Licensing and Feature Interaction Processes in Child Language

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1. Introduction

In this paper, I explore two feature interaction processes, consonant harmony and metathesis, found in the outputs of Clara, a learner of Québec French. I argue that the patterns observed in Clara's data are best captured in an analysis based on (a) highly-articulated prosodic representations and (b) licensing relationships taking place between place features and heads of prosodic constituents. I then discuss previous approaches to consonant harmony in light of Clara's patterns, and argue that only an analysis based on prosodic licensing can account for these data in a unified fashion.

Consonant harmony involves a featural agreement relation at a distance between two consonants. For example, in (1a), the harmonized output for an input such as *duck* will surface as [gʌk] or as [dʌt], depending on which feature neutralizes the other. Metathesis, exemplified in (1b), also involves a relation at a distance between consonants, but without feature neutralization. Metathesis instead yields a reversal in the ordering of the features found in the target word. Taking again the input *duck*, its metathesized output will be pronounced [gʌt] by the child.

(1) Consonant feature harmony versus metathesis: an example

a. Consonant harmony:			b. Metathesis:		
• Input:	*duck*	[dʌk]	• Input:	*duck*	[dʌk]
• Output:		[gʌk] / [dʌt]	• Output:		[gʌt]

Such processes, especially consonant harmony, are pervasive in children's early outputs, as evidenced by the many works devoted to their study, for example, Smith (1973), Ingram (1974), Cruttenden (1978), Vihman (1978), Donahue (1986), Spencer (1986), McDonough and Myers (1991), Stemberger and Stoel-Gammon (1991), Macken (1992), Levelt (1994), Pater (1996, 1997), Velleman (1996), Dinnsen, Barlow, and Morrissette (1997), Goad (1997, 2000, in press), Bernhardt and Stemberger (1998). So far, however, with the exception of Goad (2000, in press), most studies have envisaged feature interaction processes from a segmental point of view. In

* I am indebted to Heather Goad for her support and feedback throughout the course of this research, which is fully discussed in chapter 4 of my dissertation. I would also like to thank Glyne Piggott for useful comments on aspects of my proposal. Thanks also to the participants of *WCCFL* 20 for their questions and suggestions, especially to Jessica Barlow, Jill Beckman, Suzanne Curtin, Ewa Czaykowska-Higgins, and Alan Prince. All errors or omissions are mine. This research was supported by a doctoral fellowship #752-95-1415 and a postdoctoral fellowship #756-00-0235 from SSHRCC. E-mail contact: yrose@mac.com.

 WCCFL 20 Proceedings, ed. K. Megerdoomian and L.A. Bar-el, pp. 484-497. Somerville, MA: Cascadilla Press.

contrast to these, Goad suggests that prosodic licensing might play a role in consonant harmony patterns. In this paper, building on Goad's initial insight, I propose an analysis of consonant harmony based on the constraint LICENSE, and extend this analysis to cases of place feature metathesis.

The paper is organized as follows. In section 2, I present the consonant harmony and metathesis data from Clara. In section 3, I detail the theoretical framework and assumptions required for a unified analysis of these data, which will be proposed in section 4. As we will see, much importance is attributed to representations and to relationships taking place between features and heads of prosodic constituents. In section 5, I discuss previous approaches to consonant harmony. A brief conclusion is offered in section 6.

2. The data

In the interest of space and clarity, I will focus only on the interaction between Dorsal and Coronal in Clara's grammar.[1] Firstly, as can be seen in (2a), Dorsal undergoes Coronal assimilation in [Dor…Cor] CVCV words.

(2) Clara's CVCV words

a. [Dor…Cor]: Coronal harmony *couleur* [kulœʁ] → [tʊˈlœɻ̩] 'color'
gâteau [gɑto] → [tæˈto] 'cake'

b. [Cor…Dor]: No target inputs of this shape.[a]

a. This accidental gap is presumably an artifact of the relative rarity of target words of this shape in French.

A comparison of (2a) with (3a) reveals that consonant harmony is observed in Clara's CVCV words only. In CVC [Dor…Cor] words in (3a), no harmony is found, even though it would be expected in light of (2a). Finally, in CVC [Cor…Dor] words, in (3b), we find a pattern of place metathesis between the two input place features.

(3) Clara's CVC words

a. [Dor…Cor]: No harmony *goutte* [gʊt] → [gʊt] '(a) drop'
→ [gʊtʰ]

b. [Cor…Dor]: Metathesis *sac* [sak] → [kaʧ] 'bag'
tigre [t͡sɪg] → [kɪːn] 'tiger'

As I will demonstrate below, an approach based on the way that non-final and final consonants are prosodified in French enables a unified explanation of Clara's data.

