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Spanish Rhotics and Dominican Hypercorrect /s/[1]

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1. Introduction

Spanish dialects may be broadly characterized as either conservative or radical with respect to the realization of syllable-final consonants (Guitart 1978, Zamora and Guitart 1982). In the radical Caribbean variety of Dominican Spanish, consonantal reduction in the syllable rhyme is so pervasive that /s/ is systematically absent from this position. Given the social stigma associated with rampant /s/-deletion, some speakers often attempt to emulate more conservative styles by reinserting /s/ in the syllable rhyme. The result is frequently hypercorrect in that the fricative either fails to match the position of etymological /s/, e.g., *dipusta* < *disputa* 'dispute', or altogether lacks a corresponding /s/ in the conservative lexical item, e.g., *asbogado* < *abogado* 'lawyer'.

One of the restrictions on hypercorrect /s/ is that it is never inserted before an intervocalic tap or trill: **casro* 'expensive', **casrreta* 'cart'. Núñez Cedeño (1988, 1989, 1994) argues that /s/-epenthesis is structure-preserving and that these restrictions lend support to the analysis of Spanish rhotics proposed by Harris (1983). In this analysis, the tap /ɾ/ is the only underlying rhotic phoneme, and the intervocalic surface trill [r] is derived by rule from an underlying geminate /ɾɾ/. Epenthesis is blocked from applying in the context of a geminate tap because the result would violate a principle of autosegmental well-formedness, whereby association lines may not be crossed. Furthermore, epenthesis is blocked before intervocalic taps because the [s] would trigger an independent rule of postconsonantal strengthening, thereby altering the underlying specification of /ɾ/. On the assumption that epenthesis cannot produce illicit structures or alter phonological features of adjacent segments, the patterning of Dominican hypercorrect /s/ offers a compelling argument in favor of the trill-as-geminate analysis.

The present study revisits the issue of rhotic representation in light of the Dominican facts. First, I show that the trill-as-geminate analysis requires three separate rules to derive syllable-initial surface trills, which belies the simple generalization that syllable-initial rhotics are trills except after a vowel, where trills and taps appear contrastively. Second, I review Padgett's (2003c) analysis of Catalan and Spanish rhotics, cast within a recent version of Dispersion Theory (Flemming 1995, 2002), and demonstrate how the account better captures the syllable-initial trill generalization without requiring the geminate representation. Third, I show that hypercorrective consonantal epenthesis can be accounted for in an Optimality-theoretic grammar by a high-ranking output-output correspondence constraint. By temporarily promoting this constraint, Dominican speakers attempt to reestablish in their own outputs a phonotactic generalization about the shape of conservative Spanish outputs, namely that [s] can appear before consonants and word-finally. Finally, the failure of epenthetic [s] to appear before intervocalic rhotics is explained as the effect of a phonotactic constraint banning [s] + rhotic clusters in the output. Since it does not depend on the geminate representation, the analysis of hypercorrect /s/ is fully compatible with the Dispersion-theoretic account, in which intervocalic surface trills need not be geminates underlyingly.

This paper is organized as follows. Section 2 presents the basic facts of Dominican hypercorrect /s/ and shows how they support an analysis of the Spanish intervocalic trill as underlying geminate tap. Section 3 further examines the trill-as-geminate approach in light of the syllable-initial trill generalization, and Section 4 shows how Dispersion Theory provides a simpler account without assuming geminates. Section 5 develops an analysis of hypercorrective /s/-epenthesis and explains its restriction before rhotics. Section 6 summarizes the analysis and concludes.

2. Dominican hypercorrective /s/-epenthesis and the Spanish rhotic contrast

The reduction of postnuclear consonants is so extreme in Dominican Spanish that /s/ has been lost in syllable-final position, though in syllable-initial position it is retained (Harris 2002, Núñez Cedeño 1988, 1989, 1994, Terrell 1986). Compare the examples in (1a) with those in (1b), where those of the second column represent conservative Spanish varieties that retain postnuclear /s/:

(1)		Dominican	Conservative	
	a.	*seco*	*seco*	'dry'
		caso	*caso*	'case'
		así	*así*	'thus'
	b.	*etúpido*	*estúpido*	'stupid'
		capa	*caspa*	'dandruff'
		do	*dos*	'two'

As Harris (2002: 97, Fn. 31) points out, the situation is different for other less radical dialects in which syllable-final /s/ is variably aspirated, surfacing as [h], and only sporadically deleted. As shown by the representative data in (1), no trace of postnuclear /s/ remains in the Dominican variety under discussion, which Harris accordingly labels "lost-*s*". Indeed, Terrell (1986: 133) argues that the loss of this segment from the syllable rhyme has lead to the absence of preconsonantal and word-final /s/ from the lexical representations of illiterate Dominicans.

Núñez Cedeño (1988, 1989, 1994) documents a hypercorrection phenomenon in the Dominican Republic whereby some 'lost-*s*' speakers variably insert /s/ in the syllable rhyme in an attempt to sound more educated. Commenting on the social motivation behind hypercorrective /s/-epenthesis, Harris (2002: 97) states the following:

> "Lost-*s* speakers realize that their dialect is stigmatized and the butt of jokes, so in certain social situations they attempt to speak 'high class,' a style called *hablar fisno* [< *hablar fino* 'to speak refined'—TGB]. But lost-*s* speakers aren't sure where the *s*'s are in standard dialects, so their 'corrections' are essentially random, missing the target as often as not. For example, standard *hipopótamo* 'hippopotamus' may come out *hispopótamo, hipospótamo, hipopóstamo, hipopótamos,* or even *hispospóstamos.*"

Hypercorrective /s/-epenthesis is further exemplified in (2), where words in the Dominican *fisno* style are compared to their conservative Spanish counterparts:

(2)	Dominican *fisno*	Conservative		
a.	*etúspido*	*estúpido*	'stupid'	(Núñez Cedeño 1988: 322)
	dipusta	*disputa*	'dispute'	
	dedes	*desde*	'since'	
b.	*invistado*	*invitado*	'guest'	
	yusca	*yuca*	'yucca'	
	comos	*como*	'like'	
	gols	*gol*	'goal'	
	revólvers	*revólver*	'revolver'	
	asbogado, abosgado, abogasdo, abogados	*abogado*	'lawyer'	(Núñez Cedeño 1994: 30)
	bosfe, bofes	*bofe*	'lung'	

In (2a), epenthetic [s] appears in a position that does not match that of the /s/ in the conservative form. In (2b), [s] has no etymological correspondent in the conservative form.

The apparently random nature of insertion might suggest that the occurrence of hypercorrect /s/ is triggered entirely by stylistic factors and does not exhibit phonological conditioning of any sort. However, Núñez Cedeño (1988, 1989, 1994) demonstrates that insertion in the syllable rhyme is not arbitrary, rather it obeys the phonological constraints of the language. For example, one restriction on insertion is evidenced by the lack of hypercorrect forms in which [s] appears immediately before an intervocalic tap or trill, as shown in (3a) and (3b), respectively (Núñez Cedeño 1988: 328, 1989: 162). (Note: Between vowels, Spanish orthographic <*r*> is pronounced as a single-contact tap [ɾ] and <*rr*> as a multiple-contact trill [r].)

(3)	Dominican *fisno*		Conservative	
a.	*asmara, amaras*	**amasra*	*amara*	'would love'
	caros	**casro*	*caro*	'expensive'
	toreros	**tosrero,* **toresro*	*torero*	'bullfighter'
	aspura, apuras	**apusra*	*apura*	'hurry up'

b.	*carresta, carretas*	**casrreta*	*carreta*	'cart'
	asmarro, amarros	**amasrro*	*amarro*	'I tie'
	borras	**bosrra*	*borra*	'erases'
	borresgo, borregos	**bosrrego*	*borrego*	'sheep'

Núñez Cedeño (1988) provides an account of hypercorrect /s/ in terms of the structure-preserving rule of epenthesis in (4), which is subject to the conditions in (5):

(4) $\emptyset \rightarrow s / \_\_]_{\sigma}$

(5) a. (4) cannot create structures that are not generated by phonological rules
b. (4) cannot alter the phonological features of immediately adjacent segments

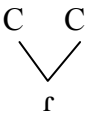
Given the above conditions on epenthesis, the failure of the rule to apply before intervocalic rhotics lends support to an analysis in which the tap /ɾ/ is the only underlying rhotic phoneme, and the intervocalic surface trill [r] is derived from a geminate /ɾɾ/ (Harris 1983, 2002, Núñez Cedeño 1988, 1989, 1994).

