CODA OBSTRUENTS AND LOCAL CONSTRAINT CONJUNCTION IN NORTH-CENTRAL PENINSULAR SPANISH[1]

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0. Introduction

In this study, the principle of local constraint conjunction is applied to account for the distribution of coda obstruents in a variety of colloquial Peninsular Spanish. The dialect in question is spoken primarily in north-central Spain. Martínez-Gil (1991), a study of rule parameters in Peninsular Spanish phonology, labels this dialect "Dialect B" and argues that it can be differentiated from "Dialect A," which corresponds to standard Castilian, by means of rule reordering. This dialect is also alluded to frequently in Hualde's (1989) study on Spanish consonant processes and feature geometries, as well as in Navarro Tomás's (1967) *Manual de pronunciación española*, which remains a definitive analysis of standard Castilian phonetics. These and other studies generally concur that the dialect spoken in the north-central region is characterized by considerable inter- and intra-speaker variation.[2] It is therefore likely that this dialect is in a state of transition (cf. Labov 1994).[3]

A presentation and evaluation the relevant data from Dialect B is followed by a discussion of local conjunction. An Optimality Theoretic analysis is then proposed. It is shown that the principle of local conjunction can be applied to account for unexpected input-to-output mappings which would otherwise pose a problem for Optimality Theoretic analysis. Finally, the significance of local conjunction for phonological theory, in light of the present analysis, is discussed.

1. Coda obstruents in north-central Peninsular Spanish

In the colloquial dialect of north-central Peninsular Spanish, it is customary to spirantize and devoice voiced coda obstruents, thus /b, d, g/ → [ɸ, θ, x]. Examples of these operations are shown in figure (1).

(1) Underlyingly voiced coda obstruents (Martínez-Gil 1991: 547; cf. Hualde 1989: 33-35)[4]

abdicar	→[aɸ.ði.káɾ.]	'abdicate'
absoluto	→[aɸ.so.lú.to.]	'absolute'
admirar	→[aθ.mi.ɾár.]	'admire'
adjuntar	→[aθ.xuŋ̟.táɾ.]	'adjoin'

2002. *Current Issues in Linguistic Theory: Selected Papers from the 29th Linguistic Symposium on Romance Languages*, ed. by D. Cresti, T. Satterfield & C. Tortora (eds)., Amsterdam: John Benjamins.

digno	→[díx.no.]	'worthy'
zigzag	→[θix.θáx.]	'zigzag'

In this dialect, the unvoiced coda obstruents - /p, t, k/ - are realized as fricatives [ɸ, θ, x] *only* if they precede a voiced consonant; otherwise, they emerge as stops [p, t, k]. This alternation is shown in figure (2).

(2) Underlyingly unvoiced coda obstruents (cf. Martínez-Gil 1991)

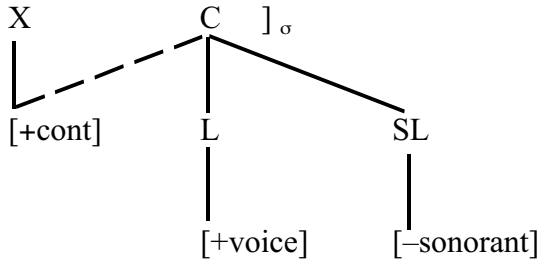
before C[-voice]	*apto*	→[áp.to.]	'apt'
	eclipse	→[e.klíp.se.]	'eclipse'
	et cétera	→[et.θé.te.ɾa.]	'et cetera'
	actuar	→[ak.twáɾ.]	'to act'
	frack chico	→[frák.čí.ko.]	'small tuxedo'
	coñac francés	→[ko.ɲák.fraɲ̟.θés.]	'French cognac'
before C[+voice]	*étnico*	→[éθ.ni.ko.]	'ethnic'
	ritmo	→[ríθ.mo.]	'rhythm'
	fútbol	→[fúθ.βol.]	'soccer'
	frack grande	→[fɾáx.ɤɾáɲ̟.de.]	'large tuxedo'
	coñac malo	→[ko.ɲáx.má.lo.]	'bad cognac'

Note that in a form like *actuar*, the underlying /k/ may not be spirantized because it precedes a voiceless segment. In *coñac malo*, however, spirantization is possible because /k/ does precede a voiced consonant.

Hualde (1989) and Martínez-Gil (1991) concur that the underlying voiced stops /b, d, g/ are realized as unvoiced fricatives as a result of two separate rules: Spirantization and Devoicing. These rules are stated autosegmentally in figures (3) and (4).