3. Theoretical framework and assumptions

In this section, I outline the theoretical background and assumptions necessary for a satisfactory account of Clara's feature interaction patterns. As mentioned above, much importance will be attributed to phonological

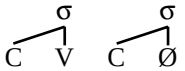
1. See Rose (2000) for a complete analysis including the feature Labial, as well as a cross-linguistic comparison with patterns from two English-learning children.

representations, which are at the core of the account proposed. All aspects of the representations to be discussed are assumed to be provided by Universal Grammar (UG) as part of the child's innate linguistic competence. In order to regulate both input-output faithfulness and licensing relationships in surface forms, I will appeal to constraints on representations, cast within Optimality Theory (OT; e.g. Prince and Smolensky 1993), which are assumed to be part of the UG endowment as well (Gnanadesikan 1995).

3.1. Representations

In this section, I detail the representations and constraints on which the unified analysis of Clara's patterns proposed below is based. First, I follow Goad and Brannen (in press), who argue that children initially syllabify word-final consonants as onsets, as in (4), independently of the syllabification constraints of the target language.[2]

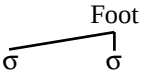
(4) CVC word in early grammars



(Ø = empty nucleus)

Following Charette (1991), I assume that the stress foot in French is right-headed, as illustrated in (5).[3]

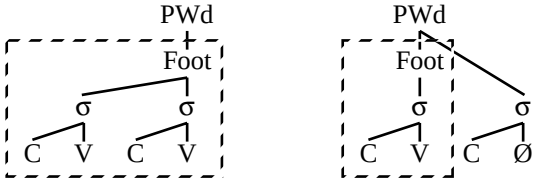
(5) French foot structure



The combination of (4) and (5) entails a crucial distinction concerning the way that non-final and final consonants are prosodified in French. While non-final consonants are part of the foot, as in (6a), the word-final consonant falls outside the foot, as in (6b). (For a similar approach, see Charette 1991.)

(6) Full prosodic structure of French CVCV and CVC words

a. CVCV: b. CVC:



As we will see in section 4, the fact that word-final consonants are prosodified outside the foot in French enables a straightforward explanation

2. Rose (2000) argues that this hypothesis holds only if word-final consonants bear place specifications, which is the case for the contexts discussed in this paper.
3. Throughout the paper, the head of a given branching constituent will be represented by a vertical line linking it to its mother node.

for the patterning of Clara's CVCV versus CVC outputs. Before I elaborate on this, it is first necessary to introduce the constraints which regulate segmental and prosodic representations in the child's grammar.

3.2. Constraints

While a whole array of constraints is necessary in order to encode additional generalizations (e.g. absence of place feature interaction between vowels and consonants; see section 5.1 below), for the sake of clarity, I will focus on the interaction between feature faithfulness, linearity, and licensing constraints only. In order to assess faithfulness between input and output forms, I appeal to input-output correspondence constraints following McCarthy and Prince (1995). The constraints relevant to the analysis are defined in (7). MAX(F), in (7a), ensures preservation of input material in output forms. LINEARITY(Pl, PCat), in (7b), regulates precedence Place structure between inputs and outputs, in a given prosodic category PCat.

(7) Faithfulness constraints
   a. MAX(F): Every input feature F has an output correspondent.
   b. LINEARITY(Pl, PCat): The precedence structure relative to Place specifications in the output is consistent with that of the input, and vice versa, in a given prosodic category PCat.

To encode the licensing relationships which are considered to be the source of Clara's feature interaction patterns, I appeal to the constraint LICENSE(F, PCat) defined in (8), which is inspired by Itô, Mester, and Padgett (1995), Piggott (1996, 1997, 2000), and Rose (1999).

(8) LICENSE(F, PCat):
   A feature F must be licensed by the head of a prosodic category PCat.

Importantly, following Piggott (2000), I argue that LICENSE is fulfilled if and only if a segment in the *head* position of PCat contains F.

Tudanca Montañés provides us with independent evidence supporting LICENSE in adult languages. This language displays a vowel centralization harmony triggered by the masculine gender suffix /-ʊ/. Importantly, as exemplified in (9), the harmony triggered by /-ʊ/ must (a) target the stressed vowel, but (b) never extend to the left of the stressed syllable.

(9) Centralization in Tudanca Montañés (Hualde 1989)[a]

a.	[o.ˈrɛ.gæ.nʊ]	(*[o.ˈr̲ɛ̲.gæ.nʊ])	'oregano'
	[an.ti.ˈgwɪ.sɪ.mʊ]	(*[an.ti.ˈgwi̲.sɪ.mʊ])	'very old (m.)'
b.	[a.ham.ˈbræ.ʊ]	(*[æ̲.hæ̲m.ˈbræ.ʊ])	'hungry (m.)'
	[se.ˈkæ.lʊ]	(*[sɛ̲.ˈkæ.lʊ])	'to dry him'

a. Ill-formed vowels are underlined.

