	[basˈkɛt]	[kɛk]	1;11.28	‘basket’

- Coronals and dorsals in Labial-initial (non-harmonized) forms:
  — Often repeated in word-final position;
  — Display a very strong aspiration pattern;
  — Very marked pause between each repeated consonant.
- Word-final labials are well-formed and non-repeated.
- [Cor…Dor] and [Dor…Cor] words display Dorsal harmony.
- Word-final coronals and dorsals are never repeated in CVC harmonized forms.[4]

4. In [Cor…Cor] and [Lab…Lab] forms, word-final consonants are never repeated. For example, *tête* [tɛt] → [tɛt] (1;11.13-2;00.25); *tartine* [taʁtin] → [tetit] (2;00.12); *propre* [pʁɔpʁ] → [pɔp] (2;00.25); *bave* [bav] → [bap] (2;00.12).

5. Constraints

(26) IDENT (after McCarthy and Prince 1995):

Let α be a segment in the Input and β be any correspondent of α in the Output.
If α is [γF], then β is [γF].

a) IDENT(Place): Identity relation applies to the Place node and its featural dependent.

b) IDENT(Feature): Identity relation applies to the Place feature.

c) IDENTHEAD(Place): Identity relation applies to the Place node of the stressed syllable. (Follows the spirit of MAXHEAD; see Rose 2000, Goad and Rose 2004; on MAXHEAD, see also Alderete 1995, Itô et al. 1996, McCarthy 1997, Pater 2000).

(27) LINEARITY (after McCarthy and Prince 1995):

a) LIN(PWd): Within the prosodic word, the precedence structure in the output is consistent with that of the input, and vice-versa.

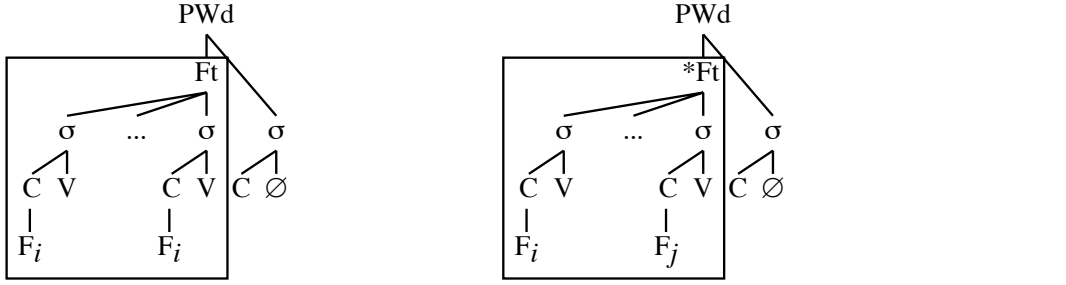
b) LIN(Foot): Within the foot, the precedence structure in the output is consistent with that of the input, and vice-versa.

(28) LICENSE(F, PCat) (after Piggott 1996, 1997, 2000, Rose 1999, 2000):
A feature F must be licensed by the head of a prosodic category PCat.

- For example, in order to satisfy LICENSE(Dor, Ft), a feature Dorsal dominated by the foot in the output must be realized in the head syllable of that foot (the stressed syllable).

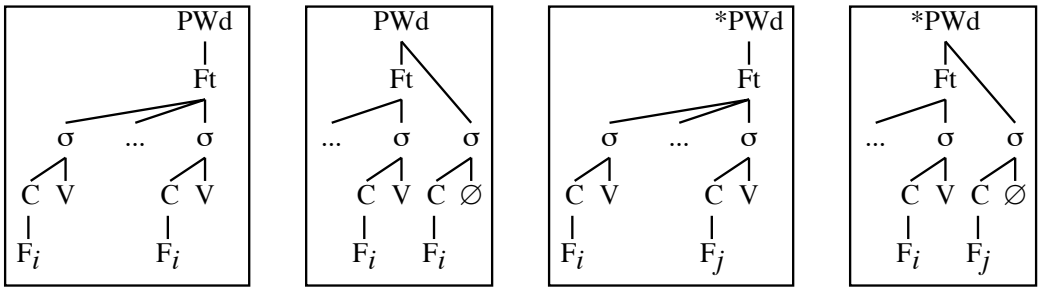
(29) LICENSE(F, Foot) relationships (domains represented with boxes):

a) Well-formed: b) Ill-formed:



(30) LICENSE(F, PWd) relationships (domains represented with boxes):

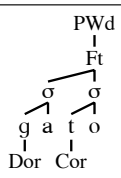
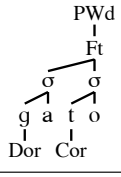
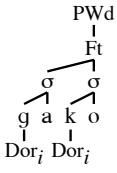
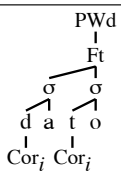
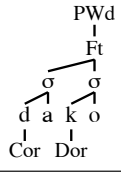
a) Well-formed: b) Well-formed: c) Ill-formed: d) Ill-formed:



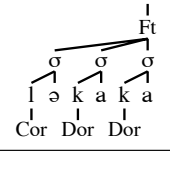
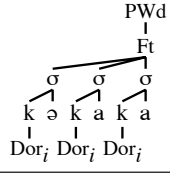
6. Tableaux[5]

6.1 Clara at Stage 1 (1;01.08 - 1;07.06)

(31) CVCV [Dor…Cor]: Coronal harmony

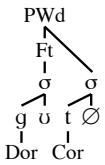
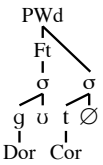
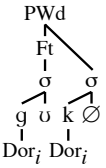
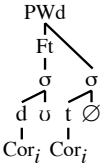
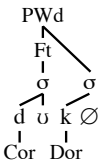
Input: [gɑto] 	Lin (Ft)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	Ident (Place)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
a) [gato] 		*! (g)		* (g)				
b) [gako] 					*	*!		
☞ c) [dato] 					*			
d) [dako] 	*!		* (d)			*	* (d)	*

(32) CVCV [Cor…Dor]: Dorsal harmony

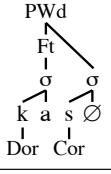
Input: [ləkaka] 	Lin (Ft)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	Ident (Place)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
a) [ləkaka]			*! (l)				* (l)	
☞ b) [kəkaka] 					*			
c) [lətata]					*	*!		
d) [kətata]	*!	* (k)		* (k)		*		*

5. In order not to kill too many trees, full prosodic representations are presented in the first tableaux for all candidates for CVCV and CVC forms for each child. Subsequent tableaux will contain full structure for the input and the optimal candidate only.

(33) CVC [Dor…Cor]: Prediction: target-like production (no example available in corpus)

Input: [gʊt] 	Lin (Ft)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	Ident (Place)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
☞ a) [gʊt] 							* (t)	
b) [gʊk] 					*!			
c) [dʊt] 					*!	*		
d) [dʊk] 				*! (k)		*		*

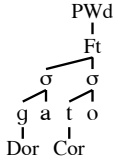
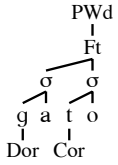
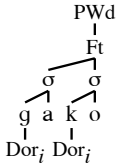
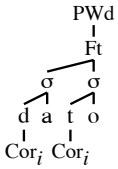
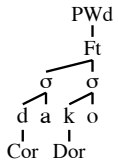
(34) CVC [Cor…Dor]: Place metathesis

Input: [sak] 	Lin (Ft)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	Ident (Place)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
a) [sak]				*! (k)				
b) [kak]					*!	*		
c) [sas]					*!			
☞ d) [kas] 						*	* (s)	*

6.2 Clara at Stage 2 (1;07.27 - 1;09.01)[6]

- Ranking difference between Stages 1 and 2: IDENT(Place) ranked higher, above LICENSE(Cor, Ft) and ranked equally with LICENSE(Dorsal, Ft).

