

# Theoretical and Experimental Approaches to Romance Linguistics

EDITED BY  
Randall S. Gess  
Edward J. Rubin

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THEORETICAL AND EXPERIMENTAL APPROACHES  
TO ROMANCE LINGUISTICS

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Volume 272

Randall S. Gess and Edward J. Rubín (eds.)

*Theoretical and Experimental Approaches to Romance Linguistics*  
*Selected papers from the 34th Linguistic Symposium on Romance Languages (LSRL),*  
*Salt Lake City, March 2004*

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EXPERIMENTAL APPROACHES  
TO ROMANCE LINGUISTICS

SELECTED PAPERS FROM THE 34TH LINGUISTIC  
SYMPOSIUM ON ROMANCE LANGUAGES (LSRL),  
SALT LAKE CITY, MARCH 2004

Edited by

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EDWARD J. RUBIN

*University of Utah*

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## PREFACE

The present volume is the outcome of the 34<sup>th</sup> annual *Linguistic Symposium on Romance Languages (LSRL)* held at the University of Utah in March, 2004. The symposium continued a 33 year-old tradition of annual conferences on the topic of theoretical Romance linguistics, sponsored and organized by different scholars at North American institutions each year. The tradition is noteworthy in that the *LSRL*, despite being an annual event, is not a regular meeting of an established scholarly organization because there is no organization or association behind the title. Rather, its continuity since 1970 is simply a testament to the number of scholars committed to the theoretical study of the Romance language family, and to the high regard granted to the conference in the field. The *LSRL* is widely recognized as one of the most prestigious venues for the presentation of scholarship on Romance linguistics, and attracts international participation from prominent senior scholars to graduate students, thereby promoting the sharing and dissemination of cutting-edge scholarly research on theoretical and Romance linguistics.

The 34<sup>th</sup> *LSRL* included participation from scholars representing institutions in the United States, Canada, Australia, the Netherlands, France and Spain. The 51 presentations covered a number of areas of linguistic inquiry: syntax, semantics, phonetics, phonology, morphology, first and second language acquisition, historical linguistics, and sociolinguistics. In addition, the first-time parsession on laboratory approaches to Romance Linguistics provided valuable empirical studies on a variety of theoretical questions. The present volume includes 20 studies selected from among those presented at the conference, both theoretical and experimental, and covering most of the areas represented there. There were revisions to the selected studies, stemming from conference-based comments and discussions.

There are several organizations and individuals that helped to make the 34<sup>th</sup> *LSRL* a success, and we would like to acknowledge them here. First we would like to thank our graduate students, Jennifer Mitchell, Aleksandra Zaba, Julia James, Vivian Ngai and David Hall, for their invaluable assistance in organizing and facilitating the conference event. At the University of Utah, we would like to thank the Office of the Vice President for Research, the College of Humanities, The Department of Linguistics, the Tanner Humanities Center and the Department of Languages and Literature. Thanks go also to our colleague, David Iannucci, who paid conference registration fees for several undergraduate students at the University of Utah. We would also like to thank the University of Utah's Lonnie Norton, and UCSD's Ezra Van Everbroeck, for their invaluable assistance with the PASHA abstract reviewing software.



Further thanks go to Brett Losee and Kelly Love at the Hotel Monaco for all of their assistance in putting on the conference. Most importantly, we must express our profound gratitude to the National Science Foundation, whose Grant No. 0344654 supported the work on which the dissemination of the material in this volume is based.

We would like to thank the following individuals for reviewing abstracts for the 34<sup>th</sup> *LSRL*:

Raul Aranovich, William Ashby, Dalila Ayoun, Judy Bernstein, Ignacio Bosque, Joyce Bruhn de Garavito, Barbara Bullock, Andrea Calabrese, Henrietta Cedergren, Ioana Chitoran, Sonia Colina, Heles Contreras, Laurent Dekydtspotter, Viviane Déprez, Anne-Marie DiSciullo, Timothy Face, Zsuzsanna Fagyal, Jon Franco, Sonia Frota, Grant Goodall, Jorge Guitart, David Heap, Julia Herschensohn, Virginia Hill, Paul Hirschbühler, D. Eric Holt, José Ignacio Hualde, Haike Jacobs, Ellen Kaisse, Paula Kempchinsky, Jürgen Klausenburger, Marie Labelle, Juana Licerias, John Lipski, Marta Luján, Enrique Mallen, Diane Massam, Cecile McKee, Gary Miller, Jean-Pierre Montreuil, Richard Morris, Rafael Nuñez-Cedeño, Francisco Ocampo, Antxon Olarrea, Francisco Ordoñez, Ana Perez-Leroux, Cecilia Poletto, Jean-Yves Pollock, Shana Poplack, Lori Repetti, Yves Roberge, Mario Saltarelli, Christina Schmitt, Carmen Silva-Corvalán, Dominique Sportiche, Jacqueline Toribio, Esther Torrego, Enric Vallduvi, Barbara Vance, Lydia White, Erik Willis, Karen Zagona, Mary Zampini, Raffaella Zanuttini.

We also thank those who presented at the conference, and especially our invited speakers, Jean-Yves Pollock and Donca Steriade. Special thanks also to our colleague, Mauricio Mixco, for his public outreach lecture on Spanish loanwords in the indigenous languages of La Nueva México.

Finally, we must thank Aleksandra Zaba a second time, for her assistance in the formatting of this volume. We would also like to thank Anke de Looper of John Benjamins Publishing Company for her help with thorny issues of formatting and editing.

# DETERMINER SHARING AND CYCLICITY IN WH-MOVEMENT\*

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## 1. *Introduction*

In determiner sharing structures, a determiner is (apparently) missing from one of the constituents in the second conjunct in a coordinate structure (see McCawley 1993):

- (1) The boys will wash the dishes, and girls, mop the floor.

This sentence is interpreted as if the determiner in the initial subject *the boys* were also present in the subject in the second conjunct.

In this paper, we examine the properties of this construction in Spanish, and provide an analysis based on Johnson's (2000) and Lin's (2002) proposals for this construction in English. An important part of the analyses proposed by these authors is the claim that determiners are licensed in functional projections above *vP* (see Sportiche 1996). We adopt Lin's (2002) version of this claim, and propose an extension to it by arguing that there are more licensing positions for determiners than originally proposed in that work. Moreover, by examining certain restrictions on word order in determiner sharing in questions, we argue that they provide evidence for the hypothesis put forth in Chomsky 1986, 2000 that *wh*-movement involves an intermediate step in a position between TP and VP.

This paper is organized as follows. In Section 2, we introduce the basic data and provide an analysis of determiner sharing in non-questions. In Section 3, we extend this analysis to sharing of *wh*-determiners, and in Section 4 we use this analysis to provide evidence for the claim that *wh*-movement involves an intermediate step between TP and VP.

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\*We would like to thank the audience at the 34th Linguistic Symposium on Romance Languages for their comments and questions. We also thank an anonymous reviewer for their help in clarifying certain aspects of our analysis.

## 2. Gapping and Determiner Sharing

Gapping sentences are coordinate structures where T (and, possibly, a verb) is ‘missing’ from the second and later conjuncts (examples from Lin 2002):

- (2) a. Jessica ate an apple and Joanne, an orange.  
 b. Jessica ate an apple, and Joanne *ate* an orange.
- (3) a. Jessica will referee the hockey game and Jori, time the luge race.  
 b. Jessica will referee the hockey game, and Jori *will* time the luge race.

In each of the (a) examples, T (in the case of (2a), the V-T complex) is apparently not present in the second conjunct, and the sentence is interpreted as if the second conjunct contained the same T (and V in (2a)) as the first conjunct (i.e. it has the same interpretation as the corresponding (b) sentence.)<sup>1</sup>

There are two approaches to gapping in the literature. In the *ellipsis*, or *large conjunct* approach, what is coordinated is entire sentences. T is missing from the second and latter conjuncts because of ellipsis (see Neijt 1979, Wilder 1997, Hartmann 2001, Murguia 2004):<sup>2</sup>

- (4) a. [<sub>TP</sub>Jessica [<sub>V-T</sub>ate]an apple]and [<sub>TP</sub>Joanne [<sub>V-T</sub>ate]an orange]  
 b. [<sub>TP</sub>J. will referee the hockey game]and [<sub>TP</sub>J. ~~will~~ time the luge race]

In the *sharing* or *small conjunct* approach, coordination is below TP. In particular, the subject and T that appear at the beginning of the sentence are not part of the first conjunct; they are part of the higher shared structure (see Siegel 1987, Johnson 1996, Lin 2002). In this approach, there is no ellipsis involved:

- (5) a. [<sub>TP</sub> Jessica ate [[<sub>vP</sub>t<sub>Sbj</sub> t<sub>V</sub> an apple]and [<sub>vP</sub>Joanne t<sub>V</sub> an orange]]]  
 b. [<sub>TP</sub> J. will [[<sub>vP</sub>t referee the hockey game]and [<sub>vP</sub>J. time the luge...]]]

In both examples, the first subject is extracted from the first conjunct to its surface position in the shared structure,<sup>3</sup> and the subject in the second conjunct

<sup>1</sup>It is also possible to have gapping of both T (an auxiliary) and V (a main verb), as in *Jessica will referee the hockey game, and Jori the luge race*. In this paper, we concentrate only on sentences where only T (and anything adjoined to it) is missing.

<sup>2</sup>What is common to all these analyses is coordination of TP and ellipsis in the second conjunct. However, they differ in how ellipsis is implemented (deletion, “reconstruction”, etc.)

<sup>3</sup>This is in apparent violation of Ross’s (1967) Coordinate Structure Constraint (CSC). As argued by Lin (2002), once this principle is properly formulated, these are in fact not violations of the

remains in its base position in  $\nu P$ . In addition, in (2a, 5a), the verb is moved Across-the-Board to T from both conjuncts.

Gapping is also possible in Spanish:<sup>4</sup>

- (6) a. Juan fue al cine y María, al parque.  
 Juan went to.the movies and María to.the park  
 “Juan went to the movies and Maria went to the park.”  
 b. Juan corrigió los trabajos y María, los exámenes.  
 Juan graded the papers and María the exams  
 “Juan graded the papers and María graded the exams.”

In the sharing analysis, the initial subject and T in (6a) are shared, i.e. not included in any of the conjuncts:<sup>5</sup>

- (7) *Sharing analysis*  
 Juan went [ <sub>$\nu P$</sub>   $t_{Juan}$   $t_V$  to the movies ] and [ <sub>$\nu P$</sub>  María  $t_V$  to the park ]

In the ellipsis analysis, the conjuncts are TPs, and T (which includes the adjoined verb) is elided in the second conjunct:

- (8) *Ellipsis analysis:*  
 [<sub>TP</sub> Juan went to the movies ] and [<sub>TP</sub> María ~~went~~ to the park ]

Lin’s (2002) evidence for the sharing analysis of gapping in English can easily be applied to this construction in Spanish. Her main arguments are based on the fact that in the sharing analysis (see (7)), the shared subject c-commands both  $\nu P$ s. However, the ellipsis analysis (8) involves coordination of whole clauses, so the first subject does not c-command anything in the second conjunct. We will only apply one of Lin’s arguments for this claim to Spanish. The following example illustrates this point:

- (9) Cada estudiante<sub>i</sub> leyó *El Quijote* y su<sub>i</sub> madre, *La Celestina*.  
 each student<sub>i</sub> read *El Quijote* and his<sub>i</sub> mother *La Celestina*  
 “Each student<sub>i</sub> read *El Quijote* and his<sub>i</sub> mother read *La Celestina*.”

---

CSC. See also footnote 6.

<sup>4</sup>For ease of exposition, the English translations of the Spanish examples do not involve any gapping.

<sup>5</sup>For ease of exposition, we only use English glosses in the analysis of Spanish examples.

In this example, the first subject *cada estudiante* ‘each student’ binds a pronoun in the second conjunct. This shows that this subject cannot be part of the coordination; it must be higher. Hence, what is coordinated is *vP*. On the other hand, in clear cases of coordination of TP (i.e. with nothing ‘missing’ from the second conjunct), this binding is not possible:<sup>6</sup>

- (10) ??Cada estudiante<sub>i</sub> leyó *El Quijote* y su<sub>i</sub> madre leyó *La Celestina*.  
 each student<sub>i</sub> read *El Quijote* and his<sub>i</sub> mother read *La Celestina*.  
 “Each student<sub>i</sub> read *El Quijote* and his<sub>i</sub> mother read *La Celestina*.”

This is predicted by the sharing analysis, but not by the ellipsis analysis. We therefore follow Lin 2002 in adopting the former.

In *determiner sharing* structures, a determiner is also missing from the non-initial conjuncts (see McCawley 1993, Johnson 2000 and Lin 2002):<sup>7</sup>

- (11) a. The boys will wash the dishes and, girls mop the floor.  
 b. The boys will wash the dishes and *the* girls will mop the floor.

In (11a), a determiner is missing from the subject in the second conjunct, and is interpreted as if it had the same determiner as the subject in the first conjunct. The resulting interpretation is the same as (11b). The following are two relevant examples of determiner sharing from Spanish:<sup>8</sup>

<sup>6</sup>There is a potential problem for the analysis if *cada estudiante* ‘each student’ (10) is allowed to undergo QR:

- (i) each student<sub>i</sub> [<sub>t<sub>i</sub></sub> read *El Quijote*] and [his<sub>i</sub> mother read *La Celestina*]

As argued in several works (see Ruys 1993, Fox 2000, Lin 2002 and references cited there), QR out of a conjunct in a coordinate structure is possible as long as the moved element binds a variable in all other conjuncts, which is precisely the case in (i). However, this specific example is ruled out due to Fox’s (2000) Scope Economy: QR of *each student* does not cross another scope bearing element. We would like to thank an anonymous reviewer for pointing out this potential problem.

<sup>7</sup>As noted by the authors cited above, not all determiners can participate in determiner sharing. For instance, it is not possible with *a*, *that* or numerals, but it is possible with most other determiners. In Spanish, the list of determiners that cannot be ‘shared’ is even greater (see footnote 8). There is no known explanation for these facts.

<sup>8</sup>The number of determiners that can participate in determiner sharing is very reduced in Spanish. Whereas it is possible with *bastante* ‘enough/several’, *cuánto* ‘how much/how many’, *demasi-*

- (12) a. Ni muchos niños han leído los libros ni niñas revisado los  
neither many boys have read the books nor girls reviewed the  
artículos.  
articles  
“Neither many boys have read the books nor *many* girls *have* re-  
viewed the articles.”
- b. Ni demasiados niños comieron las manzanas ni niñas las  
neither too.many boys ate the apples nor girls the  
peras.  
pears  
“Neither too many boys ate the apples nor *too many* girls *ate* the  
pears.”

In (12a), the first subject contains the determiner *muchos* “many”. The subject in the second conjunct is missing this determiner. Nevertheless, it is interpreted as if the determiner were present, as shown in the translation. (12b) is a similar example except that there is no auxiliary and the ‘missing’ determiner is *demasiados* “too many”.

As first shown by McCawley (1993), determiner sharing implies gapping: in addition to the determiner, T must also be missing from the second conjunct in English. This is also true of determiner sharing in Spanish.<sup>9</sup> For instance, if an auxiliary is added to the second conjunct in (12a), the result is (13a), which is not grammatical. Similarly, adding a tensed verb to the second conjunct in (12b) also results in ungrammaticality, as shown in (13b).

- (13) a. \*Ni muchos niños han leído los libros ni niñas *han*  
neither many boys have read the books nor girls *have*  
revisado los artículos.  
reviewed the articles  
“Neither many boys have read the books nor many girls have re-  
viewed the articles.”

---

*ado* ‘too much/too many’ *mucho* ‘much/many’, *poco* ‘little/few’, *qué* ‘what/which’, *suficiente* ‘enough’ and *varios* ‘several’, it is not possible with *cada* ‘each’, *el* ‘the’, *ningún* ‘no/any’, *todo* ‘all’, *un* ‘a’, numerals, demonstratives and possessives. We are not aware of any systematic way of distinguishing the determiners in the two groups.

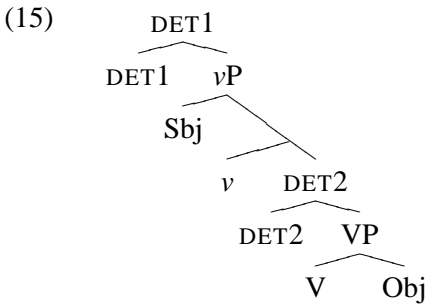
<sup>9</sup>As we will see below, not all cases of determiner sharing entail a missing T in the second conjunct. In particular, when the shared determiner is a question wh-word, T can be present in the second conjunct. See Section 3.

- b. \*Ni        demasiados niños comieron las manzanas ni    niñas  
           neither too.many    boys ate                    the apples        nor girls  
           *comieron* las peras.  
           *ate*            the pears  
           “Neither too many boys ate the apples nor too many girls ate the  
           pears.”

Given the logic of the sharing analysis, this must mean that both D and T are shared in the structure. That is, D and T are not part of the coordination. They are above the coordinated vPs. For instance, (12a) must have the following analysis:

- (14) Neither *many*<sub>D</sub> boys *have*<sub>T</sub> [<sub>vP</sub>read the books]nor [<sub>vP</sub>girls reviewed the article]

In order to implement this observation, Lin 2002 adopts a version of Sportiche’s (1996) DP-partitioning hypothesis (Lin bases her analysis on proposals made in Johnson 2000). In particular, she proposes that there are two determiner-related positions (labeled DET1/DET2 in (15)), one above vP and another one above VP:

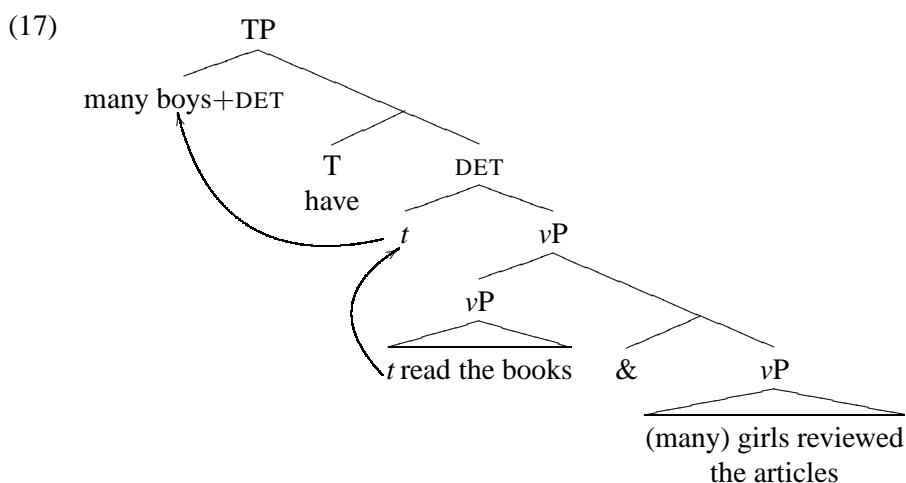


Furthermore, there are certain requirements imposed on the relation between DET and determiners in argument positions. First, a determiner must be in the c-command domain of DET. The determiners in subject and object position in (15) satisfy this requirement. Furthermore, DET must be adjoined to a DP by Spellout. This is achieved by moving DP to DET; the subject moves to DET1, and the object to DET2:

- (16) [<sub>Sbj</sub>+DET1 [<sub>vP</sub>*t*<sub>Sbj</sub>] [<sub>Obj</sub>+DET2 [<sub>VP</sub>V *t*<sub>Obj</sub>]]]

Finally, DET also imposes a restriction on the spellout of the determiner: a determiner can be spelled out overtly only if the DP it heads is adjoined to DET. In the normal case, a DP is always adjoined to a DET, so its D head is spelled out overtly.

This theory of determiners allows Lin to explain why determiner sharing implies gapping in English, and her analysis extends straightforwardly to Spanish. For instance, consider (12a) above. In this sentence, the determiner *many* is ‘missing’ from the second conjunct, and as shown in (13a), T (i.e. the auxiliary) must be missing as well. (12a) has the following structure:<sup>10</sup>



In this structure, the requirements on DET are satisfied by adjoining to it the subject from the first conjunct (and subject+DET moves further to [Spec, TP]). Since this DP is adjoined to DET, its D head is spelled out as *muchos* ‘many’. The subject in the second conjunct does not move to DET, so its D head is not spelled out overtly. Thus, in this analysis, what is shared in the coordination is DET, and conditions on the pronunciation of determiners give the illusion that the subject determiner is shared by both conjuncts. More importantly, the analysis derives the fact that T must be shared as well (see (13)). Given the structure in (17), if the conjuncts contain T, they must also contain DET, since the former c-commands the latter. Since sharing of DET is a necessary ingredient of the determiner sharing construction, it follows that this construction is not possible unless T is shared as well.

<sup>10</sup>We represent determiners that are not realized overtly by enclosing them in parentheses.

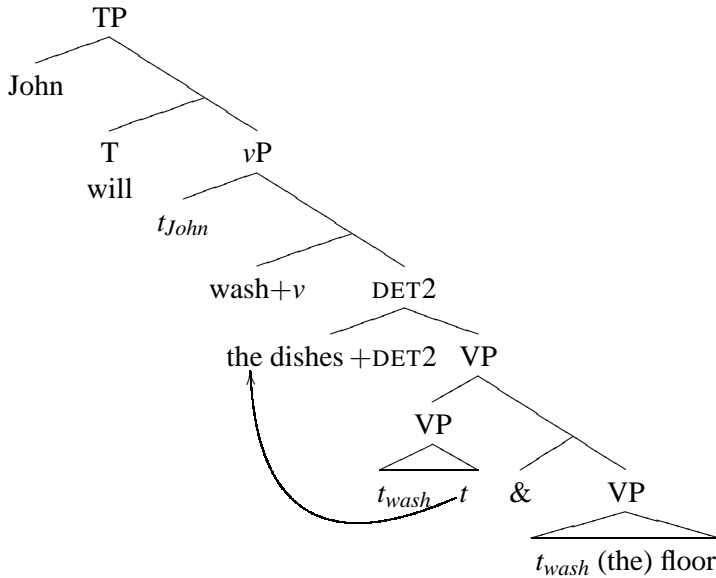


As noted in Johnson 2000 and Lin 2002, it is not possible to share determiners in object position in English:<sup>11</sup>

- (18) \*John will wash the dishes and Bill, mop floor.

This follows from the structure in (15). Since the object determiner is shared, DET2 and everything above it is excluded from the conjuncts. Thus, the second conjunct cannot contain a subject or a V (the latter having moved to *v*). Thus, sharing the object determiner can only result in a structure which is homophonous with a sentence in which just the NPs in the object are coordinated:

- (19) John will wash the dishes and floor.



In this respect, Spanish contrasts sharply with English; determiner sharing in object position *is* possible in this language:

- (20) Ni Juan leyó demasiados libros, ni Pedro revistas.  
 neither Juan read too.many books nor Pedro magazines  
 “Neither Juan read too many books, nor Pedro read too many magazines.”

<sup>11</sup>Determiner sharing in object position is possible in English when the object is initial in the second conjunct. This also follows from the analysis. See Johnson 2000 and Lin 2002.

- (21) Ni Juan ha comido demasiadas manzanas, ni Pedro bebido  
 neither Juan has eaten too.many apples nor Pedro drunk  
 cervezas.  
 beers  
 “Neither J. has eaten too many apples, nor P. has drunk to many  
 beers.”

As expected, determiner sharing also entails gapping in this case:<sup>12</sup>

- (22) \*Ni Juan leyó demasiados libros, ni Pedro *leyó* revistas.  
 neither Juan read too.many books nor Pedro *read* magazines  
 “Neither Juan read too many books, nor Pedro read too many maga-  
 zines.”
- (23) \*Ni Juan ha comido demasiadas manzanas, ni Pedro *ha*  
 neither Juan has eaten too.many apples nor Pedro *has*  
 bebido cervezas.  
 drunk beers  
 “Neither Juan has eaten too many apples, nor Pedro has drunk to  
 many beers.”

We would like to relate this difference between the two languages to a well-known difference in their syntax: while word order is quite rigid in English, it is not in Spanish. In particular, VOS orders in Spanish are quite natural:

- (24) Leyó demasiados libros Juan.  
 read too.many books Juan  
 “John read too many books.”

We assume that, in this order, the subject is in its base position in  $vP$ , and the object is in a derived position above  $vP$ , which we take to be the specifier of  $Agr_{OP}$ :<sup>13</sup>

---

<sup>12</sup>Examples (22-23) are grammatical in the irrelevant reading in which the object in the second conjunct is understood as a bare plural.

<sup>13</sup>We have chosen the label ‘ $Agr_{OP}$ ’ simply for convenience. All that is needed for the analysis is some VP-external position which can account for the attested VOS order in Spanish. Whatever this position is, it is not available for overt movement in English, where the VOS order is not possible, even if, as proposed in Johnson 1991 and Lasnik 1999, English objects move out of VP.

- (25)  $[_{TP} V+v+Agr_{OP}+T [_{Agr_{OP}} \text{Object } t_{Agr_{OP}} \underbrace{[_{vP} \text{Subject } t_v \text{ } [_{VP} t_V \text{ } t_{Object}]]}]]]]$

In order to account for determiner sharing in object position, we also need a DET position above  $Agr_{OP}$ . Its syntax is the same as the other DET positions proposed in Lin 2002 and outlined above: it licenses a determiner in its c-command domain (in this case, the one in the object in the specifier of  $Agr_{OP}$ ), and a DP must adjoin to it by Spellout (i.e. the one in the specifier of  $Agr_{OP}$ ). Under this analysis, a sentence like (20) involves coordination of  $vP$ , with movement of the object in the first conjunct to  $Agr_{OP}$  and DET:

- (26) J. read [too many books+DET [ $Agr_{OP} t$  [ $vP t_{Juan} t_V t$ ] & [ $vP$  Pedro ... ]]]

In English, the specifier of  $Agr_{OP}$  is not available for (overt) movement. This implies that determiner sharing in object position is not possible in this language (even assuming that there is an object-related DET above  $Agr_{OP}$ ).

To summarize so far, Spanish offers additional evidence for Johnson's (2000) and Lin's (2002) general approach to gapping and determiner sharing. Furthermore, the fact that determiner sharing in object position is possible in this language argues for an extension of Sportiche's (1996) and Lin's (2002) theory of determiners which makes an 'extra' DET position available to objects higher in the structure.

### 3. *Determiner Sharing in Questions*

Determiner sharing is also possible with wh-determiners:

- (27) ¿Cuántos niños han leído libros y niñas revisado revistas?  
 how.many boys have read books and girls reviewed magazines  
 "How many boys have read books and how many girls have reviewed magazines?"
- (28) ¿Cuántos libros has leído y revistas revisado?  
 how.many books have.2SG read and magazines reviewed  
 "How many books have you read and how many magazines have you reviewed?"

These two examples involve sharing of the wh-determiner *cuántos* "how many" in subject (27) and object (28) positions. Their syntax is essentially the same as

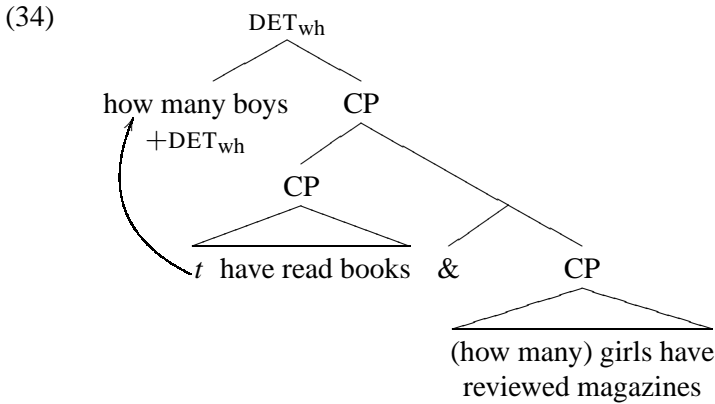


This suggests that there is a DET position above CP, which we label  $DET_{wh}$ , available to wh-determiners:

$$(33) \quad [{}_{DET_{wh}} DP_{wh} + {}_{DET_{wh}} [{}_{CP} t C TP ]]$$

The syntax of this DET position is the same as the other ones discussed here: it licenses the determiner in the DP in the specifier of CP, and this DP must adjoin to DET by Spellout.

Since  $DET_{wh}$  is above TP, sharing of wh-determiners does not necessarily involve sharing of T. (31-32) can thus be analyzed in terms of conjunction of CP. For instance, (31) has the following structure:



Therefore, determiner sharing in questions reveals a further extension of the theory of determiners adopted in this paper. At least in some cases, there is a wh-related DET position above CP, in addition to the ones proposed previously.

So far, we have seen that there are DET positions at several levels in the structure of a clause: above VP,  $vP$ , Agr<sub>o</sub>P, and CP. This might suggest that DET positions can be generated anywhere in the clause. This is not the case. For instance, we must assume that there is no DET position immediately above TP. If this were possible, it should also then be possible to coordinate TP below DET. This would result in a structure in which a non-wh subject determiner is shared and T is present in both conjuncts:

$$(35) \quad * [{}_{DET} Sbj_1 + {}_{DET} [[{}_{TP} t T \dots] \& [{}_{TP} Sbj_2 T \dots]]]$$

As we saw in the previous section, examples of this sort are not grammatical (see (13)). We conclude that DET cannot be generated immediately above TP.<sup>16</sup>

#### 4. *Cyclicity in Wh-movement*

In the previous section, we have not paid much attention to the word order of constituents in wh-determiner sharing. In this section, we argue that the order of constituents in these constructions in Spanish provides evidence for Chomsky's (1986) claim that there is an intermediate step between VP and TP in wh-movement.

In most cases, word order in the second conjunct in wh-determiner sharing is a straightforward matter. Consider first sentences in which T is not shared. (31, 32), repeated below as (36a, 37a), are relevant examples. In the second conjunct, the wh-phrase with the unpronounced determiner *how many* must precede the verb:

- (36) a. ¿Cuántos niños han leído libros y niñas han revisado  
 how.many boys have read books and girls have reviewed  
 revistas?  
 magazines  
 "How many boys have read books and how many girls have reviewed  
 magazines?"
- b. \*¿Cuántos niños han leído libros y han revisado niñas  
 how.many boys have read books and have reviewed girls  
 revistas?  
 magazines
- c. \*¿Cuántos niños han leído libros y han revisado revistas  
 how.many boys have read books and have reviewed magazines  
 niñas?  
 girls
- (37) a. ¿Cuántos libros has leído y revistas has  
 how.many books have.2SG read and magazines have.2SG  
 revisado?  
 reviewed  
 "How many books have you read and how many magazines have  
 you reviewed?"

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<sup>16</sup>Ideally, there should be an explanation for the specific distribution of DET. We leave this as a question for future research.

- b. \*¿Cuántos libros has leído y has revisado  
 how.many books have.2SG read and have.2SG reviewed  
 revistas?  
 magazines

This is a direct consequence of the structure proposed for these sentences in the previous section (see (34)). This structure involves coordination of CP. Thus, the *wh*-phrase (which contains an unpronounced *wh*-determiner) in this conjunct must move to the specifier of CP. The consequence, as desired, is that it must precede the verb.

Consider next cases of *wh*-determiner sharing with sharing of T in which the ‘missing’ *wh*-determiner is in the subject. In this case too, the *wh*-phrase in the second conjunct must precede the verb:

- (38) a. ¿Cuántos niños han leído libros y niñas revisado revistas?  
 how.many boys have read books and girls reviewed magazines  
 “How many boys have read books and how many girls have reviewed magazines?”
- b. \*¿Cuántos niños han leído libros y revisado niñas  
 how.many boys read books and have reviewed girls  
 revistas?  
 magazines
- c. \*¿Cuántos niños han leído libros y revisado revistas  
 how.many boys read books and have reviewed magazines  
 niñas?  
 girls

Recall that this structure involves coordination of *v*P (see (29)). The structure of the second conjunct is the following (ignoring a possible DET position for the object above VP):

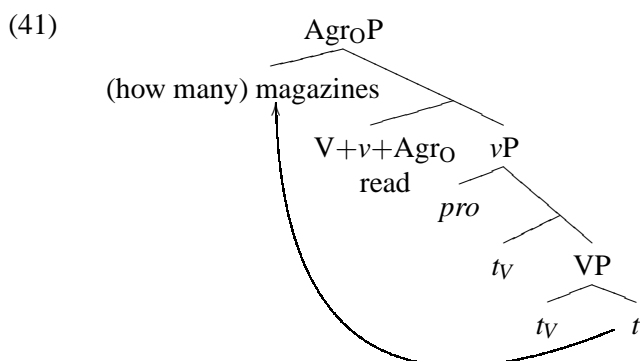
- (39) [<sub>vP</sub>(how many) girls reviewed [<sub>VP</sub>t<sub>V</sub> magazines]]

The only way in which the verb could precede the subject would be by movement of the verb to a position higher than *v*P. However, there is no such position in the second conjunct, since, by hypothesis, these sentences involve coordination of *v*P. The consequence is that the *wh*-subject must precede the verb.

When the shared wh-determiner is in the object, the facts are basically the same; the wh-phrase in the second conjunct must precede the verb:

- (40) a. ¿Cuántos libros has leído y revistas revisado?  
 how.many books have.2SG read and magazines reviewed  
 “How many books have you read and how many magazines have you reviewed?”  
 b. \*¿Cuántos libros has leído y revisado revistas?  
 how.many books have.2SG read and reviewed magazines

Clearly, the wh-object in the second conjunct (*how many*) *magazines* is not in its base position. It must move to a position above *vP*, i.e. *Agr<sub>O</sub>P* (see Section 3). This means that this structure involves coordination of *Agr<sub>O</sub>P*. The structure of the second conjunct is then:



The question that must be answered now is why this movement to *Agr<sub>O</sub>P* is necessary. The answer is straightforward: as proposed in Chomsky 1986, 2000, wh-phrases *always* move to an intermediate position between TP and VP (see also Fox 2000 and Nissenbaum 2000.) In fact, wh-determiner sharing structures provide new kind of evidence for this hypothesis. In the references cited above, the evidence given for the hypothesis is either theory internal or motivated by considerations of the syntax-semantics interface. The evidence presented here has to do with word order.

However, before we rush to this conclusion, there are a few possible objections that need to be addressed. First, as is well-known, in Spanish questions containing more than one wh-phrase, only one of them undergoes wh-movement. This might be seen as an objection to our proposal that the wh-phrase in the second conjunct in (40) undergoes wh-movement to *Agr<sub>O</sub>P*, since the wh-phrase in



the first conjunct is also moved. Closer examination of wh-movement in coordinate structures shows that this is not a real objection. In coordinate structures in general, movement of a wh-phrase in a conjunct does not prevent movement of wh-phrases in other conjuncts. The following is a relevant example which does not involve determiner sharing or any other type of ‘missing’ elements:

- (42) Juan me preguntó [<sub>CP</sub>[qué libros] había leído *t*] y ...  
 Juan me asked [<sub>CP</sub>[which books] had.1SG read *t*] and
- a. ... [<sub>CP</sub>[qué revistas ] había revisado *t*]  
       [<sub>CP</sub>[which magazines] had.1SG reviewed *t*]
- b. \*... [<sub>CP</sub>había revisado qué revistas ]  
       [<sub>CP</sub>had.1SG reviewed which magazines]
- “Juan asked me which books I had read and which magazines I had reviewed.”

This is precisely what we assumed above in our analysis for the determiner sharing structure in (40). The wh-phrases in both conjuncts must move.

Another objection to the analysis has to do with the size of the conjuncts. In our analysis, there must be some way of preventing coordination of vP instead of Agr<sub>O</sub>P. If coordination of vP were allowed, there would be no position for the wh-phrase in the second conjunct to move to, and (40b), with the verb preceding the wh-phrase, would incorrectly be predicted to be grammatical. The answer to this objection is the same as the answer to the previous objection. The wh-phrase in the second conjunct, just like the one in the first, must undergo movement. Thus, the second conjunct must be large enough to provide a landing site for this movement (i.e. it must be Agr<sub>O</sub>P, not vP).

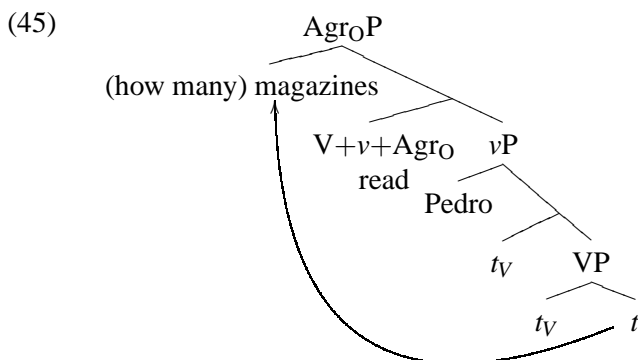
An alternative to the analysis we have proposed would be the following. In wh-determiner sharing, the wh-phrase in the second conjunct must precede the verb because of some kind of parallelism requirement on word order in coordinate structures. Since the wh-object in the first conjunct in (40) must precede the verb, the wh-object in the second conjunct must do so too. This parallelism requirement might seem like a natural condition on coordination, but it is in fact wrong. This can be shown by adding an overt subject to the sentence in (40). As shown in the following example, the subject does not need to be in parallel positions in both conjuncts; it is possible for the subject to be final in the first conjunct, but initial in the second one:

- (43) ¿Cuántos libros ha leído *Juan y Pedro* revistas revisado?  
 how.many books has read *Juan* and *Pedro* magazines reviewed  
 “How many books has Juan read and how many magazines has Pedro reviewed?”

Finally, there is a possible theory-internal objection to our analysis. We have identified the intermediate position for *wh*-movement as the specifier of  $\text{Agr}_\text{O}P$ . However, in Chomsky 2000, this position is the (higher) specifier of  $vP$ . The main reason for our claim has to do with the position of overt subjects with respect to the *wh*-object. In particular, an overt subject can appear after the verb in the second conjunct:

- (44) ¿Cuántos libros ha leído *Juan* y revistas revisado *Pedro*?  
 how.many books has read *Juan* and magazines reviewed *Pedro*  
 “How many books has Juan read and how many magazines has Pedro reviewed?”