To account for this system, Rose (1999) appeals to the domination of LICENSE([lax], PWd) and MAX([lax]) over NOSPREAD, a cover constraint against feature spreading. This analysis is summarized in (10).

(10) [lax] harmony in Tudanca Montañés (Rose 1999)

Input: /oregano/	LIC([lax], PWd)	MAX([lax])	NOSPREAD
a. [o'reganɔ]:	*! ([ɔ])		
b. [o'reganu]:		*!	
☞ c. [o'rɛgænɔ]:			**

In (10a), we can see that the input-like candidate incurs a fatal violation of LIC([lax], PWd): its feature [lax] is not licensed by the *head* of the prosodic word. In the sub-optimal candidate in (10b), deletion of [lax] fatally violates MAX([lax]). Candidate (10c) is thus the winning contender, as it simultaneously satisfies the two highly-ranked constraints and only incurs violations of lower-ranked NOSPREAD.[4]

In section 4, I will extend this proposal to Clara's data. In the next section, I briefly discuss general assumptions regarding child language and phonological development.

3.3. Assumptions about child phonology

Cross-linguistic observations on early children's productions point to a strong generalization: only unmarked structures are found in children's first words (e.g. Jakobson 1941/68, Velten 1943, Leopold 1947, Stampe 1969, Smith 1973, Ingram 1974, 1988, 1989, Ferguson and Farwell 1975, Macken 1979, Fikkert 1994, and Bernhardt and Stemberger 1998). In accordance with this generalization, I assume the initial organization of the grammar as formalized by Demuth (1995), Gnanadesikan (1995), and Smolensky (1996), in (11).[5]

(11) Initial organization of the grammar
Markedness constraints » faithfulness constraints

The ranking in (11) focuses on the constraint ranking which yields unmarked outputs at the onset of phonological development. Regarding the shape of inputs, most studies typically assume that, at the level of segmental representations, the child's inputs are essentially similar to the adult's (e.g. Smith 1973, Gnanadesikan 1995, Pater 1996, 1997, Smolensky 1996, Hale and Reiss 1998, Goad and Rose, to appear), modulo perceptual problems (Macken 1980). At the level of prosodic representations, both Gnanadesikan (1995) and Goad and Rose (to appear) provide empirical support for the position that constituent structure is present in the child's inputs. On the one hand, Gnanadesikan reports patterns of faithfulness to input syllables, i.e. to entire prosodic constituents. On the other hand, Goad and Rose argue, from

4. In the interest of space, no structures were included for the input forms and output candidates. To alleviate this notational limitation, feature sharing relations are represented by underlining of the segments containing the shared feature in the candidates, and the segments incurring licensing violations are provided next to the violation marks in the tableaux.

5. Virtually all acquisitionists working within the OT framework assume this ranking at the initial stage (cf. Hale and Reiss 1998).

left-edge cluster reduction patterns observed in the acquisition of West Germanic languages, that children are faithful to the head of the input onset constituent. Both Gnanadesikan and Goad and Rose thus provide support for the position that inputs are fully prosodified.

When the two assumptions outlined above are combined (domination of markedness constraints over faithfulness constraints and fully-prosodified inputs), the consequence is that while children's *inputs* are basically as complex as adults' inputs, children's *outputs* initially display structures that are unmarked, as well as restrictions on licensing relationships. The effect of such restrictions is demonstrated in the next section.

4. Analysis

4.1. Clara's CVCV words

The contrast observed between Clara's CVCV and CVC [Dor…Cor] words is predicted by the ranking proposed in (12).

(12) Clara's constraint ranking
LIN(Pl, Ft) » LIC(Dor, Ft), LIC(Cor, Ft) » MAX(Cor) » MAX(Dor) » LIN(Pl, PWd)

The context where consonant harmony is attested in Clara's outputs is exemplified in the tableau in (13) with the input word *gâteau* [gɑˈto] 'cake'.

(13) Clara's [Dor…Cor] words

Input: *gato*	LIN (Pl, Ft)	LIC (Dor, Ft)	LIC (Cor, Ft)	MAX (Cor)	MAX (Dor)	LIN (Pl, PWd)
a. [dæko]:	*!		* ([d])			*
b. [gæto]:		*! ([g])				
c. [g̲æk̲o]:				*!		
☞ d. [d̲æt̲o]:					*	

As can be seen with the candidate in (13a), linearity is enforced in CVCV words, because both consonants are prosodified within the foot in French words of this shape (see (6a)). The target-like candidate in (13b) fails to license its Dorsal feature in the head of the foot. Dorsal harmony, in (13c), fatally violates Coronal faithfulness, which has precedence over Dorsal faithfulness. Because of this, the Coronal-harmonized candidate in (13d) is selected as optimal.