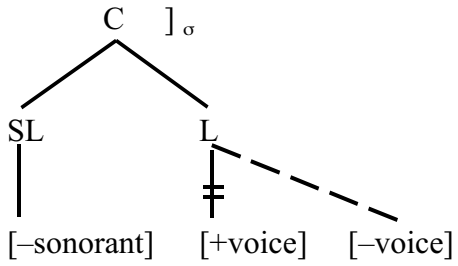
(3) Spirantization (cf. Martínez-Gil 1991: 544; Harris 1984: 151)

Operation:	Spreading
Direction:	Left to right
Argument:	[+continuant]
Target:	C[–sonorant, +voice], coda



(4) Devoicing (cf. Hualde 1989: 36)[5]

Operation: Insertion (with Delinking)
Argument: [–voice]
Target: C [–sonorant, +voice], coda



As shown, Spirantization involves the rightward spreading of the feature [+continuant] to a voiced obstruent in syllable coda. In the exact same context, Devoicing requires the suppression of [+voice] and the insertion of [–voice].

Looking at the rules of Spirantization and Devoicing, it is evident that these two rules must must be ordered such that Spirantization feeds Devoicing. Three sample derivations of the voiced coda obstruents in colloquial style are given in figure (5). Note that the reverse ordering – Devoicing *before* Spirantization – would introduce a rule relationship in which Devoicing deprived Spirantization of all inputs.

(5) Spirantization and Devoicing

	/absoluto/	/adxuntaɾ/	/digno/
Spir (3)	β	ð	ɤ
Devoi (4)	ɸ	θ	x
(other rules)	[aɸ.so.lú.to.]	[aθ.xun̪.táɾ.]	[díx.no.]

In this dialect, the unvoiced stop series /p, t, k/ is generally realized faithfully as [p, t, k]. In a serial analysis, such realization is determined by the ordering of Spirantization before Devoicing. In the case of these obstruents, Spirantization fails because it ignores obstruents which are [–voice], and Devoicing fails for the same reason. A sample derivation for the unvoiced coda obstruents is shown in figure (6).

(6) Spirantization and Devoicing

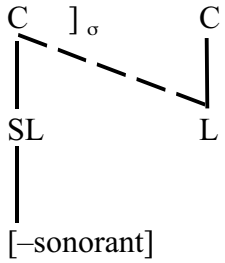
	/apto/	/etθetera/	/aktuaɾ/
Spir (3)	--	--	--
Devoi (4)	--	--	--
(other rules)	[áp.to.]	[et.θé.te.ɾa.]	[ak.twáɾ.]

It is not so, however, that the voiceless stops *never* surface as fricatives, i.e. as [ɸ, θ, x]. In his analysis of Dialect B, Martínez-Gil points out that these underlying segments emerge as fricatives whenever they precede a voiced consonant; e.g. *étnico* →

[é**θ̲**.ni.ko.], *frack grande* → [fra**x̲**.ɤrán̪.de.]. The reason, he shows, is a rule of Voicing Assimilation, crucially ordered before both Spirantization and Devoicing. Voicing Assimilation is defined in figure (7). Note that this operation involves the leftward spreading of the Laryngeal node and its associated [voice] feature – positive or negative – from an onset consonant to an immediately preceding coda obstruent. Note also that Assimilation does not involve concomitant delinking. The result is a partially assimilated coda obstruent, potentially bearing a [voice] feature contour.

(7) Voicing Assimilation (cf. Hualde 1989: 33; Martínez-Gil 1991: 549)

Operation:	Spreading
Direction:	Right to left
Argument:	Laryngeal
Source:	C
Target:	C [–sonorant], coda



Ordering Voicing Assimilation before Spirantization and Devoicing allows /p, t, k/ to voice before a voiced consonant, and therefore be able subsequently to undergo Spirantization as well as Devoicing. To illustrate this effect, sample derivations of the words *adjunto*, *etcétera*, and *étnico* are provided in (8).

(8) Voicing Assimilation, Spirantization, and Devoicing

	/adxuntaɾ/	/etθeteɾa/	/etniko/
Assim (7)	d^t	--	t^d
Spir (3)	$ð^θ$	--	$θ^ð$
Devoi (4)	θ	--	θ
	[aθ.xun̪.táɾ]	[et.θé.te.ɾa]	[éθ.ni.ko.]