If the *wh*-object were in the higher specifier of  $vP$ , we would not expect this order to be possible, since both the object and the subject would be in a position higher than the verb (and  $v$ ). On the other hand, in our analysis, the second conjunct has the following structure, which results in the order verb-subject, as desired:



To conclude this section, we have argued that a close examination of word order facts in the second conjunct in *wh*-determiner sharing provides evidence for the hypothesis that *wh*-movement involves an intermediate step between TP and VP. Furthermore, we have argued that this intermediate position is in a projection higher than  $vP$  which we have labeled  $\text{Agr}_\text{O}P$ .

## 5. Conclusion

In this paper, we have extended Johnson's (2000) and Lin's (2002) analysis of determiner sharing to several cases of this construction in Spanish. Furthermore, we have argued that this construction requires an extension of Lin's (2002) theory of determiners, so that DET positions are available above Agr<sub>OP</sub> and CP. Finally, in the last section, we used this analysis to provide evidence for Chomsky's (1986, 2000) hypothesis that wh-movement must go through an intermediate position located between TP and VP.

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# THE ACQUISITION OF OBJECT CLITIC CONSTRUCTIONS IN ROMANIAN\*

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## 1. *Introduction*

This paper is concerned with describing the acquisition of Romanian object clitics, illustrated in (1). Our main goal is twofold: first, to demonstrate that, contrary to earlier claims (see Avram 1999), Romanian children do not omit object clitics at a significant rate and second, to provide an explanation of this pattern under the Unique Checking Constraint Hypothesis (henceforth, UCC), developed in Wexler 1998 (see (2)).

- (1) a. *L-*            a        ascuns.  
          him-ACC    has    hidden  
          “She/he hid him.”
- b. *L-*            a        ascuns    pe        șoricel/pe    Mickey Mouse.  
          him-ACC    has    hidden    on        mouse/on    Mickey Mouse  
          “She/he hid the mouse/the Mickey Mouse.”

- (2)        Unique Checking Constraint Hypothesis:  
          The D-feature of DP can only check against one functional feature.

To achieve these goals, we first demonstrate that the acquisition of clitic constructions in Romance languages follows two distinct patterns: the pattern exemplified by French, Italian, and Catalan, where object clitics are problematic for young children, being rarely produced in natural speech and frequently omitted in obligatory environments, and the pattern exemplified by Spanish (and Greek), where object clitics do not cause problems for young children, appearing early in natural production data and not omitted in

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obligatory environments. We go on to show that the UCC provides a principled explanation of this type of cross-linguistic variation, predicting which pattern of acquisition the clitic constructions will show in a given language based on the derivation employed by these constructions, with Romanian being predicted to exhibit a pattern in which object clitics are produced freely by young children. Finally, we describe the elicited production experiment that was carried out with a large number of monolingual Romanian children to check this prediction, drawing the conclusion that, in contrast to the results previously reported in the literature, object clitics are not problematic for young Romanian children, exactly as predicted by the theory.

This paper is organized as follows: Section 2 contains a description of the relevant properties of the object clitic constructions in Romanian, Section 3 provides the necessary background on the acquisition of object clitics in a range of Romance languages including Romanian, Section 4 presents the details of the UCC hypothesis and goes over its predictions for Romanian, Section 5 describes the design and the results of the current study, and Section 6 provides the conclusions of the paper.

## 2. *A Description of the Object Clitic Constructions*

In this section, we provide a brief description of the properties of Romanian object clitics that will be relevant to the discussion in this paper. Overall, the Romanian object clitics show very familiar syntactic properties, similar to those observed in many other Romance languages. The two properties of the Romanian clitic system that are unique (and relevant for our purposes here) are sketched below. The first notable property concerns the position of object clitics. In most cases, pronominal clitics precede the verbs, as shown in (3) for a sentence containing a verb in the present tense.

- (3) *Îl / o vede pe băiat / pe fată*  
 Him-ACC / her-ACC sees on boy / on girl  
 “*She/he sees the boy/the girl.*”

With verbal forms using the auxiliary HAVE (illustrated here in (4) with past tense forms) the pattern is slightly more complex: here, most pronominal clitics precede the auxiliary verb (see (4a)), however, the accusative 3<sup>rd</sup> person singular feminine clitic follows the lexical verb (see (4b)):

- (4) a. *L- /i- /le- a văzut pe băiat/băieți/fete*  
 Him-ACC/them-M-ACC/them-F-ACC has seen on boy /boys /girls  
 “*She/he saw the boy/ the boys/ the girls.*”

- b. A vǎzut- o pe fată  
 Has seen-her-ACC on girl  
 “*She/he saw the girl.*”

The second notable property of the Romanian object clitics has to do with the clitic doubling patterns exhibited by the language. For common nouns acting as direct objects, two constructions are possible. The direct object can surface as a complement of the preposition *pe* and be doubled by an accusative clitic, as shown in (5), or it can surface as a complement of the verb (without the preposition), in which case clitic doubling will not be possible, as shown in (6).<sup>1</sup>

- (5) a. L- a vǎzut pe băiat/gândac  
 Him-ACC- has seen on boy / beetle  
 “*She/he saw the boy/beetle.*”  
 b. \*A vǎzut pe băiat/gândac  
 has seen on boy/beetle
- (6) a. A vǎzut băiatul /gândacul /tabloul  
 Has seen boy-the/beetle-the/painting-the  
 “*She/he saw the boy/beetle/painting.*”  
 b. \*L- a vǎzut gândacul  
 him-ACC- has seen beetle-the

Interestingly, when proper names act as direct objects, only the first type of a construction is possible, as shown in (7). In other words, a proper name direct object must be doubled by an accusative clitic and cannot occur without one, as shown in (8).

- (7) a. l- a vǎzut pe Ionuț  
 him-ACC has seen on John  
 “*She/he saw John.*”  
 b. \*A vǎzut pe Ionuț  
 has seen on John

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<sup>1</sup> Clitic doubling is not possible with inanimate objects, instead only the construction in (6) is possible when the full DP object is present. Alternatively, a clitic construction such as that in (1a) is available.



- (8) a. \*A vǎzut Ionuț  
       Has seen John  
       b. \*L- a vǎzut Ionuț  
           him-ACC- has seen John

With this description of the relevant properties of accusative clitics in place, we can turn to a review of the results in the field of language acquisition that will prove important to our study.

### 3. *Language Acquisition Background*

#### 3.1 *The Two Patterns of Acquisition*

A number of previous studies have described two distinct patterns of acquisition of clitic constructions shown by different Romance languages.<sup>2</sup> The pattern of acquisition that we refer to as Pattern I has been attributed to child French, Italian, and Catalan (see Bottari, Cipriani, Chilosi, and Pfanner 1998, Friedemann 1994, Guasti 1994, Hamman, Rizzi and Frauenfelder 1996, Schaeffer 2000, etc). The pattern of acquisition that we refer to as Pattern II has been attributed to child Spanish and Greek (see Wexler, Gavarró and Torrens 2003, Lyzcskowski 1999, Tsakali and Wexler 2003). Below, we provide a description of these two acquisition patterns.

Pattern I is produced when object clitics are problematic for young children, that is, when their grammars are not capable of generating clitic constructions in the appropriate, adult-like manner. This basic grammatical problem has a number of consequences, listed in (9). Specifically, children who lack the ability to generate clitic constructions will be forced to omit object clitics in obligatory environments, a pattern that is likely to be revealed by elicited production studies. They will also avoid utilizing constructions that require the production of clitics, so that object clitics will be mostly absent in natural production data at this stage of development, a pattern that is likely to be revealed by corpus analysis and longitudinal studies. Finally, they will produce disproportionately many definite nominals as direct objects, with a large number of these elements being used in discourse situations where clitics are more appropriate, in order to avoid the problematic clitic construction. This pattern is most likely to be revealed by elicited production studies, where the interpretation and the discourse properties of the object is carefully controlled so that clitics are most appropriate.

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<sup>2</sup> Not all of these studies recognize that more than one pattern of acquisition exists in this domain, that is, some of them view the pattern they are describing as the only possible one.

- (9) Pattern I (French, Italian, Catalan)
- a. A high rate of object clitic omission in obligatory environments;
  - b. Late appearance of object clitics in natural production data;
  - c. Disproportionately high use of definite direct objects, utilized in place of the problematic clitic objects.

Let us take a look at the behavior of objects revealed by the studies of early Italian, a typical Pattern I language. As demonstrated by the results of an elicited production experiment of Schaeffer (2000), summarized in Table 1, young Italian-learning children rarely produce object clitics in obligatory environments: for two year olds, the rate of production is only 22% and for three year olds, it is 62%. Instead of producing the clitics as the situation demands, they either produce full DP objects (14% for two year olds and 23% for three year olds) or omit the object altogether (64% for two year olds and 15% for three year olds).

Italian	Object clitics	Full DP object	Omissions
2 year olds	22%	14%	64%
3 year olds	62%	23%	15%
4 year olds	89%	11%	0%
5 year olds	91%	9%	0%

Table 1: *Object clitics in obligatory environments; elicitation (Schaeffer 2000)*

These patterns are mirrored by the results of the natural production study of Guasti (1994), summarized in Table 2. For these five children under the age of three, clitics were produced in 24-65% of the object positions, with full DP objects being used 29-49% of the time, and objects being omitted altogether 5-35% of the time. Of course, the patterns are a little less clear and easy to interpret here because, presumably, children have the option of avoiding constructions that are problematic for them, which accounts for the lower rate of object omission in these data, for example. Finally, we should also note that although we have chosen to concentrate on Italian data here, the patterns produced in early French and Catalan are very similar.

Italian	Object clitics	Full DPs	Omissions	Other
Martina 1;8-2;0	16/63	22/63	22/63	3/63
Martina 2;1-2;7	76/204	100/204	20/204	8/204
Diana 1;10-2;0	5/21	8/21	3/21	5/21
Diana 2;1-2;6	170/315	127/315	16/315	2/315
Guglielmo 2;2-2;7	76/123	36/123	8/123	3/123

Table 2: *Object clitics in natural production data (Guasti 1994)*

Pattern II is produced when object clitics are not problematic for young children, that is, when their grammars are capable of generating clitic constructions. This ability manifests itself in a number of specific ways, listed in (10). Children who have the ability to generate clitic constructions will not be forced to omit object clitics in obligatory environments, a pattern that will be revealed by elicited production experiments in which the interpretation of the direct objects is controlled. Because clitic constructions can be generated without problems, young children acquiring Pattern II languages will have no reason to avoid them, and will begin producing them early, a pattern that will be revealed by corpus analysis and longitudinal studies. Finally, the use of definite nominals as direct objects will be fairly low, since these nominals will not be produced in situations where clitics are more appropriate. This pattern is likely to be revealed in elicited production studies that manipulate the interpretation of the direct object so that the use of clitics is most appropriate.

(10) Pattern II (Spanish, Greek)<sup>3</sup>

- a. A low rate of object clitic omission in obligatory environments;
- b. Relatively early appearance of object clitics in natural production data;
- c. Relatively low use of definite direct objects.

The contrast between Pattern I and Pattern II is illustrated very clearly by the results of the elicited production study of Wexler, Gavarró, and Torrens (2003), summarized in Table 3. The results of this study are particularly striking because it utilized the same experimental procedure to test the ability to use clitic constructions in young children learning Spanish and Catalan, languages that show Pattern II acquisition and Pattern I acquisition,

<sup>3</sup> Available acquisition studies have mostly examined clitic acquisition in Romance languages, but these two patterns are not to be understood as being confined to Romance languages only, cf. evidence from Greek (Tsakali and Wexler 2003).

respectively. Although young Catalan children clearly have problems producing object clitics in obligatory environments (for two year olds, the rate of production is only 11 clitics in 62 positions, for three year olds, it is 60 clitics in 86 positions), young Spanish children showed no difficulty producing object clitics in the same contexts (for two year olds, the production rate is 58 clitics in 64 positions and for three year olds, it is 78 clitics in 80 positions). Similarly, young Catalan children showed a very high rate of object omission (49 omissions in 62 positions for two year olds and 19 omissions in 86 positions for three year olds), but young Spanish children produced almost no omitted objects in the same environments (5 omissions in 64 positions for two year olds and 1 omission in 80 positions for three year olds). These results make the existence of two very different patterns of linguistic development extremely clear.

Spanish vs. Catalan	Object clitic	Full DP object	Object omission
Catalan 1-2 year olds	11/62	2/62	49/62
Catalan 3 year olds	60/86	7/86	19/86
Catalan 4-5 year olds	85/94	4/94	7/94
Spanish 2 year olds	58/64	1/64	5/64
Spanish 3 year olds	78/80	1/80	1/80
Spanish 4 year olds	80/80	0/80	0/80

Table 3: *Object clitics in obligatory environments; elicitation (Wexler, Gavarró and Torrens 2003)*

The study described above provides evidence for the view that Spanish is a Pattern II language. Additional evidence for the finding that object clitics are not problematic in early Spanish can be found in the study of Lyzcskowski (1999), which examined natural production data of three young Spanish-learning children. Table 4 summarizes the results of this study. Crucially, object clitics were produced at a fairly high rate from a very young age (121 clitics in 415 object positions for the younger ages and 105 clitics in 279 object positions for the older ages) and the rate of object omission was quite low (6 omissions in 415 positions for the younger ages and 6 omissions in 279 positions for the older ages). Although given the nature of these data it is not possible to calculate how many of the object positions were obligatory clitic environments, the high rate of clitic production taken together with the low rate of object omission suggests that clitic constructions do not cause any problems for these children.

Spanish	Object clitics	Full DPs	Clitic doubling	Object omission
1;8-2;6 N=3	121/415	264/415	10/415	6/415
2;7-3;1 N=3	105/279	156/279	11/279	6/279

Table 4: *Object clitics in natural production data (Lyczkowski 1999)*

Having sketched the properties of clitic constructions characteristic of Pattern I and Pattern II languages, we are now in a position to review what we know about the acquisition of object clitics in Romanian, with an eye to determining which pattern of acquisition is shown by this language.

### 3.2 *Object Clitics in Early Romanian: Previous Studies*

To our knowledge, only one study of the acquisition of direct object clitics in Romanian has been conducted previously, that of Avram (1999). In our terms, the main finding of this study is that early Romanian follows Pattern I, i.e., object clitics are problematic for young children. Thus, at a time when the child's grammar is adult-like in most respects, object clitics are omitted quite frequently, so that Romanian children are described as going through an optional clitic stage.

In this section we go over the experiment on which this conclusion is based in some detail, since it becomes important below. The experiment was conducted in two sessions, with 11 monolingual Romanian children, aged 2;1 – 4;5, participating in session 1, and 14 monolingual Romanian children, aged 2;1-5;0, participating in session 2 (9 children participated in both sessions). Two experimental tasks were used in both sessions to test the children's ability to produce clitics. The first of these was a standard elicited production task, exemplified in (11). In this task, a short story is acted out in front of the child, and then the experimenter asks the child a question about the content of the story, with the expected reply containing a direct object clitic in both present and past tense contexts. Session 1 contained 10 tokens of story-question combinations, and session 2 contained 14 tokens. Each participant in the experiment was exposed to each story and elicitation question.

(11) Sample elicitation questions (Task 1, Sessions 1 and 2, Avram 1999):

a. *Question:*

Ce a făcut câinele cu oaia  
 What has done dog-the with sheep-the  
 și cu vaca?  
 and with cow-the

“What did the dog do with the sheep and with the cow?”

*Expected:*

le- a speriat  
 them-F-ACC has frightened  
 “He frightened them.”

*Child:*

\*a speriat  
 Has frightened

b. *Question:*

Ce face câinele cu oaia și cu vaca?  
 What does dog-the with sheep-the and with cow-the  
 “What does the dog do with the sheep and with the cow?”

*Expected:*

le sperie  
 Them-F-ACC frightens  
 “He’s frightening them”

*Child:*

o sperie  
 Her-F-ACC frightens  
 “He is frightening her.”

The second elicitation task consisted of questions asked about the content of fairy tales assumed to be familiar to the children participating in the experiment. In this task, the expected reply contains a direct object clitic with the verb occurring in the past tense. Table 5 provides a summary of the results of this experiment. Clearly, the rate of object omission is quite high, so Avram’s conclusion about the acquisition of clitic constructions in Romanian is understandable. However, two points need to be made in relation to these results that make this conclusion less plausible. First, the response rate is extremely low (48% for Session 1 and 50% for Session 2) and the omission rate is high even for 4 and 5 year olds, suggesting that experimental confounds are present, so that the elicitation procedure is not working successfully. Of course, if that is the case, it is important to ask whether the problematic procedure is uncovering the real patterns or not.

Second, although Avram (1999) concludes that clitic omission by Romanian children is comparable to clitic omission by French and Italian children, the numbers reported in Table 5 suggest that the youngest Romanian children are significantly more successful than Italian or French children at producing clitics in obligatory environments. Thus, Italian two year olds omit object clitics in 65% of obligatory environments (see Table 1), but Romanian two year olds omit clitics in only 17-43% of such environments.<sup>4</sup> This difference, quite mysterious if we assume that Romanian belongs to Pattern I, also suggests that the results of this experiment do not form a clean, expected pattern and may deserve closer scrutiny.

Romanian	Session 1		Session 2	
	Overall omission	Average omission	Overall omission	Average omission
2 years	1/4	17% (N=2)	14/21	43% (N=3)
3 years	11/61	15% (N=7)	21/72	30% (N=7)
4+ years	5/15	64% (N=2)	3/41	10% (N=4)
Total	17/80	27.5% (N=11)	38/134	31.3% (N=14)

Table 5: *Clitic omission based on age (calculated from individual data provided in Avram 1999)*

#### 4. *Explaining Cross-linguistic Variation in Clitic Acquisition Patterns*

In this section, we provide an overview of the theory that we plan to use to explain the existence of cross-linguistic variation in the acquisition patterns of the clitic constructions in Romance languages, describing its predictions for the Romance languages discussed in the previous section.<sup>5</sup>

The existence of the two patterns of clitic acquisition can be accounted for by the proposal based on the UCC Hypothesis, originally developed to deal with the Optional Infinitive stage of language acquisition (Wexler, 1998, to appear). The UCC Hypothesis, given in (12), states that, at the relevant stage of

<sup>4</sup> In fact Avram's (1999) results with Romanian children are not comparable with Schaeffer's (2000) Italian results at any age. Thus, while the Italian 4 year olds exhibit no clitic omissions (see Table 1), Avram's (1999) 4 year olds omit clitics 10% to 64% of the time (see Table 5). This further indicates possible experimental confounds in Avram's (1999) study, rather than clearly demonstrating that Romanian is a Pattern I language.

<sup>5</sup> This theory has been previously proposed to explain the difference between for instance Spanish and Catalan (cf. Wexler et al. 2003).

linguistic development, the grammar does not permit nominal elements (DPs) to check their DP features against more than one functional element. Simplifying somewhat, this constraint states that within early grammars, a nominal cannot move through more than one functional projection in the course of the derivation. The principle of Minimize Violations (MV) determines which derivations will be considered grammatical, stating that the derivation that violates the least number of grammatical principles (such as the UCC or the EPP) will be pursued.

(12) Unique Checking Constraint (UCC):

The D-feature of DP can only check against one functional category.

(13) Minimize Violations (MV):

Given an LF, choose a numeration whose derivation violates as few grammatical properties as possible. If two numerations are both minimal violators, either one may be chosen.

[Wexler 1998: 59]

With this basic description of the framework in place, let us see how it applies to the object clitic constructions under consideration. We adopt the analysis of clitic constructions developed in Sportiche (1996), within which accusative clitics are derived as shown in (14):

(14) a. base-generated structure:

[<sub>CIP</sub> [ **object clitic** ] [<sub>Ag<sub>r</sub>OP</sub> [ AgrO ] [<sub>VP</sub> V [<sub>DP</sub> **pro** ]]]]

b. surface structure of a language with participle agreement (e.g. French, Italian):

[<sub>CIP</sub> **pro**<sub>i</sub> [ **object clitic** ] [<sub>Ag<sub>r</sub>OP</sub> **t**<sub>i</sub> [ AgrO ] [<sub>VP</sub> V [<sub>DP</sub> **t**<sub>i</sub> ]]]]

c. surface structure of a language without participle agreement (e.g. Spanish):

[<sub>CIP</sub> **pro**<sub>i</sub> [ **object clitic** ] [<sub>Ag<sub>r</sub>OP</sub> [ AgrO ] [<sub>VP</sub> V [<sub>DP</sub> **t**<sub>i</sub> ]]]]

Under this analysis, the object clitic is base-generated as a head of a functional projection referred to as CIP in the diagram above. Another element, the associate of the clitic, is generated in the direct object (complement of the verb) position and has to undergo raising to the position of (Spec, CIP) in the course of the derivation, where it has to enter into a feature-checking relation with the clitic. In “standard” clitic constructions, the clitic associate is a *pro*, which undergoes overt movement to CIP, and in constructions with clitic



doubling, the clitic associate is a full lexical DP, which undergoes cover movement to this position.

Crucially, in languages with participle agreement, the *pro* associate has to move through the Specifier of AgrOP on its way to CIP (for justification, see Kayne 1989). This means, that this nominal must move through two functional projections (AgrOP and CIP), checking its D-feature against two functional elements (AgrO and Cl) and thus violating the UCC. In contrast, in languages lacking participle agreement, the *pro* associate does not move through the Specifier of AgrOP on its way to CIP. Thus, it moves through only one functional projection (CIP), checking its D-feature against only one functional element (Cl) and not violating the UCC.

At the stage of development where the grammars are constrained by the UCC, children acquiring languages with participle agreement will be forced to deviate from adult grammars in one of two ways: either omitting the CIP (and, therefore, the clitic) or omitting the AgrOP, which will produce a caseless *pro* and, most likely, crash the derivation. A further option available to them is to choose to utilize a different construction, one containing a full DP object, rather than a clitic with an associate. Although this choice will result in a derivation that does not violate the UCC or any other principle of grammar, it will also force the child to use a construction that is not appropriate, given the discourse and the conversational context. In contrast, children acquiring languages without participle agreement will not be forced to deviate from adult grammars and will be able to produce clitic constructions when required.

To conclude, based on the UCC Hypothesis, we expect object clitics to be problematic in French, Italian, and Catalan, languages that show participle agreement. However, we expect object clitics to be unproblematic in Spanish and Romanian, languages without participle agreement. Although most of these expectations are fulfilled (for discussion see Tsakali and Wexler 2003), the acquisition pattern attributed to early Romanian in Avram (1999) is in conflict with the predictions of this theory, a situation that prompted us to design a study that could clarify the status of clitic constructions in child Romanian, determining once and for all whether it is truly in conflict with the theory or not.

## 5. *Present Study*

The main goal of our experiment was to study the acquisition of object clitics in early Romanian in a systematic and thorough fashion, examining a range of distinct environments and conducting the experiment with a large number of children. In addition, we designed the study so that it would address several potential confounds in previous research. More specifically, we were

concerned with correcting three issues that may have affected the reliability and interpretability of the results in the study of Avram (1999). First, Avram's experiment has few conditions, as well as few tokens of each condition, with some questions relying on children's previous knowledge of specific fairy-tales. As a result, the response rate within the experiment is extremely low, which makes it difficult to judge whether the pattern of responses would be valid across children, specific constructions and even specific sentences being tested. Second, the experiment tested only a small number of children, i.e. 3 two year olds and 7 three year olds. This issue also makes it difficult to judge how general the pattern of responses is, thus reducing the validity of the conclusions. Third, we had concerns about the form of the questions used in this experiment to elicit a reply with a clitic. As the example in (11) demonstrates, the format of the question was *What did X do with Y*, and in our pilot study this question format was shown to elicit intransitive responses in both children and adults, thus producing a syntactic and discourse environment in which direct object clitics are optional, rather than obligatory. Of course, clitic omission in these optional environments cannot be interpreted as evidence for the unavailability of the clitics in early grammars.<sup>6</sup>

The current study addressed these issues in the following fashion: it included a large number of distinct conditions (8 conditions to be discussed shortly) as well as a relatively large number of tokens of each condition (4 tokens each), so that there was an excellent chance of uncovering the general underlying pattern of responses. Furthermore, we tested more children for each age group, 12 two year olds and 13 three year olds. Finally, we utilized a different question form: *What did X do to Y?*, shown by the pilot experiment to result in more transitive responses, and which additionally made our study comparable to other cross-linguistic studies, which all used a question of the type *What did X do to Y?*, rather than a question of the type Avram (1999) used. These manipulations of the experimental design were successful, in the sense that significantly more relevant responses were produced for each child (an average of 81% of the targeted tokens in our experiment vs. 48-50% in the previous study).

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<sup>6</sup> The clitic acquisition studies in Italian, Catalan and Spanish did not use the question format *What did X do with Y?*, so the same disclaimer cannot apply to these studies. Rather, all these studies used a question of the type *What did X do to Y?* (cf. Schaeffer 2000, Wexler et al. 2003).

### 5.1 *Materials*

As mentioned above, the experiment contained 8 conditions, with 4 tokens of each, which resulted in a total of 32 elicitation stories, each of which contained a different obligatorily transitive verb. The different conditions are summarized in Table 6. We varied the tense of the question/target sentence (past tense vs. present tense), the gender of the direct object (feminine vs. masculine), and the type of direct object (definite DP vs. proper name). The constructions produced by the manipulation of these factors were described in Section 2. Very briefly, we were interested in manipulating the tense and gender of the object clitic in the anticipated response because the position of feminine clitics in past tense utterances is distinct from the position of all other clitics (see Section 2 for discussion). In addition, by including target sentences with proper name objects, we included environments in which a clitic of some kind is obligatory, since an appropriate response here could be either a simple clitic construction, or a construction in which a proper name object is doubled by a clitic (see Section 2 for a description). Thus, we had an opportunity to compare structures in which using a clitic is optional in syntactic terms, although obligatory in discourse terms (i.e., the definite DP conditions), with structures in which using the clitic is obligatory in both syntactic and discourse terms (i.e., the proper name conditions).

	Definite DP		Proper Name	
	Feminine	Masculine	Feminine	Masculine
Present	4	4	4	4
Past	4	4	4	4

Table 6: *Summary of conditions*

The experiment utilized a single elicitation task, one that was based on Schaeffer (2000) and modified to accommodate the properties of Romanian clitic constructions. An example of the elicitation procedure is given in (15). In this task, the experimenter uses props to act out a simple story in front of the child, describing what is happening. After the description is completed, the experimenter asks the child to explain what happened to a puppet that is present but not paying attention. If the elicitation is successful, the child produces a description containing a transitive verb and (possibly) a clitic object, as shown in (15a). However, if the child does not respond, or uses a wrong (not obligatorily transitive) verb in the response, the experimenter

prompts the child again, asking him/her to correct the puppet, as shown in (15b). This procedure was successful 81% of the time.

(15) Model elicitation - Past masculine definite NP

*Experimenter:* Uite avem aici un dinozaur fioros, și uite se vede o codiță de șarpe din gura lui, șarpele a fost înghițit. E clar că ceva s-a întâmplat, dinozaurul i-a făcut ceva la șarpele ăsta. Zi-i la marionetă  
 “Look, here we have a fierce dinosaur and look there’s a snake’s tail hanging from his mouth, the snake was swallowed. It is clear that something happened, the dinosaur did something to this snake. Tell the puppet,”

Ce i- a făcut dinozaurul la șarpe?  
 What him-DAT has done dinosaur-the to snake?  
 “What did the dinosaur do to the snake?”

a. *Child:* l-a înghițit/mâncat  
 him-ACC-has swallowed/eaten  
 “He swallowed/ate him.”

b. *If the child does not answer or does not know the answer:*

*Experimenter:* let’s see if the puppet knows

*Puppet:* eu cred că dinozaurul a turtit șarpele  
 I think-1sg that dinosaur-the has flattened snake-the  
 “I think the dinosaur flattened the snake.”

*Experimenter:* nu, nu-i adevărat, șarpele nu e turtit, e înghițit  
 “That’s not true, the snake is not flattened, he is swallowed”

Zi- i tu la marionetă,  
 Tell-2SG-IMP her-DAT you to puppet  
 “You tell the puppet,”

ce i- a făcut dinozaurul  
 what him-DAT- has done dinosaur-the  
 la șarpe?  
 to snake?  
 “What did the dinosaur do to the snake?”

*Child:* l- a înghițit/mâncat  
 him-ACC- has swallowed/eaten  
 “He swallowed/ate him”

### 5.2 *Subjects*

The experiment was conducted with 25 monolingual Romanian children, aged 2.0 - 3.10, recruited from two Romanian kindergartens in a Southeastern Transylvanian city; they were recorded using a digital SONY Minidisc recorder. The experiment was conducted in a kindergarten classroom, either in a separate room or in a separate corner of the common room if a spare room was not available.

The children fall in two age groups: 12 children between the ages of 2;0 and 2;11 (mean age 2;5) and 13 children between the ages of 3;4 and 3;10 (mean age 3;6). In addition to considering the results we got for the two age groups, we also report the results we got for groups based on MLUs. The children were divided into 2 MLU groups: 7 children with MLU less than 2 and 18 children with MLU over 2. The MLU was calculated in terms of words, rather than morphemes, and only sentences that did not contain clitics (and should not have contained clitics) were used in the calculation, to avoid circularity.

### 5.3 *Results*

In this section we report the results of the experiment, noting both the more general and the more specific patterns that can be discerned in the numbers. Table 7 gives the results, both in raw overall numbers and in average percentages across children, broken down by the age of the subject (two year olds vs. three year olds) as well as by the MLU of the subject (MLU < 2.0 vs. MLU > 2.0).<sup>7</sup>

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<sup>7</sup> Two points need to be noted about our counting procedure. First, in cases where children produced more than one response, if a child corrected herself without interruption from the experimenter, the later corrected answer was counted, but if such correction occurred after experimenter's intervention, the very first answer was counted. Second, in cases where the answer contained a verb that did not appropriately describe the action in the story, the responses were included in the counts if the verb had the desired syntactic characteristics, i.e., was transitive.

Romanian	Object clitic	Full DP object	Object omission
2 year olds N=12 (MLU 2.05)	94/193 38%	3/193 2%	96/193 60%
3 year olds N=13 (MLU 3.7)	361/387 93%	2/387 0.5%	24/387 6.5%
<2 MLU N=7 (Age 2;7)	25/104 16%	1/104 2%	78/104 82%
>2 MLU N=18 (Age 3;3)	430/476 86%	4/476 1%	42/476 13%

Table 7: *Overall results (raw numbers and averages from individual children's performance)*

An examination of the results reported in Table 7 leads to several conclusions. First, it is clear that the rate of clitic production for three year olds, i.e., 93%, is typical of Pattern II languages, where object clitics are not problematic, rather than Pattern I languages, where object clitics cause problems (cf. 62% rate of clitic production found by Schaeffer 2000 for Italian three year olds). Second, the rate of clitic production for two year olds, i.e., 38%, is more difficult to interpret. On the one hand, it is far below the (nearly perfect) performance expected for children acquiring a Pattern II language, but on the other hand, it is also drastically better than the performance of the two year olds acquiring a Pattern I language: thus, the 38% production rate we get is nearly twice as high as the 22% production rate Schaeffer (2000) got for Italian two year olds. Before turning to the task of providing an explanation for this pattern, let us discuss the final notable pattern apparent in the results: full DP responses are extremely low for both age groups, drastically lower than those produced by children learning Pattern I languages. Thus, Romanian two year olds produce full DP objects 2% of the time, while Italian two year olds produce full DP responses 14% of the time; Romanian three year olds produce full DP objects 0.5% of the time, while Italian three year olds produce full DP objects 23% of the time. Clearly, Romanian children are not using the strategy of producing the inappropriate DP response to avoid the problematic clitic constructions. Thus, this diagnostic points to Romanian behaving as a Pattern II language, as well.

So, what should we make of the response pattern produced by the two year old subjects in our experiments? To arrive at an explanation of their mixed and not particularly clear-cut pattern of responses we need to consider the fact that this group of subjects is very young. Crucially, many of the children in this group are not capable of producing utterances of the length required to contain an object clitic. Recall that a present tense utterance containing a clitic must be at least two words long and a past tense utterance containing a clitic must be three words long (see Section 2 for discussion). If a child has to deal with a

production limitation that does not allow her to produce utterances that are at least two words long, then the clitic constructions will not be produced, regardless of whether the grammar is capable of generating the relevant clitic constructions or not. To test this explanation of the performance of the two year old subjects, we need to examine the results broken down by MLU, rather than age. Given our approach, we expect children with MLU less than 2 to show a low rate of clitic production, and children with MLU greater than 2 to show a high rate of clitic production. As the result in Table 7 demonstrate, this is exactly the pattern that is observed: children with MLU less than 2 produce object clitics at the rate of 16%, while children with MLU greater than 2 produce object clitics at the rate of 86%. Thus, we can safely conclude that Romanian is a Pattern II language, within which children produce object clitics freely as soon as they are able to produce utterances that are long enough to contain them.

Let us briefly comment on some more fine-grained patterns shown by the data, specifically, on the question of whether young children show a preference for a specific gender of clitic, type of direct object, or tense of an utterance containing the clitic. Turning to the gender of the clitic first, for the two year old group, we see more correct feminine clitic productions (46% feminine vs. 25% masculine), although there is no general bias towards responding more to feminine conditions (55% of total responses were feminine and 45% were masculine). No gender preference is shown by the three year old group. These findings suggest that young children are doing better with feminine clitics than masculine clitics, even though the placement of feminine clitic is less uniform than the placement of masculine clitics (see Section 2 for discussion). With respect to the tense of the target utterance, for the two year old group, we see more responses in the present tense than the past tense (64% present vs. 37% past), although there is no difference in the rate of correct responses with respect to tense (40% correct present vs. 35% correct past). Once again, no preference is shown by the three year old group. These findings suggest that young children have a preference for present tense utterances independent of the clitic task. Finally, no group of children showed a preference for proper name direct objects as opposed to common noun direct object. Neither was there a difference in the correct response rate based on object type. This demonstrates that Romanian children produce clitics equally successfully in syntactically obligatory and optional environments, just as we would expect if clitics do not cause any problems for these children. In more general terms, we find that although individual children might show a preference for a specific gender, tense, or type of object, the direction of preference is not consistent across children.

## 6. *Conclusions*

Let us summarize the main findings of our study. First, the results of our experiment have demonstrated that early Romanian follows Pattern II, i.e., object clitics are not problematic for young children, being produced freely in obligatory environments. Second, we have shown that the UCC Hypothesis can explain the acquisition of Romanian object clitics. Clitic omissions shown by very young children in this language are not comparable to those observed in Pattern I languages. These omissions are not triggered by the UCC (as in Pattern I languages). Rather, they are due to production limitations, i.e., the inability of very young children to produce utterances of the length required by the clitic constructions.

Although the main findings of the study are quite striking and convincing, the study does have some limitations that must be noted. Because the MLUs were calculated disregarding the experimental utterances (to make sure that the presence or absence of object clitics did not influence this measurement), for some children, MLU was calculated on rather few available independent utterances. Given that at the time of designing the experiment, we had no indication that MLUs might be a relevant factor, we did not include a separate task for collecting utterances that could be used for MLU calculation. One area of future research is going to be focused on devising a version of the experiment that could shed light on the exact nature of this production limitation, for instance, by including a subpart that would provide independent data for MLU measurement. Another direction of research that we plan to pursue is expanding the study to include the production of indirect object (dative) clitics, in addition to direct object clitics, which will allow us to further test the predictions of the UCC Hypothesis.

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# SYSTEMIC MARKEDNESS AND PHONETIC DETAIL IN PHONOLOGY\*

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## 1. *Introduction*

In Articulatory Phonology (Browman & Goldstein 1989, 1990, et seq.), the grammar is assumed to operate on articulatory *gestures*, which are dynamically defined along both spatial and temporal dimensions and produce a constriction in the vocal tract. Bybee (2001) argues that a gestural analysis provides more insightful and coherent descriptions of most phonological phenomena than does an analysis based on features and segments. Many alternations that have previously been explained in discrete, phonological terms can be analyzed in terms of gestural overlap and/or reduction in casual speech. However, the status of gestural representations in the synchronic grammar remains controversial. Should gestures be phonological primitives as well as units of articulation, or is Articulatory Phonology better viewed as a model of phonetic implementation? If gestures are primitives, should they supplant segments or coexist with them? Should the temporal coordination of gestures be specified in underlying representation, or should it be determined by the grammar?

This paper presents a case study of external sandhi in Spanish that bears directly upon these questions. Spanish has a contrast between a tap [ɾ] and trill [r] between vocoids within the morpheme, which is neutralized in coda position. In the northern Peninsular Spanish varieties spoken in the Cantabrian province around Los Montes de Pas and Tudanca, infinitival *-r* is lost before a consonant-initial clitic pronoun or determiner but surfaces as [ɾ] or [r] in other coda environments, depending on the dialect (Penny 1969, 1978). While [ɾ] +

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consonant clusters exhibit an intrusive vowel between the two consonants, other consonants appearing in first position fail to trigger vowel intrusion. The proposed analysis draws upon recent developments in gestural Optimality Theory (Davidson 2003, Gafos 2002, N. Hall 2003), as well as Padgett's (2003a,b,c) version of Dispersion Theory (Flemming 1995). Conflicting gestural constraints generate different patterns of temporal coordination. Minimal overlap produces vowel intrusion in [r<sup>3</sup>C], partial overlap favors unreleased [C<sup>3</sup>C], and complete overlap yields deletion of infinitival *-r* in the appropriate prosodic contexts. The central claim is that the phonology must incorporate phonetically detailed gestural representations in addition to segmental and prosodic structure. In Dispersion Theory, systemic markedness constraints regulate the perceptual distinctiveness of contrasts, making it possible to incorporate phonetic detail without overgenerating contrasts.

This paper is organized as follows. Section 2 presents the Peninsular Spanish data. Section 3 shows how Padgett's (2003c) Dispersion-theoretic analysis of Catalan rhotics also accounts for the patterns of intervocalic contrast and coda neutralization in the two Spanish varieties. Section 4 presents the gestural coordination framework of Gafos (2002) and develops an analysis of consonant cluster realization and of the external sandhi alternation. Section 5 further discusses the role of gestures, segments, and systemic markedness constraints in the phonology, and Section 6 concludes.