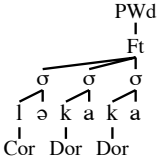
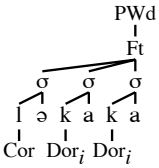
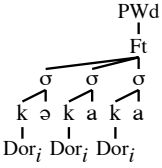
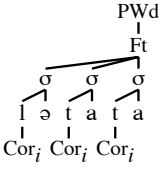
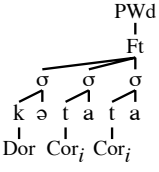
(35) CVCV [Dor…Cor]: Ranking predicts both target and coronal-harmonized output forms

	Input: [gɑto] 	LIN (Ft)	IDENT (Place)	LICENSE (Dor, Ft)	LICENSE (Cor, Ft)	LICENSE (Dor, PWd)	IDENTHEAD (Place)	LICENSE (Cor, PWd)	LIN (PWd)
☞	a) [gato] 			* (g)		* (g)			
	b) [gako] 		*				*!		
☞	c) [dato] 		*						
	d) [dako] 	*!			* (d)		*	* (d)	*

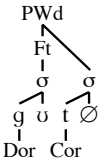
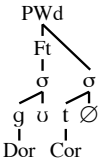
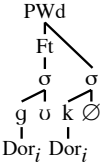
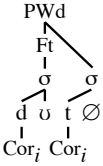
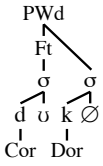
- The equal ranking of IDENT(Place) and LICENSE(Dor, Ft) has no consequence on the selected candidates in the following tableaux ((36), (37), and (38)).

6. Variation encoded following Kiparsky (1993): equally-ranked constraints A, B are variably ranked as A >> B and B >> A.

(36) CVCV [Cor…Dor]: Dorsal harmony

Input: [ləkaka] 	LIN (Ft)	IDENT (Place)	LICENSE (Dor, Ft)	LICENSE (Cor, Ft)	LICENSE (Dor, PWd)	IDENTHEAD (Place)	LICENSE (Cor, PWd)	LIN (PWd)
☞ a) [ləkaka] 				* (l)			*	
b) [kəkaka] 		*!						
c) [lətata] 		*!				*		
d) [kətata] 	*!		* (k)		*	*		*

(37) CVC [Dor…Cor]: Target-like realization

Input: [gʊt] 	Lin (Ft)	Ident (Place)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
☞ a) [gʊt] 							* (t)	
b) [gʊk] 		*!						
c) [dʊt] 		*!				*		
d) [dʊk] 					*! (k)	*		*

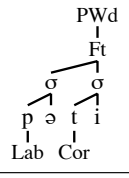
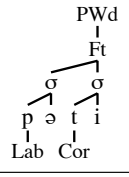
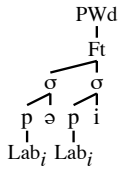
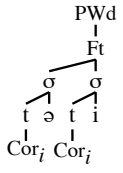
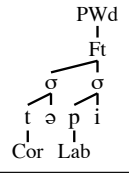
(38) CVC [Cor…Dor]: Place metathesis

Input: [sak] 	Lin (Ft)	Ident (Place)	License (Dor, Ft)	License (Cor, Ft)	License (Dor, PWd)	IdentHead (Place)	License (Cor, PWd)	Lin (PWd)
a) [sak]					*! (k)			
b) [kak]		*!				*		
c) [sas]		*!						
☞ d) [kas] 						*	* (s)	*

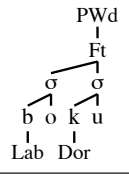
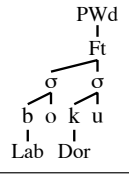
6.3 MAS's CVCV forms

- Requires a division of IDENT(Place) into more specific faithfulness constraints, each referring to specific Place features (i.e. Labial, Coronal, Dorsal).