The superscripted segments in (8) indicate a voicing contour resulting from Voicing Assimilation, either from [+voice] to [–voice] or vice-versa. In Spanish dialects without a Devoicing rule, these voicing contours are retained on the surface (see Harris 1969: 29, 40; Hooper 1972: 530; Navarro Tomás 1967: 86; Zamora Munné & Guitart 1982: 66; and others for the phonetic details). Most of these studies concur that Voicing Assimilation is seldom total in nature in any dialect, even in casual speech styles.

In the Peninsular dialect examined here, the effects of Voicing Assimilation are obscured by the subsequent Devoicing rule, which imposes the feature [–voice] on the

entire coda segment. As a result, there are no partially devoiced segments, at least not from a phonological standpoint.

Even though the effect of Voicing Assimilation is obscured by the subsequent application of Devoicing, its structural description as a spreading rule *without* concomitant delinking is crucial. If Voicing Assimilation were total in nature (that is, if it were accompanied by concomitant delinking), then the voiced obstruents /b, d, g/ could never be realized as fricatives before a voiceless segment. In this case, Assimilation would produce intermediate forms which do not satisfy the structural description of Spirantization. For example, *total* Assimilation would represent /adxuntaɾ/ as [a**t**.xun̪.táɾ.] – with a voiceless stop - and therefore disable the form from undergoing Spirantization. Because Assimilation is *partial*, the underlying [+voice] feature remains on the obstruent, and enables it to satisfy the structural description of Spirantization.[6]

The surface distribution of the features [+voice] / [–voice] and [+continuant] / [–continuant] presents an interesting problem for an OT analysis. Martínez-Gil's rule-based solution relies on the notions of rule ordering/feeding. Consequently, the distribution of allophones seems to rely crucially on the existence of both 1) ordered rules; and 2) intermediate representations on which the rules may operate. In OT, however, phonological substitutions or changes are expressed as constraints on output structure. There is no serial constraint application, nor are there intermediate stages to which constraints may make reference. For OT, the Spanish obstruent problem must be represented as direct mappings from inputs to outputs, as shown in (9).

(9) Input-to-Output Correspondence

input:	/adxuntaɾ/	/etθeteɾa/	/etniko/
	↕	↕	↕
output:	[aθ.xun̪.táɾ.]	[et.θé.te.ɾa.]	[éθ.ni.ko.]

Because each input obstruent maps directly to an output obstruent - without intervening derivational stages - the map from input /t/ to output [t] before a *voiceless* consonant in [et.θé.te.ɾa.], but from /t/ to [θ] in [éθ.ni.ko.] before a *voiced* consonant, is an odd one indeed.

2. Local conjunction

In order to account for complex phonological problems in Optimality Theory, some recent studies have developed a principle of *local constraint conjunction*. In essence, this principle enables two constraints to behave as one within the CONSTRAINT component of the grammar. The conjoined constraint is violated if and only if *both* its members are violated. We refer to Smolensky (1995) for a formal statement of this principle (see 10).

(10) Local conjunction (Smolensky 1995; cf. Kirchner 1996; Crowhurst & Hewitt 1997; Itô & Mester 1998)

The local conjunction of C_1 and C_2 in domain D, C_1 & C_2, is violated when there is some domain of type D in which both C_1 and C_2 are violated.

Previous studies on local conjunction have proposed different formal restrictions on the types and classes of constraints which may be conjoined. Three definitive studies are reviewed briefly below.

Crowhurst & Hewitt (1997) argues that conjoined constraints must have the same "primary argument," i.e. a common focus. For example, ***CODA** ("**Every syllable** ends in a vowel") and **σ-TO-FOOT** ("**Every syllable** is associated to some foot") may be conjoined in some language, as they both have "every syllable" as their primary argument (p. 12). Crowhurst & Hewitt concede that it is theoretically possible for locally conjoined constraints to have different foci, and they leave the motivation of such conjunction types open to further discussion.

Itô & Mester (1998) recommend a different set of restrictions on the types of constraints which may be locally conjoined. For example, they determine that markedness (henceforth MARK) constraints, such as ***CODA**, may be conjoined with other MARK constraints, and faithfulness (FAITH) constraints, such as **IDENT [voice]**, may be conjoined with other FAITH constraints. They conclude, however, that structural constraints may not be conjoined with faithfulness constraints on the grounds that certain conjunctions would command FAITH in marked positions (such as coda) and ban it in unmarked positions (such as onset), thereby opening up the possibility for a wide range of unattested and undesirable effects.