Consider the distribution of syllable-initial rhotics in general Spanish. The examples in (6) show phonetic forms along with their proposed underlying forms.

(6)	a.	*hon*[.r]*a*	/onɾa/	'honor'
		al[.r]*ededor*	/alɾededoɾ/	'around'
		sub[.r]*ayar*	/sub + ɾajaɾ/	'to underscore'
	b.	[.r]*osa*	/ɾosa/	'Rose'
		con [.r]*osa*	/kon ɾosa/	'with Rose'
		la [.r]*osa*	/la ɾosa/	'the rose'
	c.	*ca*[.r]*o*	/kaɾɾo/	'car'
	d.	*ca*[.ɾ]*o*	/kaɾo/	'expensive'

Syllabification rules associate the underlying taps in (6a,b,d) to a single timing slot, as shown in (7a). With respect to the underlying geminate in (6c), Núñez Cedeño (1988: 330, 1989: 164, 1994: 24) further argues that its proper representation requires a one-to-many association of a

single tap to two timing slots, as in (7b). In fact, the multiple association is required by the Obligatory Contour Principle (Leben 1973, 1980, Kenstowicz 1982, McCarthy 1986, Hayes 1986), which prohibits the identical sequence of melodic segments in (7c).[2]

(7) a.  b.  c. 

Several strengthening and deletion rules are required to derive the surface trills from the structures in (7a,b). First, Harris (1983: 63, cf. 2002: 84) proposes the rule of postconsonantal strengthening in (8) to generate trills syllable-initially after a consonant, as in (6a):

(8) ɾ → r / [+cons] __
|
Rhyme

To ensure word-initial trills in (6b), Harris (1983: 64, cf. 2002: 84) posits an additional rule:

(9) ɾ → r / X^o[__
where X^o varies over all word-level syntactic category labels

Furthermore, in order to derive the intervocalic surface trill from the geminate structure in (7b), a tap deletion rule must be ordered to apply after postconsonantal strengthening (Harris 1983: 63, cf. 2002: 84):

(10) ɾ → Ø / __ r

Motivation for the rule in (10) comes from the fact that clusters of tap + trill do not yield distinctively longer vibrations. This is evidenced by pairs such as *salí rápido* 'I left rapidly' versus *salir rápido* 'to leave rapidly', which are both realized as *sal*[i.r]*ápido* and never as **sal*[iɾ.r]*ápido*

(Harris 1983: 63). Therefore, (10) constitutes a postlexical rule that operates on tap + trill clusters both across and within word boundaries.[3]

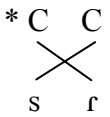
Sample derivations of *honra* 'honor', *rosa* 'rose', *carro* 'car' and *caro* 'expensive' are given in (11) to illustrate how the strengthening and deletion rules derive the correct surface representations:

(11)

	a.	b.	c.	d.
UR:	/onɾa/	/ɾosa/	/kaɾɾo/	/kaɾo/
Syllabification	on.ɾa	ɾo.sa	kaɾ.ɾo	ka.ɾo
Postcons. Str. (8)	.r		.r	—
Word-init. Str. (9)		r	—	—
Tap Deletion (10)	—	—	Ø.	—
SR:	[on.ra]	[ro.sa]	[ka.ro]	[ka.ro]

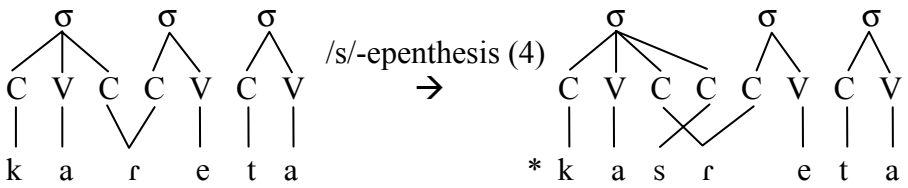
How does this analysis find support in the failure of hypercorrect [s] to appear before intervocalic rhotics? Given the standard assumption of autosegmental theory that the crossing of association lines is prohibited (Goldsmith 1976, 1979), configurations like those in (12) are universally ill-formed, and rules are blocked when such configurations would be derived:

(12)



The application of the epenthesis rule in the first syllable of a word like *carreta* 'cart' would generate such an ill-formed structure, in violation of condition (5a). As illustrated in (13), epenthetic coda /s/ illegally splits the heterosyllabic geminate tap (Núñez Cedeño 1989: 165, 1994: 31; cf. also Harris 2002: 97):

(13)



Although the insertion of /s/ before the first C-slot of the geminate tap would effectively circumvent the line-crossing violation, rule (4) cannot generate such a structure because it requires that /s/ be syllable-final.[4] Without a representation in which /ɾ/ is associated to two C-slots, epenthesis "should apply freely to *carreta* 'cart'; therefore, *carres.ta, carre.tas,* and *cas.rreta* should all be possible with an analysis positing a unitary underlying /r/" (Núñez Cedeño 1994: 30). Condition (5b) accounts for the failure of epenthesis to apply before intervocalic taps. Núñez Cedeño (1988: 329) argues that epenthesis in the first syllable of *caro* 'expensive' would trigger the independent rule in (8), which strengthens syllable-initial postconsonantal taps. Since [s] would change the features of the following tap, epenthesis is blocked in this context.

3. The syllable-initial trill generalization

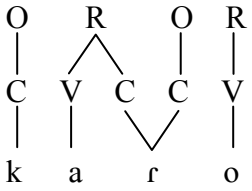
One criticism often leveled at the trill-as-geminate approach is that the number of rules needed to account for syllable-initial surface trills belies the simple generalization that *syllable-initial rhotics are trills except after a vowel, where trills contrast with taps.* As illustrated in (11a,b), two separate strengthening rules generate syllable-initial trills after a heterosyllabic consonant and word-initially. Closer scrutiny of the derivation of intervocalic surface trills reveals the necessity of yet another strengthening rule. As shown in derivation (11c), postconsonantal strengthening converts the second tap to a trill, and the deletion rule subsequently removes the first. A problem arises, however, when one attempts to reconcile the application of these two rules with the dually-linked geminate representation shown in (7b). In the theory of Schein and Steriade (1986:

693), a distinction is made between *structure-dependent* rules, which refer to both syllable and segmental structure, and *segmental* rules, which refer only to the latter. The crucial distinction here is that segmental rules may affect dually-linked geminates, whereas structure-dependent rules may not. The restricted applicability of structure-dependent rules is argued to follow from the Uniform Applicability Condition in (14):[5]

(14) Uniform Applicability Condition (UAC; Schein and Steriade 1986: 693)
Given a node *n,* a set S consisting of all nodes linked to *n* on some tier T, and a rule R that alters the content of *n,* a condition in the structural description of R on any member of S is a condition on every member of S.

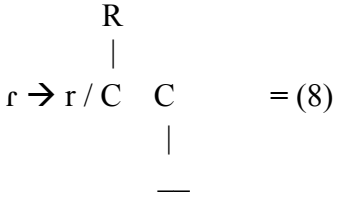
Now, consider the representation of the intervocalic trill in *carro* 'car', where /ɾ/ is dually associated to two heterosyllabic C-slots (Note: O and R denote syllable onset and rhyme positions, respectively.):

(15)



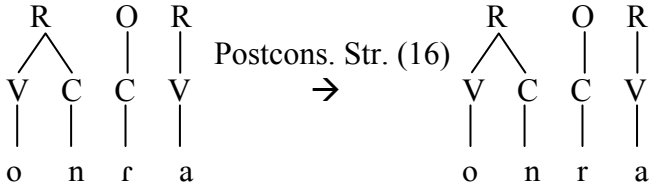
When applied to the geminate representation in (15), the UAC reads as follows: *n* is the segment /ɾ/, and S is the set of C-slots to which /ɾ/ is associated on the CV tier. The relevant rule in this case is postconsonantal strengthening. Below, I repeat the rule from (8) and adapt its structural description to facilitate comparison with the dually-linked geminate structure:

(16)

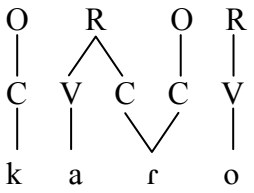


The condition specified in the structural description of (16) is that the C-slot slot to which /ɾ/ is associated must follow a consonant that is syllabified in rhyme position. According to the UAC, this condition must be true of every member of S, i.e., both C-slots that are associated to /ɾ/ in (15). However, it is true only of the second slot, since the first C-slot follows a vowel. As a result, (16) should be incapable of affecting the dually-linked geminate representation. On the other hand, the rule freely applies to any singleton /ɾ/ that is heterosyllabic with a preceding consonant, as in *honra* 'honor'. The derivations in (17) illustrate the limits imposed by the UAC on postconsonantal strengthening:

(17) a.



b.