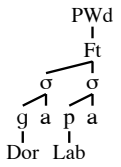
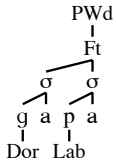
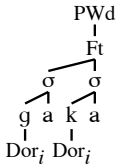
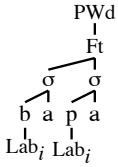
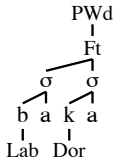
(39) [Lab…Cor]: Target-like

Input: [pəti] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
☞ a) [pəti] 							* (p)
b) [pəpi] 						*!	
c) [təti] 		*!					
d) [təpi] 				*!	* (t)		

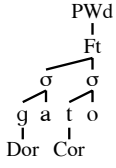
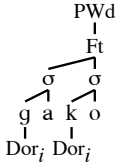
(40) [Lab…Dor]: Target-like

Input: [boku] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
☞ a) [boku] 							* (b)
b) [bopu]	*!						
c) [goku]		*!					
d) [gopu]			*! (g)	*			

(41) CVCV [Dor…Lab]: Metathesis

Input: [gaspɑʁ] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
a) [gapa] 			*! (g)				
b) [gaka] 		*!					
c) [bapa] 	*!						
☞ d) [baka] 				*			* (b)

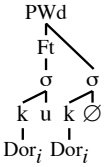
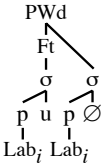
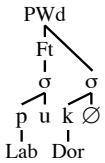
(42) CVCV [Dor…Cor]: Dorsal harmony

Input: [gɑto] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
a) [gɑto]			*! (g)				
☞ b) [gɑko] 						*	
c) [dato]	*!						
d) [dako]				*!	* (d)		

6.4 MAS's CVC forms

6.4.1 Labial-final

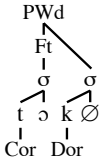
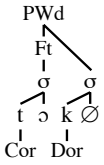
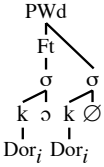
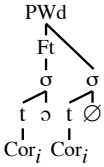
(43) Example [Dor…Lab]: Target-like production

Input: [kup] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
☞ a) [kup] 							* (p)
b) [kuk] 		*!					
c) [pup] 	*!						
d) [puk] 			*! (k)	*			

- Labial well-formed word-finally because of low ranking of LICENSE(Lab, PWd).
- Same prediction for [Cor…Lab].

6.4.2 [Cor…Dor] and [Dor…Cor]

(44) [Cor…Dor]: Dorsal Harmony

Input: [tɔk] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
a) [tɔk] 			*! (k)				
☞ b) [kɔk] 						*	
c) [tɔt] 	*!						
d) [kɔt] 				*!	* (t)		

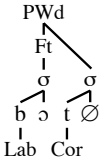
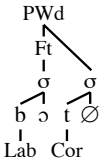
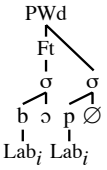
(45) [Dor…Cor]: Dorsal harmony

Input: [katʁ] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
a) [kat]					*! (t)		
☞ b) [kak] 						*	
c) [tat]	*!						
d) [tak]			*! (k)	*			

- For both [Cor…Dor] and [Dor…Cor], consonant harmony is predicted through ranking of License(Cor, PWd) and License(Dor, PWd) above IDENT(Cor).

6.4.3 The problem of Labial-initial forms

(46) [Lab…Cor]:

Input: [bɔt] 	IDENT (Dor)	IDENT (Lab)	LICENSE (Dor, PWd)	LIN (PWd)	LICENSE (Cor, PWd)	IDENT (Cor)	LICENSE (Lab, PWd)
☞ a) [bɔt] 					*!		
💣 b) [bɔp] 						*	
c) [dɔt]		*!					
d) [dɔp]				*!			*

- Problem: Our analysis predicts wrong candidate. The same problem arises with [Lab…Dor] forms.

(47) Hypothesis:

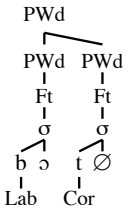
a) The strong aspiration pattern and the variable pattern of consonant repetition observed in (25) also result from licensing considerations.

b) High ranking of IDENT(Labial) and LINEARITY(PWd) prevent both coronal/dorsal harmony and metathesis in Labial-initial CVC forms ending in coronal or dorsal consonants.