In counterpoint to Itô & Mester (1998), Lubowicz (1998) demonstrates that the local conjunction of FAITH and MARK constraints is necessary to explain certain derived-environment effects in Polish, Slovak, and Hebrew. Local conjunction of FAITH and MARK constraints works, she argues, by imposing special markedness restrictions on a candidate if and only if some FAITH constraint is violated. Viewed in this way, it is the FAITH member of a conjunct which "activates" the MARK member, by setting up a "domain of evaluation (or activation)" in which the special markedness consideration is to be observed. Her analysis uses exclusively FAITH/MARK conjuncts.

In this study, it is argued that conjuncts with different foci, as well as those which combine MARK/FAITH and MARK/MARK components, are necessary to account for coda obstruent alternations in the examined variety of north-central Peninsular Spanish, and that local conjunctions are to be expected in transitional speech varieties such as this one.

3. A constraint-based analysis

This analysis uses six constraints, whereof three are locally conjoined and three are unitary (i.e. non-locally-conjoined). The constraints are defined in figure (11).

(11) Constraint Summary (active constraints only)

a. *conjoined constraints*

LICENSE [voice] & *[–cont][7]
"No (coda) stops unassimilated for [voice]."

***CODA & *[+voice]**[8]
"No voiced codas."

IDENT [voice] & *[–cont][9]
"No stops unfaithful to [voice]."

b. *unitary constraints*

IDENT [voice]
"The value of the feature [voice] may not change."

IDENT [cont]
"The value of the feature [continuant] may not change."

***[–cont]**
"No stops."

Because Voicing Assimilation – specifically the *absence* thereof – appears to be a significant factor in determining the surface value of the feature [continuant] for the voiceless obstruent series, I propose the conjoined constraint **LICENSE [voice] & *[–cont]**, which blocks all coda stops unassimilated for [voice].[10] The action of this conjunct in candidate evaluation is illustrated in tableaux (12) and (13).

(12) /etniko/ → [éθ.ni.ko.]

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice]	IDENT [voice]	IDENT [cont]	*[–cont]
a. ét.ni.ko.	*!				*
☞ b. éθ.ni.ko.				*	
c. éd.ni.ko.		*!	*		*
d. éð.ni.ko.		*!	*	*	
e. ét^{d}.ni.ko.		*!			*
f. éθ^{ð}.ni.ko.		*!		*	

(13) /etθeteɾa/ → [et.θé.te.ɾa.]

candidates	LIC [voice] & *[–cont])	*CODA & *[+voice]	IDENT [voice]	IDENT [cont]	*[–cont]
☞ a.et.θé.te.ɾa.					*
b. e θ.θé.te.ɾa.				*!	
c. e d.θé.te.ɾa.	*!	*	*		*
d. é ð.θé.te.ɾa.		*!	*	*	

As shown in the above tableaux, the conjoined constraint **LICENSE [voice] & *[–cont]** must dominate the two FAITH constraints **IDENT [voice]** and **IDENT [cont]**, as changes to the value of either feature are permitted. The conjunct ***CODA & *[+voice]**, which bans voiced codas, must dominate **IDENT [voice]**. These two conjuncts are not crucially ranked with respect to each other; neither are **IDENT [voice]** and **IDENT [cont]**. The MARK constraint ***[–cont]** occupies the low end of the constraint display and is usually inactive on the candidate set.

As tableaux (12) and (13) show, the top-ranking of **LICENSE [voice] & *[–cont]** causes the underlying voiceless coronal obstruent /t/ to surface with the correct value for [continuant] in the correct phonological environment. Candidate (12a) violates this conjunct because it contains a stop which fails to voice-assimilate. Candidate (13a) contains a stop in the same position, but in this latter case, the stop is voice-assimilated; therefore the conjunct is satisfied.

Tableau (14) shows that this same ranking shown in (12) and (13) also selects the desired output for a voiced coda stop, such as the underlying voiced velar in /digno/, realized in this variety as a voiceless fricative, i.e. as [díx.no.].

(14) /digno/ → [díx.no.]

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice]	IDENT [voice]	IDENT [cont]
a. díg.no.		*!		
b. dík.no.	*!		*	
c. díɣ.no.		*!		*
☞ d. díx.no.			*	*
e. díx^{ɣ}.no.		*!		*
f. dík^{g}.no.		*!		