Postcons. Str. (16) fails to apply

Presumably, a separate rule is required to convert the heterosyllabic geminate structure in (15) to a single phonetic trill that occupies the syllable onset:

(18)

→ [.r]

The conclusion emerging here is that in the trill-as-geminate account, three rules must be posited in order to derive syllable-initial surface trills: two rules for postconsonantal and word-

initial positions, respectively, and now the additional rule in (18) to handle underlying geminates. Harris (2002) himself points out the unattractiveness of having to appeal to both postconsonantal and word-initial strengthening processes. Acknowledging that "the disjunction reflects the difficulty of stating formally the generalization that [r] is obligatory in syllable-initial position *except after a vowel"* (84-5), he accepts the disjunction as a mere "idiosyncratic wrinkle" (105) in the grammar of Spanish. To my knowledge, no one has considered the implications of the UAC for the derivation of trills from underlying geminate taps.[6]

By Occam's razor, an account that captures the patterning of syllable-initial trills in (6) under a single, unified generalization would be preferable to one that requires an idiosyncratic reference to two disjunctive contexts, as well as an additional rule to handle the geminate structure. The problem is that if these three separate strengthening processes are conflated into a single rule mandating trills in syllable-initial position, then some additional mechanism is required to prohibit syllable-initial strengthening after vowels in order to allow taps to contrast with trills in intervocalic contexts. While this might be achieved through prespecification of taps in the input, a problem still remains with respect to the absence of hypercorrect /s/.[7] To see this, consider the rule in (19), which formally conflates postconsonantal and word-initial strengthening into a single process affecting syllable-initial taps:

(19) ɾ → r / σ[__

If the intervocalic tap is prespecified underlyingly as such, then the rule of syllable-initial strengthening cannot apply to it. The following derivations show that rule (19), in conjunction with prespecification, achieves the desired outcome in all syllable-initial positions. (Note: Prespecification of the intervocalic tap in *caro* (20d) is denoted by the [+f] diacritic.)

(20)		a.	b.	c.	d.
	UR:	/onɾa/	/ɾosa/	/kaɾo/	/kaɾ$^{+f}$o/
Syllabification		on.ɾa	ɾo.sa	ka.ɾo	ka.ɾo
Syll.-init. Str. (19)		.r	r	.r	—
	SR:	[on.ra]	[ro.sa]	[ka.ro]	[ka.ɾo]

The drawback of the analysis in (20) is that structure preservation conditions can no longer explain the blocking of /s/-epenthesis before intervocalic rhotics. Consider the derivations in (21):

(21)		a.	b.
	UR:	/kaɾo/	/kaɾ$^{+f}$o/
Syllabification		ka.ɾo	ka.ɾo
/s/-epenthesis (4)		s.	s.
Syll.-init. Str. (19)		.r	—
	SR:	*[kas.ro]	*[kas.ɾo]

In (21a), epenthesis fails to generate a line-crossing violation because the surface trill derives from an underlying singleton tap. In (21b), epenthesis does not alter the phonological features of the adjacent tap because the latter is prespecified underlyingly, which precludes strengthening.

The challenge is to show how the absence of hypercorrect /s/ before intervocalic rhotics can be explained in a way that does formal justice to the syllable-initial trill generalization, preferably without the need for diacritical marking of underlying intervocalic taps. In Section 4, I show how Dispersion Theory provides a simpler account of Spanish syllable-initial rhotics that does not require a geminate representation, multiple strengthening rules, or prespecification. In Section 5, I propose a constraint-based analysis of Dominican hypercorrective epenthesis that explains the lack of hypercorrect [s] + rhotic clusters in a way that does not depend on the geminate representation.

4. Dispersion Theory and syllable-initial rhotics in Spanish

Initially proposed by Flemming (1995), Dispersion Theory (DT) incorporates the functionalist principles of Adaptive Dispersion Theory (Lindblom 1986, 1990) into Optimality Theory (OT; Prince & Smolensky 1993) and has been developed subsequently in different directions by Ní Chiosáin and Padgett (2001), Padgett (2003a,b,c), and Sanders (2002, 2003). The first application of DT to Ibero-Romance rhotics is found in Bradley (2001), who situates Spanish within a broader typology of languages with tap-trill contrasts. Drawing upon this analysis, Padgett (2003c) develops a different account of Catalan, which is intended to cover Spanish as well. While Padgett provides a comprehensive analysis of the word- and phrase-level distributions of rhotics, the focus here is on syllable-initial contexts at the word-level.

In standard OT, single input-output mappings are evaluated to optimize single words as outputs. In DT, contrast is a systemic notion requiring evaluation not of isolated forms but of the larger system of contrasts in which those forms exist. An important type of constraint is systemic markedness, which seeks to maximize the perceptual distinctiveness of contrast. Padgett (2003c) proposes a SPACE constraint requiring a tap-trill contrast to be at least as perceptually distinct as it is between two vowels. Following Padgett, I adopt the constraint in (22), which is violated by each pair of output words that attempts a rhotic duration contrast in non-intervocalic position. (See Padgett 2003c on the perceptual superiority of intervocalic position for duration-based contrasts, as well as Bradley 2001 for typological support from languages with contrastive tap and trill.)

(22) $\text{SPACE}_{\text{DUR}}$ Potential minimal pairs differing in rhotic duration differ at least as much as rhotics do between vowels.

In DT, perceptual distinctiveness constraints work in conjunction with non-systemic faithfulness and markedness constraints. Those shown in (23) are necessary here: [8]

(23) a. $\text{IDENT}_{\text{DUR}}$ Corresponding input and output rhotics are identical in duration.
b. σ[r A rhotic in syllable-initial position is [r].
c. *r
d. *ɾ

$\text{IDENT}_{\text{DUR}}$ favors identity between input and output rhotics with respect to duration. (23b) requires trills in syllable-initial position. Following Smith (2002), Padgett (2003c: 7) motivates this constraint as a type of positional augmentation, whereby a perceptually enhancing element is required to appear in a phonologically strong position, in this case the syllable onset. The markedness constraints in (23c,d) encode the articulatory cost of the two rhotics. The trill has a longer duration and requires precise articulatory control to sustain passive vibration of the tongue tip. On the other hand, the tap requires a ballistic movement of the tongue tip, and such quickness presumably entails a certain degree of articulatory effort. See Bradley (2001) for a more detailed discussion of the articulatory properties of taps and trills.[9]

4.1 Analysis of syllable-initial rhotics

As shown in tableau (24), the ranking of $\text{IDENT}_{\text{DUR}}$ above markedness constraints guarantees a contrast between intervocalic [r] and [ɾ]. The input here contains an idealized minimal pair, VrV and VɾV, in which each rhotic appears as a single segment between vowels. Subscripts are used to illustrate whether the input contrast is maintained or neutralized in the output. Faithfulness rules out candidates (24b,c) because they each involve one unfaithful input-output mapping, and the contrastive candidate (24a) emerges as optimal.

(24)

		VrV_1 $V\text{ɾ}V_2$	$\text{IDENT}_{\text{DUR}}$	σ[r	*r	*ɾ
☞	a.	VrV_1 $V\text{ɾ}V_2$		*	*	*
	b.	$VrV_{1,2}$	*!		*	
	c.	$V\text{ɾ}V_{1,2}$	*!	*		*

The winning candidate expresses the generalization that in Spanish, words can be contrastive based on a difference between [VrV] and [VɾV], where the exact nature of V is irrelevant. Since the forms under evaluation are hypothetical and highly idealized, accidental gaps in the actual Spanish lexicon are, of course, possible. For example, *pero* 'but' and *perro* 'dog' form a minimal pair, but *acera* 'sidewalk' cannot because the form **acerra* is not an actual word. As in any generative framework, the goal of DT is to derive all and only the possible words of a given language. The advantage of assuming idealized word shapes as in (24) is that it focuses the analysis on only those aspects that are relevant, which is something phonologists already do. See Padgett (2003a,b,c) for more on the role of candidate idealization.

The lack of contrastiveness of syllable-initial rhotics in non-intervocalic contexts provides evidence that faithfulness is dominated by perceptual distinctiveness. In tableau (25), the input contains a rhotic contrast in word-initial position. Since $\text{SPACE}_{\text{DUR}}$ requires the contrast between rhotics to be at least as perceptually distinctive as when the rhotics are between vowels, candidate (25a) is ruled out. The remaining candidates both involve an unfaithful input-output mapping and tie on faithfulness. The decision is passed to the lower-ranked constraint requiring syllable-initial trills, which favors (25b). I leave it to the reader to verify that the analysis is the same for obligatory trills in syllable-initial postconsonantal position.