4.2. Clara's CVC words

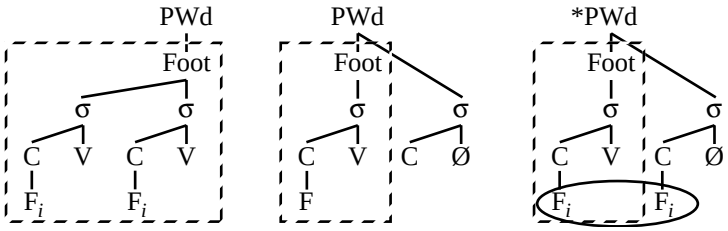
To explain the absence of consonant harmony in Clara's CVC words, I appeal to the principle of LOCALITY, which requires every relation to take place within the highest prosodic category to which it refers (e.g. Itô 1986).

(14) LOCALITY
A relation is bound within the domain of the highest category to which it refers.

Given LOCALITY, no foot-based relation can take place between the two consonants of French CVC words, because, recall from (6b), word-final consonants are prosodified outside the foot in French. Consequently, a consonant-to-consonant relation in CVC French words would lead to the impossible configuration in (15c).

(15) LICENSE(F, Ft) relationships

a. Well-formed b. Well-formed c. Ill-formed



The fact that word-final consonants in French fall outside the foot must not be construed to mean that the content of these consonants is not constrained. In order to regulate the licensing of word-final consonants in French, I introduce the two LICENSE(F, PWd) constraints underlined in (16).

(16) Clara's constraint ranking (revised)
LIN(Pl, Ft) » LIC(Dor, Ft), LIC(Cor, Ft) » MAX(Cor) » MAX(Dor) » LIC(Dor, PWd) » LIN(Pl, PWd) » LIC(Cor, PWd)

This ranking predicts that the coronal consonant of an input like *goutte* [gʊt] '(a) drop', in (17), can surface word-finally without triggering metathesis, in (17d), because of the low ranking of LIC(Cor, PWd). In contrast to this, the harmonizing candidates in (17a) and (17b) both violate higher-ranked MAX requirements. Finally, (17c), which displays metathesized Dorsal in word-final position, fatally violates LIC(Dor, PWd), because Dorsal fails to be licensed in the head of the prosodic word in this candidate.

(17) Clara's CVC [Dor…Cor] words[a]

Input: *gʊt*	LIN (Pl, Ft)	MAX (Cor)	MAX (Dor)	LIC (Dor, PWd)	LIN (Pl, PWd)	LIC (Cor, PWd)
a. [gʊk]:		*!				
b. [dʊt]:			*!			
c. [dʊk]:				*! ([k])	*	
☞ d. [gʊt]:						* ([t])

a. Because of space limitations, the constraints LIC(Cor, Ft) and LIC(Dor, Ft), which are irrelevant to the analysis of French CVC words, were removed from this tableau and the following one ((18)).

The situation is different in (18), where an input [Cor…Dor] CVC word must undergo metathesis. As it was the case in (17), the two harmonizing candidates, (18a) and (18b), both fatally violate the feature faithfulness requirements of Clara's grammar. In (18c), LIC(Dor, PWd) is fatally violated by the word-final [k]. If metathesis applies, however, Coronal ends up in the word-final position, in (18d), similar to the optimal form in (17d).

(18) CVC [Cor…Dor] words

Input: *sak*	LIN (Pl, Ft)	MAX (Cor)	MAX (Dor)	LIC (Dor, PWd)	LIN (Pl, PWd)	LIC (Cor, PWd)
a. [sat]:			*!			
b. [xak]:		*!				
c. [sak]:				*! ([k])		
☞ d. [kas]:					*	* ([s])

As we can conclude from the above demonstration, the behavior of Clara's CVC words can be explained through a combination of (a) highly-articulated representations, which enable us to establish a structural distinction between non-final and final onsets with regard to how these onsets are linked to higher prosodic structure in French, and (b) a set of constraints governing the licensing of place features at the level of the prosodic word, similar to what was observed in Tudanca Montañés. Finally, while consonant harmony violates faithfulness requirements in order to satisfy higher-ranked licensing constraints, place metathesis is viewed, under the current proposal, as a strategy available to the child to ensure that feature licensing requirements are satisfied, but without violating the grammar's feature faithfulness requirements. In contexts where consonant harmony cannot apply, the child reorders the features present within the word in order to simultaneously satisfy the highly-ranked faithfulness and licensing constraints of his or her grammar.