Before a *voiceless* consonant, however, this ranking causes the stop alternant to be incorrectly chosen, as shown in tableau (15), in which the desired (but suboptimal) candidate is marked with a ☹.

(15) /absoluto/ → [aɸ.so.lú.to.] ☹

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice]	IDENT [voice]	IDENT [cont]
a. ab.so.lú.to.	*!	*		
☞ b. ap.so.lú.to.			*	
c. aβ.so.lú.to.		*!		*
☹ d. aɸ.so.lú.to.			*	*!
e. ab^{p}.so.lú.to.		*!		
f. aβ^{ɸ}.so.lú.to.		*!		*

Optimal candidate (15b) violates only one of the two FAITH constraints: **IDENT [voice]**. The suboptimal (yet desired) candidate (15d) violates both **IDENT [voice]** and **IDENT [cont]**; violation of the latter is fatal.

To solve this problem, we first observe that the essential difference between the voiceless stop in candidate (13a) [eẗ. é.te.ra.] and the devoiced fricative in candidate (15d) [ä .so.lú.to.] is in fact the voicing heritage of each. In the former example, the stop realization accompanies voicing faithfulness. In the latter, the fricative realization accompanies a change in voicing. Stated in terms of constraints, an obstruent which violates **IDENT [voice]** may not simultaneously violate ***[–cont]**, the constraint against stops. To enforce the desired effect, I propose a local conjunction of these two constraints: **IDENT [voice] & *[–cont]**. Ranked above both unitary identity constraints, this conjoined constraint will reject any candidate containing a segment which, unfaithful to [voice], is also a stop.

The conjunct **IDENT [voice] & *[–cont]** is not arbitrarily motivated. As defined, it requires that any surface stop must be faithful to its underlying specification for [voice]. Stops are generally held to be the least sonorous – and therefore the least acoustically salient – class of segments (cf. Laver 1994: 504). One way to prevent stops from becoming even less retrievable would be to block surface stops which are unfaithful to underlying [voice]. An instrumental study undertaken by Lewis (1999) presents a compelling case that voicing (rather than closure duration or some other factor) is indeed the principal cue used by speakers to contrast stops in Spanish. It is therefore quite likely that speakers seek to preserve this cue as much as possible. The conjunct **IDENT [voice] & *[–cont]** expresses the drive to maintain voicing as the principal contrastive cue for stops.

Note that the conjunct **LICENSE [voice] & *[–cont]** contains the same arguments as **IDENT [voice] & *[–cont]** (the features [voice] and [cont]); however, it fulfills a different purpose: a coda stop violates **LICENSE [voice] & *[–cont]** if it fails to voice-assimilate to a following consonant. In the interest of articulatory economy, this conjunct

forces coda licensing of stops, possibly at the expense of voicing faithfulness. The result is a potential loss of the contrastive cue (voicing) in this position. Although these two conjuncts compete in the evaluation of surface stops, only a candidate which violates neither conjunct – and therefore presents the optimal balance of voicing economy and voicing faithfulness – is allowed to emerge.

In candidate evaluation therefore, the underlying voiced stop series is examined by the conjunct **IDENT [voice] & *[–cont]**. If devoiced, then these stops must also be realized as fricatives and thereby satisfy **IDENT [voice] & *[–cont]**. On the other hand, a member of the voiceless stop series which precedes a voiced consonant will invariably violate the top-ranked constraint **LICENSE [voice] & *[–cont]** and be rejected. As we have seen, only those voiceless stops which precede a voiceless consonant are permitted to surface as stops; otherwise, they must surface as fricatives (as shown in the data set in 3).

The final tableaux for the outputs [díx.no.], [aɸ.so.lú.to.], [et.θé.te.ɾa.] and [éθ.ni.ko.] illustrate these interactions, and are shown in (16-19). The constraint hierarchy is summarized graphically in (20).

(16) /digno/ → [díx.no.]

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice]	IDENT [voice] & *[–cont]	IDENT [voice]	IDENT [cont]
a. díg.no.		*!			
b. dík.no.	*!		*	*	
c. díɣ.no.		*!			*
☞ d. díx.no.				*	*
e. dík^{g}.no.		*!			
f. díx^{ɣ}.no.		*!			*

(17) /absoluto/ → [aɸ.so.lú.to.]