(25)

	rV$_1$ ɾV$_2$	SPACE$_{DUR}$	IDENT$_{DUR}$	σ[r	*r	*ɾ
a.	rV$_1$ ɾV$_2$	*!		*	*	*
☞ b.	rV$_{1,2}$		*		*	
c.	ɾV$_{1,2}$		*	*!		*

In Section 3, the trill-as-geminate analysis was shown to require three separate rules to yield syllable-initial trills from underlying /ɾ/ and /ɾɾ/. The conflation of these into a single rule such as (19) requires an additional stipulation on the input to ensure that intervocalic taps do not succumb to syllable-initial strengthening. The DT analysis successfully unifies the statement of syllable-initial strengthening under the single constraint σ[r in (23b). No representational stipulations on input taps are necessary, however, because contrastiveness is governed directly by perceptual distinctiveness constraints in the grammar. In (25), SPACE$_{DUR}$ dictates that rhotic contrast is not perceptually distinctive enough in non-intervocalic position, and the trill emerges as the unmarked realization of syllable-initial rhotics, thanks to lower-ranked σ[r. In this way, constraint interaction effectively captures the generalization that syllable-initial rhotics are trills except intervocalically, where they may also be taps.

4.2 Excursus on preaspirated taps in Dominican Spanish

Additional evidence from Dominican Spanish supports the geminate representation of intervocalic surface trills and must be taken into consideration. Rhotics are reported to be voiceless in the speech of many Dominicans (Jiménez Sabater 1975: 86-87, Núñez Cedeño 1987). For these speakers, the intervocalic trill is often pronounced with two phases of articulation (Quilis 1993). It begins with an aspirate moment followed by a voiceless alveolar tap, transcribed here as [hɾ̥]. The following data are from Núñez Cedeño (1994: 31). Preaspirated taps alternate freely

with voiceless trills in word-medial intervocalic position, as shown in (26a). However, voiceless trills occur to the exclusion of preaspirated taps in word-initial and syllable-initial postconsonantal positions, as in (26b). Finally, underlying taps are devoiced but never preaspirated in (26c).

(26)	a.	*piza*[r̥]*a*	~	*piza*[hɾ̥]*a*	‘blackboard’
		entie[r̥]*o*	~	*entie*[hɾ̥]*o*	‘burial’
		bu[r̥]*o*	~	*bu*[hɾ̥]*o*	‘donkey’
		ba[r̥]*iga*	~	*ba*[hɾ̥]*iga*	‘belly’
		ba[r̥]*io*	~	*ba*[hɾ̥]*io*	‘neighborhood’
	b.	[r̥]*íe*			‘s/he laughs’
		[r̥]*ubio*			‘blond’
		mal[r̥]*otar*			‘to waste’
		en[r̥]*iscar*			‘to raise’
	c.	*pisa*[ɾ̥]*a*			‘he would step’
		ente[ɾ̥]*o*			‘whole’
		bu[ɾ̥]*ó*			‘bureau’
		va[ɾ̥]*io*			‘several’

Coda /ɾ/ in Dominican Spanish is generally pronounced as aspiration before sonorant consonants (e.g., *ca*[h]*ne* < *carne* ‘meat’, *pe*[h]*la* < *perla* ‘pearl’, *a*[h]*ma* < *arma* ‘weapon’). If the rhotics in (26a) are underlying geminate taps, then the preaspirated articulation can be seen as an effect of the general aspiration rule affecting taps in coda position.[10] Coda aspiration cannot apply in (26b,c) because the rhotics are all syllable-initial.

While the preaspiration data provide support for the view that geminates underlie the surface rhotics in (26a), the data are equally compatible with the alternative view that contrastive rhotics are singleton segments phonologically. According to Zlotchew (1974), the aspirate percept arises in intervocalic voiceless trill because the glottal devoicing gesture comes to precede the lingual gesture responsible for trilling, which is itself temporally reduced:

> "The amount of time expended in producing the glottal fricative … followed by the [tap] is roughly equivalent to the time element involved in the realization of the multiple trill; however, the muscular effort has been reduced in that the tongue need be kept in position for the shorter duration of the simple vibrant [tap] only" (83).

In other words, devoicing of the trill combines with alternate oral-glottal gestural timing in such a way as to allow preservation of the rhotic duration contrast, despite temporal lenition of the lingual trill gesture. Since [r̥] and [hr̥] are roughly equivalent in duration, either sound forms a sufficient perceptual contrast with [ɾ̥].

An analysis of the distribution shown in (26) requires a positional markedness constraint, *VrV, which encodes the articulatory effort of intervocalic trills as compared to non-intervocalic ones (see Kirchner 1998, 2004 on consonant lenition as effort minimization in OT). I assume that the devoicing of rhotics is favored by other constraints not shown here, and furthermore that markedness constraints on rhotics apply equally to voiced and voiceless variants. The free variation between trills and preaspirated taps in (26a) is accounted for by the variable ranking of *VrV and $_{\sigma}$[r. When *VrV ranks high, as in tableau (27), the underlying intervocalic trill cannot surface. Since faithfulness requires maintenance of input specifications for rhotic duration, the unfaithful candidates (27c-e) are eliminated. Candidate (27b) wins because it satisfies the demands of positional markedness in a way that still allows the rhotic duration contrast to be maintained. On the other hand, a ranking of *VrV below $_{\sigma}$[r would favor (27a) with the more effortful intervocalic trill. In both cases, the intervocalic tap of the second input word VrV is realized faithfully in the output, which accounts for the failure of preaspiration to affect the underlying taps in (26c).

(27)

	VrV_1 $V\textfishhookrV_2$	$\text{SPACE}_{\text{DUR}}$	$\text{IDENT}_{\text{DUR}}$	*VrV	σ[r	*r	*ɾ
a.	$V\underset{\circ}{r}V_1$ $V\underset{\circ}{\textfishhookr}V_2$			*!	*	*	*
☞ b.	$Vh\underset{\circ}{\textfishhookr}V_1$ $V\underset{\circ}{\textfishhookr}V_2$				**		**
c.	$V\underset{\circ}{r}V_{1,2}$		*!	*		*	
d.	$Vh\underset{\circ}{\textfishhookr}V_{1,2}$		*!		*		*
e.	$V\underset{\circ}{\textfishhookr}V_{1,2}$		*!		*		*

Tableau (28) shows why preaspirated taps are found only between vowels. $\text{SPACE}_{\text{DUR}}$ rules out (28a,b) because rhotic duration contrast is less perceptually distinct word-initially than intervocalically (compare (27a,b)). Since *VrV is irrelevant for the word-initial context, σ[r favors the default realization of the syllable-initial rhotic as a trill in (28c). Since *VrV is irrelevant for syllable-initial postconsonantal contexts, the analysis accounts for the absence of preaspirated taps both word-initially and after a consonant, as shown in (26b).

(28)

	rV_1 $\textfishhookrV_2$	$\text{SPACE}_{\text{DUR}}$	$\text{IDENT}_{\text{DUR}}$	*VrV	σ[r	*r	*ɾ
a.	$\underset{\circ}{r}V_1$ $\underset{\circ}{\textfishhookr}V_2$	*!			*	*	*
b.	$h\underset{\circ}{\textfishhookr}V_1$ $\underset{\circ}{\textfishhookr}V_2$	*!			**		**
☞ c.	$\underset{\circ}{r}V_{1,2}$		*			*	
d.	$h\underset{\circ}{\textfishhookr}V_{1,2}$		*		*!		*
e.	$\underset{\circ}{\textfishhookr}V_{1,2}$		*		*!		*

Since this analysis relies on the constraint *VrV to get preaspirated taps intervocalically, preaspiration of trills is necessarily seen as distinct from the general aspiration of coda taps before sonorants, which presumably involves other positional markedness constraints. However, it is unclear from the available literature whether the preaspiration of intervocalic trills always cooccurs with aspiration of coda taps across different dialects. Furthermore, recent empirical work by Willis (2005) on the Cibao dialect of Dominican Spanish calls into question the distri-

bution in (26), as well as prior descriptions of preaspiration. Based on an acoustic analysis of recordings of ten middle-class speakers from Santiago, Willis observes that the most frequent realization of syllable-initial trills involves a very complex dual articulatory gesture characterized by initial voiced laryngeal frication combined with an alveolar-laminal tap. Preaspiration is found intervocalically within words (e.g., *el pe*[hɾ]*ito* 'the little dog') and word-initially (e.g., *la* [hɾ]*ana* 'the frog', *cerca de un* [hɾ]*ío* 'close to a river'), although at higher rates word-medially. The appearance of word-medial and word-initial [hɾ] suggests that Cibao Spanish generalizes preaspiration to all syllable-initial contexts. An analysis that attempts to unify word-medial intervocalic [hɾ] with the general aspiration of coda taps before sonorants cannot account for word-initial [hɾ], since no heterosyllabic geminate is posited for the word-initial context. However, the DT analysis can acommodate these facts with a slight modification of the $_{\sigma}$[r constraint so as to require the preaspirated rhotic in syllable-initial position. Such a move seems plausible insofar as laryngeal frication is another means of achieving percpetual salience in onset position (see the discussion surrounding (23b)).