In the next section, I discuss previous proposals in light of Clara's data.

5. Alternative views

In this section, I review a number of previous approaches to consonant harmony and compare them with the current proposal. In order not to repeat the oft-cited arguments against a strictly linear approach to phonology in the *SPE* tradition (Chomsky and Halle 1968), whose lack of explanatory power led most modern phonologists to reject it, I will restrict the discussion to the main approaches to consonant harmony proposed in the literature on non-linear phonology. These approaches, which fall into three main categories —'no skipping', feature spreading, and optimality theoretic— are discussed in turn in the next subsections.

5.1. 'No skipping' approach

In order to account for apparent consonant harmony data from Dutch-learning children, Levelt (1994) proposes a feature sharing approach which only applies between strictly adjacent segments. Indeed, Levelt rejects the

idea that consonant harmony results from a relation between two consonants at a distance.[6] Instead, she claims that consonant harmony actually follows accidentally from an independent vowel-to-consonant assimilation which yields feature identity between two consonants in output forms (see, also, Gierut, Cho, and Dinnsen 1993).

A few representative examples of the data supporting Levelt's view are given in (19). As we can see, in all of these examples, the feature shared by the consonants is also found on the vowel that intervenes between these consonants.

(19) 'Apparent' consonant harmony (Levelt 1994)

Word	Target form	Child's output	Gloss	Feature shared
boek	[buk]	[bu̲p]	'book'	Labial
vis	[vɪs]	[si̲ʃ]	'fish'	Coronal
kast	[kɑst]	[kɑ̲χt]	'closet'	Dorsal

Thus, in these examples, a vowel-to-consonant assimilation, indicated by the underlining, yields a consonant which accidentally matches the place specification of the consonant that appears on the other side of the vowel.

Goad (2000) discusses Levelt's (1994) approach and argues that these apparent cases of consonant harmony must be viewed as speech errors instead of as outputs reflecting aspects of the children's phonologies. Among other arguments, Goad mentions the low number of harmonized outputs, citing Levelt's comment that "apparent Consonant Harmony forms are present in about 10% of the utterances of a child in recordings with a peak in such assimilations" (Levelt 1994: 57, footnote #3).

Contrary to Levelt's data, Clara's patterns discussed above do not represent the exception but the rule.[7] Furthermore, as we can see from the examples in (20), the quality of the vowel intervening between the two harmonized consonants is independent from the place feature being shared.[8]

(20) Vowel quality independent of consonant harmony

Word	Target form	Child's output	Gloss	Harmony type
debout	[dəbu]	[bɑˈbuː]	'standing'	Coronal to Labial
chapeau	[ʃapo]	[pæˈpo]	'hat'	
capable	[kapab]	[paˈpæb]	'able'	Dorsal to Labial
café	[kafe]	[pəˈfɛ]	'coffee'	
couleur	[kulœʁ]	[tʊ̯ˈlœ̃ᵘ]	'colour'	Dorsal to Coronal
grelot	[gʁəlo]	[tɔˈlo]	'little bell'	

These systematic patterns are problematic for Levelt's view that consonant harmony results from an independent vowel-to-consonant assimilation

6. Gafos (1996: 162-163), based on Levelt's data, also rejects the idea of consonant harmony as a long-distance relation.
7. See Rose (2000) for additional details about the systematicity of the patterns under investigation.
8. Rose (2000) provides similar evidence from English-learning children displaying consonant harmony patterns.

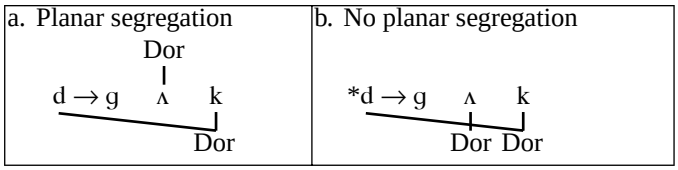
process. Instead, these data support an approach along the lines of the one proposed above, where consonant harmony is viewed as a relation which takes place between two consonants across an intervening vowel.

5.2. Feature spreading approaches

During the pre-OT period, within the tradition of non-linear phonology, consonant harmony was typically analyzed as a feature spreading relation between segments (e.g. Spencer 1986, McDonough and Myers 1991, Stemberger and Stoel-Gammon 1991, Macken 1992; see, also, Dinnsen, Barlow, and Morrissette 1997).[9]

As reported by Goad (1997), in order to avoid crossed association lines, McDonough and Myers (1991) and Macken (1992) have proposed that, at the stage when consonant harmony is observed, consonants and vowels must be represented on different planes, following the schema in (21a), with *duck* → [gʌk] (cf. (21b)).