## **2. *Rhotic neutralization and external sandhi deletion in Cantabrian Spanish***

Many varieties of Spanish contrast an alveolar tap [r] and trill [r̄] between vocoids within the morpheme (e.g., *ca[r]o* "dear" versus *ca[r̄]o* "car"). The contrast is neutralized elsewhere, with [r̄] appearing in syllable-initial position and [r] in the second position of complex onsets (e.g., [r̄]osa "rose", *hon[r̄]a* "honor" versus *t[r̄]es* "three"). The realization of coda rhotics varies across dialects and speech styles. Penny (1969) notes that in Los Montes de Pas, trills surface frequently in preconsonantal and prepausal position (1a,b). Many of his examples also show coda taps, suggesting free variation.

- |        |                 |           |                      |
|--------|-----------------|-----------|----------------------|
| (1) a. | <i>birlar</i>   | [birlar]  | “to pinch”           |
|        | <i>cuerno</i>   | [kwernu]  | “horn”               |
|        | <i>cerner</i>   | [θirniɾ]  | “to sift, sieve”     |
|        | <i>tierno</i>   | [tjernu]  | “tender”             |
| b.     | <i>escupir</i>  | [iskupir] | “to spit”            |
|        | <i>empallar</i> | [empayar] | “to press the grass” |
|        | <i>afeitar</i>  | [afitar]  | “to shave”           |
|        | <i>calor</i>    | [kaloɾ]   | “heat”               |

In contrast, Penny (1978) does not observe coda trills in the Tudanca variety, and transcriptions consistently show taps before consonants and pause (2a,b).

- |        |                 |           |                 |
|--------|-----------------|-----------|-----------------|
| (2) a. | <i>duerme</i>   | [durme]   | “s/he sleeps”   |
|        | <i>morcilla</i> | [moɾθiya] | “blood sausage” |
|        | <i>verde</i>    | [beɾðe]   | “green”         |
|        | <i>zurdo</i>    | [θuɾðo]   | “left-handed”   |
|        | <i>martes</i>   | [maɾtes]  | “Tuesday”       |
|        | <i>carne</i>    | [kaɾne]   | “meat”          |
| b.     | <i>pajar</i>    | [paʒaɾ]   | “haystack”      |
|        | <i>labor</i>    | [laβoɾ]   | “job”           |
|        | <i>mejor</i>    | [mehoɾ]   | “better”        |
|        | <i>calor</i>    | [kaloɾ]   | “heat”          |

Unlike other Spanish dialects such as Castilian, both the Los Montes de Pas and Tudanca varieties exhibit deletion of infinitival *-r* before clitic pronouns (3a) and before definite articles heading a following noun phrase (3b).

- |        |                  |            |                      |
|--------|------------------|------------|----------------------|
| (3) a. | <i>ahogarme</i>  | [axweɣame] | “to drown me”        |
|        | <i>medirlo</i>   | [miðilu]   | “to measure it”      |
|        | <i>cansarse</i>  | [kansase]  | “to tire”            |
|        | <i>reírnos</i>   | [rinus]    | “to laugh”           |
|        | <i>lavarvos</i>  | [laβaβos]  | “to wash yourselves” |
|        | <i>contarlos</i> | [kotalus]  | “to count them”      |
|        | <i>quitarlas</i> | [kitalas]  | “to take them off”   |
| b.     | <i>pintar la</i> | [pinta la  | “to paint the        |
|        | <i>pared</i>     | paɾeð]     | wall”                |
|        | <i>se va a</i>   | [se βa:    | “the fruit is going  |
|        | <i>podrir la</i> | puðɾi la   | to rot”              |
|        | <i>fruta</i>     | fruta]     |                      |

<i>comer los</i>	[kome luz	“to eat the eggs”
<i>huevos</i>	yweβus]	
<i>cocer las</i>	[koθe las	“to cook the
<i>patatas</i>	patatas]	potatoes”

Rhotic deletion in (3b) requires that the following determiner begin with a consonant. In standard Spanish, the masculine singular definite article is vowel-initial /el/. This form alternates with the allomorph /l/ in Cantabrian dialects, as well as other Leonese varieties spoken in northwestern Spain. Infinitival *-r* deletes before the consonant-initial allomorph in (4a) but is retained before the vowel-initial one in (4b) (Penny 1969: 58, 176).

(4) a.	<i>destorcer</i>	[destorθe	“to shake the tail”
	<i>el rabo</i>	l raβu]	
	<i>poner</i>	[pone	“to put the stew on”
	<i>el cocido</i>	l kuθiu]	
b.	<i> echar</i>	[etʃar	“to add the litre of
	<i>el litro</i>	el litru	oil”
	<i>de aceite</i>	ðj aθajte]	
	<i>coger el</i>	[koxer el	“to take the live
	<i>sapo vivo</i>	sapu βiβu]	toad”

While deletion is for the most part systematic, Penny’s phonetic transcriptions suggest that the process may in fact be optional for at least some speakers. The examples in (5), from Penny (1969: 176), show one of his informants from San Pedro del Romeral (southern Los Montes de Pas) pronouncing infinitival *-r* as a trill before a clitic pronoun.

(5)	<i>meterle en</i>	[meterle en	“to put it in
	<i>el puchero</i>	el putʃero]	the cooking pot”
	<i>tenerle</i>	[tenerle	“to keep cooking
	<i>cociendo</i>	kuθjendu]	it”

Rhotic deletion is a synchronic process because underlying infinitival *-r* surfaces intact outside of the triggering environments. In addition to the context (4b), deletion fails to apply before consonant-initial words (6a), before vowel-initial words (6b), and in prepausal position (6c).

- (6) a. *venga a da[r] vueltas* “it keeps spinning”  
*hace[r] mañana una labor* “to do a job tomorrow”  
 b. *para mete[r] otro* “to put another”  
*tengo que hace[r] esto* “I have to do this”  
 c. *solo lo vas a hace[r]* “Will you do it alone?”  
*ha quedado a veni[r]* “has agreed to come”

In sum, Spanish rhotics contrast between vowels but are neutralized in coda position. Cantabrian Spanish varieties show an external sandhi alternation in which infinitival *-r* optionally deletes before consonant-initial clitics and determiners. In the next section, I present a Dispersion-theoretic account of rhotic contrast and neutralization.

### 3. *Dispersion Theory and the Spanish rhotic contrast*

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). Bradley (2001) applies DT to Ibero-Romance rhotics and situates Spanish within a broader typology of languages with tap-trill contrasts. Drawing upon this analysis, Padgett (2003c) develops a different account for Catalan. In this section, I apply Padgett’s approach to the patterns of contrast and neutralization observed in Cantabrian Spanish rhotics.<sup>1</sup>

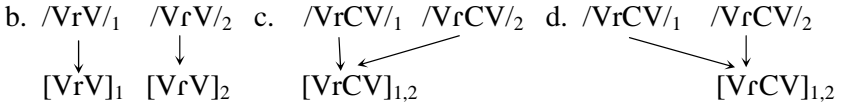
In standard OT, single input-output mappings are evaluated to optimize single words as outputs. In DT, contrast is a systemic notion requiring evaluation not of isolated forms but of the larger system of contrasts in which those forms exist. Sound patterns are explained by interaction among four basic imperatives: (a) avoid neutralization, (b) maximize the perceptual distinctiveness of contrast, (c) be faithful to underlying specifications, and (d) minimize articulatory effort.

Padgett (2003a,b,c) formalizes neutralization avoidance as a systemic faithfulness constraint, illustrated in (7). \*MERGE evaluates *sets* of input-output mappings of idealized word shapes, which are tagged by subscripts. The sets in (7b-d) contain only two mappings since the relevant contrast is between a tap and trill. The fully-faithful mapping in (7b) satisfies \*MERGE because the

<sup>1</sup> Padgett (2003c) distinguishes between a strong trill [r:] and a weak trill [r] in Catalan, but I collapse the two here, since the “analysis would work reasonably well without this extra detail” (p. 1). Also, see Padgett (2003c) and Bradley (In press) for arguments favoring the DT approach to Spanish rhotics over previous generative accounts. Space limitations prevent such a comparison here.

inputs /VrV/<sub>1</sub> and /VrV/<sub>2</sub> remain distinct in the output. (7c,d) violate \*MERGE because two words neutralize to one.

(7) a. \*MERGE: No output word has multiple input correspondents.



The second type of DT constraint, systemic markedness, regulates the perceptual distinctiveness of contrasts. Padgett (2003c) proposes the constraint in (8), which requires a rhotic contrast to be at least as perceptually distinct as it is between two vowels.

(8) SPACE<sub>R</sub>: Potential minimal pairs differing in R differ at least as much as r-r do between vowels.

'R' is a cover symbol denoting the auditory properties that distinguish taps from trills, such as duration and the presence of trilling-like noise. These properties are more available in intervocalic position. See Padgett (2003c) for discussion, as well as Bradley (2001) for typological support in favor of the superiority of intervocalic position. Since (8) is violated once for each pair of output words that attempts a tap-trill contrast in non-intervocalic position, the constraint allows contrast in (7b) but requires neutralization in (7c,d).

Neutralization avoidance and perceptual distinctiveness work in tandem with the non-systemic faithfulness and markedness constraints of standard OT. The present analysis requires the constraints in (9).

(9) a. IDENT(R): Corresponding input and output segments are identical in R.

b. \*r

c. \*r̥

IDENT(R) favors identity between input and output rhotics. This constraint overlaps somewhat with neutralization avoidance in that a violation of \*MERGE entails a violation of IDENT(R). However, non-systemic faithfulness is also necessary in order to keep input rhotics from switching in the output, i.e., /VrV/<sub>1</sub>, /VrV/<sub>2</sub> → [VrV]<sub>2</sub>, [VrV]<sub>1</sub>. The markedness constraints in (9b,c) 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 entails some degree of articulatory effort. For more on the articulatory characteristics of taps and trills, see Blecua (2001) and Bradley (2001). As shown in Tableau 1, the ranking of faithfulness above articulatory markedness constraints guarantees a contrast between [r] and [r̥] in intervocalic position. \*MERGE rules out candidates (c,d) of Tableau 1 because they neutralize the input contrast. The decision is passed to IDENT(R), which selects the fully faithful mapping in (a) of Tableau 1.

	/VrV/₁	/VrV/₂	*MERGE	IDENT(R)	*r̥	*r
a.	[VrV]₁	[VrV]₂			*	*
b.	[VrV]₂	[VrV]₁		*!*	*	*
c.	[VrV]₁,₂		*!	*		*
d.	[VrV]₁,₂		*!	*	*	

Tableau 1: *Faithfulness outranking articulatory markedness*

The optimal output expresses the generalization that in Spanish, surface words can be contrastive based on a difference between [VrV] and [Vr̥V], where the exact nature of V is irrelevant. Accidental gaps in the lexicon are, of course, possible. For example, *perro* “dog” and *pero* “but” form a minimal pair, but *acera* “sidewalk” cannot because the form \**acerra* is not an actual word in Spanish. 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 (7b-d) 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 in DT.

To account for the neutralization of coda rhotics in (1) and (2), systemic markedness must outrank faithfulness. The contrasts attempted in Tableau 2 (a,b) violate SPACE<sub>R</sub> because they are not perceptually distinctive enough in non-intervocalic position. Since the remaining candidates tie on faithfulness, both are possible winners depending on the ranking of non-systemic markedness constraints. The ranking of \*r̥ » \*r favors trills in Los Montes de Pas (c) of Tableau 2, whereas the opposite ranking favors taps in Tudanca candidate (d). The analysis of word-final codas would work the same as in Tableau 2, with both [Vr#] and [Vr̥#] as possible winners.



	/VrCV/₁	/VrCV/₂	SPACE <sub>R</sub>	*MERGE	IDENT(R)	*f	*r
a.	[VrCV]₁	[VrCV]₂	*!			*	*
b.	[VrCV]₂	[VrCV]₁	*!		**	*	*
☞ c.	[VrCV]₁,₂			*	*		*
☞ d.		[VrCV]₁,₂		*	*	*	

Tableau 2: *Systemic markedness outranking faithfulness*

Cases of free variation in Los Montes de Pas can be accounted for by leaving articulatory markedness constraints unranked. Since [VrC], [VrC], [Vr#], and [Vr#] would all be possible outputs under such a ranking, one might expect to find any combination of these shapes in the realization of actual words. This accounts for the simultaneous appearance of prenasal trills and word-final taps, even within the same word, e.g., *birlar* [birlar] “to pinch” and *cerner* [θirɲir] “to sift, sieve” in (1a).

#### 4. *Spanish clusters and Cantabrian external sandhi*

Let us examine the realizations of Spanish consonant clusters in greater phonetic detail. It has long been noted that the alveolar tap /r/ appearing in a consonant cluster is usually accompanied by an intrusive vocalic element (Gili Gaya 1921, Lenz 1892, Malmberg 1965, Navarro Tomás 1918, Quilis 1988). In a recent typological survey, N. Hall (2003) classifies Spanish as a language in which /r/ is the only consonant to trigger vowel intrusion. Compare (10a), with intrusive [ʷ], and (10b-e), in which there is no audible release between the consonants.

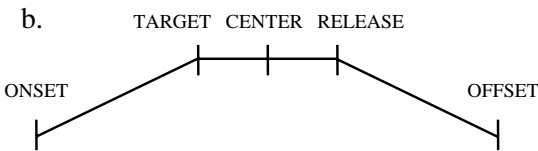
- (10) a. *arma* [arʷma] “weapon”  
 b. *arma* [arᶦma] “weapon”  
 c. *alma* [alᶦma] “soul”  
 d. *ambos* [amᶦbos] “both”  
 e. *apto* [apᶦto] “suitable, fit”

Penny (1969, 1978) does not specifically mention intrusive vowels in the Cantabrian dialects under consideration. However, subsegmental aspects of phonetic detail are typically omitted from general descriptive grammars, and transcriptions do not always indicate the type of transition occurring between two consonants. Based on an extensive acoustic study of Peninsular Spanish rhotics, Blecia (2001) concludes that vowel intrusion is an inherent characteristic of taps but fails to appear with prenasal trills. Therefore, I

transcribe the clusters in (2a) and (6a) as [r<sup>ə</sup>C] and those in (1a) and (5) as [r<sup>ɪ</sup>C].

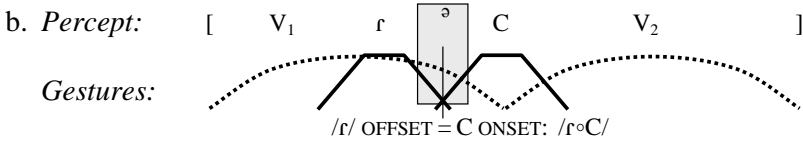
Articulatory Phonology provides an attractive account of vowel intrusion in terms of the temporal coordination of adjacent consonant gestures. According to Steriade (1990), vowel intrusion results when an overlapping vowel gesture is heard during the open transition between two consonants. Languages vary systematically in the classes of consonants triggering vowel intrusion (N. Hall 2003). Such variation can be captured in the constraint-based framework developed by Gafos (2002). He proposes that gestural coordination is determined by alignment constraints of the form (11a), which make reference to temporal landmarks during the activation period of a gesture, shown in (11b):

- (11) a. Align( $G_1$ , landmark<sub>1</sub>,  $G_2$ , landmark<sub>2</sub>):  
 Align landmark<sub>1</sub> of gesture<sub>1</sub> with landmark<sub>2</sub> of gesture<sub>2</sub>.



Researchers working within this framework have posited coordination relations for CV, VC, CC, and VV sequences (Davidson 2003, Gafos 2002, N. Hall 2003). I propose that an analysis of Spanish clusters requires the constraint in (12a), which specifies an OFFSET = ONSET coordination relation in /rC/ sequences. This ensures an open articulatory transition between /r/ and the following consonant, which I represent symbolically as /r<sup>ə</sup>C/. Open transition allows the final portion of the tautosyllabic V<sub>1</sub> gesture to be perceived on the opposite side of the tap constriction as an intrusive vowel, indicated by the shaded box in (12b). It is important to note that the intrusive vowel is not part of the formal representation of segments. Rather, it is the acoustic consequence of the open articulatory transition between adjacent oral constriction gestures. (The gesture/segment distinction is further discussed in Section 5.)

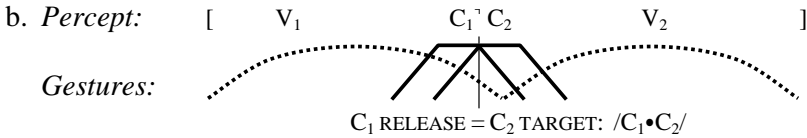
- (12) a. Align(/r/, offset, C, onset) — rC-Coord:  
 In a sequence /rC/, align the offset of /r/ with the onset of C.



In contrast, (13a) favors a RELEASE = TARGET coordination relation in which C<sub>1</sub> is unreleased. Close transition, denoted by /C<sub>1</sub>•C<sub>2</sub>/ in (13b), prevents vowel intrusion.

(13) a. Align(C<sub>1</sub>, release, C<sub>2</sub>, target) — CC-Coord

In a sequence /C<sub>1</sub>C<sub>2</sub>/, align the release of C<sub>1</sub> with the target of C<sub>2</sub>.



The ranking of rC-COORD » CC-COORD captures the fact that in Spanish, /rC/ exhibits open transition and vowel intrusion, while other clusters do not. N. Hall’s (2003) survey shows that across languages, vowel intrusion happens more with liquids than with other sonorants, and more with rhotics than laterals, except the alveolar trill. Cross-linguistic differences among vowel intrusion triggers can be captured by a universal hierarchy of constraints like (12a), each relativized to a different sonorant class. The ranking of (13a) with respect to this hierarchy would distinguish consonants that trigger vowel intrusion from consonants that favor close transition.<sup>2</sup>

Recall that in Cantabrian Spanish, infinitival *-r* is subject to optional deletion before consonant-initial clitics and determiners but that otherwise a rhotic is either a tap or trill in coda position. I assume that enclitics are adjoined to the prosodic word (PW) to form an outer PW (Loporcaro 2000, Selkirk 1995). This allows rhotic deletion before clitics to be characterized in prosodic terms as a domain-span rule applying to derived clusters within the PW. Consider the morphological and prosodic structure of the following input-output pairs, in which ‘R’ stands for both the tap and trill:

<sup>2</sup> This proposal diverges from N. Hall (2003: 28-30), who posits a hierarchy of constraints penalizing the overlap of different types of consonant gestures by a tautosyllabic vowel gesture.

- (14) a. /duRme/  
 (duRme)<sub>PW</sub>                    *duerme*                    “s/he sleeps”
- b. /axwegaR+me/  
 ((axweɣaR)<sub>PW</sub>me)<sub>PW</sub>                    *ahogarme*                    “to drown me”
- c. /daR bweltas/  
 (daR)<sub>PW</sub>(βweltas)<sub>PW</sub>                    *dar vueltas*                    “to spin”

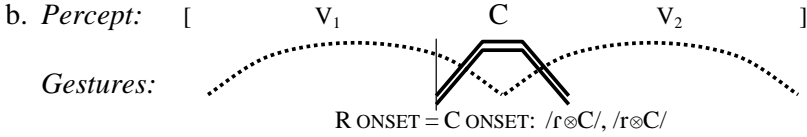
The cluster in (14a) appears within the same PW in the output, and the one in (14b) is also internal to the outer PW created by clitic adjunction. However, rhotic deletion can affect only the derived cluster in (14b). In contrast, deletion cannot apply in (14c) because the derived cluster is not internal to the same PW.

How is the loss of infinitival *-r* in (14b) to be accounted for? Formal analyses of sandhi processes typically invoke spreading and/or delinking operations, the result of which is a categorical change in the associations among autosegments. A conventional view of segment deletion would involve the removal of a timing slot, resulting in the categorical absence of the segment from the phonological surface representation. However, Browman & Goldstein (1990) argue that in many cases of optional consonant deletion, an account in terms of gestural overlap is preferable. As an example, they cite the deletion of English final /t/ in the casual speech forms [mʌsbi] and [pəˈfɛkmɛm.i] versus the canonical forms [mʌst#bi] *must be* and [pəˈfɛkt#mɛm.i] *perfect memory*, respectively. Articulatory measurements via X-ray pellet trajectories indicate that the tongue tip gesture for /t/ is still present in the casual speech form, although its acoustic effects are hidden due to overlap with the following bilabial closure. The deletion of /t/ is only apparent, since articulatory traces of the consonant remain.

The optionality of infinitival *-r* deletion in Cantabrian Spanish suggests the possibility of an account in terms of perceptual masking. Specifically, I propose the constraint in (15a), which requires an ONSET = ONSET coordination relation in /RC/ clusters that appear in the same PW domain. When ranked above rC-COORD and CC-COORD, this constraint requires complete overlap in such clusters, denoted by /r⊗C/ and /r⊗C/ in (15b).

Since the tautomorphic /RC/ clusters in (14a) are internal to the PW, they, too, fall within the purview of RC-OVERLAP<sub>PW</sub>. The blocking of complete overlap in such clusters is accounted for by a higher-ranked constraint, given in (16), which makes reference to input morphological structure.

- (15) a. Align(R, onset, C, onset) in PW — RC-Overlap<sub>PW</sub>:  
 In a PW-internal sequence /RC/, align the onset of R with the onset of C.



- (16) RECOVERABILITY IN  $\mu$  — RECOV <sub>$\mu$</sub>  (cf. Gafos 2002: 318):  
 In a tautomorphic sequence C<sub>1</sub>C<sub>2</sub>, complete overlap between the associated gestures in the output is prohibited.

The proposal in (15) is consistent with Browman & Goldstein’s account of optional deletion in external sandhi, whereby the final consonant gesture is still present but perceptually hidden. Such an explanation is based on the hypothesis in Articulatory Phonology that casual speech alternations involve changes in the magnitude and/or temporal coordination of gestures but that no gestures are literally removed from the articulatory plan. To be sure, further articulatory investigation is required to determine the extent to which Cantabrian infinitival *-r* patterns like English word-final /t/.<sup>3</sup> In any event, the gestural account is still compatible with the more conventional view of deletion as the delinking of a segment. Assuming a usage-based model of phonology, Bybee (2001: 76) argues that “[p]erceived deletion of this type can lead to actual deletion. If tokens with perceived deletion are frequent, a reorganization of exemplars will occur, with the eventual effect of the loss of the final [consonant].”

I illustrate the complete analysis below, focusing primarily on the Los Montes de Pas dialect for reasons of space. Gestural coordination constraints are now added to the hierarchy that was shown to account for rhotic contrast and neutralization in Section 3. Recall from Tableau 2 that coda neutralization is guaranteed by the ranking of SPACE<sub>R</sub> » \*MERGE. Since the focus here is on preconsonantal rhotics, I limit the analysis to input pairs of the form /VrCV<sub>1</sub> and /VrCV<sub>2</sub> and consider only neutralized output candidates. Furthermore, I distinguish between articulatory and acoustic representations in the output. The

<sup>3</sup> Another prediction of the gestural model is that overlap between adjacent gestures engaging the same articulator will result in a ‘blending’ of gestural characteristics, which “shows itself in spatial changes in one or both of the overlapping gestures” (Browman & Goldstein 1990: 362). I leave it to future research to confirm whether infinitival *-r* and a following coronal exert any mutual coarticulatory influence.

clusters in ‘/.../’ denote sequences of consonant gestures and their coordination relations, while corresponding acoustic forms are given in ‘[...]’.

Tableau 3 gives the evaluation of tautomorphemic PW-internal /RC/, as in *duerme* ‘s/he sleeps’. The first three candidates are eliminated by the articulatory markedness constraint against taps, and complete overlap in candidate (f) of Tableau 3 violates recoverability. The remaining candidates tie on RC-OVERLAP<sub>PW</sub>, and lower-ranked CC-COORD selects the unmarked coordination in candidate (e). For Tudanca Spanish, the opposite ranking of \*r » \*r would eliminate candidates (d-f), allowing lower-ranked rC-COORD to favor vowel intrusion in candidate (a).

/VrCV/ <sub>1</sub>	/VrCV/ <sub>2</sub>	*r	*r	RECOV <sub>μ</sub>	RC-OVERLAP <sub>PW</sub>	rC-COORD	CC-COORD
a. /r <sup>o</sup> C/	[Vr <sup>o</sup> CV] <sub>1,2</sub>	*!			*		*
b. /r <sup>•</sup> C/	[Vr <sup>•</sup> CV] <sub>1,2</sub>	*!			*	*	
c. /r <sup>o</sup> C/	[VCV] <sub>1,2</sub>	*!		*		*	*
d. /r <sup>o</sup> C/	[Vr <sup>o</sup> CV] <sub>1,2</sub>		*		*		*!
e. /r <sup>•</sup> C/	[Vr <sup>•</sup> CV] <sub>1,2</sub>		*		*		
f. /r <sup>o</sup> C/	[VCV] <sub>1,2</sub>		*	*!			*

Tableau 3: *Prosodic structure: (...VRCV...)PW (=14a)*

The analysis of heteromorphemic PW-internal /RC/, as in *ahogarme* ‘to drown me’, is illustrated in Tableau 4. Again, articulatory markedness eliminates output candidates that contain a tap. Since infinitival *-r* and the following consonant belong to different morphemes in the input, RECOV<sub>μ</sub> is now irrelevant. Lower-ranked RC-OVERLAP<sub>PW</sub> favors complete overlap of the cluster in (f), resulting in the perceived deletion of the rhotic. For Tudanca Spanish, high-ranking \*r would eliminate candidates (d-f), allowing RC-OVERLAP<sub>PW</sub> to choose candidate (c).<sup>4</sup>

<sup>4</sup> Rafael Núñez Cedeño (personal communication) suggests that gemination of the following consonant is another plausible repair for derived rhotic + consonant clusters. In fact, total assimilation of infinitival *-r* to the clitic-initial consonant is attested in earlier stages of the language, presumably when Spanish still allowed geminate sonorants: *dezirlo* > *dezillo* ‘to say it’, *hazerlo* > *hazello* ‘to do it’, *considerarlo* > *considerallo* ‘to consider it’ (Álvar & Pottier 1983: 182-184). Subsequently in Leonese dialects of northwestern Spain, geminate *-ll-* derived from infinitive + clitic combinations underwent the same reductive changes as other geminate laterals (see Zamora Vicente 1967: 124-127). A comprehensive diachronic analysis would take us too far afield, but see the Dispersion-theoretic accounts of Baker (2004) and Holt (2003).

$/Vr+CV/_{1,2}$	$[Vr^{\circ}CV]_{1,2}$	* $r$	* $r$	RECOV $_{\mu}$	RC- OVERLAP $_{PW}$	rC- COORD	CC- COORD
a. $/r^{\circ}C/$	$[Vr^{\circ}CV]_{1,2}$	*!			*		*
b. $/r^{\bullet}C/$	$[Vr^{\bullet}CV]_{1,2}$	*!			*	*	
c. $/r^{\otimes}C/$	$[VCV]_{1,2}$	*!				*	*
d. $/r^{\circ}C/$	$[Vr^{\circ}CV]_{1,2}$		*		*!		*
e. $/r^{\bullet}C/$	$[Vr^{\bullet}CV]_{1,2}$		*		*!		
f. $/r^{\otimes}C/$	$[VCV]_{1,2}$		*				*

Tableau 4: *Prosodic structure: ((...VR)<sub>PW</sub>CV...)<sub>PW</sub> (= (14b))*

The optionality of infinitival  $-r$  deletion is accounted for by the fact that RC-OVERLAP $_{PW}$  can be ranked either above or below the gestural coordination constraints with which it conflicts. When it is ranked below CC-COORD, candidate (e) becomes optimal, with a preconsonantal trill surfacing before the consonant-initial clitic. This pattern is reflected in the Los Montes de Pas data shown in (5). For Tudanca Spanish, in which  $*r \gg *r$ , it is sufficient that RC-OVERLAP $_{PW}$  rank below rC-COORD to generate the default coordination pattern for preconsonantal taps in candidate (a) of Tableau 4.

Recall that infinitival  $-r$  is subject to deletion not only before clitic pronouns but also before consonant-initial determiners, as in *pintar la pared* “to paint the wall” (3b). If determiners adjoin as proclitics to the following noun to form an outer PW, as in (17), then the derived  $/RC/$  cluster would straddle the PW boundary, as in (14c).

(17)  $/pintaR\ la\ pared/$  (pintaR)<sub>PW</sub>(la(pared̃))<sub>PW</sub>

The problem is that RC-OVERLAP $_{PW}$  fails to produce deletion because the cluster is not internal to the same PW. One possibility is to relativize (15a) to the phonological phrase in order to allow for deletion across PW boundaries, but this would incorrectly predict deletion in phrases like *dar vueltas* (14c). Another approach is to formalize deletion in a way that targets  $/r/$  + lateral clusters within the phonological phrase, but this would predict deletion before any lateral-initial PW domain (e.g., *decir locuras* “to say silly things”).

In his description of infinitival  $-r$  deletion in Leonese dialects of northwestern Spain, Zamora Vicente (1967: 160) claims that deletion occurs by analogy before the  $/l/$  of a following definite article. This can be formalized

via prosodic restructuring, whereby the determiner of the direct object noun phrase in (17) adjoins to the preceding PW, as in (18a).

- (18) a. /pintaR la pared/ ((pintaR)<sub>PW</sub>la)<sub>PW</sub>(pareð)<sub>PW</sub>  
 b. /pintaR-la/ ((pintaR)<sub>PW</sub>la)<sub>PW</sub> *pintarla* “to paint it”

Prosodic analogy is plausible inasmuch as the infinitive + determiner sequence in (18a) is *segmentally identical* to the corresponding infinitive + clitic sequence in (18b). On the assumption that analogical restructuring requires homophony, deletion is predicted not to apply before other function words (e.g., *pintar más paredes* “to paint more walls”). I leave it to future research to confirm or refute this empirical prediction.

Remaining to be accounted for is the maintenance of infinitival *-r* before a consonant in other phrasal contexts, as in *dar vueltas* “to spin”. Since RC-OVERLAP<sub>PW</sub> is relevant only to clusters that are PW-internal, it follows that derived /RC/ sequences are not subject to the pressure of complete overlap across a PW boundary. As shown in Tableau 5 (e), CC-COORD ensures preconsonantal trills in Los Montes de Pas. I leave it to the reader to verify that in Tudanca Spanish, candidate (a) of Tableau 5 would be optimized by rC-COORD.

$/Vr\#CV/_{1,2}$	$/Vr\#CV/_{1,2}$	*r	*r	RECOV <sub>μ</sub>	RC-OVERLAP <sub>PW</sub>	rC-COORD	CC-COORD
a. /r <sup>o</sup> C/	[Vr <sup>o</sup> CV] <sub>1,2</sub>	*!					*
b. /r <sup>•</sup> C/	[Vr <sup>•</sup> CV] <sub>1,2</sub>	*!				*	
c. /r <sup>⊗</sup> C/	[VCV] <sub>1,2</sub>	*!				*	*
d. /r <sup>o</sup> C/	[Vr <sup>o</sup> CV] <sub>1,2</sub>		*				*!
e. /r <sup>•</sup> C/	[Vr <sup>•</sup> CV] <sub>1,2</sub>		*				
f. /r <sup>⊗</sup> C/	[VCV] <sub>1,2</sub>		*				*!

Tableau 5: *Prosodic structure: (...VR)<sub>PW</sub>(CV...)<sub>PW</sub> (=14c)*

**5. Gestures, segments, and systemic markedness in the phonology**

In this section, I argue that both gestures and segments are present in the phonological representation but are subject to different constraints interacting at the same level in the phonological grammar. I show how systemic



markedness in DT keeps the grammar from overgenerating unattested contrasts based on differences in intergestural coordination.

Many phonologists assume a division between phonological and phonetic components in the grammar (see Liberman & Pierrehumbert 1984, Keating 1990, Cohn 1990). Underlying forms are devoid of non-contrastive properties such as syllabification or temporal relations between articulatory gestures. The phonological component derives a syllabified surface representation that is categorical, qualitative, and timeless, and phonetic implementation then supplies gradient, quantitative aspects of non-contrastive detail to yield a fully-specified phonetic representation. Another common assumption is that underlying morphological structure is not present in the input to the phonetic component. The erasure of morphological boundaries at the end of each transformational cycle in SPE and the Bracket Erasure Convention of Lexical Phonology both predict that morpheme boundaries should be invisible to the phonetics.

The division between phonetics and phonology entails that morphological structure cannot influence gestural coordination. On this view, however, it is difficult to explain why complete overlap yields rhotic deletion in clusters derived by enclisis but not in morpheme-internal ones. If phonetic implementation has no access to underlying morphological structure, then forms like /duRme/ (14a) and /axwegaR-me/ (14b) should pattern together with respect to rhotic deletion. This problem does not arise in a unified model that incorporates gestural representations and constraints directly into the phonology (Davidson 2003, Gafos 2002, N. Hall 2003). In the present analysis, RECOV<sub>μ</sub> in (16) makes reference to morphological structure in the input and is capable of blocking complete overlap in morpheme-internal /RC/ sequences. The blocking effect is possible only if the two constraints are able to interact at the same level in the phonological grammar, where underlying morphological structure is still accessible.

Any proposal to place gestural coordination within the purview of the phonology must also account for the facts that motivate a phonology-phonetics division. Evidence that gestural coordination belongs in phonetic implementation comes from the observation that vowel intrusion is in many ways invisible to the phonology, which tends to count the intrusive vowel and tautosyllabic vowel it copies as one. This suggests that vowel intrusion does not create a new syllable, unlike true phonological epenthesis of a nuclear vowel (N. Hall 2003). Three arguments from Spanish support this claim. First, intrusive vowels are never counted in stress computation. In Spanish, main stress is confined without exception to a three-syllable window at the right edge of the morphological word (Harris 1995: 869). If the intrusive vowel in

*ártico* [ˈar̥.ti.ko] “Arctic” were to create a new syllable, then stress would fall outside the three-syllable window, yielding ungrammatical results: \*[ˈa.ra.ti.ko]. Stress shift, \*[a.ˈra.ti.ko], is an unattested repair strategy. Second, in the Spanish language game *Jerigonza*, often used by younger speakers as a secret speech code, intrusive vowels are invisible. In one version of the game, an epenthetic CV syllable is inserted to the right of every syllable boundary in a word. The consonant is from the set /p,t,k,tʃ/, and the vowel is a copy of the preceding syllable nucleus (Piñeros 1999). If the intrusive vowel in *carta* [kar̥.ta] “letter” were syllabic, then CV-insertion would also target this nucleus. *Jerigonza* word formation yields [kar̥.pa.ta.pa] instead of \*[ka.pa.ra.pa.ta.pa], suggesting that the intrusive vowel is invisible.

Perhaps the best evidence for the invisibility of vowel intrusion is that gradient differences in intergestural timing are universally non-contrastive. N. Hall’s (2003) cross-linguistic survey shows that in each language, vowel intrusion either always happens or never happens in a given environment. This places the intrusive vowel on a par with consonant release, which plays an important role in perceptual licensing of contour segments although it is never phonologically contrastive *per se* (Steriade 1993). Moreover, Spanish speakers are typically unaware of the existence of intrusive vowels in clusters containing /r/. It seems unlikely that any language would have minimal pairs based solely on minute differences in the phonetic timing of adjacent consonant gestures.

In the model of Zsiga (2000), the phonology acts upon abstract features and segments, which are then mapped to gestures that are coordinated by language-specific alignment constraints in phonetic implementation. Following this model, the phonological invisibility of intrusive vowels is explained by the fact that they arise in the phonetics, where syllabification and stress constraints are no longer operative and where segments cease to be relevant after features are mapped to gestures. More recently, N. Hall (2003) argues against the necessity of a derivational mapping between featural and gestural representations. She argues instead for a unified model in which gestures are associated to segments, which in turn group together into higher prosodic constituents such as syllables, feet, prosodic words, and so on. If the constraints responsible for stress computation and for *Jerigonza* word formation refer only to higher prosodic structure, then it follows that they will be insensitive to any percepts arising from specific gestural coordination relationships. As we have seen, intrusive vowels are the acoustic consequence of non-overlapping consonant gestures and are not part of the formal representation of segments. In short, the invisibility of vowel intrusion requires not a ‘derivational’ difference between

phonological and phonetic components but rather a ‘representational’ difference between segments and gestures in the phonological representation.

According to N. Hall, the universal non-contrastiveness of intergestural timing follows from the lack of faithfulness to gestural coordination relations in the input. If UG had a constraint such as IDENT(timing), then some language might rank it above gestural coordination constraints, thereby overgenerating a contrast based on gestural coordination. In a theory with systemic faithfulness, explaining the universal non-contrastiveness of a given property requires more than simply banning input-output faithfulness. As shown in Tableau 6, high-ranking \*MERGE overgenerates a contrast between [ar<sup>ə</sup>.ma], with /r<sup>ə</sup>m/ in open transition, and [ar<sup>ˈ</sup>.ma], with /r<sup>ˈ</sup>m/ in close transition.<sup>5</sup>

	/ar <sup>ə</sup> ma/ <sub>1</sub>	/ar <sup>ˈ</sup> ma/ <sub>2</sub>	*MERGE	rC- COORD	CC- COORD
● a.	/r <sup>ə</sup> m/ [ar <sup>ə</sup> ma] <sub>1</sub>	/r <sup>ˈ</sup> m/ [ar <sup>ˈ</sup> ma] <sub>2</sub>		*	*
b.	/r <sup>ə</sup> m/ [ar <sup>ə</sup> ma] <sub>1,2</sub>		*!		*
c.		/r <sup>ˈ</sup> m/ [ar <sup>ˈ</sup> ma] <sub>1,2</sub>	*!	*	

Tableau 6: *Overgeneration of contrast based on intergestural timing*

This problem has a parallel in syllable structure. Most phonologists agree that syllabification in itself is not contrastive, given that no language permits a tautomorphemic contrast between *pa.ta* versus *pat.a* or *pa.kla* versus *pak.la*. If in some language \*MERGE dominates syllable structure constraints, then input morphemes differing solely in the syllabification of intervocalic consonants would be contrastive in the output. Padgett (2003c) argues that forms differing solely in syllabification are perceptually too similar to contrast, and I propose the same type of explanation for intergestural coordination. According to Padgett, “impossible contrasts are the result of impossible perceptual distinctions, the jurisdiction of SPACE constraints. From this perspective, the problem is one of markedness, not faithfulness” (p. 15). In DT, universally imperceptible contrasts can be ruled out by placing the relevant SPACE

<sup>5</sup> An anonymous reviewer questions the necessity of systemic faithfulness in this paper, especially since IDENT(R) alone seems to be sufficient in Tableaux 1 and 2. However, independent motivation for the existence of \*MERGE is found in Holt (2003) and Padgett (2003a,c). Therefore, the overgeneration problem in Tableau 6 still remains and must be dealt with.

constraints in GEN, making them inviolable.<sup>6</sup> In Tableau 7, the potentially contrastive pair [ar<sup>◦</sup>.ma] versus [ar<sup>˘</sup>.ma] is universally ruled out by inviolable systemic markedness. Even if input representations include gestural coordination relations, neutralization to the unmarked form is unavoidable.