5. Accounting for hypercorrective /s/-epenthesis and its restrictions

In Núñez Cedeño (1988), the mechanism of insertion is a variable rule of epenthesis that applies after syllabification to insert /s/ in the syllable rhyme, presumably as an attempt by the speaker to undo the effects of a previous historical process whereby postnuclear /s/ was lost. Historical deletion is formalized and exemplified in (29). Underlying /s/ is deleted from the syllable rhyme, as shown in (29b), while the rule is irrelevant for inputs with no etymological /s/, as in (29c).

(29) a. Deletion: s → Ø / __]$_\sigma$

b.	/disputa/	diputa	'dispute'
	/kaspa/	kapa	'dandruff'
	/dos/	do	'two'
c.	/abogado/	abogado	'lawyer'
	/kapa/	kapa	'cape'
	/gol/	gol	'goal'

Terrell (1986: 133) argues that deletion is so pervasive that preconsonantal and word-final /s/ are absent from the lexical representations of illiterate Dominicans. Therefore, let us assume that the outputs of deletion, such as the forms shown in (29b), are stored as such in the underlying form as the learner acquires her lexicon. That is, historically prior /disputa/, /kaspa/, and /dos/ are now underlying /diputa/, /kapa/ and /do/, respectively, in the mental lexicon of adult 'lost-*s*' speakers.

The hypercorrective epenthesis rule in (4) can be seen as an instance of *rule inversion* in the sense of Vennemann (1972, 1974). The rules of /s/-epenthesis and /s/-deletion are symmetrical in that the input and output are reversed while the structural description remains the same. Halle and Idsardi (1997: 346) describe the conditions under which such mirror-image rules develop:

> "Hypercorrection typically arises when a phonetic contrast is lost by a group of speakers in whose speech the contrast is maintained. Once the speakers of the innovative dialect become aware of the fact that they are pronouncing certain words differently from many of the individuals with whom they are in contact, it is not uncommon for the former to take corrective steps to eliminate the differentiating trait. The corrective rule, however, often fails to restore the status quo ante and produces instead hypercorrection."

In other words, hypercorrection results from the misapplication of the inverted rule. In (30a), /s/ may be inserted in the correct position but also in positions where it does not belong in the conservative word *disputa*. The forms in (30b) are hypercorrect because there is no etymological /s/ in *abogado.* The variable location of [s] in these examples shows that epenthesis applies variably in any syllable rhyme to produce outputs that are in non-contrastive free variation.

(30) a. /diputa/ disputa ~ dipusta ~ diputas
b. /abogado/ asbogado ~ abosgado ~ abogasdo ~ abogados

The conception of hypercorrective epenthesis in terms of rule inversion poses a challenge for constraint-based models such as OT in which no theoretical status is accorded to serial rule application. How is the appearance of hypercorrect /s/ to be explained in a model where the mapping of inputs to outputs is determined by constraint interaction? Given the hypothesis that preconsonantal and word-final /s/ is absent from the lexical representations of adult speakers, input-output faithfulness cannot be at issue here. Since the insertion of non-underlying material is typically determined by interacting markedness constraints in OT, the prediction is that the least marked segment will always be chosen depending on the language. To claim that /s/ is the least marked consonant in Spanish seems questionable, especially given the ubiquitous tendency toward /s/-weakening and total effacement across many dialects. Furthermore, Vaux (2001, 2002) shows that the predictions of markedness-driven consonantal epenthesis do not hold up cross-linguistically and argues instead for a derivational model of phonology, in which the choice of epenthetic consonant can be easily and arbitrarily specified in rewrite rules. Such an approach was taken early on in the OT literature by McCarthy (1993), who analyzed the intrusive *r* in the variety of English spoken in Eastern Massachusetts with a phonologically arbitrary epenthesis rule that functions independently of OT constraints (also see Halle and Idsardi 1997, who favor a purely derivational approach of intrusive *r*). A similar proposal is found in Blevins (1997), who argues that arbitrary, language-specific rules, such as *r*-epenthesis, should be co-indexed with constraints in order to invoke specific repair strategies.

5.1 An output-output correspondence account of hypercorrect /s/

Instead of attempting a hybrid analysis involving an insertion rule, I propose an account for Dominican hypercorrective epenthesis within a wholly constraint-based OT approach. In what follows, I argue that hypercorrective epenthesis stems from an output-output correspondence relation that the Dominican Spanish speaker establishes between her own outputs and those of conservative speakers who retain /s/ in the syllable rhyme.

As a first step in the analysis, let us establish the ranking of constraints that yields the conservative pattern. The faithfulness constraints in (31a,b) are from McCarthy and Prince (1995) and forbid deletion and epenthesis, respectively. The markedness constraint in (31c) disfavors [s] in surface rhymes (Kenstowicz 1996; see also Bakovic 1998, Colina 1997, and Wiltshire 2002). I assume that syllabification is determined by other constraints not shown here.

(31) a. MAXIO-C Every consonant in the input has a correspondent in the output.
b. DEPIO-C Every consonant in the output has a correspondent in the input.
c. *s]$_{\sigma}$ No syllable-final alveolar fricatives.

If markedness is subordinate to both faithfulness constraints, then input /s/ will be allowed to surface faithfully. This is shown in tableau (32), which illustrates input-output mappings involving the idealized words VsV, VV, VsC, and VC. High-ranking faithfulness constraints forbid both the deletion of /s/ in (32b,f) and the insertion of a non-underlying segment in (32d,h). (Note: In this and subsequent tableaux, I distinguish underlying from epenthetic [s] in the output by presenting the latter in italics.) Under this ranking, /s/ is contrastive with its absence in both onset and coda position. Compare these idealized output words to actual minimal pairs such as [asi] *así* ‘thus’ versus [ai] *ahí* ‘over there’ and [kaspa] *caspa* ‘dandruff’ versus [kapa] *capa* ‘cape’.

(32)

	DEPIO-C	MAXIO-C	*s]$_\sigma$
☞ a. /VsV/ → VsV			
b. /VsV/ → VV		*!	
☞ c. /VV/ → VV			
d. /VV/ → V*s*V	*!		
☞ e. /VsC/ → VsC			*
f. /VsC/ → VC		*!	
☞ g. /VC/ → VC			
h. /VC/ → V*s*C	*!		*

In contrast to the conservative Spanish grammar, MAXIO is ranked below the markedness constraint against syllable-final [s] in the Dominican 'lost-*s*' grammar. The subordination of this constraint does not change the input-output mappings for onset position, since *s]$_\sigma$ is irrelevant in this context. As shown in (33a,c), syllable-initial [s] remains contrastive with its absence. In coda position, however, markedness neutralizes the surface contrast by forcing input /VsC/ to map to [VC] in (33f). This output is indistinguishable from that of the fully faithful /VC/ → [VC] mapping in (33g). Therefore, [asi] *así* 'thus' versus [ai] *ahí* 'over there' constitutes an actual minimal pair in both the 'lost-*s*' and the conservative varieties (compare (32a,c)). While [kaspa] *caspa* 'dandruff' versus [kapa] *capa* 'cape' constitute an actual minimal pair in conservative Spanish, these forms are realized homophonously as [kapa] by 'lost-*s*' speakers.