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice]	IDENT [voice] & *[–cont]	IDENT [voice]	IDENT [cont]
a. ab.so.lú.to.	*!	*			
b. ap.so.lú.to.			*!	*	
c. aβ.so.lú.to.		*!			*
☞ d. a ɸ.so.lú.to.				*	*
e. ab^{p}.so.lú.to.		*!			
f. aβ^{ɸ}.so.lú.to.		*!			*

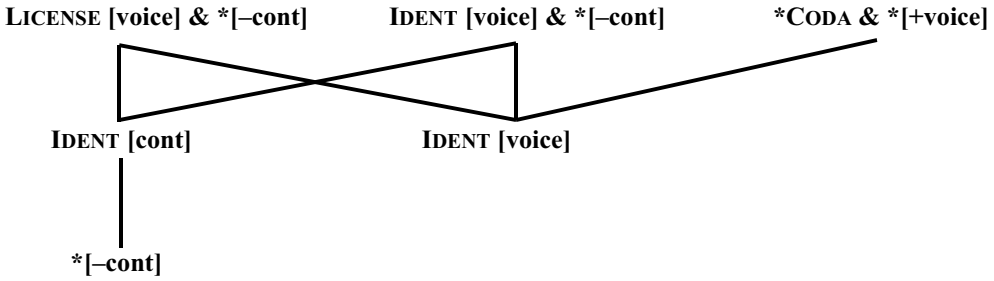
(18) /etθeteɾa/ → [et.θé.te.ɾa.]

candidates	LIC [voice] & *[–cont]	*CODA & [+voice]	IDENT [voice] & *[–cont]	IDENT [voice]	IDENT [cont]	*[–cont]
☞a. et.θé.te.ɾa.						**
b. ed.θé.te.ɾa.	*!	*	*	*		**
c. eθ.θé.te.ɾa.					*!	*
d. eð.θé.te.ɾa.		*!		*	*	*

(19) /etniko/ → [éθ.ni.ko.]

candidates	LIC [voice] & *[–cont]	*CODA & *[+voice])	IDENT [voice] & *[–cont]	IDENT [voice]	IDENT [cont]
a. ét.ni.ko.	*!				
b. éd.ni.ko.		*!	*	*	
☞ c. éθ.ni.ko.					*
d. éð.ni.ko.		*!		*	*
e. ét^{d}.ni.ko.		*!			
f. éθ^{ð}.ni.ko.		*!			*

(20) Constraint hierarchy (active constraints only)



4. Conclusion

Local constraint conjunction allows the interaction of Spirantization, Devoicing, and Voicing Assimilation in north-central Peninsular Spanish to be handled specifically. It also enables the coda devoicing and spirantization patterns observed in the data to be explained in terms of input-to-output correspondence.

Martínez-Gil (1991) argues that Devoicing in this dialect of Peninsular Spanish is undergoing "simplification" – i.e. the generalization of its structural description. If this is

so, then it is quite plausible in light of the present data that Spirantization may be next to undergo simplification. In its simplified restructuring, Spirantization would be broadened so that it could apply to underlying [–voice] obstruents as well as those which are [+voice]. The result would be a general ban on all [–continuant] outputs. Faced with this general ban, speakers would be able to simplify their grammar by collapsing the conjuncts **LICENSE [voice] & *[–cont]** and **IDENT [voice] & *[–cont]** into a single new one ***CODA & *[–cont]**, which would be ranked alongside the already existing ***CODA & *[+voice]**. Conjunct simplification is therefore analogous to rule simplification. The constraint hierarchy for this possible future grammar is shown (21).[11]

(21) Constraint hierarchy (possible future ranking showing conjunct simplification)

Levelt & Van der Vijver (1998) sheds light on the motivation for local conjunction from a language learner's perspective. In that study, evidence is presented that reference to local conjunction by speakers represents an intermediate stage in grammar acquisition. In their analysis, language learners posit constraint conjuncts in order to bridge developmental "gaps" between universally attested grammars. I propose that this argument may be extended to account for the Peninsular Spanish data considered here. If it is maintained that the Peninsular Spanish variety is undergoing gradual processes of coda obstruent Spirantization and Devoicing, then the data illustrate a waypoint grammar, not a steady-state grammar. At this particular waypoint, these processes are incomplete, and therefore only a subset of coda obstruents – specifically the [+voice] class – is so far uniformly spirantized and devoiced. If this variety of north-central Peninsular Spanish is indeed transitional, then local conjunction may be regarded as an *ad-hoc* device employed by speakers to account for as yet ungeneralized patterns of input-to-output correspondence.