	/ar <sup>◦</sup> ma/ <sub>1</sub>	/ar <sup>•</sup> ma/ <sub>2</sub>	*MERGE	rC-COORD	CC-COORD
a.	/r <sup>◦</sup> m/	[ar <sup>◦</sup> ma] <sub>1,2</sub>	*		*
b.		/r <sup>•</sup> m/	*	*!	

Tableau 7: *Systemic markedness in GEN rules out imperceptible contrast*

**6. Conclusion**

As Bybee (2001: 57) notes, “[c]ases in which morphological status interacts with variable phonetic processes constitute important evidence against modularization. Phonetic implementation cannot be relegated to a derivative role in which it has no access to the lexical or morphological status of the elements upon which it works.” In this paper, I have analyzed Cantabrian Spanish external sandhi deletion in terms of gestural recoverability and coordination constraints that are relativized to morphological and prosodic domains, respectively. Alternative approaches that view gestural timing as a low-level aspect of phonetic detail incorrectly predict that morphological structure should have no effect on phonetic realization.

Furthermore, I have shown that there is no danger in assuming phonetically rich gestural representations along with segments in the phonology. The fact that intrusive vowels are not part of the segmental representation accounts for their invisibility to phenomena that refer to higher levels of prosodic structure. In DT, inviolable SPACE constraints ensure that no language grammar can generate imperceptible contrasts based solely on differences in syllabification or gestural coordination – even if such differences happen to be present in the input. The combination of gestural and systemic phonologies provides a unified account of the Cantabrian Spanish data that captures the interaction among morphological, prosodic, and gestural structure without overpredicting the range of possible contrasts.

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<sup>6</sup> It is possible that such inviolable SPACE constraints simply reflect the limits of the human perceptual apparatus, whereas only rankable and violable SPACE constraints are truly linguistic/grammatical.

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# QUANTIFYING RHYTHMIC DIFFERENCES BETWEEN SPANISH, ENGLISH, AND HISPANIC ENGLISH

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## 1. *Introduction*

Although sociolinguists working within the variationist tradition have become increasingly interested in the interactions between varieties of English and Spanish spoken in the United States, the overwhelming majority of studies have been either qualitatively based, or focused on the adaptation of segmental structures. Accordingly, rigorous, quantitative analyses of suprasegmental features from Spanish-English contact situations are largely underrepresented in the variationist literature. This, coupled with the fact that the West, Southwest, and major urban centers such as New York and Philadelphia have received most of the attention, has left emerging Spanish-English contact situations essentially unexamined in the Mid-Atlantic South, where core Hispanic communities are just now beginning to develop. In the past decade, North Carolina has witnessed a higher percentage of growth in its Hispanic population than any other state, and currently has the largest percentage of monolingual Spanish speakers of any state in the US. In part, these somewhat surprising statistics are a function of the limited representation of Hispanics in North Carolina a decade ago, but it is also a testament to the changing demographics of the linguistic situation in the Mid-Atlantic South at the beginning of the twenty-first century.

North Carolina's current linguistic situation provides a unique opportunity to examine the earliest stages of Spanish-English contact at nearly every level of the linguistic spectrum including the level of prosody and, more specifically, rhythm. This situation gives rise to a number of important research questions. First, is the rhythm associated with native English-speakers attainable to immigrant Spanish-speakers beyond childhood, or are the rhythmic differences between L1 and L2 too vast to overcome? How rapidly do Spanish-speaking immigrants acquire the unmarked, native-like rhythm of the contiguous English-speaking community? To what extent does the rhythm of Spanish provide substrate influence for the emerging dialects of English spoken by



Hispanics? How might the rhythm of Southern English be affecting the prosodic patterns of Spanish for speakers who live in a minority, immigrant community? And finally, what are the empirically measurable differences between Spanish, English, and the linguistic varieties resulting from the contact of the two?

In this preliminary study, I explore some of these questions by examining the rhythm from the Spanish of monolingual Spanish-speakers, the Spanish of their bilingual community cohorts, and the English of these same bilinguals. As a baseline for comparison, these data are compared to the corpus provided by Thomas & Carter (2003a, b) which contains data from native English-speaking North Carolinians. All of the participants in this study reside in the same exclusively-Hispanic neighborhood in the capital city of Raleigh, North Carolina, the location of which can be found in Figure 1.

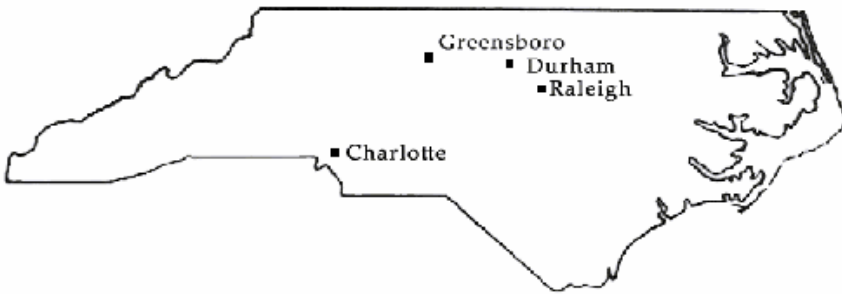


Figure 1: *Location of Raleigh, NC*

This community is unique because, although located in a metropolitan area, it is relatively insular in that community members interact socially and recreationally primarily with other community members. Contact occurs with extra-community members only via institutional affiliations such as work or school. Correspondingly, a clear ethnolinguistic boundary demarcates this community from the surrounding, mostly European-American, English-speaking community. Field recordings were used to collect data obtained from sociolinguistic interviews which lasted from 60 to 90 minutes. One-on-one interviews were conducted in English, Spanish, or both, though code-switched data were not analyzed for this study. A demographic profile of the speakers considered in the study is located in Table 1. It should be noted that all participants in this study are originally from Mexico City or the Mexican state

of Colima and that no participant has lived anywhere in the US other than North Carolina.

<b>Speaker</b>	<b>Age</b>	<b>Sex</b>	<b>Length of Res.</b>	<b>Lg. Status</b>
AG	11	female	3.5 years	bilingual
MB	11	male	8 years	bilingual
LB	15	female	8 years	bilingual
CB	19	male	8 years	bilingual
BG	18	female	3 months	monolingual
FG	18	female	3 months	monolingual
JV	27	male	6 years	monolingual
CA	30	female	4 years	monolingual

Table 1: *Demographic Profile of Raleigh Sample*

## 2. *Theoretical Background*

Early studies on rhythm, particularly Pike (1945) and Abercrombie (1967), stressed a strict dichotomy between languages that were considered stress-timed, which included Germanic languages, Slavic languages, and Arabic, and those considered syllable-timed, which included, among others, the Romance languages. Syllable-timed languages were reported to have syllables of nearly equal duration that occurred at regular intervals, while stress-timed languages exhibited a wider range of syllable durations, with syllables recurring at irregular intervals.

It was the original stress/syllable dichotomy that led to the classification of English and Spanish as stress- and syllable-timed languages, respectively. Conventional thinking on rhythmic timing prevailed until the 1980s, when more rigorous analyses of rhythm problematized the dichotomy, leading to a proposal of a continuum model of rhythm. In this conception, stress-timed languages are at one pole and syllable-timed languages at another, allowing for the infinite gradation of rhythm across linguistic systems. This model seemed effective in accounting for ‘intermediate languages’ (Ramus, Nespors, & Mehler 1999) such as Catalan and Polish, which may exhibit syllable structures characteristic of either stress- or syllable- timed languages but also display segmental phenomena such as vowel reduction typically associated with one rhythmic variety or the other. Further evidence for a continuum model instead of a dichotomous model comes from work by Borzone de Manrique & Signorini (1983), who found unequal syllable duration in Spanish despite its having more syllable-timed characteristics. Another contribution

comes from Dasher & Bolinger (1983), who propose that a language's timing is more dependent on its segmental phonological features, such as consonant-vowel distribution, lexical stress, and the presence or absence of syllable reduction, than on the syllable structure itself. Findings from studies in the 80s demonstrate that the earlier thinking was based on a spurious dichotomy and that, rather than taxonomizing linguistic varieties into a categorical or binary set, we should instead consider varieties as being 'more or less' syllable-timed or 'more or less' stress-timed.

### 3. *PVI Methodology*

One of the primary reasons for the debate among phoneticians and phonologists over the appropriate rhythmic model and resulting rhythmic taxonomy of languages has had to do with a lack of a standard, accepted methodology for quantifying differences. An appropriate methodology has been elusive since it would have to consider a number of factors that influence rhythmic production, namely syllable duration and interval differences.

Despite these challenges, Low & Grabe (1995) introduced the Pairwise Variability Index (PVI) which compares pairs of syllables while taking into account speaking rate. In this method, measurements for syllable duration are taken and each syllable is then compared with the adjacent syllables by using the PVI equation (Figure 2). The result is an index of scores that indicate the degree of syllable- or stress-timing found in examined varieties. High scores indicate more stress timing while lower scores indicate more syllable timing. Using this method, Low & Grabe demonstrated that Singapore English was substantially more syllable-timed than standard British English, as was expected based on prior impressionistic accounts. The PVI method was soon adopted by several phoneticians and sociolinguists eager to illuminate differences in rhythm among different languages and dialects. Gut et al. (2002), for instance, used the PVI method coupled with their own 'rhythm ratio' (RR) to examine rhythmic differences between three West African tonal languages.

$$PVI = \frac{[\text{abs syllableA} - \text{syllableB}]}{(\text{syllableA} + \text{syllableB})}$$

2

Figure 2: *PVI Formula (Low & Grabe 1995)*

Among those using PVI to explore cross-dialectal differences were Low, Grabe, & Nolan (2000), who returned with more results from Singapore English; Spencelayh (2001), who compared four dialects of English in the UK;

and Fought & Fought (2003), who compared Hispanic English with the English of the adjacent Anglo California community. Fought & Fought's (2003) application of PVI revealed more syllable timing for the Hispanics than for the Anglos, though syllable timing was concentrated in the first five syllables of an utterance. Likewise, they found a similar localization of syllable timing in Mexican Spanish, signaling a link between the two varieties. In Thomas & Carter (2003a, b), we used the PVI method to examine rhythm production among Southern African American and European Americans and found that no significant differences exist among the two.

In this study, following the work of Thomas & Carter (2003), I adapt Low & Grabe's PVI methodology. Field recordings from the Raleigh sample were digitized and spectrograms were analyzed using PRAAT phonetics software. Duration measurements were taken at the onset and offset of the vocalic nucleus of the syllable, instead of at the onset and offset of the syllable itself. This nucleus measuring was necessary because of the use of field recordings that often included non-linguistic background noise, making consonant identification difficult if not impossible in some cases. For each speaker, over 200 comparisons were made in each language, yielding over 2,500 measurements for this study.

For the English data, all cases of the canonical diphthongs /ai/, /oi/, and /aw/ were considered as one measurement. Further, because the retroflex English /r/ and the liquid English /l/ are nearly impossible to separate from the preceding vocalic segment, these consonants were considered with the syllabic nucleus as one measurement. For the Spanish data, all diphthong combinations were considered as one measurement, except when split in lexical items where an orthographic accent would be needed. The issue of the *sinalefa* for the Spanish data was addressed on a case-by-case basis. Where clear diphthongization occurred across word boundaries, one measurement was taken, but when spectral cues indicated separate monophthongs, two measurements were taken. In cases of syllable deletion as in *mija* for *mi hija* and *lamburguesa* for *la hamburguesa*, the chain of comparison was not broken and no zero value was assigned for the 'missing' syllable. For both languages, the pre-pausal syllable was omitted from analysis because of the effects of pre-pausal lengthening. When the pre-pausal syllable was unstressed, the entire syllabic foot was omitted.

#### 4. Results

Figure 3 provides a scatter plot of the aggregate PVI results for individuals from each of the five groups considered: Spanish monolingual, Spanish bilingual, and English bilingual, as well as the native English-speaking African

American and European American North Carolinians provided by Thomas & Carter (2003a, b). The points labeled ‘Spanish’ in this plot include both the bilinguals and the monolinguals. It should be noted that the lack of previous quantitative work on rhythm leaves us with no clear, external baseline data to which we can compare the English of the native North Carolinians. PVI results from the studies of English varieties mentioned earlier are not comparable due to methodological differences in measurement.

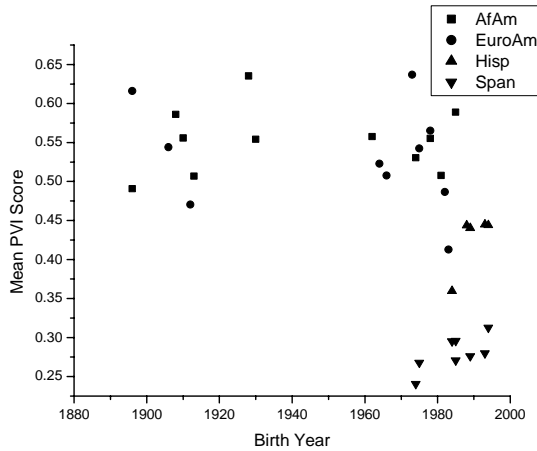


Figure 3: *Mean PVI Results for All Speakers, Including Benchmark North Carolinians*

Clearly, the mean PVI scores for the Hispanic English speakers and Spanish speakers fall well below those for the native English speaking North Carolinians, indicating some difference in rhythmic production among the different varieties. Figure 4 provides the mean PVI group scores for each of the groups, including the benchmark African American and European American North Carolinians. The raw scores are presented in Table 2. Here again, Figure 4 clearly shows differences in rhythmic production among the groups considered, with the benchmark groups having scores above .5, the Hispanic English group having scores above .4, and the combined Spanish group at well below .3.

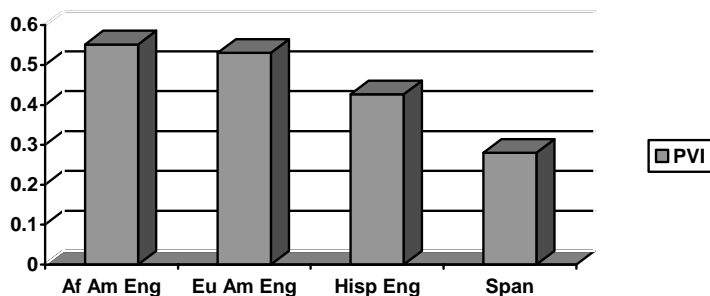


Figure 4: Mean PVI Group Scores

	Af-American	Euro-American	Hispanic (Eng)	All Spanish
<b>Group PVI</b>	.5515	.5304	.4264	.2798

Table 2: Mean PVI Group Scores

As we have seen, prosodic variation at the group level is evident but what type of variation might we expect *within* the groups? Figure 5 provides the mean PVI scores in each language for each of the four bilinguals considered in the study thus far. The raw scores, total number of comparisons, and the standard deviations are located in Table 3.

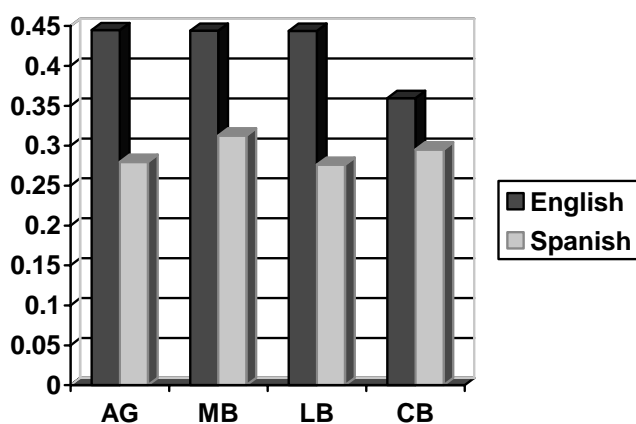


Figure 5: Mean PVI Results for Spanish-English Bilinguals

Speaker	N (Eng)	PVI (Eng)	Std. Dev. (Eng)	N (Span)	PVI (Span)	Std. Dev. (Span)
AG	213	.4447	.3262	201	.2797	.2348
MB	236	.4440	.3415	205	.3127	.2601
LB	226	.4438	.3163	206	.2762	.2477
CB	216	.3596	.2533	238	.2953	.2422

Table 3: *Statistical Information for Raleigh Bilinguals*

Though the sample size is relatively small, some instructive points about rhythm can be made. First, it is clear that each of the speakers has different rhythmic productions for each of his/her two languages, though to somewhat varying degrees. Second, there is much more uniformity across the English set than across the Spanish one. AG, MB, and LB have nearly identical PVI scores in English but exhibit more variation in their Spanish productions. This may be the result of an orientation towards a perceived English norm or ‘target’ acquired in school or the ESL classroom, though this is somewhat unlikely given the different educational experiences of the three speakers. Or, perhaps the speakers do not learn stylistic variation at the prosodic level because acquiring the formal structures of the language is already challenging enough. This uniformity may also be the result of some intra-community English norm and may indicate the emergence of a new Hispanic English dialect for the Raleigh area (Wolfram, Carter, & Moriello 2004).

This possibility seems to be evidenced most by MB, an eleven year old male who has lived in the community for 8 years. Of all the speakers, it seems he would have the most opportunity to acquire or accommodate to English prosody because of his relatively long length of residency and early age of arrival, but his PVI score is in line with LB, his older sister, who received more schooling in Mexico, and with AG, who moved to the community just three years ago. Only MB exhibits a PVI score above the .3 level for the Spanish production, while the other three speakers have productions between .27 and .29. This may signal some possible influence by the English pattern onto the Spanish one. This explanation, though preliminary, seems viable, as MB, more than any other speaker, has spent the overwhelming majority of his life in the Raleigh community. This finding is instructive for linguists interested in the ways in which the children of Spanish-speaking immigrants acquire Spanish prosody in an English speaking context.

We should now consider CB, the 18 year old brother of MB and LB. CB's Spanish production is in line with the other bilinguals, but his English production is much lower. Of all the bilinguals, CB received the greatest amount of his compulsory education in Mexico and because of intra- and inter-ethnic conflict at his North Carolina high school, dropped out of school at the age of 16. Over the past two years, he has worked alongside other Hispanics in construction, and though his peer group is exclusively Hispanic and is characterized by frequent code-switching to English, the dominant language is Spanish. It is impossible to say at this point if the more marked pattern is the result of not mastering the English pattern even at the level of his community cohorts, or if the marked pattern is an assertion of his Hispanic identity.

Figure 6 provides the PVI results for the Spanish monolinguals from the Raleigh community. The bilingual results are reproduced here (marked \*) for the sake of comparison. The raw PVI scores, the total number of comparisons, and the standard deviations are given for each monolingual speaker Table 4.

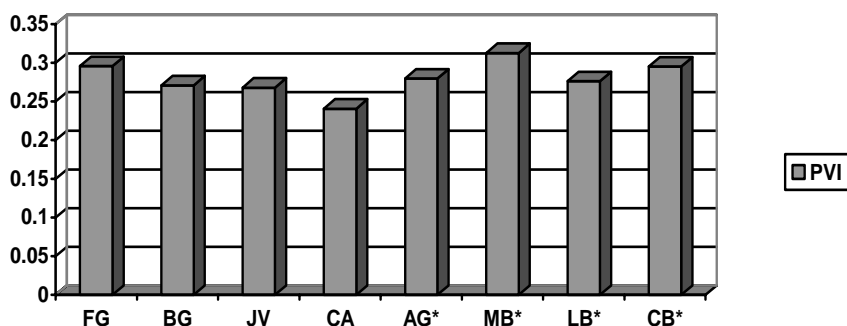


Figure 6: *Mean PVI Scores for All Spanish-speakers*

Speaker	N	Mean PVI	Std. Deviation
FG	206	.2957	.2386
BG	202	.2708	.2409
JV	217	.2678	.2335
CA	200	.2406	.2297
		<b>Mono. Span. Group Mean</b>	<b>Biling. Span. Group Mean</b>
<b>PVI Score</b>		.2687	.2909

Table 4: *Statistical Information for Spanish Monolinguals*



Though no clear pattern is easily discernible, some trends can be noted. First, there is a nominal difference in the group means for the two groups, as the bilingual speakers have a mean above .29 while the Spanish monolinguals have a lower score at above .26. This difference may signal some influence from the English pattern onto Spanish prosody. Thomason & Kaufman (1988) entertain this possibility in their theory of language shift. They write: "Shifting speakers maintain their original language's prosodic patterns if they haven't learned those of the TL [target language]. But immigrants who have succeeded in learning the prosodic patterns of a language their group is shifting to may use those patterns so often in speaking the target language, and their own so seldom (or with a feeling that low prestige adheres to the native language), that they replace the native patterns with the ones borrowed from the target language." Accommodation at this level is unlikely since there is no evidence of language shift or low prestige *per se*, but many of the young bilinguals do show a heightened orientation toward American values and, indeed, toward English language use. Still another possibility is that because the bilingual speakers tend to be younger with, correspondingly, a much younger age of arrival in North Carolina, the Spanish they acquired in the Raleigh community is prosodically different from the Spanish they would have acquired had they remained in Mexico.

## 5. Conclusions

Although this study is still preliminary, several points about rhythm production in Spanish and English and more generally about language acquisition are emerging. First, this study shows that there are some clear differences between the rhythm of Spanish and the rhythm of English, once again confirming our previous expectations based on impressionistic accounts, as well as the findings of Ramus et al. 1999. It is evident that this variety of Mexican Spanish is indeed more syllable-timed than English, and English is more stress-timed than this variety of Spanish, but we should be cautious about assigning one label or the other to either language. The data from each language are only noteworthy when considered in relation to each other. In other words, at this point there is no exogenous norm for comparison using this application of the PVI methodology. Examinations of other Romance languages using this methodology are necessary in order to further our understanding of rhythm in these languages. Further, examinations of rhythm in diasporic varieties of the Romance languages can provide crucial insights for the field of comparative Romance linguistics.

Next, this study does provide some evidential support for Dasher & Bolinger's (1983) claim that the segmental structure of languages may

influence rhythm output. In Thomas & Carter (2003), we found that syllable reduction played an important role in the stress-timing of English. The more syllables are reduced, the difference in duration among syllables increases, leading to higher PVI scores and, correspondingly, more stress-timing. Syllable reduction was much less common in the English of the native Spanish speakers, and even less common in the Spanish data. Accordingly, we may expect lower PVI scores (indicative of more syllable-timing) in other varieties of Spanish that are even less prone to syllable reduction than Mexican Spanish.

The findings from this study also support Borzone de Manrique & Signorini's (1983) finding that Spanish is characterized by differences in syllable duration. If Spanish were ideally syllable timed, we would have seen PVI scores of zero instead of scores in the .2 range. The findings here do not support the findings of Fought & Fought (2003) who found that California Hispanic English was more syllable-timed than the English of the contiguous European American community, but only for the first five syllables of an utterance. The data from the Raleigh community show no evidence of clustering at any fixed location within the utterance, neither for the English nor the Spanish data.

This study also provides some important insights for sociolinguists and dialectologists interested in new dialect formation and the origins of Hispanic English. The data provide signs of Spanish substrate influence on the English of the Hispanic group, as evidenced by the intermediate rhythm production by the bilinguals. Additionally, the uniformity of English rhythm production may signal the emergence of new varieties of English spoken Hispanics. Longitudinal studies will be needed to determine the impact of these incipient communities on future generations of Hispanics, especially on those born in the US.

Further investigation is needed to determine how interactions with other segmental and suprasegmental features, particularly intonation, affects rhythm production (Fought & Fought 2003). More quantitative work on rhythm is also needed to explore cross-dialectal differences of Spanish. Though this variety of central Mexican Spanish is more syllable-timed than the English of North Carolina, it nevertheless may be more stress-timed than other varieties of Spanish, both Castilian and Latin American.

Finally, it is evident that with technological advancements in acoustic phonetics, laboratory examinations of non-segmental features are more feasible than ever before. Reliance on longstanding impressionistic assumptions is no longer necessary in the face of cogent laboratory methodologies. Further research using these tools is critical to a comprehensive understanding of not

only rhythm in the Romance languages, but also to a host of suprasegmental features that previously eluded the quantitative analysis of phoneticians.

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# PHONETICALLY-DRIVEN EPENTHESIS ASYMMETRIES IN FRENCH AND SPANISH OBSTRUENT-LIQUID CLUSTERS

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## 1. *Introduction*

It has been argued that obstruent-liquid (OL) clusters constitute the optimal branching onset (Clements 1990, among others). As concerns French and Spanish in particular, these clusters have been the object of various analyses, which have focused on their phonology (e.g. Dell 1995; Bradley 1999); their cross-dialectal realization (e.g. Malmberg 1965; Bradley 1999); and their acquisition (e.g. Rose 2000; Steele 2002; Barlow 2003). In spite of this considerable body of research, there are surprisingly few laboratory studies which detail the phonetic realization of such clusters. For this reason, we present the results of an acoustic analysis of OL clusters in Quebec French and Argentinean Spanish. Particular attention will be paid to the patterns of cluster-medial vocalic epenthesis observed.

Examples of the French and Spanish clusters under investigation are given in (1a,b).

- (1) a. French  
*précis*      [p~~ɹ~~esi]      “precise”  
*gifler*      [zi~~ʃ~~le]      “to slap”
- b. Spanish  
*prevé*      [p~~r~~eve]      “s/he foresees”  
*aflo~~r~~a*      [a~~f~~lora]      “it emerges”

Under standard phonological analyses, such clusters constitute branching onsets (i.e. [zi.ʃle], [a.flo.ra]). While French and Spanish OL clusters are phonologically similar in their syllabification, they differ in at least two respects as concerns their phonetics. First, whereas French <r> is realized as the voiced

uvular fricative [ʁ],<sup>1</sup> the Spanish rhotic is the voiced alveolar tap [r]. Second, a number of researchers (Malmberg 1965; Quilis 1970, 1993; Ramírez 2002) have noted the presence of an epenthetic vowel breaking up OL clusters in Spanish. To our knowledge, no such observation has been made for French.

In this paper, we investigate this apparent between-language epenthesis asymmetry using experimental data from Quebec French and Argentinean Spanish. In doing so, we set out two goals. First, we will demonstrate that cluster-medial epenthesis is not limited to Spanish but also occurs in French, although in a more restricted set of environments. Second, following others (e.g. Malmberg 1965; Ohala 1992), we will argue that the epenthesis attested is a form of dissimilation which serves to increase the articulatory distance between the two members of the cluster. We will show that distance can be measured on the manner, place and voicing dimensions, with voicing being the most important of the three. On the manner dimension, continuancy plays a crucial role in both languages. In particular, if the two members of the cluster are [-continuant], epenthesis occurs quasi-categorically. As for place, epenthesis tends to be more frequent when both members of the cluster share place features. Finally, in French, epenthesis occurs only with clusters containing voiced obstruents; in Spanish, epenthetic vowels are significantly longer in these environments.

The rest of the paper is structured as follows. In §2, we outline the basic phonological and phonetic properties of French and Spanish OL clusters. We attempt to explain the epenthesis previously reported for Spanish and also attested in the current French data in the context of the dissimilation hypothesis in §3, where we forward a number of hypotheses. The experimental study used to test these hypotheses is outlined in §4, followed by the reporting of the results in §5. In §6, we evaluate each of the hypotheses, providing explanations for those cases refuted by the data. We conclude briefly in §7.

## 2. *Obstruent-liquid clusters in French and Spanish*

In the following sections, we provide a characterization of the basic phonological and phonetic properties of French and Spanish OL<sup>2</sup> clusters relevant to the present work.

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<sup>1</sup> French <r> is standardly described as uvular (e.g. Léon 1992). As concerns Quebec French, the variety to be investigated here, both O'Shaughnessy (1982:383) and Tousignant (1987:75) describe it as velar. The exact place of articulation is not relevant to the current discussion, only that it be dorsal.

<sup>2</sup> We use the term 'liquid' here to designate a subset of laterals and rhotics, namely [l,ʁ] in French and [l,r] in Spanish. See Colantoni & Steele (2005) for further discussion of this term.

2.1 French OL clusters

While French permits a variety of cluster types, OL clusters are the most frequent and varied. Such clusters occur in all positions within the word (initial: *travail* [tʁavaj] “work”; medial: *conclure* [kɔ̃klyʁ] “to conclude”; final: *vinaigre* [vinɛɡʁ] “vinegar”). For both lateral and rhotic clusters, all permutations of obstruent manner, place and voicing are permitted with one exception: clusters consisting of a coronal obstruent plus lateral are illicit (e.g. \**tlaie* [tlɛ]; \**dlɔʁ* [dlɔʁ]), except when syllabified heterosyllabically (e.g. *athlète* [at.lɛt] “athlete”; *modeler* [mɔd.lɛ] “to model”).

As stated earlier, we are unaware of any reports of cluster-medial epenthesis in French. Indeed, phonetic descriptions of these clusters typically mention the direct transition from the obstruent to the liquid (e.g. Delattre 1966: 115; O’Shaughnessy 1982: 390-391; Léon 1992: 71). This is also true for OL clusters derived via schwa deletion, both as concerns production and perception (Fougeron & Steriade 1997; Fougeron & Steriade 1999).

2.2 Spanish OL clusters

OL clusters are one of the few consonant combinations allowed in Spanish. Phonologically, they syllabify as branching onsets. The number of possible permutations of obstruent and liquid is similar to that observed in French.<sup>3</sup> Indeed, most combinations of manner, place and voicing are possible, with the exception of voiced coronal-lateral sequences. Voiceless coronal-lateral onset clusters are permitted in some varieties, including Argentinean Spanish, but are syllabified heterosyllabically in most others. As concerns position in the word, Spanish OL clusters may appear initially or medially (e.g. *drama* [dra.ma] “drama”; *agrio* [a.ɣɾjo] “sour”).

In contrast to French, previous experimental studies have indeed shown that Spanish OL sequences may be broken up by a cluster-medial epenthetic vowel (Malmberg 1965; Quilis 1970, 1993; Ramírez 2002), as illustrated in (2).<sup>4</sup>

- (2) *prevé* /preve/ → [pəreve] “s/he foresees”
- sopla* /sopla/ → [sopəla] “s/he blows”

<sup>3</sup> For the existing accidental gaps, see the table of Spanish experimental stimuli in the Appendix.

<sup>4</sup> This contrasts with native speaker intuitions. For example, following their participation in the present study, subjects were informally asked if they were aware of the cluster-medial vowel and, without exception, indicated not being so.



This research has consistently observed that the epenthetic vowel can be as long as an unstressed vowel, with a mean length of approximately 32ms (Quilis 1970:143). The quality of the epenthetic vowel varies depending on that of the surrounding vowels, although authors mostly agree that it copies the quality of the following vowel (Quilis 1970:143). Epenthetic vowels have been consistently reported for obstruent-rhotic clusters, less so for obstruent-lateral clusters (see Ramírez 2002). Previous studies, however, do not explore the motivations of this asymmetry, nor do they analyze in sufficient detail the role that similarities in manner, place and voicing between the obstruent and liquid play in predicting the cross-dialectal patterns observed.

In the remainder of the present study, we will demonstrate that OL cluster-medial epenthesis is productive in both French and Spanish and that the rate of epenthesis, as well as the length of the epenthetic vowel, are a function of the similarity between the two members of the cluster; that is, the more similar the members of the cluster, the higher the rate of epenthesis. In this way, epenthesis is interpreted as a type of dissimilation. We turn to the dissimilation hypothesis in the following section.

### 3. *The dissimilation hypothesis*

Syllables with branching onsets are typologically less common than CV syllables, and can be simplified via three alternative strategies, all of them attested in Romance languages diachronically and/or synchronically (Walker 1984; Lloyd 1993; Penny 2002, among others). These include: (i) deletion of one member of the cluster; (ii) assimilation; and/or (iii) epenthesis. Only assimilation and epenthesis are observed in the present data. Assimilation has been reported for clusters involving obstruents and laterals, both synchronically (Gibbon et al. 1993; Romero 1996) and diachronically (Lloyd 1993; Penny 2002). In the current study, as we will discuss below, assimilation is also observed in French obstruent-rhotic clusters. In general, assimilation only takes place when the second member of the cluster is [+continuant].

We will focus, however, on the most frequently used strategy for cluster-simplification, namely vowel epenthesis. Several authors (Malmberg 1965; Ohala 1992) have argued that epenthesis is a type of dissimilation, i.e., a strategy to increase the articulatory and perceptual distance between two segments. On this view, we expect that increased similarity between the obstruent and liquid will lead to a higher rate of epenthesis. Similarity, according to some authors, is not categorical but gradient, being dependent upon the number of features shared by two or more segments (e.g. Pierrehumbert 1992;

Frisch et al. 1997): the greater the number of overlapping features, the stronger the tendency towards dissimilation.<sup>5</sup>

The importance of featural contrast for onset cluster well-formedness is witnessed to by the fact that the unmarked complex onset is a stop-liquid sequence, that is a low-sonority non-continuant followed by high-sonority continuant. When this ideal segmental profile is not met – for example, if one of the members is either non-continuant or the sonority difference is insufficient – the likelihood of simplification increases, with the increase being directly proportional to the number of features shared. To illustrate, a higher rate of epenthesis should be expected when the two members of the clusters are non-continuant, as is the case with Spanish obstruent-rhotic clusters.<sup>6</sup> We argue here that manner plays a crucial role in epenthesis, since a necessary (although insufficient) condition for epenthesis to take place, is the presence of at least one non-continuant segment in the cluster.

Voicing and manner interact with the place dimension. There is a cross-linguistic tendency to prohibit OL sequences with identical place (Rice 1992, among others), i.e. clusters such as [tl], [dl] are dispreferred. Note, however, that this tendency is gradient. For example, while [dl] clusters, which agree in both voicing and place, are categorically disallowed in Spanish, [tl] clusters, which differ in voicing but not place, are allowed in some varieties (e.g. both Mexican and Argentinean Spanish).

### 3.1 *Predicted asymmetries*

The asymmetries to be discussed here follow from our general proposal that the similarity between the members of a cluster determines the particular phonetic realization. Specifically, the greater the degree of identity between the obstruent and the liquid in manner, place of articulation and voicing, the greater the tendency towards simplification, either via vowel epenthesis or cluster reduction (e.g. affrication). Accordingly, we predict the three asymmetries outlined in the following sections.

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<sup>5</sup> We assume the following features: manner [ $\pm$ continuant]; place [labial, coronal, dorsal]; and voicing [ $\pm$ voice]. Ultimately, what is critical is not the exact features, but rather their similarity/difference.

<sup>6</sup> As such, epenthesis is also expected in environments where spirantization occurs.

3.1.1 *Manner of articulation.* In both French and Spanish, the lateral is a sonorant, continuant<sup>7</sup> segment. In contrast, the rhotic is either non-sonorant (French /ʁ/) or non-continuant (Spanish /r/).<sup>8</sup> As such, laterals are phonetically less similar to obstruents than rhotics in both languages and, consequently, less dissimilation, specifically a lower rate of epenthesis, should be expected in obstruent-lateral clusters. Moreover, a higher rate of epenthesis is predicted for Spanish, since obstruent-rhotic clusters consist of two non-continuant segments.

This prediction is supported by diachronic, cross-dialectal and experimental evidence in Spanish. First, obstruent-lateral clusters evolved differently from Latin vis-à-vis their obstruent-rhotic counterparts. While the former underwent assimilation and eventually palatalization, the latter exhibited a greater tendency towards maintenance (Lloyd 1994; Penny 2002). Second, cross-dialectal studies reveal different assibilation patterns for obstruent-lateral versus obstruent-rhotic clusters (Lenz 1940; Alonso 1953; Lipski 1994; Penny 2000, among others); specifically, the former may undergo assibilation while the latter do not. Finally, articulatory studies on Spanish and Catalan have reported assimilation in both lateral-obstruent clusters (Romero 1996) and obstruent-lateral clusters (Recasens & Pallarès 2001). In contrast, sequencing is reported for rhotic-obstruent (Romero 1996) and obstruent-rhotic clusters (Recasens & Pallarès 2001).

3.1.2 *Place of articulation.* We predict a between-language asymmetry related to the obstruent's place of articulation. In French, the rhotic is dorsal; thus, dorsal obstruent-rhotic clusters should involve greater simplification (i.e. epenthesis or reduction). In Spanish, where the rhotic is alveolar, more incidences of simplification should be observed with coronal obstruents.<sup>9</sup> This

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<sup>7</sup> Some authors (Cressey 1978; Núñez Cedeño & Morales Front 1998) characterize Spanish laterals as [-continuant] and rhotics as [+continuant]. We will follow Quilis (1993) and Martínez Celdrán (1994) here, since acoustically, laterals are periodic sounds, while the rhotic tap is a short stop.

<sup>8</sup> French rhotics are traditionally described as non-sonorant. However, acoustic analyses (e.g. O'Shaughnessy 1982:390) demonstrate that they may be realized as approximants (i.e. as sonorant segments). As concerns Spanish, in the variety under study, <r> is always realized as a tap (i.e. as [-continuant]) (see Borzone de Manrique 1980). In other dialects, it may be realized as a fricative (Lipski 1994).

<sup>9</sup> Both Spanish liquids are traditionally described as alveolar (Navarro Tomás 1970). However, recent phonological and phonetic studies have argued against an identical place of articulation for /l/ and /r/ (Colantoni 2001; Recasens & Pallarès 2001). According to these analyses,

prediction is supported by cross-dialectal assibilation asymmetries, with assibilation in clusters being more frequent in coronal-rhotic sequences (Malmberg 1965; Navarro Tomás 1970; Bradley 1999).

3.1.3 *Voicing*. If the segments agree in voicing, we expect higher rates of epenthesis or reduction. Again, the prediction is supported by diachronic and synchronic variation in Spanish. Clusters in which both members agreed in voicing evolved differently from Latin than clusters with different voicing specifications (Lloyd 1993; Penny 2002). Finally, clusters that agree in voicing show lower rates of assibilation (Malmberg 1965).