(33)

	DEPIO-C	*s]$_\sigma$	MAXIO-C
☞ a. /VsV/ → VsV			
b. /VsV/ → VV			*!
☞ c. /VV/ → VV			
d. /VV/ → V*s*V	*!		
e. /VsC/ → VsC		*!	
☞ f. /VsC/ → VC			*
☞ g. /VC/ → VC			
h. /VC/ → V*s*C	*!	*	

If we take seriously Terrell's (1986) claim regarding the absence of underlying preconsonantal and word-final /s/ for illiterate speakers of Dominican Spanish, then what must now be shown is how such speakers arrive at these lexical representations in the constraint-based theoretical model adopted here. I assume that language learners of the 'lost-*s*' variety select the optimal winners in (33a,c,f,g) as optimal underlying forms in the process of acquiring lexical items. In fact, this is exactly what the OT model would predict, given the mechanism of Lexicon Optimization proposed by Prince and Smolensky (1993: 192):

(34) Lexicon Optimization
Suppose that several different inputs $I_1, I_2, \ldots, I_n$, when parsed by a grammar G lead to corresponding outputs $O_1, O_2, \ldots, O_n$, all of which are realized as the same phonetic form Φ—these inputs are all *phonetically equivalent* with respect to G. Now, one of these outputs must be the most harmonic, by virtue of incurring the least significant violation marks: suppose this optimal one is labeled O_k. Then the learner should choose, as the underlying form for Φ, the input I_k.

According to this definition, the optimal input for a given output is the form whose input-output mapping involves the least significant violations of constraints, that is, the form that most closely resembles the output. As seen in (33f,g), both /VsC/ and /VC/ converge on the same output [VC] under the Dominican ranking *s]$_\sigma$ » MAXIO-C. In this case, Lexicon Optimization favors the most transparent input-output mapping in (35b), and /VC/ is chosen as the optimal lexical form. For adult speakers who have acquired a lexicon based on positive linguistic evidence lacking postnuclear [s], etymologically distinct *caspa* 'dandruff' and *capa* 'cape' now have lexical representations that are phonologically identical, i.e., /kapa/ and /kapa/, respectively.

(35)

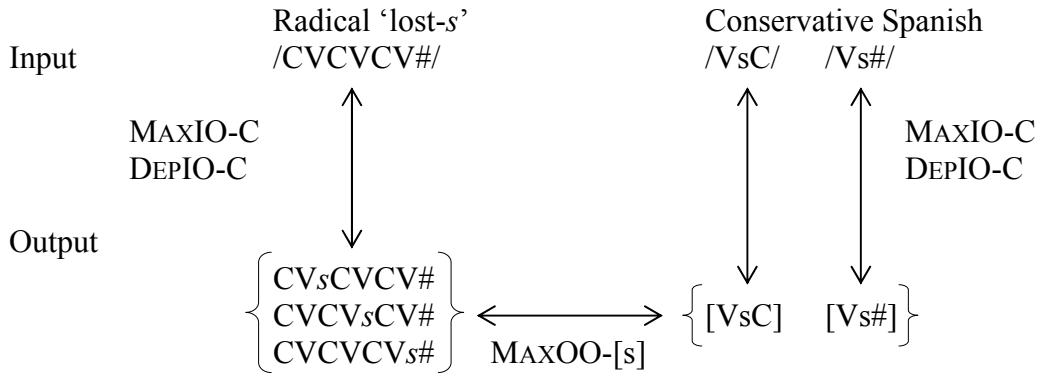
	DEPIO-C ▮ *s]$_\sigma$	MAXIO-C
a. /VsC/ → VC		*!
☞ b. /VC/ → VC		

Turning now to hypercorrective /s/-epenthesis, I propose an output-output correspondence (OO-C) model to explain the appearance of non-underlying [s] in Dominican *fisno* speech style. Correspondence constraints on output forms have been abundantly motivated in the OT literature (see Bakovic 1998, 2000, Benua 1995, 1997, Burzio 1997a,b, Flemming 1995, Kenstowicz 1996, 1997, McCarthy 2004, and Steriade 2000, among many others; for specific applications to Spanish, see Bakovic 1998, Colina 1997, 1999, and Face 2002). Typically, OO-C relations and constraints are posited in order to account for phonological similarities among morphologically related outputs, such as between a stem and its affixed form, between the citation form of a word and its phrasal realizations, and among surface allomorphs of a morpheme belonging to an inflectional paradigm. The proposal put forth here is to extend correspondence relations to include surface realizations of words across different speech styles. Specifically, I propose that *fisno* speech involves the anti-deletion constraint in (36), which is relativized to the segment [s]:

(36) MAXOO-[s] A preconsonantal or word-final [s] in the conservative style output has a correspondent in the radical style output.

According to this constraint, the postnuclear [s] that appears in surface forms of conservative Spanish speech must have a corresponding surface [s] in the *fisno* style of the radical 'lost-*s*' variety. Consider the basic model in (37), which depicts various correspondence relations among idealized input and output forms. Here, I assume that the input to the 'lost-*s*' grammar contains no postnuclear /s/, as predicted by Lexicon Optimization in (35b).

(37)



This model expresses the generalization that 'lost-*s*' speakers attempt to instantiate in *fisno* style outputs, namely that [s] can appear before consonants or at the end of a word. By incorporating idealized word shapes in the input-output mappings, the model also expresses the fact that 'lost-*s*' speakers have no knowledge of where /s/ belongs in actual lexical items. In both grammars, the constraints MAXIO-C and DEPIO-C regulate identity between input and output. In the 'lost-*s*' grammar, MAXOO-[s] evaluates the relation between the output and what the 'lost-*s*' speaker believes to be the conservative output, and it requires either preconsonantal or word-final [s] in the latter to have a correspondent in the former. Whenever MAXOO-[s] is satisfied by the appearance of non-underlying [s] in the output, DEPIO-C is necessarily violated because the epenthetic segment has no correspondent in the input.

According to Halle and Idsardi's (1997: 346) description, cited above in the discussion following (29), what happens in hypercorrection situations is that speakers of an innovative variety become conscious of the fact that their pronunciation differs from that of conservative speakers with respect to some phonetic trait. Subsequently, the innovators attempt to eliminate this difference by making their outputs conform to those of conservative speakers.[11] In the present case, Dominican 'lost-*s*' speakers come to realize that their outputs differ from conservative speakers' outputs of the form [VsC] and [Vs#]. On occasion, 'lost-*s*' speakers take corrective measures to

eliminate this discrepancy by ranking MAXOO-[s] above DEPIO-C, which requires surface [s] to appear at the expense of inserting a non-underlying segment.

The analysis of Dominican *fisno* speech is illustrated in tableau (38) with the input /abogado/ 'lawyer'. The fully-faithful mapping in (38a) violates MAXOO-[s] and is ruled out. Each of the remaining candidates exhibits epenthetic [s] in some syllable rhyme, thereby satisfying MAXOO-[s]. In each case, epenthesis entails a violation of both DEPIO-C and *s]$_\sigma$. Since (38b-e) are all tied on these two constraints, they are predicted to be co-optimal outputs in free variation.

(38)

	MAXOO-[s]	DEPIO-C	*s]$_\sigma$	MAXIO-C
a. /abogado/ → abogado	*!			
☞ b. /abogado/ → a*s*bogado		*	*	
☞ c. /abogado/ → abo*s*gado		*	*	
☞ d. /abogado/ → aboga*s*do		*	*	
☞ e. /abogado/ → abogado*s*		*	*	

One advantage of the OO-C model is that it adequately explains the choice of epenthetic segment in a constraint-based approach. Vaux (2001, 2002) points out that if consonantal epenthesis in OT is determined by markedness constraints alone, then the prediction would be insertion of the least marked consonant. In the analysis put forth here, hypercorrective epenthesis is driven by output-output correspondence, which requires postnuclear [s] at the expense of violating the markedness constraint against this segment. By hypothesis, the OO-C relation responsible for epenthesis is established by 'lost-*s*' speakers only when they come into contact with conservative speech and realize that their outputs differ with respect to the presence of postnuclear [s] in some words. 'Lost-*s*' speakers never insert, say, a glottal stop instead of [s] because glottal stops are never present in conservative outputs. No OO-C relation can be posited involving glot-

tal stops because the two language varieties do not differ in this respect. Rather, [s] is epenthesized precisely because this is the segment that was lost historically.

Another advantage of the OO-C model is that it accounts for the impossibility of multiple /s/-epenthesis within a word. Harris (2002: 97) seems to assume that hypercorrective insertion can apply iteratively, generating hypercorrect forms with more than one postnuclear [s], e.g., *hispospóstamos* < *hipopótamo* 'hippopotamus' (although this example is most likely theoretical). However, Rafael Núñez Cedeño (personal communication) points out that multiple occurrences of epenthetic [s] never occur in the Dominican 'lost-*s*' variety, and to my knowledge, such examples have never been empirically documented. In the present analysis, an output candidate with more than one postnuclear [s], e.g., [a*s*bogado*s*], would satisfy the demands of output-output correspondence, but this would entail extra violations of DEPIO-C. Such a candidate would be harmonically bounded by candidates (38b-e), all of which have only one [s] and, therefore, only one violation of DEPIO-C. The OT tenet of minimal constraint violation accounts for the fact that just one postnuclear [s] is necessary to satisfy output-output correspondence.