NOTES

1 I am grateful to the audience at the 29th Linguistic Symposium on Romance Languages (April 1999) for comments and discussion on an earlier version of this paper. I also wish to thank Fernando Martínez-Gil, Carlos-Eduardo Piñeros, Caroline Wiltshire, Timothy Face, and Travis Bradley for their comments on earlier versions of this paper. All errors remain my own.

2 Antón (1998) is a quantitative study of coda obstruent variation patterns in northern Peninsular Spanish. In addition to finding considerable speaker vacillation between stop and fricative realizations of coda obstruents, she shows that realizations as glides [j, w], unvoiced bilabials [ɸ], and unvoiced interdentals [θ] are also attested.

[3] Martínez-Gil (1991: 552) describes Dialect B as an "innovative variety" of Dialect A, and proposes that Dialect B is undergoing a regular sound change as a result of simplification to the structural description of the Devoicing rule.

[4] Martínez-Gil (1991: 545) observes that coda /b, d, g/ are almost invariably realized as surface fricatives, either voiced or voiceless, in all Peninsular Spanish dialects. Their realization as voiceless [ɸ, θ, x] is limited, he claims, more to northern and central Spain. Throughout this paper, I refer exclusively to the dialect of this particular region. Other studies, such as Navarro Tomás (1967), refer to the dialect spoken in Valladolid and Salamanca provinces (northwestern Spain) and find the voiced fricative [β, ð, ɤ] to be more common.

[5] In this study, I assume that all obstruents are fully specified underlyingly for both [voice] and [continuant], without major consequence to the analysis.

[6] Alarcos Llorach (1968) and Hualde (1989) indicate that the realization of voiced coda obstruents /b, d, g/ as unvoiced stops [p, t, k] (rather than as fricatives) is possible in Peninsular Spanish, yet is associated with a more emphatic, careful style, not with the colloquial style being considered here. See Martínez-Gil (1991) for a detailed discussion of how such stylistic effects may be achieved by rule reordering and rule omission.

[7] The **LICENSE** constraint uses nomenclature developed by Itô & Mester (1993), Lombardi (1994), Padgett (1996) and others. In this paper, I use **LICENSE [voice]** analogously to Padgett's **LICENSE (place)**, which requires that a coda segment be structurally linked to the place node of the following syllable onset (cf. Padgett 1996: 15; see also Zoll 1998). Alternative approaches to voicing feature spreading are found in Lombardi (1995) and Pulleyblank (1997).

[8] Devoicing has been handled a number of ways in constraint-based analyses. For example, in her analyses of Devoicing in a number of languages, Lombardi (1995) uses the MARK constraint ***LAR(YNGEAL)** and the FAITH constraint **ID(ENT)ONS(ET)LAR(YNGEAL)**. The ranking **IDONSLAR** » ***LAR** enforces voicing faithfulness in syllable onset (but allows coda Devoicing). In an analysis of German, Hahn (1998) uses the constraint **NOCODA[voice]**. Grijzenhout & Krämer (1999), which focuses on Devoicing in Dutch, uses the constraint **DEVOICING**.

[9] Compare Lubowicz's (1998) conjunct ***VOICED/STOP & IDENT [voice]**. Whereas her conjunct blocks only voiced stops which are unfaithful to voicing, my conjunct **IDENT [voice] & *[–cont]** targets all stops - the entire class of [-continuant] segments.

[10] It should be noted that coda stops are not the only segments which voice-assimilate in Spanish; it is common for fricatives to assimilate as well; e.g. *afgano* → a[f^{v}]gano, *isla* → i[s^{z}]la (cf. Harris 1969: 29, 40; Hooper 1972: 530; Navarro Tomás 1967: 86; Zamora Munné & Guitart 1982: 66; and others). In a coda-devoicing dialect such as this one, coda fricatives are realized as [–voice]: a[f]gano, i[s]la. Because there are no underlying [+voice] fricatives in the examined dialect, it is unnecessary to assume that these surface realizations are the result of anything except faithfulness to underlying [–voice]. For this reason, fricative devoicing will not be of interest here.

[11] I am grateful to Travis Bradley (personal communication) for calling to my attention the analogous relationship between "rule simplification" and "conjunct simplification." My figure (21) is based on his observations about how such simplification might plausibly be manifested in a future grammar of the examined dialect.

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