(21) CV segregation and consonant harmony (schema from Goad 1997)



In order to account for the feature strength effects found in much of the data investigated whereby Coronal assimilates to Labial and Dorsal, authors such as Spencer (1986) and Stemberger and Stoel-Gammon (1991) argue in favour of Coronal underspecification (see, especially, the contributions to Paradis and Prunet 1991). For example, in (21), the consonant [d] of *duck* is represented without a Coronal feature. As a result, only Labial and Dorsal can trigger consonant harmony.

Both CV segregation and Coronal underspecification, however, are problematic. On the one hand, CV segregation, which is traditionally supported in the literature on Semitic and templatic morphology, as well as in languages where the order between consonants and vowels is predictable (see, especially, McCarthy 1989), finds no independent support in child language. As Levelt (1994) and Goad (1997) report, consonant harmony still occurs at stages when the order between consonants and vowels is no longer predictable. Coronal underspecification, on the other hand, is empirically problematic when put in the broader context. For example, Goad (1997) demonstrates that this notion makes wrong predictions in the case of Amahl's consonant harmony patterns (Smith 1973). The data from Clara provide additional support against Coronal underspecification. Indeed, if Coronal were underspecified across the board in child language, as proposed by Stemberger and Stoel-Gammon (1991), it would be impossible to explain the pattern of Dorsal assimilation to Coronal found in Clara's outputs.

9. Levelt (1994) also appeals to Feature Geometry in the analysis of the vowel-to-consonant assimilation patterns reported in (19).

5.3. Optimality theoretic approaches

5.3.1. ALIGN and PARSE

In order to overcome the difficulties posed by feature spreading and underspecification approaches, Goad (1997) proposes an optimality theoretic account of consonant harmony. The two constraints that are central to Goad's proposal are PARSE, in (22), a constraint similar to MAX which is part of the original OT approach to faithfulness by Prince and Smolensky (1993), and ALIGN, in (23), a constraint proposed by McCarthy and Prince (1993) which requires that some element be aligned with the edge of some prosodic domain.

(22) PARSE(F)
An underlying feature F must be parsed in surface forms.

(23) ALIGN(F, L/R, ArticDomain L/R)
The left/right edge of a feature F must be aligned with the left/right edge of the articulator domain.

Adopting Pulleyblank's (1996) definition of harmonic domain, Goad proposes that the argument ArticDomain in (23) refers to any place feature (Labial, Coronal, Dorsal). Based on Amahl's data from Smith (1973), Goad proposes that ALIGN(Dor, L, ArticDomain, L) outranks PARSE(Cor), accounting for the regressive Dorsal harmony targeting Coronal found in Amahl's outputs.

However, under such an approach, which in essence views consonant harmony as a relation at the level of the prosodic word, it is impossible to account for the asymmetry observed between Clara's CVCV and CVC words. Recall from section 2 that Clara's [Dor…Cor] CVCV words surface as [Cor…Cor]. An alignment-based account of this pattern would require domination of the constraint PARSE(Dor) by ALIGN(Cor, L, ArticDomain, L). However, recall further that Clara's [Dor…Cor] CVC words surface without consonant harmony. This last context would be difficult to reconcile with high ranking of the Coronal alignment constraint required for the CVCV word shape.

5.3.2. REPEAT

Another proposal found in the recent literature comes from Pater (1996, 1997), who analyses consonant harmony as the result of REPEAT, a constraint which accounts for the preference for repeated gestures in children's productions, as defined in (24).

(24) REPEAT
Successive consonants must agree in place specification.

Pater (1996, 1997) proposes that REPEAT must be active in grammars showing consonant harmony alternations but that this constraint must be eliminated from the system prior to the adult stage, in order to account for the absence of consonant harmony in adult language.

As Pater admits, however, this approach to child-specific constraints raises a few problems. First, OT adopts the premise that all grammars contain a finite number of constraints (e.g. Prince and Smolensky 1993). Given this, and given that child-specific constraints find no independent support in the literature beyond consonant harmony, appealing to such a constraint should be considered only as a last resort option. Furthermore, from an empirical perspective, as formulated, REPEAT cannot account for the domain asymmetries found in Clara's outputs.

As opposed to this, the current approach appeals primarily to (a) licensing, a notion well-established in the literature on non-linear phonology, and (b) faithfulness constraints, which are central to most analyses framed within OT. Furthermore, no constraint needs to be eliminated from the grammar. Indeed, all of the constraints used in the analysis proposed are independently motivated from patterns attested in adult languages. Finally, under the current proposal, consonant harmony and metathesis are analyzed in a unified fashion, something which would be difficult to achieve under any of the alternative approaches discussed above.