The requirement that DEPIO-C violations be minimal provides a natural account for another restriction on hypercorrect /s/ involving vowels in hiatus. The examples in (39), from Núñez Cedeño (1988: 24), show that epenthesis does not apply between two adjacent vowels:

(39)	*[tesatɾo]	[teatɾo]	*teatro*	'theater'
	*[gɾusa]	[gɾua]	*grúa*	'crane'
	*[kaso]	[kao]	*cao(s)*	'chaos'
	*[poseta]	[poeta]	*poeta*	'poet'
	*[asi]	[ai]	*ahí*	'over there'

In tableau (40), MAXOO-[s] rules out both the fully faithful candidate (a) and the candidate with intervocalic insertion (b) because neither contains an [s] before a consonant or word-finally. The

input-output faithfulness constraint DEPIO-C eliminates (40e) because it has more insertions than (40c,d), which emerge as co-optimal. In other words, MAXOO-[s] is satisfied by any output that has a preconsonantal or word-final [s] in the output, but again, the number of insertions must be kept to a minimum.

(40)

	MAXOO-[s]	DEPIO-C	*s]$_\sigma$	MAXIO-C
a. /poeta/ → poeta	*!			
b. /poeta/ → po*s*eta	*!	*		
☞ c. /poeta/ → poe*s*ta		*	*	
☞ d. /poeta/ → poeta*s*		*	*	
e. /poeta/ → po*s*eta*s*		**!	*	

Finally, it should be pointed out that not only Dominican 'lost-*s*' speakers produce hypercorrect forms. Middle class speech also shows evidence of the misapplication of /s/-epenthesis, and it is possible to hear utterances on radio or television broadcasts such as *Yo mismo no digo nadas de estas cosas* 'I myself don't say anything about these things' (Rafael Núñez Cedeño, personal communication). Here, the speaker has clear conscience of underlying fricatives and realizes them faithfully in pronunciation, yet non-etymological [s] appears at the end of the word *nada* 'nothing'. Hypercorrective insertion by middle class speakers can be accounted for by combining MAXOO-[s] with the constraint ranking for conservative Spanish, in which *s]$_\sigma$ ranks below input-output faithfulness, as shown in tableau (41). High-ranking MAXOO-[s] rules out the faithful mapping of input /nada/ since the output has no postnuclear [s] in (41a). Lower-ranked DEPIO-C rules out multiple epenthesis in (41d), and both [na*s*da] and [nada*s*] are predicted to be possible hypercorrect forms in (41b,c).

(41)

	MAXOO-[s]	DEPIO-C	MAXIO-C	*s]$_\sigma$
a. /nada/ → nada	*!			
☞ b. /nada/ → na*s*da		*		*
☞ c. /nada/ → nada*s*		*		*
d. /nada/ → na*s*da*s*		**!		**

As illustrated in (38) and (41), an OO-C approach can explain the appearance of hypercorrect [s] in the speech of both the 'lost-*s*' and middle class speakers. The approach also makes a novel prediction regarding hypercorrection by middle class speakers, namely that epenthesis of non-underlying [s] should not be possible for conservative words that already have /s/ in their lexical representation. For example, the representation of *disputa* 'dispute' in the conservative Spanish lexicon contains the etymological /s/, as seen in the input word in tableau (42). The faithful mapping in (42a) satisfies the demands of output-output correspondence without incurring any violations for epenthesis or deletion. In contrast, the lexical representation of the same word for a 'lost-*s*' speaker contains no trace of etymological /s/, and the locus of epenthesis is predicted to vary as shown in (30a).

(42)

	MAXOO-[s]	DEPIO-C	MAXIO-C	*s]$_\sigma$
☞ a. /disputa/ → disputa				*
b. /disputa/ → diputa	*!		*	
c. /disputa/ → dipu*s*ta		*!	*	*
d. /disputa/ → diputa*s*		*!	*	*
e. /disputa/ → dipu*s*ta*s*		*!*	*	**

5.2 Restrictions on hypercorrective /s/-epenthesis

Notice that even in conservative Spanish varieties that maintain /s/ in coda position, /s/ is still deleted before the trill, e.g., *lo(s) reyes* 'the kings' (Navarro Tomás 1980, Solé 2002). As for [s] + tap, this type of surface cluster is not found in any variety of Spanish. If clusters of [s] fol-

lowed by a rhotic consonant are phonotactically more marked than other [sC] clusters, then in a rule-based approach, we could explain the failure of hypercorrective /s/-insertion to apply before rhotics by saying that the rule does not violate the phonotactics of the language. That is, the rule is blocked if its application would create an illegal consonant cluster.[12]

In a constraint-based approach, output candidates that contain the illegal clusters can be ruled out by a phonotactic markedness constraint. Following Colantoni (2001), I assume the feature [vibrant] in (43), which defines a natural class that includes taps and trills. The constraint in (44) bans any sequence of a strident fricative followed by a [vibrant] consonant but is irrelevant to other C_1C_2 clusters in which either C_1 is not [strident] or C_2 is not [vibrant].

(43) [vibrant] sounds involve very short vertical movements of the tongue. The tongue blade is slightly cupped; the tongue body is retracted. (Colantoni 2001: 78)

(44) *[strident][vibrant]
No sequences of a strident fricative followed by a vibrant consonant.

A constraint against [strident][vibrant] sequences is phonetically grounded in articulatory and aerodynamic conditions that govern the production of lingual frication and trilling. Solé (2002) conducted an experiment investigating the articulatory and acoustic realizations of /sr/ versus /r/ sequences in Catalan. Results indicate that the loss of /s/ is complete and categorical in the great majority of cases at syllable and word boundaries. Solé argues that lingual fricatives and trills have more narrowly constrained articulatory and aerodynamic manner requirements in comparison to other consonants. If these requirements are not met, due to maximal overlap with adjacent consonants, then frication or tongue-tip vibration may not be produced. "As the time to attain the critical cross-sectional area of constriction and to build up the oral pressure for frication becomes shorter, due to anticipatory movements for the trill, the pressure drop required for frication is not achieved. This results in both aerodynamic and acoustic lack of turbulence" (Solé 2002: 381).

Furthermore, Solé suggests that the reduction of /s/ before trills can be understood phonetically in terms of greater gestural overlap or phonologically in terms of a categorical rule that brings about "higher level restructuring of consecutive motor commands for /s/ and /r/ in a single articulatory gesture" (381).

I propose that the phonotactic constraint in (44) is part of the phonological grammar and is grounded in the phonetic difficulty of co-producing lingual frication and vibration. Given the appropriate ranking of this constraint relative to input-output faithfulness constraints, conservative Spanish varieties can generally maintain preconsonantal [s] but still prohibit [s] + rhotic clusters. Assuming the constraint is also present in the grammar of Dominican 'lost-*s*' speakers, we can now explain why hypercorrective [s] is unattested before intervocalic rhotics in *fisno* speech. Tableau (45) gives the evaluations of the inputs for *carreta* 'cart' and *apura* 'hurry up' for situations in which the speaker promotes MAXOO-[s]. In both cases, output-output correspondence eliminates the fully faithful candidates (45a,e) because they have no preconsonantal or word-final [s]. However, the phonotactic constraint *[strident][vibrant] winnows down the set of remaining candidates by excluding those that contain illegal clusters, namely (45c,f).[13] The remaining candidates in each evaluation are all deemed co-optimal by the grammar. The set of permissible *fisno* outputs predicted in (45b,d,g,h) correspond exactly to the hypercorrect pronunciations that Núñez Cedeño (1988: 328) documents for *apura* and *carreta,* shown in (3a,b).