#### 4. *Current study*

In order to test our hypotheses, 10 speakers (5 male; 5 female) of Quebec French, and 11 speakers (5 male; 6 females) of Buenos Aires Spanish were recorded. These varieties were chosen both for pragmatic reasons – availability of speakers – and, in the case of Spanish, to avoid the possibility that the OL clusters under investigation be realized as affricates (e.g. Chilean Spanish; Alonso 1953). The stimuli used consisted of 48 words containing the target OL clusters (see Appendix), as well as 27 distractors. The stimuli were controlled for (i) the type of liquid; (ii) the manner, place and voicing of the obstruent;<sup>10</sup> and (iii) the position of the cluster in the word, including stress.

The data were elicited via a word-reading task in which the targets and distractors were intermixed. All words were presented in the same carrier sentence (French: “Je dis [TARGET] encore une fois”; Spanish: “Digo [TARGET] otra vez”; ‘I say [TARGET] again’) in random order three times, generating 134 (48 x 3) tokens per subject.<sup>11</sup> Testing sessions were recorded

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laterals are front alveolars as opposed to rhotics, which are back alveolars (Recasens & Pallarès 2001: 288).

<sup>10</sup> In order to have comparable sets of stimuli, no /v/-initial clusters were included, given their absence in Spanish.

<sup>11</sup> The reason for placing the targets in carrier sentences was to permit measurement of the stop. One consequence, however, was the increased probability of underlying voiced stops being spirantized (i.e. realized as approximants). Indeed, in both languages, some speakers did exactly this, with a higher rate observed in Spanish. Note that such tokens were grouped with other clusters for which the underlying initial consonant was a stop in the statistics. Standard phonological descriptions for Spanish (Navarro Tomás 1970; Quilis 1993) claim that spirantization is a categorical process. The patterns in our data demonstrate that it is a variable (gradient, non-categorical) phenomenon. In order to determine whether spirantization has an effect on the length of the epenthetic vowel, a speaker-by-speaker analysis is needed; we leave this task for future studies.

using a Marantz CDR300 CD recorder (44100Hz; 32bit; Stereo) and a unidirectional Audiotechnica AT803B lavalier microphone.

The sound files were downsampled (22050Hz; 16-bit; Mono), and low-pass filtered (11050Hz). Target words were then extracted and labelled. The clusters were analyzed with PRAAT 4.0.41 for (i) the presence/absence of the epenthetic vowel; (ii) the length and first three formants of the vowel, when present; and (iii) voicing. Results were entered in a spread-sheet, and statistics were calculated with SAS 8.2. The confidence level for all the statistics was set at 0.05.

### 5. Results

As shown in Table 1, epenthetic vowels are detected in both French and Spanish. The rate of epenthesis varies across liquid types, obstruent manner and voicing, as well as between languages, with the exception of obstruent-lateral clusters. In the case of these latter clusters, epenthetic vowels are almost categorically absent, with an epenthesis rate of less than 2% in both languages. In all other cases, epenthetic vowels, when present, have a mean intensity and length similar to that of unstressed vowels (see waveform in Figure 1).

	Cluster	French			Spanish		
		N	Total	%	N	Total	%
<l>	Obstruent + /l/	9	599	<b>1.5</b>	11	591	<b>1.9</b>
	/fr/	3	122	<b>2.5</b>	168	198	<b>84.9</b>
<r>	/p,t,k/ + /r/	20	356	<b>5.6</b>	339	360	<b>94.2</b>
	/b,d,g,/ + /r/	320	356	<b>89.9</b>	386	395	<b>97.7</b>
		352	1433		922	1544	

Table 1. *Rate of epenthesis in French and Spanish*

We now turn to the particular phonetic realization of these vowels in both languages.

#### 5.1 Epenthesis in French

In French, epenthetic vowels are observed for all speakers almost exclusively in voiced obstruent-rhotic clusters,<sup>12</sup> an example of which is given in Figure 1. There is an effect for place, with the rate of epenthesis being

<sup>12</sup> There is only one speaker in the sample who epenthesizes in both voiced and voiceless rhotic clusters. However, the rate of epenthesis is higher with voiced obstruents.

significantly lower with dorsals (85%;  $\chi^2 = 4.94$ ,  $p < .05$ ) than coronals (93.2%) or labials (91.5%).

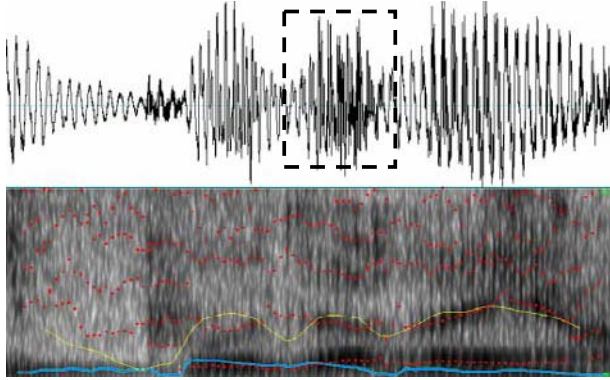


Figure 1: *Epenthetic vowel in French voiced obstruent-rhotic cluster (target poudrer /puʁʁe/ “to powder”)*

The mean duration of the vowel varies across speakers. Given that our subject group included similar numbers of males and females, statistics were run to determine the possibility of a gender-based difference; no effect was found. Rather, differences seem to be an individual characteristic of the speaker. 8 out of 10 of the speakers in the sample constitute a group with no significant difference in the length of their epenthetic vowel, which may range from 27ms to 38ms; this is comparable to Quilis’ (1970) findings for epenthetic vowels in Spanish (see §2.2).<sup>13</sup> The other two speakers, one male and one female, produce a significantly longer vowel in the range of 50ms. The length of the epenthetic vowel is affected by the place of the obstruent: it is significantly longer in coronal clusters ( $F_{(3, 39)} = 3.26$ ,  $p = .03$ ), than in labial or dorsal clusters, between which there was no significant difference in vowel length. Finally, the duration of the epenthetic vowel is not significantly affected by the position of the cluster in the word (initial vs. internal;  $t = 0.86$ ;  $p > .38$ ) or by the presence versus absence of stress ( $t = 1.66$ ;  $p > .09$ ).

<sup>13</sup> Subjects were instructed to read at a normal speech rate. With the exception of one speaker, this directive was respected. Indeed, the length of all rounds was similar across speakers (i.e. approximately 2.5 minutes).

As concerns the quality of the epenthetic vowel, it is affected by the preceding (F1:  $F_{(4, 356)}=7.12$ ,  $p=.0000$ ; F2:  $F_{(4, 356)}=15.21$ ,  $p=.0000$ ) and following vowels (F1:  $F_{(4, 356)}=19.87$ ,  $p=.0000$ ; F2:  $F_{(4, 356)}=9.35$ ,  $p=.0000$ ).<sup>14</sup>

### 5.2 Epenthesis in Spanish

The Spanish data display a greater overall rate of epenthesis than those from French. Indeed, epenthetic vowels are attested in both voiceless and voiced obstruent-rhotic clusters, as shown in Figure 2 (a, b), and were detected for all the speakers in the sample. Note that epenthesis in fricative-rhotic clusters is highly variable, with the rate ranging from 27% to 100% among speakers. As concerns the effect of place, there is virtually no difference between coronal (96.6%), labial (95.4%), and dorsal (94.9%) clusters.

As with French, the obstruent's place of articulation also plays a role in determining the length of the epenthetic vowel; the vowel is significantly longer in dorsal clusters ( $F_{(2, 743)}= 9.3$ ,  $p=.0001$ ). Voicing also influences length, with longer vowels found in voiced clusters ( $t(936)= 14.99$ ,  $p<.0000$ ). In contrast to French, the position of the cluster in the word and the presence of stress on the following vowel do condition epenthesis in Spanish. The epenthetic vowel is significantly longer in word-internal versus word-initial clusters ( $t(936)=3.55$ ;  $p<.0004$ ), and in stressed versus unstressed syllables ( $t(936)=3.52$ ,  $p<.0004$ ). For 8 of the 11 speakers, there is no significant difference in the mean length of the vowel which ranges from 31ms to 40ms; two speakers (one male and female) have a significantly lower mean around 20ms, and one of the speakers has a significantly higher mean, around 47ms. Again, as in French, gender plays no role in determining the length of the epenthetic vowel.

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<sup>14</sup> Previous studies for Spanish (e.g. Quilis 1970) report that the epenthetic vowel had the same quality as the following vowel. In order to test whether this was the case for French and Spanish here, we measured the formant frequencies and ran statistics to test the role of the flanking vowels. In contrast to Quilis (1970), we found an effect for both vowels. Since the objective of the present paper is not to discuss the quality but rather the presence and length of the vowel, no further tests were performed.

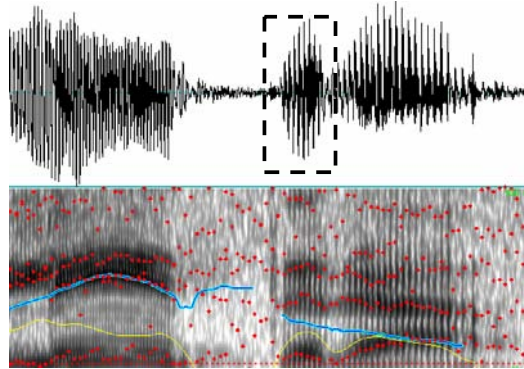


Figure 2a: *Epenthetic vowel in Spanish voiceless obstruent-rhotic cluster (target letra /letra/ “letter”)*

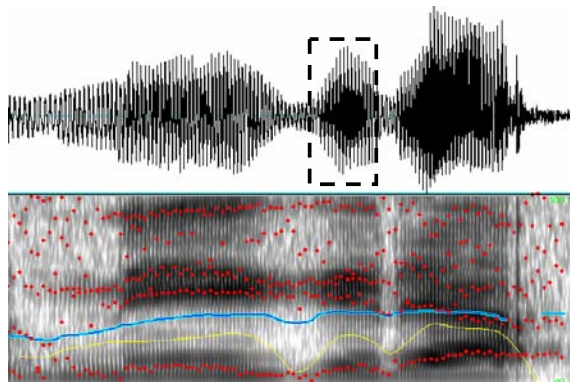


Figure 2b: *Epenthetic vowel in Spanish voiced obstruent-rhotic cluster (target negra /ne yra/ “black”)*

The quality of the epenthetic vowel is significantly affected by the preceding (F1:  $F_{(4, 953)}=13.25$ ,  $p=.0000$ ; F2:  $F_{(4, 953)}=16.81$ ,  $p=.0000$ ) and following vowels (F1:  $F_{(4, 953)}=36.98$ ,  $p=.0000$ ; F2:  $F_{(4, 953)}=13.13$ ,  $p=.0000$ ).

### 5.3 Summary

The experimental data from the present study witness to three asymmetries in the phonetic realization of French and Spanish OL clusters. The first asymmetry exists between lateral and rhotic clusters. In both languages, virtually no epenthesis is observed in lateral clusters, while there is variable epenthesis in rhotic clusters. The second asymmetry, affecting only rhotic



clusters, involves voicing. In French, epenthesis is attested almost exclusively in voiced obstruent-rhotic clusters. In contrast, all Spanish rhotic tokens contain an epenthetic vowel, but the epenthetic vowel is significantly longer in voiced clusters. The final asymmetry involves place of articulation: French epenthetic vowels are longer in coronal clusters, whereas Spanish epenthetic vowels are longer in dorsal clusters.

## 6. *Analysis and discussion*

To this point, we have demonstrated that cluster-medial epenthesis in OL clusters is not restricted to Spanish. Moreover, we have shown that there exist three asymmetries in the phonetic realization of such clusters. In the remainder of this article, we will seek to explain these asymmetries in the context of the dissimilation hypothesis. We begin by evaluating the three hypotheses forwarded in §3.1.

### 6.1 *Hypothesis evaluation*

In §3, we predicted that the rate of epenthesis would be a function of the similarity between the members of the cluster, i.e. the more similar the two consonants in terms of manner, place or voicing, the higher the rate of epenthesis, and possibly the longer the epenthetic vowel. We look at each of the specific hypotheses in turn.

6.1.1 *Manner of articulation.* We hypothesized that, as laterals are phonetically less similar to obstruents than rhotics on either the sonority (French and Spanish) or continuancy (Spanish) dimension, a lower rate of epenthesis should be expected in obstruent-lateral clusters in both languages. In addition, we predicted a lower rate of epenthesis in French, where the rhotic is continuant.

Our results support this hypothesis. Virtually no epenthesis (under 2%) was observed in obstruent-lateral clusters, in contrast to the high rate of epenthesis observed in obstruent-rhotic clusters. The rate with rhotics was higher in Spanish (94%), where epenthesis is attested in both voiceless and voiced clusters, yet nonetheless relatively high in French at 41%. A closer look at the data reveals that the lower rate of epenthesis in French is the result of competing strategies of cluster simplification. Recall from §3 that epenthesis is but one of several dissimilatory strategies available for cluster simplification. An alternative tactic involves assimilation, including the reduction of the cluster via affrication. While French voiceless rhotic clusters differed from those of Spanish in generally not triggering epenthesis, they often involved such simplification. For the group, 30% of voiceless labial-rhotic clusters were

blended; the rate increased to 49% and 71% for voiceless coronal and dorsal tokens respectively. Assimilation in voiceless rhotic clusters is not surprising, particularly for clusters composed of a dorsal obstruent, which shares the place of articulation with /ʁ/.

6.1.2 *Place of articulation.* Following the dissimilation hypothesis, we predicted that the rate of epenthesis would be higher in clusters that shared place of articulation; this is not supported. In French, where rhotic /ʁ/ is dorsal, we predicted higher rates in /kʁ/ and /gʁ/ clusters. However, epenthesis in our data is disfavoured in dorsals; indeed, it is significantly lower (85%) than in coronals (93%) and labials (91%). In Spanish, where the rhotic /r/ is coronal, we predicted greater epenthesis in coronal clusters. Yet, there is no significant difference across places of articulation (coronal: 97%; labial and dorsal: 95%).

If we look at the length of the epenthetic vowel, we observe another asymmetry in both languages that goes against the prediction of greater dissimilation in clusters where the obstruent and liquid share their place of articulation; namely, epenthetic vowels are significantly longer in French coronal clusters, while the epenthetic vowel in Spanish is significantly longer in clusters with a dorsal obstruent. This asymmetry is not without explanation if one takes into account the phonetic characteristics of the rhotics in both languages. In French, the rhotic is dorsal, while in Spanish it is coronal. As a result, rhotic clusters consist of a coronal-dorsal sequence or the mirror dorsal-coronal sequence. In both cases, the production of the clusters involves tongue displacement, with the gestural adjustment leading to longer epenthetic vowels. Such displacement is absent from labial-rhotic clusters, and from clusters with identical place of articulation.

6.1.3 *Voicing.* It was hypothesized that the rate of epenthesis would be higher in clusters that agreed in voicing. This third prediction is supported by the French and Spanish data. In French, there is a clear voicing asymmetry in rhotic clusters favouring epenthesis in voiced tokens. In Spanish, although epenthetic vowels are observed in both voiced and voiceless clusters, they are significantly longer in the former. Thus, voicing plays the most important role in cluster simplification.

The observation that voicing has the strongest effect in cluster simplification deserves further explanation. We hypothesize that it is not the presence versus absence of vocal fold vibrations that is relevant, but that voiced obstruents are shorter than their voiceless counterparts (Colantoni & Steele 2004). Thus, the presence of the epenthetic vowel, in French, and the

longer epenthetic vowel, in Spanish, would be a compensatory effect to preserve isochrony.

### 6.2 *Phonetics or phonology?*

One final question which we wish to address is the nature of the epenthesis attested in the present data. Specifically, are the French and Spanish cluster-medial vowels driven by the phonetics or phonology?

We believe that what we are observing is primarily a phonetic phenomenon. While many of the French and Spanish epenthetic vowels resemble underlying vowels in both length and intensity, they do not appear to participate in phonological phenomena. For French, word-final syllabification constitutes such a phenomenon. Consider a form such as *sucre* /sykʁ/ ‘‘sugar’’. In Quebec French, syllabification of such a form involves deletion of the liquid, resulting in [syk]. Simplification arguably occurs because word-final OL clusters, highly marked sequences cross-linguistically, are illicit in this variety. Deletion allows for a surface form attested elsewhere in the language (compare [syk] and *duc* [dyk] ‘‘duke’’). Now consider a voiced final OL cluster, such as that of *maigre* ‘‘thin’’. If the medial vowel observed in voiced obstruent-rhotic clusters in the present Quebec French data were phonological in nature, learners’ underlying representation of *maigre* would be /mɛgəʁ/. One would thus expect a syllabification of [mɛ.gəʁ], on par with forms such as *bancaire* /bā̃kɛʁ/ → [bā̃.kɛʁ] ‘‘banking’’. However, syllabifications such as [mɛgəʁ] are unattested. Indeed, word-final voiceless and voiced obstruent-rhotic clusters pattern identically as concerns their syllabification; *maigre* can only be realized as [mɛg].

In Spanish, one might use stress as a diagnostic (see e.g. Bradley 2004). Were the Spanish cluster-medial vowels underlying, they should be stressed when syllabified in the antepenultimate syllable of word with a light penult. For example, in the case of a form such as *tímbrico* in (3), stress would fall on the second syllable [bə], were the vowel underlying. However, as shown in (3b), stress falls on the word-initial syllable.

- (3) a. [tim.'bə.ri.ko] ‘‘timbral’’  
 b. ['tim.bə.ri.ko]

Note that, in order to use stress as a diagnostic, one requires words of three or more syllables containing an obstruent-rhotic cluster in the penult. Such words are few in number and are generally technical or learned vocabulary. As such, the stress patterns of these words could be learned on a word-by-word

basis. Were this the case, stress placement in such words would not be an appropriate diagnostic.

Keeping this potential limitation in mind, we cautiously forward the syllabification of final OL clusters in French and the Spanish stress pattern in (3) as evidence for the phonetic nature of the cluster-medial vowels observed in the current data. Determining whether or not the epenthetic vowels described here have either synchronic or diachronic consequences for the phonology of either or both languages will be left for future research.

## 7. *Conclusions*

In this paper, we have presented data from an experimental study of French and Spanish OL clusters that demonstrate the productivity of cluster-medial epenthesis in both languages. We have shown that the degree of simplification via epenthesis is a function both of the type of liquid and of the similarity of the members of the cluster in manner, place and voicing. Of these four dimensions, liquid type, followed by voicing, has the strongest effect.

The tendency towards cluster simplification observed is consistent with both a general Romance and cross-linguistic trend favouring maintenance of clusters exhibiting greater sonority contrast. Moreover, the present results indicate that both French and Spanish observe the Romance tendency towards an asymmetrical evolution of (i) obstruent-lateral and obstruent-rhotic clusters, and (ii) voiced versus voiceless obstruent clusters.

The findings of this paper are limited to the production of OL clusters in Quebec French and Argentinean Spanish. In current work, we are studying the realization of these clusters in two other varieties, namely European (France) French and Chilean Spanish. Preliminary analysis of the data reveals the presence of epenthetic vowels in the same environments described here; further analysis will be required to determine the effect of the other variables (e.g. voicing, stress) on the realization of these vowels. In future research, we also intend to study the perception of these clusters. As stated earlier, native speakers report being unaware of the epenthetic vowel when questioned. However, this does not necessarily mean that the vowel is not perceived at a prelexical level. If this is the case, it is possible that phonetic epenthesis may have long-term effects on the phonology of OL clusters in French and Spanish.

## APPENDIX

### Experimental Stimuli

French

Word shape	Liq	Labial		Coronal	Dorsal
	p	b	f	d	k
CLV	[l]	<i>plat</i> [plɑ]	<i>flot</i> [flo]	*	<i>clé</i> [kle]
	[ʁ]	<i>bras</i> [brɑ]	<i>frais</i> [frɛ]	<i>très</i> [tʁɛ]	<i>crée</i> [kʁe]
	[l]	<i>placer</i> [plɑs]	<i>flatter</i> [flɑt]	*	<i>classer</i> [klɑs]
CLV:CV	[ʁ]	<i>précis</i> [pʁesi]	<i>frapper</i> [frɑp]	<i>tracer</i> [trɑs]	<i>gratter</i> [grɑt]
	[l]	<i>couplet</i> [kuplɛ]	<i>siffler</i> [siflɛ]	*	<i>boucler</i> [buklɛ]
	[ʁ]	<i>mépris</i> [mɛpʁi]	<i>coffret</i> [kɔfrɛ]	<i>poudrer</i> [puδʁɛ]	<i>degré</i> [dɛgʁɛ]
CV:CLV:CV	[ʁ]	<i>déplacer</i> [dɛplɑsɛ]	<i>refléter</i> [ʁɛflɛtɛ]	*	<i>déclarer</i> [deklaʁɛ]
	[ʁ]	<i>soprano</i> [sɔpʁɑno]	<i>naufragé</i> [no fʁaʒɛ]	<i>détriquer</i> [dɛtʁikɛ]	<i>décrasser</i> [dekʁasɛ]
				<i>redresser</i> [ʁɛδʁɛsɛ]	<i>dégrader</i> [dɛgʁadɛ]

Spanish

Word shape	Liq	Labial		Coronal		Dorsal
		p	b	t	d	k
CLV	[l]	<i>plan</i> [plan]	<i>bla</i> [bla]	*	*	<i>clan</i> [klan]
	[r]	*	*	<i>tras</i> [tras]	*	* <i>gran</i> [gran]
CLV.CV	[l]	<i>plegó</i> [pleyo]	<i>blasón</i> [blason]	*	*	<i>clavé</i> [klaβe]
	[r]	<i>prevé</i> [preβe]	<i>bramó</i> [bramo]	<i>traté</i> [trate]	<i>drogó</i> [droyo]	<i>grabé</i> [graβe]
CV.CLV	[l]	<i>soplé</i> [sople]	<i>doblá</i> [doβla]	*	*	*
	[r]	*	<i>cobrá</i> [koβra]	*	<i>podré</i> [poðre]	<i>lucrá</i> [lukra]
'CV.CLV	[l]	<i>sopla</i> [sopla]	<i>tabla</i> [taβla]	*	*	<i>tecla</i> [tekla]
	[r]	<i>lepra</i> [lepra]	<i>sobra</i> [soβra]	<i>letra</i> [letra]	<i>sidra</i> [siðra]	<i>sacra</i> [sakra]
'CLV.CV	[l]	<i>plato</i> [plato]	<i>bledo</i> [bleðo]	*	*	<i>claro</i> [klaro]
	[r]	<i>prado</i> [praðo]	<i>brazo</i> [braso]	<i>traje</i> [traxe]	<i>drama</i> [drama]	<i>crema</i> [krema]

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# AGREE, THE EPP-F AND FURTHER-RAISING IN SPANISH\*

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## 1. *Conceptual problems for Agree as in Chomsky 2000*

In this paper I will only deal with Agree and its relation to the EPP-F (which usually corresponds to subject agreement). In cases where the agreeing functional projection lacks an EPP-F, I basically follow Chomsky 2000.

To illustrate how Agree works when there is an EPP-F present, consider (1) below, where DP is an external argument and Tense is the functional head encoding both tense and agreement:

$$(1) \quad \text{TenseP} [\text{Tense}_{\text{EPP}} \phi \text{ } \nu\text{P} [\text{DP}_{\text{CASE}} \phi [ \nu [ \dots ] ] ] ]$$

As can be seen in the configuration above, Tense has two sets of features: an EPP-F, which requires that some XP be merged with it, and  $\phi$ -Fs (person, number and gender). The DP also has two sets of features, Case-Fs and  $\phi$ -Fs as well. All of these features, except for the  $\phi$ -Fs of the DP, are uninterpretable, which means that the syntax has to get rid of them. The EPP-F on Tense is a structural requirement, with no meaning associated to it. The Case-Fs on the DP do not have any meaning associated to them either, neither do the  $\phi$ -Fs in Tense, which are only required to agree with the  $\phi$ -Fs of the DP. These uninterpretable Fs enter the derivation unvalued. Agree applies to erase all these uninterpretable Fs in the following way:

First, there is matching between the  $\phi$ -Fs of Tense and the  $\phi$ -Fs of the DP. The set of  $\phi$ -Fs of Tense is called the Probe and the set of  $\phi$ -Fs of the DP is called the Goal. For this matching to take place, the Probe must c-command the Goal.

Second, there is Valuation and Deletion of the  $\phi$ -Fs of Tense and the Case-F of the DP licensed by the matching procedure just mentioned. Once Agree

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applies, the DP cannot undergo A-movement. In Chomsky's (2000) words, the DP is "frozen in place". (2) below illustrates this step in the derivation:

$$(2) \quad \text{TenseP} [\text{Tense}_{\text{EPP}} \phi \text{ } \nu\text{P} [ \text{DP}_{\text{CASE}} \phi [ \nu [ \dots ] ] ] ]$$

Third, the EPP-F is satisfied with raising of the DP, an operation that Chomsky calls "Second-Merge". This step is illustrated in (3):

$$(3) \quad \text{TenseP} [ \text{DP}_{\text{CASE}} \phi [ \text{Tense}_{\text{EPP}} \phi \text{ } \nu\text{P} [ \text{DP}_{\text{CASE}} \phi [ \nu [ \dots ] ] ] ] ]$$

There are three main problems with this approach to Agree:

First of all, there is a contradiction in Chomsky's formulation. If a DP gets frozen after its Case-F gets deleted under Agree, how come it is able to raise and satisfy any EPP at all? Chomsky's answer to this problem is that inside a phase all operations apply simultaneously. I adhere to Epstein and Seely's (2002) criticism of this idea. If operations apply simultaneously, we lose the explanatory power of a derivational approach with step-to-step rule application (see Epstein and Seely 2002 for more arguments against simultaneity).

Second, Chomsky stipulates that under Agree the only Fs that delete are the  $\phi$ -Fs of the probe and the Case-Fs of the goal, although they are not the ones that match. One way out of this stipulation would be to say that all and only uninterpretable Fs under Agree delete, but then, the EPP-F (for some reason) should go away as well, which is not the case. This means that the EPP-F has to be treated differently, since it is uninterpretable, but it does not delete under Agree.

Third, in this approach, movement of the DP applies after Case-F deletion, so none of the copies displays undeleted Case-Fs. In the (previous) Checking approach (Chomsky 1995), only the upper copy gets its Case-Fs deleted. Nunes (1999, 2000) provides a theory of linearization based on this distinctness between the different links in a chain. He argues that, after movement, only the upper copy surfaces in the phonology because economy conditions favor the Case-less copy to be pronounced. He observes that movement creates a contradiction for the Linear Correspondence Axiom (Kayne 1994) that has to be eliminated. If we delete the upper copy and make PF interpret the lower copy the derivation crashes because of its unchecked Case-F, which would trigger another deletion operation. Conversely, if we delete the lower copy, this problem does not arise. Under the Agree approach, we have to stipulate that only the upper copy is pronounced by some deep (but non-explanatory) principle of the grammar (i.e., go back to GB's Trace

theory), that is, we have to give up Nunes's economy-based account on the fact that only the upper copy is pronounced.

## 2. *Proposal: a different timing for Agree and "second-Merge"*

It is interesting to notice that all three problems that I have pointed out in the previous section are related to the relation of Agree with the EPP-F. In this respect, it is worth noticing that Chomsky is assuming that the EPP-F is satisfied after Agree applies. In previous work (Fernández-Salgueiro 2002) I argued that it is not clear why this should be the case. In fact, the grammaticality of cyclic raising constructions like the one in (4), where the subject originates in the non-finite embedded clause suggests that previous Agree is not a necessary condition to satisfy an EPP-F (although undeleted Case-Fs on the DP is, following Chomsky's assumption):

(4) John seems to be very smart

Let us assume, instead, that the EPP-F is satisfied *prior* to Agree. The sentence in (4), for instance, would have the derivation in (5) below:

(5)  $\text{TenseP}[\text{John}_{\text{CASE}} [\text{Tense EPP VP}[\text{seems } [\text{TenseP}[(\text{John}_{\text{CASE}}) \text{ to EPP } [(\text{John}_{\text{CASE}}) \dots ]]]]]]$

This approach entails that the DP raises to satisfy the EPP-F before it gets its Case-Fs valued and deleted. This also means that we have to extend the 'search domain' of the Probe. In this version of Agree, Agree between the probe and the goal can apply as long as the goal is in the checking domain of the probe, or in more derivational terms, if the goal is merged with the probe (Müller 2004 proposes the same idea based on independent grounds).

If, as I claim here, the EPP is satisfied first, we resolve the contradiction pointed out in the previous section and maintain the idea that Case-Fs on a DP is what render the goal active and enables a DP to raise in order to satisfy any EPP. As a welcome result, we do not have to assume simultaneity, which was an *ad hoc* solution. Moreover, if the EPP is satisfied and goes away by the time Agree applies, we do not have to stipulate that the EPP does not delete after Agree. When Agree applies, it deletes all the uninterpretable Fs present in the elements that undergo the operation. There is no stipulation that says that the Un  $\phi$ -Fs of Tense have to delete and also does the Case-F of the DP but not the EPP-F of Tense.

Finally, a theory of Linearization of Chains based on Feature distinctness between the copies (cf. Nunes 1999, 2000) becomes tenable again, because

now only the upper copy of the DP gets its Case-Fs deleted (as was the case in the Checking approach), and we do not have to stipulate that only upper copies are pronounced, as it was done in GB.

### 3. *Further-raising in Spanish*

Apart from solving the problems that we saw in the first section, this alternative view of Agree will open the possibility to account for instances of what I call Further-raising (a term that I will clarify below). In this section I present and discuss the relevant data.

Alongside with sentences (6) and (7), Spanish, Galician, European Portuguese, Basque, Italian and Catalan (at least) also allow (8) (I will be using Spanish examples throughout the paper):

- (6) Juan y Pedro parecen ser muy listos  
 John and Peter seem to.be very smart  
 “John and Peter seem to be very smart”
- (7) Parece que Juan y Pedro son muy listos  
 Seems that John and Peter are very smart  
 “it seems that John and Peter are very smart”
- (8) Juan y Pedro parece que son muy listos  
 John and Peter seems that are very smart  
 “John and Peter seem to be very smart”

Sentences (6) and (7) are straightforward: in (6) the subject cannot check case in the embedded clause because the verb is not finite so it has to raise to the matrix clause. In (7) the subject can check case in the embedded clause so it does not have to raise. Therefore, given economy conditions, if it does not have to raise, it cannot raise.

Nor (6) or (7) are problematic then for the standard approach to Agree. In (6) the uninterpretable  $\phi$ -Fs of *parecen* match the  $\phi$ -Fs of *Juan y Pedro* (and the Case-F of *Juan y Pedro* delete) and then the EPP-F of *parecen* is satisfied with raising of *Juan y Pedro*. In (7) it is the uninterpretable  $\phi$ -Fs of the verb *son* in the embedded clause that enter into Agree, and its EPP-F is satisfied with raising of *Juan y Pedro* as well. As in both cases *Juan y Pedro* raises to the specifier of the head that enters into the Agree operation, Agree can account for the grammaticality of both.

In (8), however, the DP *Juan y Pedro* raises to the specifier position of *parece* although it agrees with the Tense head in the embedded clause. This derivation is illustrated in (9) below (ignoring verb movement for simplicity):

- (9) [[Juan y Pedro <sub>CASE</sub>] [Tense <sub>EPP</sub>  $\phi$  [... [(Juan y Pedro <sub>CASE</sub>)]  
[Tense <sub>EPP</sub>  $\phi$  [... (Juan y Pedro <sub>CASE</sub>) ...]]]]]

The main problem with this derivation is the following: the embedded Tense projection and the DP *Juan y Pedro* undergo Agree, then raising of the DP occurs to satisfy the EPP-F of Tense and then the DP raises again to satisfy the EPP-F of tense in the matrix clause. If we take the idea seriously that DPs get ‘frozen’ after Agree, how can the DP raise twice here?

There could be two possible solutions under the standard Agree approach: First, we could say that the DP in (8) is base-generated in a Topic position, so there is no raising at all. However, there is convincing evidence that this cannot be the case. (10) and (11) below show that the DP has moved, since it observes island constraints:

- (10) Complex NP island  
 \*Juan y Pedro parece que el hecho de que  
 John and Peter seems that the fact of that  
     vengan nos alegra  
     come-SUBJ us cheer  
 “it seems that the fact that John and Peter are coming makes us happy”

- (11) Wh island  
 \*Juan y Pedro parece que Eva se pregunta  
 John and Peter seems that Eva REFL wonders  
     si se marcharon  
     if REFL left  
 “it seems that Eva wonders whether John and Peter left”

Another possibility would be saying that the second movement of the DP is an instance of topicalization and the  $\phi$ -Fs of Tense in the matrix clause probe an expletive null subject *pro*. Again, there is evidence that this movement of the DP cannot be topicalization. First, the DP cannot cross an experiencer, which is a constraint that applies to subject movement generally across Romance languages (see Torrego 2002):

- (12) No raising over an experiencer  
 \*Juan y Pedro le parece que vieron hoy a  
 John and Peter to.him seems that saw today to  
 los chicos  
 the boys  
 “John and Peter seem to him to have seen the boys today”

Second, the subject of an idiom chunk is allowed in this position, which means that this is an instance of A-movement. In the idiom *mala hierba nunca muere*, which roughly means ‘bad people live for a long time’, we can extract *mala hierba*, as in (13) without altering the idiomatic meaning:

- (13) Mala hierba parece que nunca muere  
 Bad herb seems that never dies  
 Roughly: “a bad/cruel person seems to live for a long time”

Moreover, we cannot have a pronoun in the embedded clause referring back to *Juan y Pedro* that would be fine if the DP *Juan y Pedro* were a real topic, as shown in (14). Actually, if there is a prosodic boundary between *Juan y Pedro* and the rest of the sentence (thus clearly signalling a topic-comment construction), the pronoun can appear in the embedded clause:

- (14) \*Juan y Pedro parece que ellos son muy listos  
 John and Peter seems that they are very smart  
 (cf. ok: Juan y Pedro, parece que ellos son muy listos)

A final piece of evidence that shows that this movement is not topicalization is that in Spanish and Catalan, at least, an embedded subject can also surface as object in the matrix clause. I will discuss this in the next section.

These data that I have provided here show that the standard formulation of Agree cannot account for the properties of the movement of *Juan y Pedro* in sentences like (8), since this is an instance of subject A-Movement that occurs after agreement with Tense is established. This type of movement is slightly different from hyper-raising examples (see Ura 1994, 2000) in that the subject only agrees with one Tense head, not with two. In order to distinguish the two phenomena, and avoid any possible terminological confusion, I am giving a new name to the constructions I am dealing with here: Further-raising.

#### 4. *Allowing for Further-raising*

The question that arises after considering the data in the section above is: what makes all the languages that I mentioned (let us call them the Spanish-type) different from, say, English? Why is it that in English a DP cannot raise further than to the specifier position of the functional head with which it enters into an Agree relation?

Taking seriously the assumption that it is undeleted Case-Fs that render a given DP active (see Section 2 above), we can say that the Case-Fs of the DP are necessarily deleted after Agree in a language like English but not in a language like Spanish. How can this be the case?

We argued that, after matching and valuation, we have deletion of the uninterpretable  $\phi$ -Fs of the functional head and deletion of the Case-F of the DP. However, we have not said anything about the ordering of these deletion operations. Do they apply all at once? Does the Case-F delete first? Do the  $\phi$ -Fs delete first? My answer to these questions is that it could be the case that different languages behave differently in this respect and this relative timing of the operations of deletion could be taken to be a source of parametric variation.

In languages like English, the two deletion operations apply at once (or Case-F deletion applies right after  $\phi$ -Fs deletion, which we cannot tell), so further-raising is not possible. Once Agree applies between the functional head and the DP, the DP gets the Case-F deleted and is unable to undergo further A-movement. In Spanish-type languages, however, the  $\phi$ -Fs on the functional head delete first but Case-F deletion can be delayed. The third possibility, that the Case-F deletes first and the deletion of the  $\phi$ -Fs on the functional head can be delayed, I am not pursuing here, but it is possible that certain languages may behave like that.

The proposal that I want to put forward here then is that what happens in cases of further-raising like (8) is that Case-F deletion applies after a higher EPP is inserted in the derivation, as illustrated in (15):

- (15) [[Juan y Pedro <sub>CASE</sub>] [Tense <sub>EPP</sub> [... [(Juan y Pedro <sub>CASE</sub>)  
[Tense <sub>EPP</sub>  $\phi$  [... (Juan y Pedro <sub>CASE</sub>) ...]]]]]

Notice that in this derivation only the upper copy gets its Case-F deleted, as follows from the alternative approach to Agree that I propose here, where the EPP-F is satisfied first. Another important aspect to be taken into account here is that delaying Case-F deletion is only possible if an EPP-F forces movement, under this approach.

There is evidence that this is actually the case. Consider (16) below, which is an instance of subject further-raising to object position:



- (16) Vi            a        María    que    llegaba        tarde  
 Saw-1ST    to     Mary    that    arrived-3RD    late  
 “I saw Mary arriving late”

In this example, the DP *María* satisfies the EPP-F in the embedded clause, but Case-F deletion is delayed, which allows it to surface as object of the matrix verb, presumably by movement to a thematic position as in Hornstein 1999. Again, a base-generation analysis for the DP would be inadequate here. If there is more embedding, the DP cannot surface as object in the matrix clause, as (17) below illustrates, which means that the DP has moved:

- (17) \*Vi        a        María    que    Juan    dijo    que    llegaba        tarde  
 Saw-1ST    to     Mary    that    John    said    that    arrived-3RD    late  
 “I saw John saying that Mary arrived late”

Now, if we try to raise an object from the embedded clause, the result is ungrammatical:

- (18) \*Vi        a        María    que    Juan    la    besaba  
 Saw-1ST    to     Mary    that    John    her    kissed  
 “I saw John kissing Mary”

In this sentence the DP *Maria* gets its Case-Fs deleted *in situ* by means of Agree (given that *v* does not have an EPP-F, as Tense does). Therefore, it is unable to raise at all, even in a language like Spanish.