6. Conclusion

In this paper, we witnessed the role that licensing relationships taking place between segmental features and constituent heads play in early grammars. This was demonstrated from the feature interaction processes of consonant harmony and metathesis found in Clara's outputs. We also saw that the previous approaches to consonant harmony would have difficulty accounting for Clara's data, because none of these approaches makes reference to prosodic domains. This observation provides additional support for the current approach, which draws a formal distinction concerning the prosodification of non-final and final consonants in French. Importantly, only reference to highly-articulated prosodic representations enables one to establish such a distinction and predict its effects on licensing.

References

Bernhardt, Barbara H. and Joseph P. Stemberger (1998). *Handbook of Phonological Development from the Perspective of Constraint-based Nonlinear Phonology*. San Diego: Academic Press.

Charette, Monik (1991). *Conditions on Phonological Government*. Cambridge, MA: Cambridge University Press.

Chomsky, Noam and Morris Halle (1968). *The Sound Pattern of English*. New York: Harper and Row.

Cruttenden, Alan (1978). Assimilation in child language and elsewhere. *Journal of Child Language* 5: 373-378.

Demuth, Katherine (1995). Markedness and the development of prosodic structure. In Jill N. Beckman (ed.) *NELS* 25. Amherst, MA: GLSA. 13-25.

Dinnsen, Daniel A., Jessica Barlow, and Michelle L. Morrisette (1997). Long-distance place assimilation with an interacting error pattern in phonological acquisition. *Clinical Linguistics and Phonetics* 11: 319-338.

Donahue, Mavis (1986). Phonological constraints on the emergence of two-word utterances. *Journal of Child Language* 13: 191-208.

Ferguson, Charles A. and Carol B. Farwell (1975). Words and sounds in early language acquisition. *Language* 51: 419-439.
Fikkert, Paula (1994). *On the Acquisition of Prosodic Structure*. Dordrecht: ICG.
Gafos, Adamantios I. (1996). *The Articulatory Basis of Locality in Phonology*. Ph.D. dissertation. Johns Hopkins University.
Gierut, Judith A., Mi-Hui Cho, and Daniel A. Dinnsen (1993). Geometric accounts of consonant-vowel interactions in developing systems. *Clinical Linguistics and Phonetics* 7: 219-236.
Gnanadesikan, Amalia E. (1995). Markedness and faithfulness constraints in child phonology. ROA-67. Ms.
Goad, Heather (1997). Consonant harmony in child language: an optimality-theoretic account. In S. J. Hannahs and Martha Young-Sholten (eds.) *Focus on Phonological Acquisition*. Amsterdam: John Benjamins. 113-142.
___ (2000). Phonological operations in early child phonology. Paper delivered at SOAS Linguistics Colloquium Series. University of London.
___ (in press). Assimilation phenomena and initial constraint ranking in early grammars. In Anna H.-J. Do, Laura Dominguez, and Aimee Johansen (eds.) *Proceedings of the 25th Annual Boston University Conference on Language Development*. Somerville, MA: Cascadilla Press.
Goad, Heather and Kathleen Brannen (in press). Syllabification at the right edge of words: parallels between child and adult grammars. In Jeroen van de Weijer (ed.) *Issues in the Phonology-phonetics Interface*. Amsterdam: John Benjamins.
Goad, Heather and Yvan Rose (to appear). Input elaboration, head faithfulness and evidence for representation in the acquisition of left-edge clusters in West Germanic. In René Kager, Joseph V. Pater, and Wim Zonneveld (eds.) *Fixing Priorities: Constraints in Phonological Acquisition*. Cambridge: Cambridge University Press.
Hale, Mark and Charles Reiss (1998). Formal and empirical arguments concerning phonological acquisition. *Linguistic Inquiry* 29: 656-683.
Hualde, José I. (1989). Autosegmental and metrical spreading in the vowel-harmony systems of Northwestern Spain. *Linguistics* 27: 773-805.
Ingram, David (1974). Fronting in child phonology. *Journal of Child Language* 1: 233-241.
___ (1988). Jakobson revisited: some evidence from the acquisition of Polish. *Lingua* 75: 55-82.
___ (1989). *First Language Acquisition: Method, Description, and Explanation*. Cambridge, MA: Cambridge University Press.
Itô, Junko (1986). *Syllable Theory in Prosodic Phonology*. Ph.D. dissertation. University of Massachusetts, Amherst. Published (1988), New York: Garland.
Itô, Junko, Armin Mester, and Jaye Padgett (1995). Licensing and underspecification in Optimality Theory. *Linguistic Inquiry* 26: 571-613.
Jakobson, Roman (1941). *Kindersprache, Aphasie, und Allgemeine Lautgesetze*. Uppsala: Almqvist and Wiksell. [Translated in 1968: *Child Language, Aphasia, and Phonological Universals*. The Hague: Mouton.]
Leopold, Werner F. (1947). *Speech Development of a Bilingual Child: A Linguist's Record, Vol. II: Sound-learning in the First Two Years*. Evantson, IL: Northwest University Press.
Levelt, Clara C. (1994). *On the Acquisition of Place*. Leiden: Holland Institute of Generative Linguistics.
Macken, Marlys A. (1979). Developmental reorganization of phonology: a hierarchy of basic units of acquisition. *Lingua* 49: 11-49.
___ (1980). The child's lexical representation: the 'puzzle-puddle-pickle' evidence. *Journal of Linguistics* 16: 1-17.
___ (1992). Where's phonology? In Charles A. Ferguson, Lise Menn, and Carol Stoel-Gammon (eds.) *Phonological Development: Models, Research, Implications*. Timonium, MD: York Press. 249-269.