(45)

	*[strident][vibrant]	MAXOO-[s]	DEPIO-C	*s]$_\sigma$	MAXIO-C
a. /apura/ → apura		*!			
☞ b. /apura/ → aspura			*	*	
c. /apura/ → apusra	*!		*	*	
☞ d. /apura/ → apuras			*	*	
e. /kareta/ → kareta		*!			
f. /kareta/ → kasreta	*!		*	*	
☞ g. /kareta/ → karesta			*	*	
☞ h. /kareta/ → karetas			*	*	

In addition to vowels in hiatus and intervocalic rhotics, two other contexts have been argued to be exempt from hypercorrective /s/-epenthesis in Dominican Spanish. First, Núñez Cedeño (1988: 326-7) observes that epenthesis can yield forms such as the grammatical ones in (46a,b) but not the ungrammatical ones in (46b):

(46)	Dominican *fisno*		Conservative	
a.	*puedos, puesdo*		*puedo*	'I can'
	cuabas, cuasba		*cuaba*	'Jamaica rosewood'
	cielos, cieslo		*cielo*	'sky'
b.	*cuerdas*	**cuersda*	*cuerda*	'string'
	cuartos	**cuarsto*	*cuarto*	'room'
	cientos	**ciensto*	*ciento*	'hundred'

According to Harris (1983), prevocalic glides in Spanish are part of the syllable nucleus, and the syllable rhyme may contain a maximum of three segments. Since the initial syllables of the conservative Spanish words in (46a) contain only two segments in the rhyme, epenthesis is allowed. However, the initial syllables in (46b) already contain a maximum of three segments in the rhyme. Epenthesis is ruled out because it would violate the restriction on rhyme formation by adding a fourth segment.

The second restriction on /s/-epenthesis involves stress assignment, illustrated in (47). Epenthesis cannot yield the ungrammatical forms in (47b). (Note: Written accents denote syllable stress even when orthographic conventions do not require it.)

(47)	Dominican *fisno*		Conservative	
a.	*caslamidá, calasmidá, calamisdá, calamidás*		*calamidád*	‘calamity’
	muschácho, muchásch o, mucháchos		*muchácho*	‘boy’
b.	*plástano, plátanos*	**plátasno*	*plátano*	‘plantain’
	ásguila, águilas	**águisla*	*águila*	‘eagle’
	lástigo, látigos	**látisgo*	*látigo*	‘whip’

Harris (1983) argues that Spanish is quantity-sensitive, meaning that antepenultimate stress is not possible if the penultimate syllable contains a branching rhyme (i.e., if the penultimate syllable is heavy).[14] Since the conservative Spanish words in (47b) already exhibit antepenultimate stress, epenthesis into the penultimate syllable would violate this restriction on stress assignment by creating a heavy penult.

An OT analysis of these additional restrictions is equally available in which markedness constraints on syllable structure and stress assignment serve to rule out such illicit forms as outputs. The idea that markedness restricts the appearance of hypercorrect [s] was already expressed by Morales-Front (1999): “Since what the speaker is attempting to do in hypercorrection situations is to guess what the position of /s/ might be in the standard variety, it is understood that she would opt for the least marked pattern [*my translation*—TGB]” (224). The proposal put forth here is that the set of outputs instantiating the least marked pattern is determined by the interaction of ranked and violable constraints in an OT grammar. In *fisno* speech, candidates that satisfy markedness constraints on phonotactic and prosodic structure are preferred over candidates that violate the constraints.

6. Conclusion

Since Núñez Cedeño (1988) first pointed out the theoretical relevance of such data, the absence of hypercorrect [s] before intervocalic rhotics in Dominican Spanish has remained one

of the best known arguments in favor of the geminate representation of intervocalic trills. The present study has demonstrated that the hypercorrection facts are also compatible with the alternate view in which taps and trills are separate phonemes. I have proposed an OT account of hypercorrective /s/-epenthesis involving output-output correspondence, thereby obviating the need for an insertion rule that operates independently of the constraint-based grammar. Speakers of the 'lost-*s*' variety can attempt to emulate conservative Spanish speakers by inserting a non-underlying [s], but the resulting output candidates still must satisfy other constraints in the grammar. The requirement of minimal constraint violation ensures that only one [s] is ever inserted in a word and that the locus of insertion is never between vowels in hiatus. The failure of hypercorrect [s] to appear before intervocalic rhotics is accounted for by a phonetically-grounded phonotactic constraint against [strident][vibrant] clusters in the output, and a similar analysis can be given for other restrictions on epenthesis in terms of syllabic and prosodic markedness constraints that otherwise active in the grammar.

Since an analysis in terms of surface phonotactics does not require an underlying geminate representation of intervocalic surface trills in Spanish, it is fully compatible with Padgett's (2003c) Dispersion-theoretic account of syllable-initial rhotics.[15] In this account, the general preference for trills in syllable-initial contexts is uniformly captured by a single formal mechanism, which is not possible in the trill-as-geminate approach. The exceptionality of intervocalic contexts, where syllable-initial rhotics may also be taps, does not require any diacritical marking of inputs but instead follows directly from the interaction of faithfulness and perceptual distinctiveness constraints in the grammar.

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[2] Diverging somewhat from his original (1983) proposal, Harris (2002: 84-5) acknowledges that the single rhotic phoneme may be left unspecified as /R/ in the phonological representation and furthermore, following Valerga (1995), that the geminate versus singleton distinction may stem from the moraic versus non-moraic status of /R/, respectively. In this paper, however, I will assume the representations shown in (7) since the works of Núñez Cedeño (1988, 1989, 1994) are based on these and since "there is apparently no empirical difference between the [geminate and moraic] notations" (Harris 2002: 85).

[3] An experimental study by Hualde (2004) suggests that for some speakers, there is no obligatory neutralization of postlexical tap + trill sequences. Rather, the situation seems to be similar to the pronunciation of sequences of identical consonants across word boundaries. For example, the phrases *sigue solo* 's/he continues alone' and *sigues solo* 'you continue alone' can be pronounced as identical but can also differ in duration in normal speech. The implication of this finding is that at least for speakers who do not reduce postlexical tap + trill sequences, tap deletion in (10) must apply in the lexical component after postconsonantal strengthening.

[4] An alternative formulation of the rule might specify that epenthesis apply anywhere within the syllable rhyme instead of making reference to the syllable boundary (for example, see Núñez Cedeño 1989: 161). In this case, the failure to insert /s/ before the first element of the geminate tap could be explained by the fact that "coda **sr* is not allowed in Spanish … and this string would be a violation of sonority sequencing in any event" (Harris 2002: 98).

[5] For a related proposal of geminate inalterability, see the *Linking Constraint* of Hayes (1986).

[6] Lipski (1990) proposes a rule similar to (18), but independently of any consideration of the implications of the UAC.

[7] For example, Bonet and Mascaró (1997) and Lipski (1990), who argue against the singleton-geminate distinction, both appeal to prespecification as a strategy to avoid the strengthening of underlying taps in intervocalic position. However, these authors do not consider the implications of such an approach for the hypercorrection facts.

[8] Padgett (2003c) argues that a neutralization avoidance constraint, *MERGE, is necessary in addition to standard input-output faithfulness in order to account for the phrasal behavior of rhotics at word boundaries. Only $\text{IDENT}_{\text{DUR}}$ is assumed in the present study, however, since the focus is on the word-level distribution of hypercorrect /s/.

[9] Based on phonetic descriptions of Catalan rhotics by Recasens (1986, 1991, 1993), Padgett (2003c) further distinguishes between a strong syllable-initial trill [r:] and a weak coda trill [r], although both categories abstract away from even more rate- and register-induced phonetic variation. For present purposes, I collapse these two and employ just the symbol [r] because I am primarily concerned with syllable-initial trills in Spanish. This assumption should not affect the analysis presented here.

[10] Note that aspiration of the first half of a geminate tap seems to contravene the Uniform Applicability Principle, discussed in Section 3 above. See Núñez Cedeño (1994) for further discussion and analysis.

[11] Gussenhoven (2000) uses a similar argument to explain the origin and development of lexical tone contrasts in West Germanic. He argues that for social reasons, speakers of Central Franconian emulated an analogical change that had taken place in Eastern Germanic, i.e., the analogical lengthening of short vowels in singular noun forms whose plurals had undergone Open Syllable Lengthening. See Gussenhoven (2000) for specific details and analysis.

[12] Thanks to an anonymous reviewer for suggesting the possibility of an analysis in terms of segmental phonotactics.

[13] I assume that Colantoni's proposed feature [vibrant] is specified for voiceless taps and trills, as well as voiceless preaspirated taps (recall Section 4.2). Therefore, *[strident][vibrant] would be violated by output candidates containing [s] before these rhotics as well.

[14] Much recent work has reconsidered the psychological reality of prior generative accounts of Spanish stress assignment and quantity sensitivity (see Alvord 2003, Bárkányi 2002, Face 2000, 2003, Lord 2001, among others).

The growing consensus of this research is that stress is computed not by generative phonological rules or constraints but by analogy with similar forms stored in the lexicon (cf. Bybee's 2001 usage-based model of phonology and morphology).

[15] Harris (2002) presents other arguments in favor of the geminate representation. Full consideration of these arguments would have taken us too far afield, but see Padgett (2003c) on their implications for the DT account.

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