This alternative approach, however, raises two new crucial questions:

First, how does the DP *Juan y Pedro* get the Case-F deleted in the configuration in (15)? Do we have a second operation of Agree? It can easily be seen that this is not possible, since the DP does not agree with the matrix Tense (cf. *Juan y Pedro* (pl) parece (sg)). Again, we are not considering hyper-raising constructions here, where that is precisely what happens. Consider, in this respect, the data in (19-22):

- (19) Ellos    pareció        que    sabían    la    lección  
 They    seemed-3SG    that    knew-3PL    the    lesson
- (20) \*Ellos    parecieron    que    sabían    la    lección  
 They    seemed-3PL    that    knew-3PL    the    lesson

- (21) Tú parecerá que no sabes nada  
 You will.seem-3SG that not know-2SG nothing
- (22) \*Tú parecerás que no sabes nada  
 You will.seem-2SG that not know-2SG nothing

Agree here is actually impossible because in these constructions Tense cannot be inflected for person (20) or number (22) (i.e.,  $\phi$ -Fs) although it can be inflected for Tense. The 3sg inflection that we find is an impersonal (fixed) form of the verb, not an agreeing form, which I assume does not enter into any Agree operation. If we have a look at other verbs with which this construction is possible, we see that we always find impersonal forms:

- (23) (with *decir* “to say”, with an impersonal marker)  
 Los Romanos se decía que eran muy listos  
 The Romans impersonal said-3SG that were very smart  
 “it was said that the Romans were very smart”
- (24) (with *resultar* “to result in”)  
 Juan resulta que suspendió el examen  
 John results that failed the exam  
 “John ended up failing the exam”
- (25) (with *ser* “to be”)  
 Juan era la primera vez que iba a un concierto  
 John was the first time that went-3SG to a concert  
 “it was the first time that John was going to a concert”

This means that we do not need a second operation of Agree to apply and delete the uninterpretable  $\phi$ -Fs of Tense, simply because there is no undeleted uninterpretable  $\phi$ -F that would cause the derivation to crash at the interface. As for the DP, I assume that it gets its Case-F deleted by virtue of the Agree operation that applied in the embedded clause. This construction shows the interesting property that the two characteristics traditionally associated with subjects (agreement with Tense and Nominative Case checking) is split across two different positions, that is, the two operations (Agree and Case Deletion) apply at different points in the derivation.

The second question that arises is: why is it that Spanish can delay Case-F deletion for so long? What property of Spanish-type languages allows for this that English, for example, does not have?

As can be seen, there is a look-ahead paradox here. In order for the DP to remain without its Case-F deleted we need to know whether there is going to be another EPP-F available later in the derivation. At first, it looks as if Spanish-type languages had a look-ahead device that English lacks; while in Spanish we can choose to delay Case-F deletion based on a higher EPP-F being inserted in the derivation at a later stage, in English we are not allowed to do so.

There is, however, another deeper and more plausible explanation. All languages that I mentioned in Section 3 (languages that allow (8)) are pro-drop languages. If we do not have look-ahead device in the system (something that is desirable, since look-ahead introduces derivational complexity), it seems that there should be no problem in leaving Case-Fs undeleted after raising in these languages. An interesting way to link these two properties (pro-drop and further-raising) is to assume that a non-overt subject in these languages is a DP without Case-Fs deleted. Notice that this approach allows us to make an interesting prediction: only pro-drop languages can allow for instances of further-raising like the ones I have considered here.

This assumption would not be tenable in a weak derivational approach with levels of representation PF and LF (cf. Chomsky 1995), because there would be uninterpretable Fs remaining undeleted at the interfaces, something which is ruled out by Full Interpretation.

Conversely, this would be plausible under a strong derivational approach without levels of representation (Epstein et al. 1998, Epstein and Seely 2002). Under this kind of approach, there is no notion of Full Interpretation applying at PF or LF, rather, a given operation of Merge provides instructions to the performance systems directly. In the case at hand, the Semantic Fs of a further-raised DP subject would be interpreted already when it is merged for the first time in the derivation. The Phonological Fs, however, would not be interpreted until the Case F gets deleted and, in any case, after the DP is re-merged. If there is no other EPP-F available, the DP will not be pronounced, yielding a null subject; if there is, we can get a further-raised subject.

## 5. *Conclusion*

In this paper I have tried to show conceptual and empirical problems that bear on Chomsky's (2000) original formulation of Agree. I have tried to show that looking for a more internally coherent and conceptually desirable approach to Agree and its relation to the EPP-F can provide a way of explaining instances of further-raising in terms of parametric variation that actually depends from a different principle of the grammar, e.g., whether the language is pro-drop (Spanish-type) or non-pro-drop (English-type).

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# DIMINUTIVES IN BRAZILIAN PORTUGUESE AND OUTPUT- OUTPUT CORRESPONDENCE\*

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## 1. *Introduction*

In this paper, I discuss some puzzling, long-distance phonological effects triggered by the plural suffix *-s* in Brazilian Portuguese (BP), when it attaches to diminutives. I present an optimality-theoretic analysis (Prince and Smolensky 1993; and subsequent references), based on output-output correspondence (Benua 1995; Burzio 1994; Kenstowicz 1996; Steriade 1996; *inter alia*), and argue that it provides a simple solution to the puzzles. I show that the analysis can be straightforwardly extended to cover cases of under- and over-application related to mid-vowel alternations and nasality in BP diminutives, providing thus a unified account for all the morphophonological peculiarities involving diminutives in the language.

The paper is organized as follows: in Section 2, I present the relevant background on diminutive and plural formation in BP, focusing on cases in which the plural morpheme triggers phonological changes on the bases to which it attaches. In Section 3, I discuss the affixal nature of the diminutive morphemes and reject the idea that BP diminutives involve infixation or compounding. In Section 4, I present my analysis, according to which diminutive words in BP are evaluated with respect to the corresponding non-diminutive forms, *i.e.*, forms that share the same grammatical features (number and gender) but in which the diminutive morphemes are absent. In Section 5, I show how the same mechanisms can straightforwardly account for the absence of certain vocalic alternations in BP diminutives. Section 6 is a brief conclusion.

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## 2. BP diminutives and plurals

There are two diminutive affixes in BP: stem-level *-inho/a* and word-level *-zinho/a* (*nh* represents a palatal nasal).<sup>1</sup> *-inho/a* attaches to consonant-final stems that form nouns and adjectives with the theme vowels *-a*, *-o* and *-e*, whereas *-zinho/a* typically attaches to words ending in consonants, diphthongs, and stressed vowels:<sup>2</sup>

- |     |    |               |   |                      |
|-----|----|---------------|---|----------------------|
| (1) | a. | <i>cas-a</i>  | - | <i>cas- inh -a</i>   |
|     |    | “house        | - | little house”        |
|     | b. | <i>livr-o</i> | - | <i>livr- inh -o</i>  |
|     |    | “book         | - | little book”         |
|     | c. | <i>pent-e</i> | - | <i>pent- inh -o</i>  |
|     |    | “comb         | - | little comb”         |
| (2) | a. | <i>mar</i>    | - | <i>mar-zinh -o</i>   |
|     |    | “sea          | - | little sea”          |
|     | b. | <i>irmão</i>  | - | <i>irmão-zinh -o</i> |
|     |    | “brother      | - | little brother”      |
|     | c. | <i>caju</i>   | - | <i>caju-zinh -o</i>  |
|     |    | “cashew       | - | little cashew”       |

The plural suffix *-s* is always the outermost suffix in plural words. Thus, the plural of both diminutive and non-diminutive words are formed by adding *-s* to the corresponding singular forms.

- |     |    |                |   |                     |
|-----|----|----------------|---|---------------------|
| (3) | a. | <i>casa-s</i>  | - | <i>casinha-s</i>    |
|     |    | “houses        | - | little houses”      |
|     | b. | <i>irmão-s</i> | - | <i>irmãozinho-s</i> |
|     |    | “brothers      | - | little brothers”    |

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<sup>1</sup> Throughout the paper, examples are given in their orthographic forms, except for the segments directly involved in the morphophonological alternations related to the analysis presented in the paper. In these cases, a phonetic transcription is given and its interpretation provided in the text.

<sup>2</sup> I say ‘typically’ because the use of *-zinho/a* with words ending in a theme vowel is also attested and in some cases, alternation between the two forms has become a matter of preference. For relevant diachronic and dialectal considerations on the use of these morphemes, see Maurer Jr. (1969) and Skorge (1957).

However, sometimes, adding *-s* to a base triggers some phonological changes, as can be seen in (4)-(6) below (*i/w* refers to the front and back glides respectively; *o/O* refers to the +/- ATR contrast).

- (4) a. *jornaw* - *jornai-s*  
       “newspaper- newspapers”  
    b. *hotew* - *hotei-s*  
       “hotel - hotels”
- (5) a. *porco* - *pOrco-s*  
       “pig - pigs”  
    b. *corpo* - *cOrpo-s*  
       “body - bodies”
- (6) a. *coraçãõ* - *coraçõẽ-s*  
       “heart - hearts”  
    b. *capitãõ* - *capitãẽ-s*  
       “captain - captains”

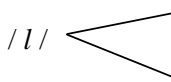
I will start by discussing the cases in (4). In those cases, there is evidence that the final glide *w* is, underlyingly, the lateral consonant *l*, as attested by the following alternations (syllable boundaries indicated by dots):

- (7) a. *jornal* + *-eiro* → *jor.na.lei.ro*  
       “newspaper dealer”  
    b. *jornal* + *-ista* → *jor.na.lis.ta*  
       “journalist”
- (8) a. *ho.tel* + *-aria* → *ho.te.la.ria*  
       “hotel business”  
    b. *hotel* + *-eiro* → *ho.te.lei.ro*  
       “related to a hotel”

In BP, *l* never appears in coda position. If a root or stem ending in *l* is followed by a vowel initial suffix, *l* can be syllabified as an onset, as shown in (7) and (8). But if no such suffix is available, *l* is vocalized, becoming a glide. The glide is then realized as a dorsal segment. However, as attested in (4), when *l* is immediately followed by the plural suffix *s*, it becomes *i*, not *w*. I assume that alternations as in (4) correspond to cases of tautosyllabic coronal



assimilation, in which the coronal consonant *s* is responsible for changing the back glide *w* into its front counterpart *i* (cf. Girelli 1988; Morales-Front and Holt 1997).

- (9)  $/l/$   *l* in onset position  
*w* in coda position
- $w+s]_{\sigma} \rightarrow is]_{\sigma}$  (assimilation triggered by the plural morpheme)

Turning now to cases like (5)-(6), I will consider them irregular plurals, since the changes observed in those forms do not seem to be phonologically motivated.<sup>3</sup> I will treat them as allomorphs:

- (10) a. *porko* → *pOrko* / \_\_ + pl  
 b. *coraçãO* → *coraçõE* / \_\_ + pl

Notice the locality constraint in the conditioning environment. Here, the suffix *-ada*, roughly meaning “bunch of”, intervenes between the root and the plural marker, and no alternation is observed:

- (11) *pork-ada-s* \**pOrkadas*  
 “bunches of pigs”

Consider now what happens with diminutives and their plurals:

- (12) a. *jornawzinho* - *jornaizinho-s*  
 “little newspaper(s)”  
 b. *hotewzinho* - *hoteizinho-s*  
 “little hotel(s)”
- (13) a. *porkinho* - *pOrkinho-s*  
 “little pig(s)”  
 b. *corpinho* - *cOrpinho-s*  
 “little body(ies)”

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<sup>3</sup> Cf. Morales-Front and Holt (1997) for an alternative for cases involving nasal diphthongs, as in (10b).

- (14) a. *coraçãozinho* - *coraçõezinho-s*  
 “little heart(s)”  
 b. *capitãozinho* - *capitãezinho-s*  
 “little captain(s)”

The alternations above are unexpected. In (12), for instance, the plural morpheme is too far away from the glide to trigger any phonological change. In (13) and (14), the diminutive affix intervenes between the base and the plural marker, and should prevent the application of the process in (10). How can we explain the alternations above? The answer to this question will occupy us through the rest of the paper.

### 3. *Are -inho/a and -zinho/a suffixes?*

Looking at the cases in which no phonological change affects the base to which *-inho/a* and *-zinho/a* attaches, it seems natural to conclude that these morphemes are stem-level and word-level suffixes respectively. However, in the face of the problematic cases in (12)-(14), one might suspect that this conclusion is not warranted. In this section, I briefly sketch two alternative treatments to diminutive formation in BP, but end up rejecting them as being descriptively inadequate.

#### 3.1 *Against infixation*

A plausible way to deal with the cases in (12) is to treat *-inh-* as an infix attaching to fully inflected words.<sup>4</sup>

- (15) a. *porco* + *-inh-* → *porkinho*  
 “little pig”  
 b. *pOrcos* + *-inh-* → *pOrkinhos*  
 “little pigs”

In (15b) the choice of the allomorph *pOrc-* is justified by the presence of the plural marker *-s*, which is generated adjacent to the root. Despite its appealing simplicity, the analysis is problematic, since it cannot be extended to cases of roots that select for the theme vowel *-e*. As shown below in (16), what follows *-inh-* in these cases is not *-e* but *-o* or *-a* depending on the gender of the

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<sup>4</sup> This proposal raises important questions about the ordering between derivational and inflectional affixation, which I will not address here. See Anderson (1992), Perlmutter (1988) and Rainer (1995), among others, for discussion and relevant literature.

root (masculine or feminine). This is totally unexpected and constitutes a strong argument against the proposal.

- (16) a. *pent-e* + *-inh-* → *pentinho* (\**pentinhe*)  
 “little comb”  
 b. *corrent-e* + *-inh-* → *correntinha* (\**correntinhe*)  
 “little chain”

### 3.2 Against diminutives as compounds

Another possible approach is to assume a different internal structure to diminutive words, one that treats them as compounds.<sup>5</sup> The proposal goes as follows: *-inh-* and *-zinh-* first attach to the theme vowel and the number morpheme, and then to the bases. In the case of *-inho/a*, the base is a bounded form, a stem, and in the case of *-zinho/a*, the base is a free form, a fully inflected word:

- (17) a.  $[[pOrc]+[inh+o+s]] \rightarrow pOrkinhos$   
 b.  $[[jornal+s]+[zinh+o+s]] \rightarrow jornaizinhos$

In (17a), the constituent *-inhos* is marked as being plural, requiring the presence of the allomorph *pOrc-*. In (17b), the plural morpheme *-s* is adjacent to the root *jornal* and the presence of the front glide *i* is expected. Details of implementation aside, these are welcome results. But they come at a price. Consider the doubly inflected form in (17b). Semantically, the second constituent acts as a modifier of the first one, in a way similar to noun phrases in which a noun is modified by an adjective. *Bona fide* compounds of this sort exist in BP. For instance, in (18a) below, we have a fish that looks like a sword, and not a sword that looks like a fish. Crucially, however, plurality is marked only on the first constituent in these compounds.<sup>6</sup> This is never an option for diminutives, as shown below:<sup>7</sup>

<sup>5</sup> Maurer Jr. (1969) contains a suggestion along these lines.

<sup>6</sup> It is true that there are also compounds in BP that have both constituents inflected for number, as in *radio-gravador/radios-gravadores* “radio-recorder(s)”. But their semantics are similar to the semantics of conjoined phrases: A *radio-gravador* is both a radio and a recorder. There is no reason to single out one constituent as acting as the modifier of the other, as in the case of diminutives. For discussion of Portuguese nominal compounds, see Mateus et alii (2003, chapter 24).

<sup>7</sup> Diminutives are also special with respect to other nominal compounds in having a bounded form as its second constituent. This asymmetry was pointed out by Rainer (1995) as another problem for the compound analysis.

- (18) a. *peixes-espada*  
       “swordfish (pl)”  
       b. \**jornaizinho*  
       “little newspaper (pl)”

Moreover there is an empirical problem with the diminutives in *-zinho/a*. For words ending in *r* and *l*, the analysis leads to predictions that are not borne out, as in (19):<sup>8</sup>

- (19) a. *flor - flores*  
       “flower(s)”  
       *florzinha - florzinhas* (\**florezinhas*)  
       “little flower(s)”  
       b. *mar - mares*  
       “sea - little sea”  
       *marzinho - marzinhos* (\**marezinhos*)  
       “seas - little seas”

According to the analysis, the first half of these forms should be the plural non-diminutive words, *flores* and *mares*. The problem is that the epenthetic vowel *e* that appears in these forms is not carried over to the diminutive plural forms. This represents a serious threat to the compound analysis. I will offer an alternative in the next section.

#### 4. *Output-Output correspondence and diminutives in BP*

My analysis is couched within an optimality theoretic framework (Prince and Smolensky 1993 and much subsequent work), according to which phonological changes affecting the underlying form of a word reflect the existence of markedness constraints that militate against the presence of certain elements (features) in the surface form. These constraints are always in conflict with faithfulness constraints, which militate against discrepancies between elements in the input and their correspondents in the surface form. In addition to these families of constraints, I will also assume the existence of Output-Output Faithfulness constraints (Benua 1995; Burzio 1994; Kenstowicz 1996; Steriade 1996; inter alia). The idea is that certain derived words are evaluated not only with respect to an input, but also with respect to another word or

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<sup>8</sup> The 10 native speakers that I consulted found the starred forms below unacceptable or marginal.

output (its base). Faith-OO militates against discrepancies between elements of the output and their correspondents in the base.

The idea I want to pursue here is that BP diminutive words are evaluated with respect to a base, and that the word serving as the base is the non-diminutive form that has the same grammatical features (number and gender) as the diminutive.<sup>9</sup> As an illustration, let us see how the word *jornawzinho* is obtained.

/jornal+zinh+o/ Base: jornaw	*LAT- CODA	IDENT-OO (BACK)	IDENT- IO(CONS)
a. jor.nal.zi.nho	*!		
☞ b. jor.naw. zi.nho			*
c. jor.nai. zi.nho		*!	*

Tableau 1: *jornawzinho*

Since the word is singular, the base here should also be singular. Candidate a. violates the markedness constraint banning lateral codas. This constraint appears here undominated, reflecting the inexistence of such codas in BP. Candidate c. violates the OO-FAITH constraint stating that the specification of the feature [BACK] of a segment of the base must be preserved in its output correspondent. This is so, because the back glide *w* in the base has become the front glide *i* in the diminutive output. This violation turns out to be fatal, since candidate c., in which the back specification of this segment is preserved, does not violate the constraint. Candidates b. and c. both violate the IO-FAITH constraint enforcing identity of the specification of the feature [CONSONANTAL] in the output and its correspondent in the input. The reason for these violations is the fact that the lateral consonant *l* has been changed into a vocalic segment, a back glide in the case of candidate b. and a front glide in the case of candidate c. Since this constraint is dominated by the other two, these violations are irrelevant in Tableau 1.

Now, consider what happens in the case of the plural form *jornaizinhos*. The base now should be plural, and in this case we have the non-diminutive form *jornais*. Notice the presence of the front glide *i* preceding the plural marker *s* in the base, which results from what we saw above about assimilation. IDENT-OO(BACK) will enforce the preservation of the [BACK]

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<sup>9</sup> On the relevance of grammatical features for choosing the base, see the discussion of vowel deletion in Palestinian Arabic in Kager (1999:278ff).

specification of this segment, and candidate c. of Tableau 2, which is most faithful to the base, wins. Interestingly, the front glide surfaces here, despite the absence of any local conditioning environment, a case that would be described in more traditional, derivational terms as the over-application of a phonological process.<sup>10</sup>

/jornal+zinh+os/ Base: jornais	*LAT-CODA	IDENT-OO (BACK)	IDENT-IO (CONS)
a. jor.nal. zi.nhos	*!		
b. jor.naw. zi.nhos		*!	*
☞ c. jor.nai. zi.nhos			*

Tableau 2: *jornaizinhos*

The cases involving *-inho/a* work the same way, as shown in Tableau 3:

/pork+inh+os/ Base: pOrkos	IDENT-OO(ATR)	IDENT-IO(ATR)
a. porkinhos	*!	
☞ b. pOrkinhos		*

Tableau 3: *pOrkinhos*

In the base, the allomorph containing the [-ATR] vowel *O* was selected due to its adjacency to the plural morpheme. In the input, adjacency is not obtained, and the allomorph with the [+ATR] vowel *o* was selected. Since IDENT-OO (ATR) is ranked above IDENT-IO(ATR), candidate (b), which is most faithful to the base, wins.

Turning now to the cases of words ending in *r*, such as *flor* ‘‘flower’’, recall that the plural forms contain an epenthetic vowel preceding the plural marker *s*, which is a strategy to avoid complex codas in BP<sup>11</sup>. As can be seen in Tableau

<sup>10</sup> Notice that the [z] of *jornaizinhos* cannot condition the glide to be front, since a syllable boundary intervenes between them. Cf. the singular form *jorna[w]zinho* discussed above.

<sup>11</sup> As an anonymous reviewer pointed out, there are few exceptions, consisting of words beginning with *per-*, such as *perspectiva* ‘‘perspective’’, *perspicaz* ‘‘perspicuous’’, and related words. I suspect that *per-* is being treated as a prefix in these cases, and the prefix-stem boundary is enough to make the constraint against complex codas irrelevant. Indeed, prefixes in BP are different from suffixes in several respects, including the fact that they never change

4, we get the desired output by ranking the relevant markedness constraint above DEP-IO, which militates against epenthesis.

/flor+s/	*COMPLEX-CODA	DEP-IO
a. flors	*!	
☞ b. flores		*

Tableau 4: *flor*<sub>s</sub>

Now, consider again the plural of the diminutive form, *florzinhas*. What we detected above as a potential problem for the compounding analysis, according to which the first constituent of this form is the plural of *flor*, the absence of the epenthetic vowel is unexpected. At first sight, this problem carries over to our analysis, but in a different guise. Although diminutives in *-zinho/a* involve suffixation to a non-plural form, candidates are also evaluated with respect to a base, which, according to our assumptions, should be plural. Moreover, we have just seen two cases in which similarity to the base takes precedence over similarity to the input (cf. Tableaux (2)-(3)). Shouldn't we expect *florezinhas* instead of *florzinhas* here too? After all, the latter does not have a vocalic segment that is present in the base, namely the vowel *e*. Notice, however, that we have not dealt with discrepancies like this before. Our previous cases had to do with different specifications of a segment with respect to a certain feature, something that IDENT-OO constraints are designed to take care of. But now we are dealing with the presence/absence of a segment in one of the forms, but not in the other, something that DEP-OO/MAX-OO should take care of. As shown in Tableau 5, our problem is solved if we rank MAX-OO below DEP-IO. MAX-OO states that segments of the base must have output correspondents (no deletion!).

/flor+zinh+as/ Base: flores	*COMPLEX-CODA	DEP-IO	MAX-OO
a. florezinhas		*!	
☞ b. florzinhas			*

Tableau 5: *florzinhas*

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the syntactic category of the base forms, suggesting that prefix-stem boundaries are of a different nature than stem-suffix boundaries.

Candidate a. incurs in a violation of DEP-IO because of the presence of the epenthetic vowel *e*, which is missing in the input. Being faithful to the input is, in this specific case, more important than being faithful to the base. That is why candidate b. is the winner, despite a violation of MAX-OO due to the absence of the epenthetic vowel in the candidate.

Our analysis based on OO-correspondence seems capable of solving all the puzzles concerning the interaction of diminutive formation and plurality in BP. In the next section, I show that the same ideas employed above can be used to explain the absence of certain vowel alternations in BP diminutives in a very simple way.

## 5. *Expanding the analysis*

### 5.1 *Mid-vowels*

BP has four mid-vowels that contrast in stressed positions: *e, E, o, O*.<sup>12</sup> When unstressed, the contrasts *e/E* and *o/O* are neutralized in favor of *e* and *o*. Alternations can be observed with suffixes that attract stress, such as the nominalizer *-eza* (stressed syllables are underlined below):

- (20) a. bE.lo - be. le.za  
           “beautiful - beauty”  
       b. pO.bre - po. bre.za  
           “poor - poverty”

Diminutive suffixes also attract stress. However, mid-vowels *E, O* never change into *e, o* in these cases:

- (21) a. fIE.cha - fIE. chi.nha  
           “arrow - little arrow”  
       b. bO.la - bO. li.nha  
           “ball - little ball”

The asymmetry can be explained if we assume, as we did in the previous section, that diminutive words are evaluated with respect to a base, the non-diminutive form that shares the same grammatical features. The facts illustrated in (21) become then another consequence of the work of OO-Faith

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<sup>12</sup> On the vowel system of Portuguese, cf. Redenbarger (1981), Mateus and d’Andrade (2000), and references therein.



constraints enforcing similarity of vocalic features of segments of the base and the output. Tableau 6 illustrates the point:

/bOl+inh+a/ Base: <u>bO</u> la	IDENT-OO (ATR)	*[-ATR; -STRESS]	IDENT-IO (ATR)
a. <u>bol</u> inha	*!		*
☞ b. b <u>Ol</u> inha		*	

Tableau 6: *bOlinha*

As can be observed in Tableau 6, when we try to avoid violating the markedness constraint \*[-ATR; -STRESS], which prohibits [-ATR] vowels in unstressed positions, we automatically incur violations of the higher ranked IDENT-OO(ATR). As a consequence, the candidate faithful to the base wins.

### 5.2 Nasal vowels

BP oral vowels *a*, *e*, *i*, *o*, *u* all have nasal counterparts. When followed by a nasal consonant that occupies the onset of the following syllable, vowels appear as oral, if unstressed, and nasal if stressed, as attested by the alternations below involving the stress attracting suffixes *-oso* and *-agem*:

- (22) a. fã.ma - fa. mo.so  
           “fame - famous”  
       b. clõ.ne - clo. na.gem  
           “clone - cloning”

Once more, diminutives behave differently in preserving the nasality of their base:

- (23) a. cã.ma - cã. mi.nha  
           “bed - little bed”  
       b. clõ.ne - clõ. ni.nho  
           “clone - little clone”

This follows from ranking the markedness constraints conspiring against unstressed nasal vowels followed by heterosyllabic nasal consonants below

IDENT-OO (NASAL), which states that the specification of the feature [NASAL] of a segment of the base must be preserved in its output correspondent.<sup>13</sup>

/cãminha/ Base: <u>cã</u> .ma	IDENT-OO (NASAL)	*V.N +nasal; -stress
a. ca. <u>mi</u> .nha	*!	
☞ b. <u>cã</u> . <u>mi</u> .nha		*

Tableau 7: *cãminha*

As in the case involving mid-vowels discussed above, similarity between the base and the output takes precedence here, enforcing the preservation of the vocalic features of the base in the output.<sup>14</sup>

## 6. Conclusion

In this paper, I developed an optimality-theoretic account of the peculiar behavior of diminutives in BP with respect to plural formation and vowel alternation. Central to the analysis was the notion of output-output correspondence (Benua 1995; Burzio 1996; Kenstowicz 1996; Steriade 1996; inter alia). In particular, I made crucial use of faithfulness constraints enforcing similarity between diminutive words and their corresponding non-diminutive forms. This provided the basis for a unified analysis of several cases, without the need of changing the apparent suffixal status of these morphemes.

<sup>13</sup> For simplicity, I pack these constraints into a single one, informally represented in Tableau 7.

<sup>14</sup> Notice that for the analysis defended here to work, it is crucial that derived words formed by other stress-attracting suffixes, such as the above mentioned *-eza*, *-oso/a*, *-agem*, should not be evaluated with respect to a base, otherwise the vowel alternations observed above in (25) and (28) are not captured. This raises some deep issues: Why are certain affixes (in our case the diminutive ones) evaluated with respect to a base, while others are not? Is it possible to predict this asymmetry on the base of some morphophonological and/or syntactic-semantic features of specific morphemes? Is there crosslinguistic variation in this area? For instance, are diminutives evaluated with respect to a base in all languages that have a diminutive affix? These important questions still await satisfactory answers. In BP, *-issimo/a*, the superlative suffix, also behaves like diminutives.

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# CHILDREN'S PRODUCTION AND COMPREHENSION OF SPANISH GRAMMATICAL ASPECT\*

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## 1. *Introduction*

Although languages vary on how they encode the expression of time, the two major grammatical systems that express temporal notions are tense and aspect. The ability to express and comprehend temporal concepts like tense and aspect is one of the earliest tasks that children perform in acquiring a first language. Research on the production of children's verbal morphology has shown that children as young as 2;6 years-old restrict certain types of verbs according to certain verbal morphology. For example, it has been observed that inherently telic verbs such as break and make are used with perfective markers and inherently atelic verbs such as play and run are used with imperfective markers. In other words, young children produce forms like 'broke' and 'made' (telic + perfective) and 'playing' and 'running' (atelic + imperfective) and not 'breaking' and 'making' or 'played' and 'ran' (Bronckart and Sinclair 1973; Brown 1973; Antinucci and Miller 1976; Bloom, Lifter and Hafitz 1980) and others.

Research on children's comprehension on the semantics of verbal morphology has shown contradictory results as to the age of the acquisition of aspectual semantics. For example, young learners of English and Dutch (aged 3-5) differ significantly from adults in how they interpret certain kinds of predicates. Telic predicates such as 'She ate the sandwich' are interpreted by adults as denoting an event that has reached a natural point of culmination: when the sandwich is eaten, the event is completed. Children, by contrast, allow the same predicates to have both telic and atelic interpretations. In other words, children interpret 'She ate the sandwich' as having an arbitrary

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\* I would like to thank all the subjects that participated in this study, especially the children at Obra Diocesana Santo Domingo de Silos in Zaragoza and the children at Instituto de Estudio Primario Al'zina in Barcelona who made this research possible.

endpoint: the sandwich does not have to be completely eaten (van Hout 1997; Wagner 1997). On the other hand, young learners of Polish and Russian have shown they are able to assess correctly aspectual meaning from form as young as 2;5 years-old (Weist et al. 1991; Stoll 1998; Vinnitskay and Wexler 2001).

The objective of this research is to investigate children's knowledge of Spanish grammatical aspect in production and in comprehension. I ask whether young learners of Spanish distribute grammatical aspect according to lexical aspect in their production of verbal morphology as it has been reported in other languages, and whether children are able to assess aspectual meaning from aspectual morphology. I will show that children at the age of 3-4 have difficulties understanding the entailment of completion carried out by perfective morphology in a telic verb. In addition, I will show that children at this age do not know the entailment of non-completion carried out by imperfective morphology in a telic verb even though they use these forms in their production at a very early age. It will be argued that the comprehension of the semantics of Spanish grammatical aspect does not take place until approximately the age of 5.

## **2. *Background on Aspectual Meaning***

Aspect has been defined in the literature as "different ways of viewing the internal temporal constituency of a situation" (Comrie 1976: 5). Aspectual meaning is conveyed by two independent components, lexical aspect, which is determined by the lexical properties of the whole verb phrase, and grammatical aspect, which is determined by the verbal system of the language, which includes tense and aspect morphology (Comrie 1976; Mourelatos 1981; Chung and Timberlake 1985; Smith 1991, 1997).

Lexical aspect refers to the inherent semantic properties displayed by the verb and its arguments in a sentence. These properties are defined as contrasting sets, telic/atelic, stative/dynamic, and instantaneous/durative. However, the properties that distinguish the telic/atelic contrasting set have been regarded as the basic semantic feature determining lexical aspect (Dowty 1986; Smith 1991, 1997; Tenny 1994; Verkuyl 1993). A predicate is telic when the event that it denotes reaches its point of culmination; in other words, when it entails the completion of an event. A predicate is atelic when the event that it denotes does not reach its point of culmination; instead, it denotes an arbitrary ending. In Spanish, the entailment of completion obtained in a telic predicate is determined by the whole verb-phrase: the theme argument of the verb must be a count NP and it must appear in a transitive verb frame as the examples in (1) show. On the other hand, the entailment of non-completion obtained in an atelic predicate is determined by the direct object's non-

countable reference, as the sentences in (2) demonstrate. Although the predicates in (2) are also in a transitive verb frame, they do not entail the completion of the event. Therefore, the type of the object NP – countable or non-countable – matters in the computation of telicity in Spanish:

- (1) a. Construir una casa.  
 “Build a house.”  
 b. Jugar al baloncesto por una hora.  
 “Play basketball for one hour.”  
 c. Escribir una carta.  
 “Write a letter.”
- (2) a. Construir casas.  
 “Build houses.”  
 b. Jugar al baloncesto.  
 “Play basketball.”  
 c. Escribir cartas.  
 “Write letters.”

However, Bosque (1996) noticed that in Spanish, the specific cardinality of the direct object may not be enough to entail the completion of the event. For example, the NPs *el piano* “the piano”, as in *tocar el piano* “play the piano” or *la radio* “the radio” as in *escuchar la radio* “listen to the radio” denote objects of cumulative reading in which the event does not reach the endpoint of the situation. Therefore, these sentences do not entail the completion of an event. On the other hand, sentences like *tocar una sonata* “play a sonata” or *escuchar un programa* “listen to a program” with a specific direct object of non-cumulative value, do entail the completion of the event and are consequently telic. Therefore, it is not enough to have a count NP but also a count NP of non-cumulative value.

Grammatical aspect refers to aspectual distinctions of the language, which specify the boundaries of an event. Grammatical aspect is usually marked by auxiliaries, and by the inflectional or derivational morphology of the language. For example, in Spanish, a perfective reading is obtained by the use of the morpheme *-ó* (used in the preterite tense) while an imperfective reading is obtained by using the morpheme *-aba* and *-ía* (used in the imperfect tense). While perfective aspect focuses on the initial and final boundary of the event, imperfective aspect, on the other hand, focuses on an ongoing action without indicating the initial or final boundary of the event. The aspectual meaning of a sentence is therefore construed on the interaction of the two types of aspect,



lexical and grammatical. The use of perfective aspect in a telic verb phrase entails the completion of the event, whereas in an atelic verb phrase, the use of perfective aspect entails an arbitrary end, i.e., an event that has terminated, as the examples in (3a) and (3b) demonstrate. By contrast, the use of imperfective aspect in either telic or atelic verb phrase entails an event in progress, as the examples in (3c) and (3d) indicate. The interaction of lexical aspect with imperfective grammatical aspect has shown that imperfective aspect overrides lexical aspect, a phenomenon known as the Imperfective Paradox (Dowty 1979):

- (3) a. *Construyó una casa.*      Telic—Perfective reading  
       “He built a house.”  
       b. *Construyó casas.*          Atelic—Perfective reading  
       “He built houses.”  
       c. *Construía una casa.*      Atelic—Imperfective reading  
       “He was building a house.”  
       d. *Construía casas.*          Atelic—Imperfective reading  
       “He was building houses.”

The interaction of grammatical aspect and lexical aspect has been the center of much interest in the field of language acquisition – both, first and second language acquisition – because it stands at the interface between the lexicon and the grammar. The challenge that it involves is that learners need to acquire both lexical aspect, which is relatively similar across languages, and grammatical aspect, which varies widely across languages.

Another challenge faced by the learners is that in some languages, aspect is expressed through tense. Spanish is one of such language. While grammatical aspect expresses the boundaries of a situation, tense informs the receiver of the time line on which a situation occurred. Both aspect and tense are fused in the same morpheme and configure the verb-inflectional system of the Spanish language. For example, in the sentence *Ana construyó un robot* “Ana built a robot”, the morpheme *-ó* carries within it the temporal line, which in this case is past time, and the aspectual temporal contour – initial and final, indicating that the robot building event was completed. The perfective tenses most commonly used are *Pretérito Indefinido*, simple past, and, *Pretérito Perfecto*, present perfect.<sup>1</sup>

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<sup>1</sup> Other tenses in the perfective are the perfects past: *pretérito anterior*, *pretérito pluscuamperfecto*. Futures: *futuro*, and *futuro perfecto*. Conditional: *Potencial*.

### 3. *Acquisition Background*

Several empirical studies have analyzed the acquisition of tense and aspect in several languages. Among the first studies that investigated the developmental relation between tense and aspect was Brown (1973) and Bloom, Lifter and Hafitz (1980) on the production of English; Bronckart and Sinclair (1973) on the production of French; and Antinucci and Miller (1976) on the production of Italian. Their results showed that young children use tense markers to describe the properties of the events, i.e., they use verbal morphology to mark the lexical aspectual distinctions telicity/atelicity of the events and not to mark the deictic properties of tense. Furthermore, Antinucci and Miller (1976) concluded that children's development of tense depends crucially on the child's cognitive construction of the time dimension as described by Piaget's (1954, 1971) cognitive model. Thus, leading to the claim that children mark aspect and not tense due to a cognitive deficiency. However, Bloom et al. (1980) departed from Bronckart and Sinclair's (1973) and Antinucci and Miller's (1976) claim on children's cognitive deficiency by concluding that children's inflectional distinction between the types of events emphasized the type of the event rather than the end result of the event. Based on the results of their investigation and following Jakobson's (1957) Aspect before Tense Hypothesis, Bloom et al. proposed that children acquire aspect before they acquire tense.

One prominent study against the claims reviewed above was the investigation conducted by Weist, Wysocka, Witkowska-Stadnick, Buczowska, and Konieczna (1984) on the production of tense and aspect in Polish. One of the most important observations of their study was that Polish children (aged 1;7 -3;11) used past tense morphology independently of the aspect system, thus indicating that tense was not a defective category in children's competence as claimed by previous hypotheses. Weist et al. labeled the previous claim on children's tense cognitive deficiency The Defective Tense Hypothesis.

In contrast to the analyses based exclusively on early children's production of grammatical morphology, several studies have investigated children's comprehension of aspect. Among some of the languages investigated are Polish (Weist 1991; Weist et al. 1991, 1997), Russian (Stoll 1998; Vinnitskaya and Wexler 2001), Finnish (Weist et al. 1991, 1997), English (van Hout 1997; Wagner 1997, 2002), Dutch (van Hout 1998a, and b, 2003). While the results of children acquiring Polish and Russian showed that young children as early as 2;6 performed like the adults in the comprehension of the grammatical aspect of their language – children were able to differentiate a completed situation from an ongoing situation as marked by the perfective – children

acquiring Finnish, English, and Dutch did not perform well. In these studies, while adults interpreted telic predicates as predicates that denote a completed event, young children, on the other hand, differed from the adults' interpretation by allowing the same predicates to denote a complete and an incomplete event. These authors concluded that the differences in the pace of development of particular aspects may depend on the manner in which aspect is marked in the language. For example, languages like Finnish and English in which aspectual information is encoded by the combination of the verb and its arguments appear to be more difficult to be acquired than languages in which aspectual information is encoded by prefixes on the verb itself like Polish and Russian. In other words, children's ability to map aspectual meaning to morphological form may depend on the type of language they are acquiring.