McCarthy, John J. (1989). Linear order in phonological representation. *Linguistic Inquiry* 20: 71-99.
McCarthy, John J. and Alan S. Prince (1993). Generalized alignment. Technical report no. 3 of the Rutgers Center for Cognitive Science. Rutgers University.
___ (1995). Faithfulness and reduplicative identity. In Jill N. Beckman, Laura Walsh Dickey, and Suzanne Urbanczyk (eds.) *Papers in Optimality Theory*. Amherst: GLSA. 249-384.
McDonough, Joyce and Scott Myers (1991). Consonant harmony and planar segregation in child language. UCLA and University of Texas, Austin. Ms.
Paradis, Carole and Jean-François Prunet (eds., 1991). *The Special Status of Coronals: Internal and External Evidence*. San Diego: Academic Press.
Pater, Joseph V. (1996). *Consequences of Constraint Ranking*. Ph.D. dissertation. McGill University.
___ (1997). Minimal violation and phonological development. *Language Acquisition* 6: 201-253.
Piggott, Glyne L. (1996). Reconfiguring harmony. *McGill Working Papers in Linguistics* 12: 61-98.
___ (1997). Licensing and alignment: a conspiracy in harmony. *Phonology* 14: 437-477.
___ (2000). Against featural alignment. *Journal of Linguistics* 36: 85-129.
Prince, Alan S. and Paul Smolensky (1993). Optimality Theory: constraint interaction in generative grammar. Rutgers University and University of Colorado, Boulder. Ms.
Pulleyblank, Douglas (1996). Neutral vowels in Optimality Theory: a comparison of Yoruba and Wolof. *Canadian Journal of Linguistics* 41: 295-347.
Rose, Yvan (1999). Quand la structure métrique impose son accent au trait harmonique. Paper delivered at the 1999 Annual Meeting of the Canadian Linguistic Association. Université de Sherbrooke.
___ (2000). *Headedness and Prosodic Licensing in the L1 Acquisition of Phonology*. Ph.D. dissertation. McGill University.
Smith, Neilson V. (1973). *The Acquisition of Phonology, a Case Study*. Cambridge: Cambridge University Press.
Smolensky, Paul (1996). On the comprehension/production dilemma in child language. *Linguistic Inquiry* 27: 720-731.
Spencer, Andrew (1986). Towards a theory of phonological development. *Lingua* 68: 3-38.
Stampe, David L. (1969). The acquisition of phonetic representation. *Papers from the 5th Annual Regional Meeting of the Chicago Linguistic Society*: 433-444.
Stemberger, Joseph and Carol Stoel-Gammon (1991). The underspecification of coronals: evidence from language acquisition and performance errors. In Carole Paradis and Jean-François Prunet (eds.) *The Special Status of Coronals: Internal and External Evidence*. San Diego: Academic Press. 181-199.
Velleman, Shelly S. (1996). Metathesis highlights feature-by-position constraints. In Barbara H. Bernhardt, John Gilbert, and David Ingram (eds.) *Proceedings of the UBC International Conference on Phonological Acquisition*. Somerville, MA: Cascadilla Press. 173-186.
Velten, Harry de Veltheyme (1943). The growth of phonemic and lexical patterns in infant language. *Language* 19: 281-292.
Vihman, Marilyn May (1978). Consonant harmony: its scope and function in child language. In Joseph H. Greenberg (ed.) *Universals of Human Language, vol. 2: Phonology*. Stanford: Stanford University Press. 281-334.

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