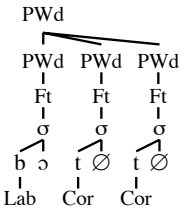
c) In order to license word-final coronal and dorsal consonants in this context, MAS epenthesizes a word-final PWd.[7]

(48) Representation: PWd appendix enables word-final licensing (example with word-final Coronal):

a) Single strongly-aspirated consonant:



b) 'Reduplicated' strongly-aspirated consonants:



7. See Goad, White and Steele (2003) for the role of appendix structure in explaining production patterns observed in second language acquisition.

(49) Arguments for proposed representation:

a) Reduplicated forms in early word productions often show main stress on each syllable (e.g. Holmes 1927; Fikkert 1994). This supports the possibility of reduplicated PWd structures in early representations. (Also, Fee and Ingram 19XX on reduplication in child language.)

b) Left-headedness ensures faithfulness to input stressed vowel, which remains the most prominent element of the output form.

c) The appended PWd enables licensing of word-final consonants (by the head of the appended PWd) without violating faithfulness constraints (except DEP(Segment), a constraint against segmental epenthesis, presumably lowly-ranked in MAS's grammar).

d) The pattern of strong aspiration observed in the data comes from the overt realization of the empty nuclei (Goad and Brannen 2003): MAS almost never produces 'voiced' schwas in word-final position. The strong aspiration observed in the context of 'reduplicated' word-final consonants look a lot like devoiced schwas (as reported by Goad and Brannen 2003, Holmes 1927 makes the same remark about word-final aspiration of child Mollie).

(50) Arguments in support of our hypothesis

a) Recall from (25a,b):
Word-final consonant 'repetition' only occurs in the case of non-harmonized.

Explanation: word-final coronal and dorsal consonants (i.e. coronals and dorsals which cannot be licensed by the preceding consonant in the string; cf. (25e,f)).

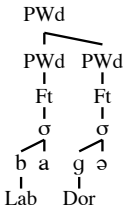
b) Recall from (25c,d):
Word-final labials are never repeated, even though they do not trigger/undergo consonant harmony:

Explanation: low ranking of LICENSE(Lab, PWd), motivated independently by the fact that Labial can be realized in unstressed syllables in CVCV forms (see (24)).

c) Positive evidence to the learner:
In phrase-final position, Lyon French optionally displays word-final schwa epenthesis, especially in emphatic contexts. In such cases, the word-final schwa bears stress (comparable to preceding 'full' vowel).

i) Examples: *botte* ['bɔt / 'bɔ'tə] 'boot'; *bague* ['baɡ / 'ba'ɡə] 'ring'.

ii) Because of the right-headedness of the Foot in French, the prosodic structure of the forms with 'emphatic' word-final schwa must include an appended word-final PWd.



iii) Motherese tends to contain lots of emphasis. Is word-final emphasized schwa highly frequent in Lyon French motherese (topic for further study).

d) Such phrase-final schwa emphasis is much rarer in Québec French; this dialectal difference may explain why Clara did not display word-final repetition the way MAS.

7. Discussion

- Children's productions are constrained by licensing requirements targeting different levels of prosodic representations (which themselves define relations within prosodic domains).
- Licensing appears to be central in explaining various production strategies found in the data: consonant harmony, metathesis, word-final consonant reduplication.
- There are no universal markedness (strength) relations between place features. Child/grammar specific relations appear to be more accurate, from an empirical perspective.
    - Question: why does Dorsal appear to be so consistently strong in English but not so strong in French?
- Prosodic differences across languages predict different patterns. Because of the default status of place-specified word-final consonants as onsets of empty-headed syllables:
    - Right-headed systems such as French may display differences between CVCV and CVC word shapes.
    - Left-headed systems should not display differences between CVCV and CVC word shapes.
    - Are these predictions borne out outside of French acquisition?

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