One of the problems about the claims made by Defective Tense Hypothesis and the Aspect before Tense Hypothesis is that their predictions were solely based on production, and as we have seen by the comprehension studies above, there is a mismatch between children's ability to produce and understand aspectual morphology. In what follows, I will present a study on the production and comprehension of Spanish grammatical aspect. The subjects tested in the study were older than the subjects that participated in Bronckart and Sinclair, and Antinucci and Miller studies. The results were obtained through elicited data and not spontaneous data.

#### **4. *Experimental Design***

This study will report the results of three experiments: one experiment on the production of aspect and two experiments on the comprehension of perfective and imperfective aspect. All three experiments address the theoretical perspective proposed by Antinucci and Miller (1976) concerning children's defective cognitive notion of tense, as well as Bloom's et al. (1984) claim that children initially use tense morphology to mark lexical aspect and not temporality.

##### *4.1 Experiment I. Production of Grammatical Aspect*

The goal of the production task was to investigate children's distribution of grammatical aspect morphology and it was based on Bronckart and Sinclair's (1973) experiment. The experiment was presented in digital video format on the computer screen. Children were presented with a short silent movie, which they had to describe when the movie was over. Therefore, the selection of grammatical aspect (e.g., perfective or imperfective) was the subject's choice.

4.1.1 *Subjects.* Fifteen native adult speakers and thirty-three children: eleven 3-4 year-olds; eleven 5-6 year-olds; eleven 7-8 year-olds. The adults were tested at their homes, and the children were tested at school and at home in Barcelona, Spain.

4.1.2 *Materials.* The materials consisted of silent video events presented to the subject on a computer screen. The events described three telic type situations, which were alternated with three atelic type situations. The three events that represented telic type situations were: a cow crosses a river, a horse jumps an obstacle bar, and a girl stacks two blocks. The actions that represented the atelic type situations were: a girl rides a scooter, a dog plays with a ball, and a boat sails in the river. For example, the HORSE JUMPS AN OBSTACLE BAR event consisted of a hand-guided horse toy that runs towards two obstacles, jumps each one at a time, turns around, and jumps another obstacle. The GIRL RIDES A SCOOTER event consisted of a hand-guided toy that rides a scooter around a park. All the other events were acted out in a similar way on a table that had a background of a park and a small river. Within each event, the actions were repeated. For example, in the jumping event, the horse jumps over three obstacles; in the riding event, the girl rides around making several turns. The objective of having the toys repeat the same action was to help the children remember the action so they could describe the event more vividly. Each event was filmed individually with a digital camera, imported to a computer where it was copied onto a CD-ROM.

4.1.3 *Production Trial Test and Experimental Procedure.* Before the experiment was carried out, the subjects were presented with a trial test. The objective of the trial test was to see if the child was ready for the task, and to help the child to be familiar to what he was going to watch. The child's task, for both the trial test and the actual experiment, was to describe the situation when it was over. In describing the situation, the participant would have to select how he wanted to convey the information. The subject has two choices, he can either express himself by using perfective morphology or by using imperfective morphology. To train the children, two events were acted out with toys (instead of six as in the actual experiment). As an example, a horse playing with a ball was acted out in front of the child, then the child was told *cuentame* 'tell me'; then a dog crossing a river was also acted out and the child was again told *cuentame* 'tell me'. Once the child was familiar with the procedure, the subject was told the following: we are going to watch a short movie on the computer screen about these toys. I need you to pay a lot of attention, because when the movie is over, you are going to tell me what you

saw. Each individual participant was then presented with the six events. At the end of every event, the subject was asked *cuéntame* ‘tell me’. At that point, the subject described the event. Each participant was tested individually in a quiet place. The adult participants were presented with the same procedure except for the trial test. The children that did not perform well on the trial test did not take part in the experiment. These were either children that couldn’t communicate very much because of their age (some 2-2;5 year-olds), or children that were too timid to express themselves.

4.1.4 *Results*. Tables 1 and 2 represent the percentages of tenses used to describe telic aspectual type situations and atelic aspectual type situations for each age group of children and for adults.<sup>2</sup>

Age	<b>Prete-rite</b>	<b>Perfect</b>	Present	Imp. Prog.	Imperf	Progr.	Pres. Prog	RIs
	<b>cantó</b>	<b>ha cantado</b>	canta	estaba cantando	cantaba	cantando	está cantando	cantar
Adu (n=15)	<b>62</b>	<b>20</b>	11	0	4	0	2	0
3-4 (n=11)	<b>44</b>	<b>25</b>	0	15	6	3	0	6
5-6 (n=11)	<b>27</b>	<b>21</b>	0	9	18	0	9	15
7-8 (n=11)	<b>36</b>	<b>48</b>	6	0	6	3	0	0

Table 1: *Production results. Percentage of tenses used in telic type situations*

<sup>2</sup>As a clarification on some of the abbreviations used on the tables, the Spanish Imperfect Progressive is formed by the auxiliary *estar* ‘be’ in the imperfective and the present participle (e.g., *estaba cantando*, ‘was singing’). The Spanish Imperfect is the simple past but in the imperfective aspect, English does not have this tense (e.g., *cantaba*, ‘sang (IMP)’). The Spanish Progressive is the present participle form (e.g., *cantando*, ‘singing’). The Spanish Present Progressive is formed by the combination of the auxiliary *estar* in the present and the present participle, (e.g., *está cantando* ‘is singing’). RIs refer to root infinitivals. In table 2, the Spanish Present Perfect Progressive is formed by the auxiliary *haber* ‘have’, the past participle *estar* ‘be’, and a present participle (e.g., *ha estado cantando*, ‘has been singing’).

Adults used perfective tenses, namely, the preterite and the present perfect 82% of the time to describe completed situations (this number is obtained by adding all the perfective tenses). Adults used imperfective tenses to express incomplete situations 91%, which accounts for the following tenses: the present, the imperfect progressive, the imperfect, the progressive, and the present progressive (this number is obtained by adding all the imperfective tenses). Following the adult rate of production and considering the rate of 75% as the acceptable target performance, the youngest group, the 3-4 year-olds used perfective tenses 69%, which is above chance, but non-target like performance in describing completed situations. However, they performed at the 78% rate in expressing incomplete situations with imperfective tenses, which is considered target like behavior. The 5-6 year-olds used perfective tenses 48% when talking about completed situations and used the imperfect tense and the imperfect progressive tense 36%. They also used root infinitives 15% of the time. These children performed below chance. However, they performed at the 87% ratio when relating incomplete events, which is well within target. The 7-8 year-olds' performance followed the adult's performance, they produced 84% perfective tenses in their description of completed situations, while they used imperfective tenses to describe incomplete events 81% of the time.

Age	Pre-terite	Perf	Pres	Imp. Prog.	Imp.	Prog-res.	Pres. Prog	PP Pro.	RIs
	e.g. cantó	ha +ado	canta	estaba + cantaba	cantando	cantando	está + ando	ha estado +ando	cantar
Adult (n=15)	6	2	18	9	24	18	18	4	0
3-4 (n=11)	6	0	6	36	24	0	12	0	15
5-6 (n=11)	3	0	3	36	36	9	3	0	12
7-8 (n=11)	0	15	3	45	15	15	3	0	3

Table 2: *Production results. Percentage of tenses used in atelic type situations*

4.1.5 *Interpretation of the results of the production task.* The main findings in testing the Aspect before Tense Hypothesis and the Defective Tense Hypothesis are that adults as well as children aged 3-4, and children aged 7-8 distributed grammatical aspect according to lexical aspect. The results initially conform to the predictions that young children use past tense inflections to mark the telicity/atelicity aspectual distinction, but they do not conform to the

predictions that young children only mark aspect and not tense since both children and adults patterned the same way in their distribution of grammatical morphology. Therefore, we conclude that neither hypothesis receives support from this data.

If children code the telic/atelic distinction by grammatical aspect morphology, what does that tell us about children's linguistic competence? In other words, how does performance translate into competence? A theory of language acquisition is not only concerned with how the language is used but also with what constitutes knowledge of a language and how it develops. Therefore, relying alone on elicited or spontaneous production may underestimate children's grammatical competence of their language.

#### 4.2 *Experiment II. Comprehension of Perfective Grammatical Aspect*

This experiment tested children's comprehension of Spanish perfective aspect in a telic type situation. The main objective is to test children's ability to map perfective meaning to perfective form as it is encoded by the use of *pretérito indefinido* 'simple past' a Spanish perfective tense. By testing children's comprehension of a perfective past tense we will be also testing the predictions put forward by the Aspect before Tense hypothesis that claims that young children use past tense inflections to mark lexical inherent telic events and not to mark past reference. This study is also concerned as to the age of semantic development of perfective aspect.

4.2.1 *Subjects.* Fifteen adults and forty-four children native speakers of Spanish participated in the study. The 3-4 year-old group consisted of 14 subjects, the 5-6 year-old consisted of 17 subjects, and the 7-8 year-old was made of 13 subjects. The adults were tested at their homes, and the children were tested at school at two locations, Barcelona and Zaragoza, Spain.

4.2.2 *Trial Test and Experimental Procedure.* The participant child was first tested in a trial test. The objective of the trial test is to help the child become familiar with the experimental procedure to assure his cooperation in the actual test. The two telic verbs used in the trial test were *llenar* 'fill', and *escribir* 'write'. Both, the trial test and the actual experiment consisted of a story that describes a telic situation type and a question stated in the *pretérito indefinido* 'simple past' at the end of the story. The child's task, for both trial and experiment, is to match the question with the completed event. The trial test introduces the participant to a story and pictures with characters involved in an event that described a telic predicate. During the story an adjective that emphasizes the entailment of completion is used (e.g., fill an entire bucket,

write a whole letter). The trial test was presented to the subjects in picture format instead of video format. For example, the subject is told that we are going to play a guessing game, and at the end of the game, he is going to answer a question. The subject is then introduced to two characters, one of them is filling a bucket with water. In the next picture set, the participant is presented with a picture of two buckets, one completely full and the other half full. Then the other character says, ‘Billy said that he filled the entire bucket of water’, the participant is then asked, can you tell me which bucket Billy filled? The subjects that did not pass the trial test, or had difficulties understanding the procedure did not take part in the experiment. Most of the children that did not pass the trial test belonged to the youngest group.

After the trial test, each participant was introduced to the experiment. The experiment consisted of a context, a story that describes the context, and a who-question presented to the subject at the end of the story. The experiment was shown on the computer screen using CD-ROM video format. The conditions of the experiment were one lexical aspect type – telic and one grammatical aspect type – perfective. The perfective tense used was the *pretérito indefinido* ‘simple past’. The two telic verbs used in the task were *pintar* ‘paint’ and *construir* ‘build’. The two events that described the telic verbs were PAINT THE WALL, and BUILD A ROBOT. For each event, the participants had to select between an ongoing situation and a completed situation. For example, The BUILD A ROBOT event shows two children building a robot each. Both children have pieces of the robot on the table. As the story is told, one of the children finishes the robot and shows the finished robot to the camera (the completed situation), while the other child continues building the robot (the ongoing situation). When the story ends the movie shows the entire built robot, and the ongoing building robot. Then the participant is asked *¿Quién construyó el robot?* ‘Who built a robot?’ at that point the participant makes a choice. The following extract is the story used in the building event:

- (4) A estos chicos les gusta hacer robots. Cada uno quiere hacer un robot. Ves, éste tiene piezas en la mesa, y éste otro también. Ya llevan un rato trabajando. ¿Quién construyó el robot?  
 “These boys like to make robots. Each one wants to build a robot. See, this one has some pieces on the table, and this one too. They have been working for a while (the camera shows for few seconds both of them working). Who built the robot?”  
 Answer: the boy who shows the built robot.



4.2.3 *Results.* The results for both events are presented in percentages in the table below. Event 1 refers to the painting event. Event 2 refers to the building event.

Age	Event 1 “paint”	Event 2 “build”
Adults (n=15)	100	100
3-4 (n=14)	36	64
5-6 (n=17)	35	94
7-8 (n=13)	69	92

Table 3: *Correct percentage on the comprehension of perfective aspect. Selection between Ongoing/Completed*

Adults scored 100% in both events. In the building event, the 3-4 year-olds performed above chance but below target (64%), and the 5-6 and 7-8 year-olds performed like the adults. These results indicate that children at the age of 3-4 are having difficulties in mapping perfective morphology to perfective meaning when selecting between an ongoing/completed situation, which further indicates that they have not quite acquired the semantics of perfective morphology. In the painting event, children aged 3-4 and 5-6 performed very low. We think that children scored low because they were not able to see that the entire wall was painted (due to the size of the wall and camera zoom) and instead chose the ongoing event – which has the potential of culmination – by relying on the agent’s intentions.

4.2.4 *Interpretation of the Perfective Comprehension Task.* According to the hypotheses above, children initially use tense markers to describe the properties of the events. Therefore, the predictions for this study are that children would understand the Pretérito Indefinido, which carries simple past tense inflection to indicate that the event was completed, i.e., to indicate the inherent telic properties of the event and not to indicate the past temporal reference of the event. Our main finding in testing the comprehension of perfective morphology is that young children aged 3-4 performed significantly lower than the 5-6 year-olds in the building a robot event. The youngest group did not make a significant distinction between an ongoing/completed event, which indicates that young children at the age of 3-4 years old do not quite know the semantics of perfective morphology. These results do not conform to the predictions of either hypothesis. Since the Pretérito Indefinido is considered a marker of perfectivity, when selecting between an ongoing event

and a completed event, subjects are predicted to choose the completed event and reject the ongoing event, however, that is not what children aged 3-4 did. On the other hand, children aged 5-6 distinguished between the two events and successfully mapped perfective meaning to perfective form. Based on the experimental results, we conclude that neither hypothesis is supported by the data.

#### 4.3 *Experiment III. Comprehension of Perfective and Imperfective Aspect*

This experiment tested children's ability on the semantics of perfective and imperfective morphology in a telic situation. Recall that the use of perfective morphology in a telic situation type emphasizes the natural endpoint of the situation while the use of imperfective morphology in a telic situation type overrides the telic properties of the verb phrase, changing a situation from telic to atelic. Therefore this experiment tested if children could distinguish the two types of aspectual information (perfective/imperfective) when used in the same type of situation (telic). Also recall that in the previous experiment the participants had to select from a complete/ongoing (which requires the presence of an agent) situation and that children's ability to read the agent's intentions appeared to have played a role in their selection. Therefore, in this experiment the subjects select from a completed/incomplete situation in the absence of the agent. While the previous comprehension experiment showed the characters of the story involved during the event and in the outcome of the event, this experiment does not show the characters involved in the event at any point. The character's involvement is only mentioned in the story.

4.3.1 *Subjects and Procedure.* The same children subjects that participated in the perfective comprehension task above also participated in this second comprehension experiment. The conditions of this experiment were one lexical aspect type – telic, and two grammatical aspect type – perfective and imperfective. The *pretérito indefinido* 'simple past' was the tense used as the perfective, and the *imperfecto* (English does not have such a tense) was the tense used as the imperfective. The verbs used in the perfective were, *construir* 'build' and *hacer* 'make' which describe the events of BUILD A SCHOOL TOWER, and MAKE A DOOR. The verbs used in the imperfective were *dibujar* 'draw' and *pintar* 'paint', which describe the events of DRAW THE SCHOOL, and PAINT THE WALL. This experiment consisted of a story that describes a situation and a which-question stated in the perfective or imperfective according to the story. The child's task is to match the question with either the completed or the incomplete event. The experiment was presented with toys and pictures.

After the procedure was explained to the participants, they were introduced to four animal characters that want to build a school. Each animal wants to take part in building the school, so each one selects what he wants to do (e.g., the cow wants to draw the plans of the school, the sheep wants to build the school tower, the horse wants to paint the walls, the pig wants to make the door). At the end of the story each animal says in an I-statement what he did (e.g., I built the school tower or I was painting the wall yesterday morning). At that point, the subject is presented with a picture that contains a completed outcome (e.g., a tower that has been finished), and an incomplete outcome, (e.g., a tower that is half built). Then, the participant is asked a which-question that leads him to select one of the outcomes presented in the picture. For example, after the story was told, the sheep says *I built (PERF) the school tower*, the subject was presented with the picture that contains both outcomes and was asked *which tower is the sheep talking about?* After the participant selected one outcome, the horse says *Yesterday morning I was painting the wall*. Again, the participant selected from one of the outcomes (a completed painted wall or a half-painted wall). Each animal with its I-statement, the outcome pictures (complete/incomplete), and the which-question, is presented to the subject. The animals in the story were never seen engaged in constructing any part of the school, i.e., they only talk about it. When the story ends and the pictures of the outcomes are introduced, the characters of the story are not standing next to the object they said they built. In other words, the participants are not led in their decision by reading the intentions of the agent, either as the situation develops or in the final outcome. The example below is the story used in the experiment:

- (5) La vaca, la oveja, el caballo, y el cerdo quieren ir al colegio, pero no pueden porque no hay colegios para ellos. Entonces deciden construir un colegio. Cada animal quiere hacer una parte. La vaca decide dibujar los planos del colegio. La oveja decide construir la torre del colegio. El caballo quiere pintar las paredes. Y el cerdo quiere hacer la puerta.

La oveja dice: yo construí la torre del colegio. ¿De qué torre está hablando la oveja? A: la torre construida.

El caballo dice: Ayer por la mañana yo pintaba la pared. ¿De qué pared está hablando el caballo? A: la pared que no está terminada de pintar.

“The cow, the sheep, the horse, and the pig want to go to school, but they can’t because there is no school for them. So they decide to build their own school. Each animal wants to do a part. The cow decides to draw the plans of the school. The sheep decides to build the school tower. The horse wants to paint the walls. The pig wants to make the door.

The sheep says: I built (PERF.) the tower of the school. Which tower is the sheep talking about? A: The completed built tower.

The horse says: Yesterday morning I was painting the wall. Which wall is the horse talking about? A: the incomplete painted wall.”

4.3.2 *Results.* Tables 4 and 5 contain the results of the perfective and imperfective comprehension task. Adults scored 100% in all four events. When describing a telic situation using a perfective tense, children aged 3-4 scored above chance (64%, 57%) but showed non-target like behavior, while children aged 5-6 and 7-8 performed well above target. These results are similar to the previous comprehension experiment on the perfective. Again, these findings indicate that children at the age of 3-4 still have difficulty determining perfective meaning from perfective morphology. This data also indicates that the absence of the agent did not play a significant role in their selection of outcome.

In describing a telic situation using an imperfective tense, children aged 3-4 scored just about chance in both events (43%, 57%), an indicative that these children have even more difficulty mapping imperfective meaning to imperfective morphology. Children aged 5-6, although they performed just barely within target in one of the events (65%, 76%), still scored lower than when perfective morphology was used to describe a telic situation. Children aged 7-8 performed at ceiling.

Selection between completed/incomplete. Absence of Agent			
Age		“build”	“make”
Adults	(n=15)	100	100
3-4	(n=14)	64	57
5-6	(n=17)	94	82
7-8	(n=13)	100	100

Table 4: *Correct percentages on the comprehension of perfective aspect*

Selection between completed/incomplete. Absence of Agent			
Age		“draw”	“paint”
Adults	(n=15)	100	100
3-4	(n=14)	43	57
5-6	(n=17)	65	76
7-8	(n=13)	87	100

Table 5: *Correct percentages on the comprehension of imperfective aspect*

4.3.3 *Interpretation of perfective and imperfective comprehension tasks.* The main finding in testing children’s comprehension of perfective and imperfective aspect is that children aged 3-4 do not make a distinction between the tenses. According to the hypotheses, when selecting between a completed and an incomplete event, subjects are predicted to select a completed event when described by the Pretérito Indefinido and an incomplete event when described by the Imperfecto, however, the youngest children selected at random in 3 of the 4 events. However, the 5-6 year-olds did make a distinction between completion and not completion according to the tense. Again, these results do not conform to the predictions that young children understand tense as a marker of lexical aspect.

## 5. Conclusion

Following the claims stated by the Defective Tense Hypothesis and the Aspect before Tense Hypothesis, this study has provided information on children and adults’ production and comprehension of Spanish grammatical aspect. The hypotheses general claim is that initially children use past tense inflection to mark properties of lexical aspect and not properties of temporal reference, i.e., children use past tenses to mark telicity and present tense to mark atelicity and not the time line of the event. Studies on the production of aspect in many languages have shown that children distribute aspectual morphology according to the inherent properties of the verb-phrase. On the other hand, studies on the comprehension of aspect have shown that in some languages children’s early production and distribution of grammatical aspect according to lexical aspect does not translate into early comprehension. These contradictory results between production and comprehension depend on the type of language a child is acquiring: children acquiring Slavic languages appear to have less difficulties in mapping meaning to form than children acquiring Romance and Germanic languages.

According to the hypotheses above, Spanish speaking children are predicted to produce perfective tenses to encode telicity and imperfective tenses to encode atelicity, without making reference to a temporal line. In terms of comprehension, Spanish children are predicted to understand Pretérito Indefinido to encode telicity (e.g., a completed event) and Imperfecto to encode atelicity (e.g., an incomplete/ongoing event). This study is new in that it provides data on children's comprehension and production of Spanish grammatical aspect and not just production as the studies on which the hypotheses were based. The conclusion that can be drawn from this study is that the data does not support either hypothesis. The main finding in testing production was that adults as well as young children distributed grammatical aspect according to lexical aspect. If children's production patterns the same way as adults' production, then, this indicates that the distribution of aspect is not connected to any cognitive deficiency in tense. The production data also indicated that young children use a similar rate of past tenses (perfective and imperfective tense) as the adults, i.e., children used other imperfective tenses to mark atelicity and not just present tense.

Concerning the production rate of the 5-6 year-old group, the question arises as to why the 5-6 year-olds overextended the imperfective to express telic situations? A possible explanation is that since the Spanish imperfect tense and the imperfect progressive tenses are used in narration to describe the past, these children were using the tenses as narratives to tell a story, without paying attention to the entailment of non-completion that the tenses carry. However, further tests need to be conducted.

In terms of the comprehension data, the results indicate that children at the age of 3-4 have difficulties understanding the entailment of completion carried out by perfective morphology. The comprehension data also suggested that when children are presented with a complete/incomplete situation, 3-4 year-old children do not make a semantic distinction between perfective and imperfective tenses. These results suggest that at this age, children do not know the semantics of grammatical aspect even though they produce these tense forms at an earlier age than 3. The data also indicated that children have more difficulty in comprehending the meaning of imperfective morphology than comprehending the meaning of perfective morphology. This was even attested by the 5-6 year-olds. Other studies have also corroborated that the comprehension of imperfective aspect emerges later than perfective aspect van Hout (in press). According to the results of this study the age of semantic development of Spanish aspect is around the age of 5.

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**MORPHEME REALIZATION AND MORPHOLOGICAL  
COALESCENCE  
EVIDENCE FROM ROMANIAN**

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**1. Introduction**

Research on the phonology-morphology interface within the framework of Optimality Theory (Prince & Smolensky 1993) has long acknowledged the necessity of considering constraints on morpheme realization in cases where the shape of morphologically complex outputs cannot be predicted only from the interaction of phonological constraints generally active in a language (Samek-Lodovici 1992, 1993, Gnanadesikan 1997, Walker 2000, Kurisu 2001 etc.). While the idea behind this proposal is essentially the same, namely that the realization of inflectional morphemes can override requirements imposed by the phonology, the way in which the proposal is implemented sometimes differs considerably from author to author.

The present paper argues for a theory of morpheme realization in terms of correspondence between morphological and phonological structure within outputs. Such an approach was taken by Walker (2000) in her analysis of affixation in Mbe. This study extends the applicability of Walker's suggestion beyond morpheme realization. Specifically, evidence from Romanian nominal morphology is brought to bear on the necessity of considering a mechanism of morphology-phonology correspondence in outputs in the analysis of apparent phonological deletion of the definite article in Romanian masculines and neuters in casual speech.

**2. Data**

The morpheme structure of Romanian masculine and neuter definite nominals is transparent in the sense that in the base (nominative-accusative) form one can uniformly distinguish the nominal root followed by the number-gender vocalic formative *u* (also known as the theme vowel, henceforth referred to as the singular affix) and the definite article *-l*, which closes off the DP projection. The theme vowel is generally not realized in the indefinite form

unless its presence in outputs is necessary for syllable well-formedness (complex codas with rising sonority are disallowed in the language). This is the situation in careful speech, illustrated in (1) below:

- (1) Romanian masculine and neuter nominals in careful speech, singular
- a. Indefinite
- |                       |                           |
|-----------------------|---------------------------|
| pom-Ø <sub>SG</sub> . | UR/pom-u <sub>SG</sub> /  |
| “fruit-tree”          |                           |
| akr-u <sub>SG</sub> . | UR /akr-u <sub>SG</sub> / |
| “sour-MASC.”          |                           |
- b. Definite
- |   |  |
|---|--|
| pom-u <sub>SG</sub> -l <sub>DEF</sub> . | UR/pom-u <sub>SG</sub> -l <sub>DEF</sub> / |
| “the fruit-tree”                        |  |
| akr-u <sub>SG</sub> -l <sub>DEF</sub> . | UR/akr-u <sub>SG</sub> -l <sub>DEF</sub> / |
| “the sour-MASC.”                        |  |

Interestingly, in casual speech the definite determiner is usually dropped, but the singular affix still surfaces. From a phonological perspective, the retention of the latter affix is unexpected, given the fact that the occurrence of (final) high vowels is restricted in Romanian and the retention of the singular affix *u* is normally due to phonotactic requirements such as the above-mentioned ban on complex codas rising in sonority (Iscrulescu 2003):

- (2) Romanian masculine and neuter nominals in casual speech, singular
- a. Indefinite singular
- |                       |                           |
|-----------------------|---------------------------|
| pom-Ø <sub>SG</sub> . | UR /pom-u <sub>SG</sub> / |
| “fruit-tree”          |                           |
| akr-u <sub>SG</sub> . | UR /akr-u <sub>SG</sub> / |
| “sour-MASC.”          |                           |
- b. Definite singular
- |   |   |
|---|---|
| pom-u <sub>SG</sub> -Ø <sub>DEF</sub> . | UR /pom-u <sub>SG</sub> -l <sub>DEF</sub> / |
| “the fruit-tree”                        |   |
| akr-u <sub>SG</sub> -Ø <sub>DEF</sub> . | UR /akr-u <sub>SG</sub> -l <sub>DEF</sub> / |
| “the sour-MASC.”                        |   |

The situation is similar in the plural, where the relevant suffixes are /i/ (number) and /i/ (definite). For ease of exposition, we can consider that the plural morpheme is realized as palatalization on the final consonant of the stem (C<sup>j</sup>) or as the full vowel [i] after stems ending in unsyllabifiable codas (see Chitoran 2002, Iscrulescu 2003 for a more comprehensive account of Ro-

manian phonotactics in relation to morphology). The definite article surfaces as [j] in careful speech and as [Ø] in casual speech:

- (3) Romanian masculine and neuter nominals in careful speech, plural
- a. Indefinite
- |                            |                           |
|----------------------------|---------------------------|
| $\text{pom}^{\text{iPL}}$  | UR /pom-i <sub>PL</sub> / |
| “fruit-trees”              |                           |
| $\text{akr-i}_{\text{PL}}$ | UR /akr-i <sub>PL</sub> / |
| “sour-MASC.-PL.”           |                           |
- b. Definite
- |  |   |
|--|---|
| $\text{pom-i}_{\text{PL}}\text{-j}_{\text{DEF}}$ | UR /pom-i <sub>PL</sub> -i <sub>DEF</sub> / |
| “the fruit-tree”                                 |   |
| $\text{akr-i}_{\text{PL}}\text{-j}_{\text{DEF}}$ | UR /akr-i <sub>PL</sub> -i <sub>DEF</sub> / |
| “the sour-MASC.-PL.”                             |   |

Since the treatment of plural forms is fairly similar (apparent phonological deletion of the definite determiner), in this paper I will concentrate on the phenomena in the singular. If we consider the distribution of forms in casual speech, from a syntactic point of view, the form with deleted article continues to function as a definite DP (4b.), despite the overt absence of the determiner. The absence of both the determiner and the number affix (4c.) leads to ungrammaticality:

- (4) a. *Pomul* este înalt.      Singular and definite both expressed  
 b. *Pomu* este înalt.      Definite not expressed  
 c. \**Pom* este înalt.      Neither affix expressed (bare stem)  
 “The fruit-tree is tall.”

At first sight, what is going on in casual speech is a process of coda deletion that leads to open final syllables. From an optimality-theoretical perspective, one may be inclined to believe that NOCODA, the constraint militating against closed syllables, otherwise low-ranked in the language, is promoted in fast speech, leading to less marked, open syllables in word final position. However, such an approach, although apparently plausible from a purely phonological point of view, is hardly tenable. Evidence against this line of analysis comes from the fact that in monomorphemic forms there is no deletion of *-l* in final *-ul* sequences in casual speech:

- (5) No final *-l* deletion in monomorphemic words
- |        |        |              |
|--------|--------|--------------|
| kalkul | *kalku | “calculus”   |
| kumul  | *kumu  | “cumulation” |

Final definite article (*-l*) deletion in casual speech operates only in morphologically complex words and is blocked in simple forms, even when there is homophony between the two:

- (6) Final *-l* retention in morphologically complex words in
- a. Careful speech
 

kalk-u <sub>SG.</sub> -l <sub>DEF.</sub>
“tracing paper, DEF.”
  - b. Final *-l* deletion in morphologically complex words in casual speech
 

kalk-u <sub>SG.</sub> -∅ <sub>DEF.</sub>
“tracing paper, DEF.”
  - c. Final *-l* retention in monomorphemic words in careful or casual speech
 

kalkul	*kalku
“calculus”	

The data in (5) and (6) indicate that in casual speech we are not simply dealing with promotion of NoCODA. Rather the process is more complex and is sensitive to the morphological structure of forms. The fact that in casual speech nominals without an overt article still count as definite shows that, although not expressed in outputs, the definite determiner is still part of the morphological structure of the words. To account for these findings, I propose a mechanism of correspondence between morphological and phonological structure within outputs, along the lines of Walker (2002), henceforth referred to as MP correspondence.

### 3. *MP correspondence*

Correspondence, first introduced by McCarthy and Prince (1995), is a relation  $\mathfrak{R}$  from elements of  $S_1$  to those of  $S_2$ , where  $S_1$  and  $S_2$  are strings of elements that belong to various levels of representation:

- (7) Correspondence relations:
- a.  $S_1 = \text{Input}, S_2 = \text{Output} \Rightarrow \text{I - O Correspondence}$
  - b.  $S_1 = \text{Output}_1, S_2 = \text{Output}_2 \Rightarrow \text{O - O Correspondence (in general)}$
  - c.  $S_1 = \text{Base}, S_2 = \text{Reduplicant} \Rightarrow \text{B - R Correspondence}$

As part of the proposal defended in this paper, morphological variation in inflected forms can be captured in terms of correspondence between Morphological Structure and Phonological Structure in outputs. As a measure of the extent to which morphological information is reflected in the phonological makeup of an output, constraints on morpheme realization are used. The general definition of the morpheme realization constraint is given in (8), following Walker's (2000) implementation of the existential definition of MAX due to Alderete (1999):

- (8) REALIZE-MORPHEME
- a. Let  $m$  be a variable ranging over morphemes,
  - b.  $p$  be a variable ranging over phonological elements, and
  - c.  $M$  and  $P$  be the related morphological and phonological structures of a given output.
  - d. Let  $m \mathfrak{M} p$  mean that  $m$  is in a correspondence relation with  $p$ .  
 REALIZE-MORPHEME is satisfied iff  $\forall m \in M \exists p \in P [m \mathfrak{M} p]$ .

As a legitimate object of linguistic description, Morphological Structure (MS) is acknowledged in Distributed Morphology (Halle & Marantz 1993) as a syntactic representation that nevertheless serves as part of the phonology. It is at MS that syntactic, hierarchical information translate into linear order, which makes MS a facet of output representations. Within the approach advocated in this paper, MS is viewed not as a separate level of representation (we uphold the classic two-level, input-output architecture of Optimality Theory), but rather as a dimension of outputs at which morphological constituency is spelled out. At Phonological Structure (PS), the other facet of outputs considered here, the morphological specification given by MS finds a featural, (supra)-segmental or null phonological expression, as the case may be. Thus the two levels of analysis (morphological and phonological) are kept apart, which does not preclude correspondence between them as a means of capturing the morphology-phonology interaction.

As regards the M-P correspondence definition in (8), REALIZE-MORPHEME is satisfied whenever a morpheme specified at MS has a PS correspondent. Figure 1. shows how morpheme realization is assessed for the Romanian nominal output *pomul* ("the fruit-tree"). As suggested by an anonymous reviewer, this view of M-P Correspondence may seem opportunistic in the absence of adequate specification of the syntactic tree that makes up Morphological Structure. Indeed, while it is assumed that the terminal node for number phrase contains the polar values of the number feature ([singular] vs. [plural] or just [-plural] vs. [+plural]), the terminal node for the definite phrase

does not, as long as it is assumed that only [+definite] is present, and not [-definite]. While acknowledging the asymmetry that exists between nominal categories like number (polar in point of morphological expression) and definiteness (defective in that the indefinite does not generally have a separate morphological expression), the answer to this question is an empirical matter and has to do with the inventory of functional projections available in a language, as a subset of the universal inventory. Specifically, an indefinite noun phrase can be either a genuine bare noun phrase, with no determiner projection, or a determiner phrase with a null head, and it is an empirical matter to decide which of the possibilities is the case.

Assessing REALIZE-MORPHEME

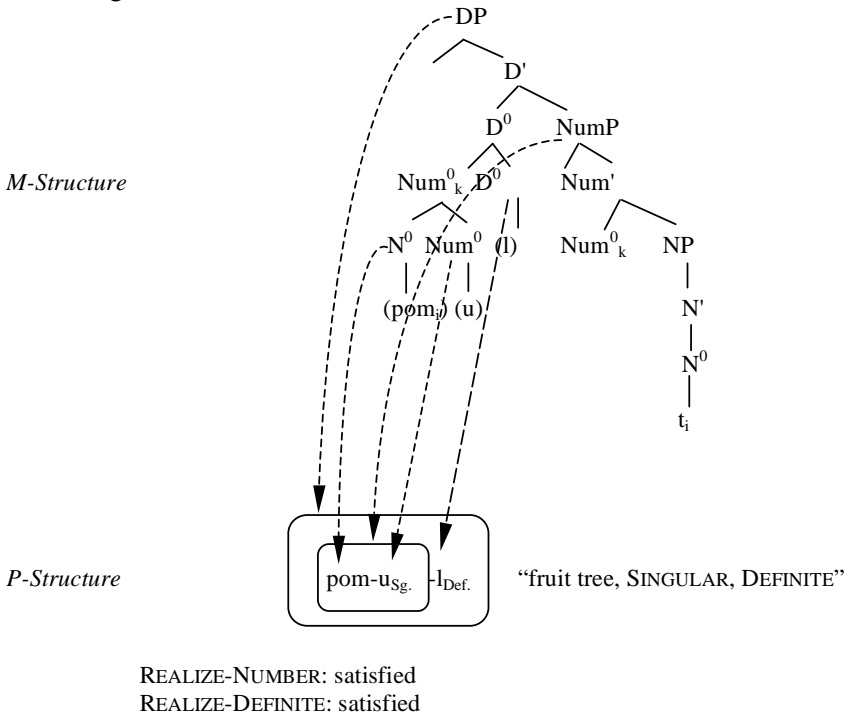


Figure 1: Assessing *REALIZE-MORPHEME*

The mechanism of M-P Correspondence proposed for assessing morpheme realization has significant consequences for the interface effects observed in inflection. For example, it appears that *REALIZE-MORPHEME* has versions specific to particular morpho-syntactic categories (Iscrulescu, to appear), a

property that distinguishes it from other approaches to morpheme realization Morpheme Realization Theory (Kurusu 2001). According to this result, function of the inflectional category considered at MS, one distinguishes specific constraints of the type REALIZE-NUMBER, REALIZE-DEFINITE, REALIZE-CASE etc. Also, MP correspondence introduces a family of interface constraints among which REALIZE-MORPHEME is in actuality an instance of MAX-MP for the inflectional category under consideration. Other MP Correspondence constraints are defined accordingly: UNIFORMITY-MP, DEP-MP etc. The Romanian data discussed in this paper will be used to argue for the necessity of MAX-MP (category-specific REALIZE-MORPHEME) and UNIFORMITY-MP (note that UNIFORMITY as a correspondence constraint was introduced by McCarthy & Prince, 1995).

#### 4. *Morphological coalescence in definite masculine and neuters in Romanian*

Let us now return to the Romanian data introduced in Section 2. Recall that in fast or casual speech the masculine-neuter definite article is not realized in nominal outputs in casual speech (Table 1 c.), although the forms continue to count as definite from a morpho-syntactic point of view. On the other hand, in careful speech the number morpheme *-u* is not realized in indefinite forms in careful speech (Table 1 a.) unless required to prevent a coda rising in sonority. The morphological structure of singular definites in careful speech is faithfully realized (Table 1 b.). As shown in the preceding section of the paper, casual speech is characterized by the overt absence of the definite article (Table 1 c.):

<i>Careful speech</i>		<i>Casual speech</i>
(a)	(b)	(c)
<i>[pom]</i> “fruit-tree” UR: /pom-u <sub>SG</sub> /	<i>[pom-u<sub>SG</sub>-l<sub>DEF</sub>]</i> “fruit-tree, definite” UR: /pom-u <sub>SG</sub> -l <sub>DEF</sub> /	<i>[pom-u<sub>SG DEF</sub>]</i> “fruit-tree, definite” UR: /pom-u <sub>SG</sub> -l <sub>DEF</sub> /
*[pom-u]	*[pom-l]	
<i>[akr-u<sub>SG</sub>]</i> “sour, masculine indefinite” UR: /akr-u <sub>SG</sub> /	<i>[akr-u<sub>SG</sub>-l<sub>DEF</sub>]</i> “sour, masculine, definite” UR: /akr-u <sub>SG</sub> -l <sub>DEF</sub> /	<i>akr-u<sub>SG DEF</sub>]</i> “sour, masculine, definite” UR: /akr-u <sub>SG</sub> -l <sub>DEF</sub> /
*[akr]	*[akr-l]	

Table 1: *Careful speech – casual speech*



Cross-linguistically, consonant final deletion is attested in monomorphemic words under a variety of circumstances, but can be blocked when the consonant in question is the sole exponent of a grammatical category that conveys morphological information which would be otherwise lost. The English example in (12) (Raymond *et al.* 2003) shows that the final consonant in the monomorphemic word *mist* (9 a.) can be dropped in casual speech, but in the homophonous past tense form *missed* (9 b.) the final consonant resists deletion:

- (9) a. [mist]<sub>STEM</sub> → mis  
 b. [mist]<sub>STEM-t<sub>PAST</sub></sub> → \*mis

With respect to the Romanian facts, the data suggest that in casual speech we are not simply dealing with a process that leads to open syllables by promoting NOCODA. It seems that the process is more complex and sensitive to Morphological Structure. The occurrence of casual speech forms without an overt article that still count as definite shows that, although not expressed in outputs, the definite determiner continues to be part of the Morphological Structure.

The immediate question is what the exponent of the determiner node in MS is at Phonological Structure, in other words, whether the casual speech form *pom-u* (“the fruit-tree”) should be represented as the output candidate *pom-u<sub>SG,DEF.</sub>* in (10a.), with the singular formative *-u* expressing both number and definiteness, or as *pom-u<sub>SG.</sub>∅<sub>DEF.</sub>* (10b.), with a null definite determiner:

- (10) MS a. pom-SG-DEF  
 PS pom-u<sub>SG,DEF.</sub>
- MS b. pom-SG-DEF  
 PS pom-u<sub>SG.</sub>-∅<sub>DEF.</sub>

In this section of the paper I will lay out arguments in favor of an analysis based on the coalescence of the two categories (number and definiteness) in casual speech, an idea that naturally connects with the M-P Correspondence approach to Morpheme Realization.

Let us first discuss the behavior of Romanian masculine and neuter nominals in careful speech. In Romanian the distribution of high vowels in final position is relatively restricted, so the number affix *-u* is generally not

realized. This shows that \*PK/i,u (11), a constraint that disallows high vowel syllable peaks, dominates REALIZE-NUMBER.

- (11) \*PK/i,u ('high vowels are not syllable nuclei')  
 (Prince & Smolensky 1993)

Also, since closed syllables are freely allowed in Romanian, NOCODA is low ranked. The ranking \*PK/i,u » REALIZE-NUMBER is illustrated in Tableau 1:

/pom-u <sub>SG</sub> /	*PK/i,u	REALIZE-NUMBER	NOCODA
a. $\varnothing$ pom- $\emptyset$ <sub>SG</sub>		*	*
b. po.m-u <sub>SG</sub>	*!		

Tableau 1: *pom* ("fruit-tree")

In the definite, the determiner is always realized, which indicates that the specific morpheme realization constraint REALIZE-DEFINITE is undominated. Also, the number and definiteness affixes present in Morphological Structure are disjointly realized in the actual output. What keeps the two affixes apart is the constraint UNIFORMITY-MP, as part of the M-P Correspondence mechanism assumed for morpheme realization. UNIFORMITY-MP enforces a ban on structures that coalesce morphemes at PS so that no element in the phonological structure of an output has multiple correspondents in the morphological structure of that output. A formal definition of the constraint is given in (12):

- (12) UNIFORMITY-MP
- a. Let *m* be a variable ranging over morphemes,
  - b. *p* be a variable ranging over phonological elements,  
and,
  - c. *M* and *P* be the related morphological and phonological structures of a given output.
  - d. Let *m*ŋ*p* mean that *m* is in a correspondence relation with *p*.  
UNIFORMITY-MP is satisfied iff  $\forall p \in P$  there is a unique element *m* ∈ *M* such that [*m*ŋ*p*].

Note that the activity of UNIFORMITY-MP is reminiscent of the one of the Morphemic Disjointness constraint (MORPH-DIS, McCarthy & Prince 1995) in

that both constraints militate in favor of a one to one morpheme to morpho-syntactic category ratio, disallowing *portmanteau* morphemes. However, I prefer to use the label UNIFORMITY-MP, because it falls naturally under the heading of MP Correspondence mechanism defended in this paper.

From Tableau 2 it follows that in careful speech UNIFORMITY-MP is dominated by \*PK/i,u in order to prevent the morphological coalescence candidate from winning:

/pom-u <sub>SG</sub> -l <sub>DEF</sub> /	REALIZE-DEFINITE	*PK/i,u	UNIFORMITY-MP	REALIZE-NUMBER	NoCODA
a. $\mathcal{C}$ po.m-u <sub>SG</sub> -l <sub>DEF</sub>		*			*
b. pom- $\emptyset$ <sub>SG</sub> - $\emptyset$ <sub>DEF</sub>	*!			*	*
c. po.m-u <sub>SG</sub> - $\emptyset$ <sub>DEF</sub>	*!	*			
d. po.m-u <sub>SG,DEF</sub>		*	*!		

Tableau 2: *pomul* (“fruit-tree”) in careful speech

In Tableau 2, candidates b. and c. have no overt exponent of the definite article, thus violating top-ranked REALIZE-DEFINITE. Candidate d., which ties up to a certain point with the winning candidate a. eventually loses due to a fatal violation of UNIFORMITY-MP, since the candidate in question collapses number and definiteness into a single segment. Note that low-ranked NO-CODA does not get the chance to rule out a. Therefore in careful speech the singular definite is realized faithfully according to the ranking:

(13) Constraint ranking in careful speech

REALIZE-DEFINITE » \*PK/i,u » UNIFORMITY-MP » REALIZE-NUMBER, NoCODA

In casual speech, where the definite article is usually dropped, what surfaces is the stem plus the singular affix *-u*. Recall from the previous sections that *-u* is not allowed in word final position unless its presence is necessary to avoid a coda rising in sonority, which is not the case in simple coda forms like *pom* (“fruit-tree”). From a purely phonological perspective, what seems to be going on in word final position in casual speech is deletion of the definite marker *-l*. However, the sensitivity to morphological affiliation displayed by the process suggests that the remaining functional morpheme (the number affix *-u*) can ‘take over’ and express the value of the category formerly expressed by

the apparently deleted segment (the definite article *-l*). This situation represents an instance of morphological coalescence where UNIFORMITY-MP is violated.

In the Romanian case under examination, I suggest that casual speech brings about the demotion of the anti-coalescence constraint UNIFORMITY-MP, making *portmanteau* morphemes possible:

/pom-u <sub>SG</sub> -l <sub>DEF</sub> /	REALIZE- DEFINITE	*PK/i, u	REALIZE- NUMBER	NOCODA	UNIFORMITY- MP
a. $\varnothing$ po.m-u <sub>SG</sub> .DEF.		*			*
b. po.m-u <sub>SG</sub> - $\varnothing$ <sub>DEF</sub> .	*!	*			
c. po.m-u <sub>SG</sub> -l <sub>DEF</sub> .		*		*!	
d. pom- $\varnothing$ <sub>SG</sub> - $\varnothing$ <sub>DEF</sub> .	*!		*	*	

Tableau 3: *pomul* (“the fruit-tree”) in casual speech

My proposal is that the mechanism that allows coalescence is demotion of UNIFORMITY-MP. Once demotion is achieved, NOCODA is activated and breaks the tie between candidates a. and c. of Tableau 3, allowing the former to emerge as the winner. The question that arises at this stage of the analysis is how we can tell that the actual output in casual speech is a. and not b. These candidates are phonetically identical, but their morphology-phonology mappings differ. a. is the candidate with morphological coalescence, in which number (singular) and definiteness are expressed by the same *-u* segment, while b. is the candidate in which definiteness has a null realization (REALIZE-DEFINITE is violated). A possible answer to the question lies in the observed fact that in Romanian there are no null determiners, at least not in the realm of common nouns, so the definiteness effect noted in casual speech in the absence of an overt article can be attributed to morphological coalescence.

As noted above in (6c.), monomorphemic forms do not undergo final deletion in casual speech. This means that root segments are protected from deletion due to the activity of the anti-deletion constraint MAX-ROOT, which has to be ranked above NOCODA (Ioana Chitoran, p.c.). This situation is illustrated in Tableau 4 below, in which a monomorphemic word like *kalkul* (“calculus-indefinite”) is considered (only violations of \*PK/i,u in final position are included):

/kalkul-u <sub>SG</sub> /	*PK/i,u	REALIZE- NUMBER	MAX-ROOT	NOCODA
a. $\varnothing$ kalkul- $\varnothing$ <sub>SG</sub>		*		*
b. kalkul-u <sub>SG</sub>	*!			
c. kalku- $\varnothing$ <sub>SG</sub>		*	*!	

Tableau 4: *kalkul* (“*calculus-indefinite*”)

Let us now examine in more detail the possibility instantiated by candidate b. in Tableau 4, namely of having a null definite determiner in casual speech. A legitimate question to ask is whether Romanian has null determiners in general. The answer to this question is negative, at least as concerns common nouns. Cross-linguistically, proper names are inherently definite, given their referential properties, and, as shown by Longobardi (1994) the determiner can have null or non-null realizations. In Romance, in particular in Italian, proper names can take overt determiners – for example, the opera singer Maria Callas can be referred to as *la Callas* (literally, “the Callas”). In English, the definite determiner of proper names is null, and a DP like *\*the John* is not acceptable as an argument, at least without additional modification.

Returning to Romanian common nouns, there is no independent evidence for the presence of a null determiner in fast or casual speech as opposed to the absence thereof in careful speech.

Finally, consider the case of Romanian feminines. If in masculines and neuters the morphological structure of singular definites is transparent, in feminines the definite article *-a* surfaces immediately after the stem:

## (14) a. Singular indefinite:

kás- $\varnothing$  <sub>FEM.SG.</sub>  
“house”

## b. Singular definite:

kás-a <sub>FEM.SG.DEF.</sub>  
“the house”

In feminine definites, deletion is not possible in casual speech or, for that matter, in careful speech. If a null determiner (and/or a null exponent of number) were available, one could wonder why their occurrence is possible in certain lexical classes (masculine-neuters) and not in others (feminines).

In sum, it should be emphasized that casual speech deletion is only possible in polymorphemic words, more precisely, in forms that consist of a

stem and at least two functional affix segments. Phonological deletion will affect the rightmost functional morpheme and, as a last resort, the surviving morpheme segment will take over the exponence of the deleted one, hence the process of morphological coalescence referred to above.

An important issue to address is what the driving force of deletion in casual speech is. If fast or casual speech is generally characterized by reduction phenomena (see Dressler 1972 for a general account), we expect phonological deletion and coalescence to play an important role. The case of Romanian nominals is particularly instructive, because it shows that the phonology-morphology interaction allows for phonological deletion that conceals morphological coalescence. Given the morphology-phonology interaction observed in Romanian, a theory of M-P Correspondence as the one argued for in the paper is, in principle, better equipped to handle such cases than mere I-O correspondence. The correspondence between morphological and phonological structure thus comes to the fore in resolving the phenomenon under discussion.

At the same time, *portmanteau* morphemes are generally attested in Romanian. For example, in the nominal domain case and number are expressed by one and the same morpheme, and in the verbal domain person and number are also systematically collapsed into a unique form, as the case is in Indo-European in general. As a rankable, violable OT constraint, UNIFORMITY-MP can be used to express the extent to which morphological coalescence is allowed cross-linguistically. Agglutinative languages, where there is no morphological coalescence are characterized by high-ranked UNIFORMITY-MP, whereas flexive languages, in which morphological coalescence is possible, have relatively low-ranked UNIFORMITY-MP. More interesting are cases of mixed, agglutinative and flexive morphology, where function of various factors (phonological, morphological or lexical) categories can be expressed with or without coalescence (see Plank 1999 for a review). To account for such situations the necessity arises to consider category-specific versions of UNIFORMITY-MP that can occupy different places in the constraint hierarchy, leading to a factorial typology of morphological coalescence.

Even if the benefits of an analysis that takes into account UNIFORMITY-MP are considerable from a cross-linguistic perspective, there exists an alternative account, based on phonological coalescence. Phonological coalescence represents the fusion of two underlying segments into one surface segment, which combines the properties of its underlying parents (Lamontagne and Rice 1995, Causley 1996, McCarthy 1996, 2000 etc.). Under this assumption, the phonological coalescence of the final *-ul* sequence in definite forms in casual speech is represented as in (15):

(15) /Stem-u<sub>1</sub>l<sub>2</sub>/ → [Stem-u<sub>1,2</sub>]

The phonological coalescence approach is nevertheless confronted with two problems. First, it is hard to tell what the common, significant properties of the two underlying segments are that can make phonological coalescence possible, more so if we take into account the fact that Romanian [l] is never saliently velar(ized), not even in word-final position. Second, as hinted in the this paper, a phonological coalescence analysis would fail to account for the observed impact of morphological structure and complexity as inextricably associated with the process.

### 5. Conclusion

In this paper I argued for the possibility of capturing morphological variation (morpheme realization) in terms of correspondence between M(orphological) and P(honological) structure in outputs. Evidence from the behavior of Romanian masculine and neuter definites in careful and casual speech was brought to bear on the issue. M-P Correspondence introduces a new family of constraints whose activity can account for phenomena at the Morphology-Phonology interface, as the apparent deletion of the definite article in casual speech in Romanian nominals, which was used to illustrate the morphological coalescence mechanism supported by the proposal.

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# COMPLEX NUCLEI IN ARTICULATORY PHONOLOGY THE CASE OF ROMANIAN DIPHTHONGS\*

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## 1. *Introduction*

This paper examines complex nuclei, as an instance of syllable complexity, taking as a concrete example the Romanian phonological diphthong /ea/. My goal will be both to propose a theoretical Articulatory Phonology analysis of complex nucleus effects and to provide experimental evidence that such a proposal is warranted and preferable to existing analyses.

The main claim of Articulatory Phonology, henceforth AP (Browman and Goldstein 1986, 1989, 1990, 1992, 1995, 2000) is that speech can and should be described in a unitary structure that captures both its physical and its phonological properties. AP's "working" units (gestures) are coordinated dynamic events that are simultaneously units of action (encapsulating constriction production) and units of information (encapsulating linguistic contrast). Since both physical and phonological properties of speech are encoded in these atomic units and their "gluing"/coordination together, no "translation" (phonetic implementation) is needed between units of representation and their execution. This makes AP theoretically and explanatorily appealing by offering a way to avoid the questions that mainstream phonetics and phonology have to face with respect to the relation between the two and the mechanisms that would be needed to go from one to the other.

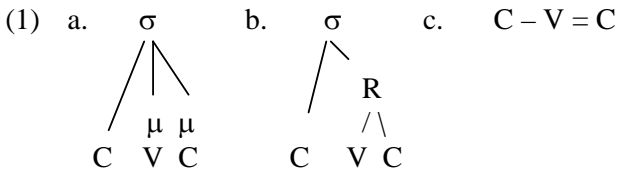
Of interest here is the fact that specific "gluing" (coordination) of the gestures would also derive observations on syllables and syllable position effects (cf. Browman and Goldstein 1995, 2000). Affiliated consonants preceding and following a vowel (mainstream "onset/coda" syllable positions) can be identified without reference to hierarchical syllable structure or without reference to the syllable itself beyond a purely descriptive function. All that is

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needed to define and identify syllables and syllable positions are specific modes of coordination between the gestures involved. Syllable position effects, such as (complex) onset and coda effects are the lawful consequences in articulation and acoustics of synchronous vs. sequential dynamical coupling between various gestures. This coupling relation between gestures is understood and modeled as a coupling between oscillators, with speech gestures being assumed to exhibit the properties of individual oscillators with critical damping (cf. Browman and Goldstein 1990, Saltzman 1995, Nam and Saltzman 2003 for details on the coupled oscillator model).

Segmental (non-AP) syllable representations in (1a) or (1b) where onset vs. coda positions are hierarchically distinguished, can be replaced by the one in (1c), where lawful physical consequences of synchronous vs. sequential coupling of the consonant with the vowel distinguishes between the two positions.<sup>1</sup>

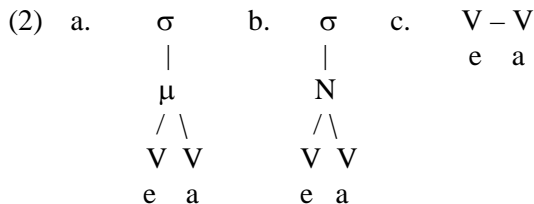


The representation in (1c), whose validity has been empirically proven (cf. Browman and Goldstein 1995) correctly accounts for a multitude of phonological facts (e.g. syllable weight) without any need for hierarchy, or for reference to the syllable as a phonological unit. When properly expanded to include further coordination relations, it can also yield the correct generalizations for standard complex onset and codas effects.

The aim of this paper is to examine another phonological aspect of syllable complexity – complex nuclei/moras, of which a concrete example are Romanian phonological diphthongs /ea/ and /oa/. The theoretical question is whether complex nucleus effects can, just like (complex) onset and coda effects, be predicted by a specific coordination pattern of articulation (2c) rather than result from syllable hierarchy, as assumed in standard non-AP analyses (2a-b). The question is therefore whether the gestural coordination representation in (2c) can successfully replace the hierarchical syllable

<sup>1</sup> Throughout the paper, “ – ” represents synchronous coordination, and “ = ” represents sequential coordination.

structure in (2a-b), in the same way in which (1c) has been shown elsewhere (e.g. Browman and Goldstein 1995) to adequately replace (1a-b).



The proposal in (2c) is that Romanian phonological diphthongs (and potentially other cross-linguistic “complex moras/nuclei”) are two vowels in synchronous coordination with each other. Whether both are recoverable or not is determined by additional dynamical laws/requirements applying to the two vowel gestures, viewed in this model as critically damped oscillators (cf. the coupled oscillator model). If the two vowels have the same oscillatory frequency, then potentially the two are blended into one, since they have to be synchronously at target and then synchronously move away from target. If the two vowels have different oscillatory frequencies, the vowel with lower frequency will take longer to reach and move away from the target and this will presumably result in less blending and hence recoverability of both vowels.

I will start by summarizing the relevant Romanian data and previous analyses proposed. I will then present an acoustic experiment whose results confirm that in the case of Romanian diphthongs there is evidence of the presence of the two vowels even when they are truly simultaneous (i.e. apparently non-recoverable). This experiment empirically proves the superiority of the representation in (2c) over those in (2a-b), since as it will be shown, only the representation in (2c) will be able to predict the observed result, as an effect of blending. The adequacy of (2c) over (2a-b) suggests that indeed what had previously been assumed to be the result of syllable hierarchy is in fact the result of a specific pattern of dynamic gestural organization.

## 2. *The phonological status of Romanian diphthongs ea - oa*

Phonological analyses on Romanian have been in disagreement with respect to the (non)-phonemic status of diphthongs *ea* - *oa*, as well as with respect to the status of high glides and of the sequences *ja* - *wa*. The most recent and exhaustive investigations of the issue (Chitoran 2001, 2002) convincingly argue in favor of viewing the diphthongs *ea* and *oa* as phonological, on the basis of both observed alternations and experimental

evidence. Following Rosetti et al. (1955), Chitoran (2001) proposes that the diphthongs *ea* and *oa* should be viewed as phonological and structurally specified as complex nuclei (moras), while high glides should be represented as consonantal and occupying syllable onset position.

In this work, I will exclusively provide examples of one of the Romanian diphthongs – *ea*, since the contrast *ja-ea* has been more thoroughly studied and is also more robustly attested than the contrast *wa-oa* (cf. Chitoran 2001, 2002).<sup>2</sup> The factual observations summarized below with respect to *ea* also hold for *oa* and this latter diphthong will make the object of a further study. The examples used in this paper come from Chitoran (2001, 2002) as well as from my own work with native speakers.

### 2.1 *The data*

There are several observations, presented below that all corroborate the conclusion that the Romanian diphthong *ea* is phonological and must be specified as different from both a sequence of two vowels and from glide-vowel sequences. Lengthy discussions on this can be found in previous studies (Rosetti 1955, Chitoran 2001, 2002).

The diphthong *ea* appears exclusively under stress, and when unstressed, word finally (3). For easiness, the diphthong is written as *ea* and the hiatus sequence as *e.a*. Unless otherwise specified, the given syllabification is the only one attested.

- (3) 'kar.te        “book”  
       'kar.tea      “the book”

There are minimal pairs showing that the diphthong is contrastive with simple vowels (4), and suggesting that some difference must be lexically specified.

- (4) a. 'se.a.rə      “evening”  
       'se.rə        “greenhouse”  
       b. 'te.a.mə    “fear”  
       'te.mə       “homework”

---

<sup>2</sup> *Wa* is attested in very few words, most of them being recent borrowings. Chitoran (2001, 2002) proposes that the contrast *wa-oa* is not phonetically maintained due to both its low functional load (no minimal pairs) and to the fact that it is more difficult to maintain contrast in the back vowel space than in the front.

The data in (5) is a strong argument for the phonological status of the diphthong *ea*. The forms in (5a) show that the sequence *ea* is not always syllabified as a diphthong. Furthermore, a comparison between (5a) and (5b) suggests that there is no predictability on whether *ea* should be syllabified as a diphthong or as a hiatus. Consequently, the sequence *e-a* must be lexically specified either as a diphthong in instances such as those in (5b) or as a hiatus in instances such as those in (5a).

- |     |    |                      |            |
|-----|----|----------------------|------------|
| (5) | a. | <i>re.'ak.tsi.je</i> | “reaction” |
|     |    | <i>re.'al</i>        | “real”     |
|     |    | <i>le.'al</i>        | “loyal”    |
|     | b. | <i>'leak</i>         | “remedy”   |
|     |    | <i>'deal</i>         | “hill”     |

Furthermore, the diphthong *ea* is also distinct from the glide-vowel sequence *ja*, as proven by the existence of (near) minimal pairs (6):

- |     |    |                   |              |
|-----|----|-------------------|--------------|
| (6) | a. | <i>'bea.tə</i>    | “drunk-F-SG” |
|     |    | <i>'bja.t ə</i>   | “poor-F-SG”  |
|     | b. | <i>fu.'mea.zə</i> | “he smokes”  |
|     |    | <i>a.'mja.zə</i>  | “noon”       |

The diphthong *ea* alternates with unstressed *e* (7a-b), while the glide-vowel sequence *ja* never alternates as a unit (7c). Also, unlike the diphthong *ea* (7d), the glide-vowel sequence cannot follow complex onsets (7e).

- |     |    |                                     |                 |
|-----|----|-------------------------------------|-----------------|
| (7) | a. | <i>'sea.rə</i>                      | “evening”       |
|     |    | <i>se.'ra.tə</i>                    | “evening party” |
|     | b. | <i>'tea.mə</i>                      | “fear”          |
|     |    | <i>te.mə.'tor</i>                   | “fearful”       |
|     | c. | <i>'bja.tə</i>                      | “poor-F-SG”     |
|     |    | <i>'bje.te</i>                      | “poor-F-SG”     |
|     | d. | <i>'treaz</i>                       | “awake-M”       |
|     |    | <i>'zdrean.tsə</i>                  | “rag-F”         |
|     | e. | <i>tri.'umf/*trjumf</i>             | “triumph”       |
|     |    | <i>stri.'a.tsi.je/*strja.tsi.je</i> | “indentation”   |

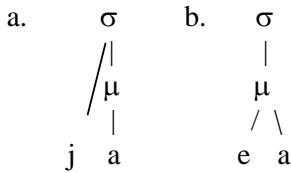
Taken together, all this evidence warrants the conclusion that the Romanian diphthong *ea* is phonological and must be lexically specified as different from both a sequence of two vowels and from glide-vowel sequences.

## 2.2 Experimental evidence

There are several experimental studies available that point to the phonological status of the Romanian diphthong *ea*. Chitoran's (2001) acoustic analysis shows that *ea* and *ja* are significantly different in duration (with *ea* shorter), F2 onset values (with lower F2 for *ea*) and F2 transition rate (faster for the glide). A further perceptual experiment (Chitoran 2002) confirms this distinction between *ea-ja*, listeners being able to distinguish between *ea-ja* heard independently from any lexical context. This experimental evidence supports a distinction between the diphthong *ea* and the glide-vowel sequence *ja*.

The data and the experimental evidence are accountable for in a standard segmental analysis by assuming that the glide *j* is a consonant part of the syllable onset (8a), while the diphthong *ea* forms a syllable nucleus unit (8b). In the case of Romanian, since there is no evidence for syllable weight associated with the diphthong (cf. Chitoran 2001), *ea* is assumed to be monomoraic.

(8) Chitoran (2001, 2002)



Given the representation in (8), the alternation between the stressed diphthong *ea* and unstressed *e*, as illustrated in (7a-b) is assumed to be a qualitative change, either rule- or constraint-driven (cf. Chitoran 2001, 2002). If this analysis is correct, then the expectation is that unstressed *e* in alternating roots (9b) is articulatorily and acoustically not significantly different from unstressed *e* in non-alternating roots (9d). This expectation is warranted given that, unlike other Romance languages, Romanian is described as using the same set of seven vowels in both stressed and unstressed positions, with the addition of the diphthongs *ea* and *oa* to the set of stressed vowels (cf. Chitoran 2001).

- |     |    |            |                      |
|-----|----|------------|----------------------|
| (9) | a. | 'seɑ.r ə   | “evening”            |
|     |    | 'teɑ.mə    | “fear”               |
|     | b. | se'ra.tə   | “evening show/party” |
|     |    | te.mə.'tor | “fearful”            |

- c. 'bɛ.ri.le            “the beers”  
 d. bɛ.'ri.kə            “beer (DIMINUTIVE)”

However, if, as suggested in the introduction, alternating *e* is the result of a blending between the two vowels forming the diphthong *ea* under certain dynamic conditions, one would expect significant articulatory and possibly also acoustic differences.

These diverging predictions are easily testable from an acoustic perspective and the results of an experiment bearing on this issue are reported in the next section.

### 3. *An acoustic study on alternating/non-alternating [e] in Romanian*

The question that the present experiment addresses is whether *e* alternating with the diphthong *ea* is acoustically similar or different from non-alternating *e*. If the previous analyses of the Romanian diphthong *ea* are correct (Chitoran 2001, 2002), then the expectation is that alternating and non-alternating *e* should not be significantly different from an acoustic point of view, since the alternations observed are analyzed as qualitative in nature, and no source for variation is predicted. If however, alternating and non-alternating *e* turn out to be acoustically different, an alternative analysis for the Romanian diphthong *ea* will have to be proposed, one that will be able to predict such a difference.

#### 3.1 *Method*

The subjects of this experiment were two male and one female native speakers of Romanian, from the same region and speaking the same dialect. A number of 8 experimental words given in Table 1 were recorded in a carrier phrase, repeated 10 times in random order and separated by a random number of filler tokens. The recording was made in a quiet room directly onto a computer using Praat 4.1.18 software (Boersma & Weenink 1992-2003). The analysis was also made with the Praat 4.1.18 software.



	Experimental Word	
Non-alternating /e/	<i>'serə</i>	“greenhouse”
	<i>'temə</i>	“homework”
Alternating /e/	<i>se'ratə</i>	“evening party”
	<i>temə'tor</i>	“fearful”
Diphthong	<i>'searə</i>	“evening”
	<i>'teamə</i>	“fear”
Stress control	<i>'berile</i>	“the beers”
	<i>be'rikə</i>	“beer (DIMINUTIVE)”

Table 1: *Experimental series – the target vowels are italicized*

The experimental words were two series of minimal pairs, illustrating the contrast between *e* and the diphthong *ea*, and the respective alternations of the diphthong with *e* under stress shift. Because alternating *e* only occurs unstressed, and in the chosen pairs, non-alternating *e* occurs under stress, a stress control pair was used, to be able to exclude stress effects as a possible source for difference between alternating and non-alternating *e*. For the analysis, 20ms at the beginning of each target vowel were manually selected and formant values were extracted using Praat's formant analysis function. The formant values obtained from the 20ms window were then averaged for each token. For each token, the difference between the first two formants was computed and used in the statistical analysis. The comparison was done for each of the speakers individually, using their 10 repetitions of each experimental word.

### 3.2 Results

One-way ANOVAs and appropriate post-hoc tests (Bonferroni for equal variances and Games-Howell for unequal variances) were performed on the 8 tokens for each speaker and for each word series. The statistical result is that F2-F1 values are significantly different ( $p < 0.05$ ) for alternating vs. non-alternating *e*, with alternating *e* more central (see Table 2).<sup>3</sup>

<sup>3</sup> For speaker M2, the difference between alternating and non-alternating *e* for the series *temə* - *teamə* - *temətor* does not reach significance but it is at trend level, with  $p = 0.07$  (see also footnote 10).

	Experimental Word	Speaker M1	Speaker F	Speaker M2
Non-alternating /e/	<i>'serə</i> “greenhouse”	1076	1365	1213
	<i>'temə</i> “homework”	1194	1438	1258
Alternating /e/	<i>se'ratə</i> “evening party”	1029	1277	1150
	<i>temə'tor</i> “fearful”	1057	1296	1202
Diphthong	<i>'searə</i> “evening”	1030	1385	1185
	<i>'teamə</i> “fear”	1077	1384	1217
Stress control	<i>'berile</i> “the beers”	1150	1391	1158
	<i>be'rikə</i> “beer (DIMINUTIVE)”	1153	1390	1128

Table 2: *F2-F1 Values – the target vowels are italicized*

The observed difference between the vowel *e* in the pairs *'serə* - *se'ratə* and *'temə* - *temə'tor* could be the result of stress shift, similar to other Romance languages which are known for having acoustically different sets of vowels in stressed versus unstressed position. However, the comparison of the two vowels *e* within the stress control series *'berile* - *be'rikə* does not reach statistical significance, showing thus that in Romanian, unlike in other Romance languages, the vowel *e* is not acoustically different depending on stress. This experimental result, showing no interaction between stress and vowel quality, corroborates existing descriptions of the Romanian vowel system, descriptions that propose the same set of vowels for both stressed and unstressed positions.<sup>4</sup> More detailed statistical information is provided in Tables i-iii in the Appendix.<sup>5</sup>

### 3.3 Discussion

Assuming that the acoustical significance observed is the result of different articulatory mechanisms in producing the two *e* sounds, it follows that the

<sup>4</sup> A further possible source of variation that was not controlled for in the present experiment is number of syllables. The words with alternating *e* have three syllables, while those with non-alternating *e* have two syllables, and a syllable number effect on formant values cannot be excluded as a possible confound to the results presented here. This will need to be tested in future work.

<sup>5</sup> The experimental results show that *e* in the diphthong is acoustically comparable to non-alternating *e* for two out of three speakers. This is an expected result given the AP hypothesis argued for in this paper. Thus, alternating *e* is hypothesized to be the result of blending between *e* and *a* (and therefore different from non-alternating *e*), while the presence of *ea* under stress is due precisely to the lack of blending of the two vowel gestures.

correct analysis should capture such articulatory differences between non-alternating *e* and unstressed *e* alternating with the diphthong *ea*.

It is puzzling why two different articulatory mechanisms should be used to produce the two types of *e*, unless one sees the link between the alternating *e* and what it alternates with – the diphthong *ea*. In light of this, the *e* alternating with the diphthong can be hypothesized to be a diphthong itself, but whose parts are “blended” due to lack of stress (since stress seems to be the alternation trigger).

Indeed, as pointed out in the introductory section, an Articulatory Phonology analysis of the Romanian diphthong *ea* predicts precisely what the experiment reported here shows – that *e* alternating with the diphthong is different from non-alternating *e*, the former being a “blended” diphthong, while the latter is a true underlying *e*.

On the other hand, if the alternation between the diphthong *ea* and *e* were qualitative in nature and were rule/constraint-driven, as proposed in the analysis summarized in 2.2, then the observed significant difference between *e* in 'serə and *e* in se'ratə would be unexpected and would remain unexplained.<sup>6</sup>

In the following section, I will flesh out the AP analysis of the diphthong *ea* that predicts an articulatory difference between the unstressed *e* with which *ea* alternates and non-alternating *e*. This articulatory difference, whose manifestation is the acoustic significant difference experimentally documented here, is predicted to arise spontaneously given my proposal that diphthongs should be represented as synchronously coordinated vowels.

#### 4. *Articulatory Phonology and Romanian ea vs. ja*

This section will provide a detailed account of my proposal for the analysis of the Romanian phonological diphthong *ea*. This account will predict the alternations and distinctions between diphthongs and glide-vowel sequences as summarized in Section 2 and will also account for the experimental results reported in Section 3. Crucially, accounting for the experimental results reported in Section 3 will prove the superiority of this account over existing accounts which, as shown, could not explain the patterns observed experimentally.

Phonological facts such as cluster prohibition suggested that in the glide-vowel sequence, the glide behaves like an onset (cf. 7c). However, in AP onset position can be subsumed to a physically controlled type of gestural

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<sup>6</sup> It must be repeated here that the observed difference cannot be due to stress shift, since the control comparison shows that there is no difference between stressed and unstressed *e* in Romanian.

coordination – i.e. the consonant and the vowel are synchronously coordinated (10).<sup>7</sup> Although synchronously coordinated, both the glide and the vowel are recoverable due to the intrinsic different dynamics (i.e. different oscillatory frequency) of vowels vs. consonants. It will take longer for vowels, with lower frequency, to reach and move away from target than it will take for consonants, and hence although synchronously coordinated, the glide and vowel will not be blended into one.

(10) 'bjatə            “poor-F-SG”

b	j	t
C = C		C
	V = V	
'a		ə

As for the phonological diphthong, I propose that it is a succession of two vowels in synchronous coordination with each other (11).<sup>8</sup>

(11) a. V – V            b. V  
       e    a                    |  
                                   V

As already pointed out in the introductory section, these two vowels in synchronous coordination with each other can have either the same frequency of articulator oscillation or different frequencies. If the two vowels have the same oscillatory frequency, then potentially the two are blended into one. Being synchronously coordinated and having the same oscillatory frequency implies that they will totally overlap each other, hence the blending effect. If, on the other hand, the two vowels have for some reason different frequencies, one can imagine that, like in the case of synchronous CV coordination, the

<sup>7</sup> Consonants and vowels are not primitives of the system – gestures, but rather constellations of gestures, already glued together in ways beyond the scope of this paper. For editing and brevity purpose, I will however use here familiar Cs and Vs as shorthand for these constellations of gestures.

<sup>8</sup> The representations in (11a) and (11b) are identical and for editing simplicity, (11a) will be used throughout. However, it must be kept in mind that since the two vowels are synchronously coordinated, no linearization information is built in this representation alone, as (11a) might mistakenly suggest. Linearization of the two vowels arises due to additional coordination relations, whose precise fleshing out is beyond the scope of this paper.

vowel with lower frequency will take longer to reach and move away from the target. This will presumably result in less blending and consequently, in recoverability of both vowels. I argue that Romanian diphthongs instantiate both these possibilities.

Thus, a diphthong results when the frequencies of the two vowels *e* and *a* respond differently to prosodic influences such as stress (12a) or boundary (12b), with the frequency of *a* as a low vowel being influenced (i.e. slowed down) more by stress and word-boundary. Thus, in (12) the two vowels are synchronously coordinated, however the oscillatory frequency of *a* is lower and therefore it will take longer for *a* to reach and move away from its target. As a consequence, both vowels will be audible/recoverable as a diphthong.

(12) a. 'beatə                      “drunk-F-SG”

b	t
C	C
V – V = V	
e	'a ə

b. 'kartea                      “the book-F”

k	r	t
C	C	C
V =	V –	V
'a	e	a

When there is no stress effect, the two vowels are truly synchronous. This means that they have (roughly) the same frequency, and they move to and away from target simultaneously and thus the two vowels are blended (13). Under this analysis therefore, the *e-ea* alternation observed (and previously analyzed as a qualitative rule/constraint-driven change) is in fact a blending effect between the two vowels whenever the lexically synchronous vowels are truly synchronous in production, i.e. whenever there is no additional factor such as stress to influence the vowels' intrinsically similar oscillatory frequency.

(13) *be'tsivə* “drunkard-F-SG”

b	ts	v
C	C	C
V	- V =	V = V
e	a	'i ə

Finally, hiatus *e.a* sequence arises if the lexical coordination of these forms is sequential, not simultaneous vowel coordination (14).

(14) *re.'alə* “real-F”

r	l
C	C
V =	V = V
e	'a ə

The theoretical proposal made here with respect to the Romanian diphthong *ea* is that instead of having to be arbitrarily represented as a split nucleus, the diphthong can be understood as a specific type of coordination between two vowels – synchronous, that can be viewed both as a unit of action (since it encodes information on how to be produced) and as a unit of linguistic information (since this coordination relation is unique to vowels that form a diphthong).

Moreover, this analysis proves to be empirically adequate since it predicts that alternating *e* is the result of blending between synchronously coordinated *e* and *a* whenever the two vowels have the same frequency of articulator oscillator, i.e. whenever their intrinsic frequency is not altered by factors such as stress or boundary.<sup>9</sup> Thus, under this analysis, the empirically observed difference between alternating and non-alternating *e* reported in Section 3 finds a natural explanation. Since alternating *e* is the result of blending, it is articulatorily different than non-alternating *e* and it is only natural that this articulatory difference would potentially manifests itself acoustically, giving

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<sup>9</sup> Note that speech rate cannot influence “blending” or lack of blending, since speech rate would determine the frequency of both vowels and it would determine it equally for both vowels.

rise to the acoustic differences between the two types of *e*, as reported in Section 3.<sup>10</sup>

As an added bonus, the representation proposed here also predicts syllable weight facts associated with this type of diphthongs. It has been proposed previously, on the basis of a competitive coupling analysis (cf. Browman and Goldstein 2000) that gestures coupled sequentially contribute to syllable weight (e.g. codas), while gestures coupled synchronously do not add to syllable weight (e.g. onsets). With respect to the Romanian diphthong under scrutiny, it has been observed (cf. Chitoran 2001, 2002) that the diphthong weighs equally to a simple vowel, and indeed the diphthong *ea* is not significantly longer than the vowel *a* (cf. data from Rosetti et al. 1955a, given in the Appendix, Table iv). Rather than arbitrarily decide that this type of split nucleus is mono-moraic as in previous analyses, the present proposal, independently motivated by theoretical and experimental considerations, predicts the diphthong's weight behavior. Thus, the two vowels of the diphthong are synchronously coupled, similarly to onset-vowel coupling, and this type of coupling and the competitive dynamic requirements that such coordination imposes on the system prevent additional weight (length) of the diphthong when compared to a singleton.

## 5. Conclusion

In this paper I proposed an Articulatory Phonology analysis of the Romanian diphthong *ea*, suggesting that it should be represented as two vowels coupled synchronously. The empirical advantage of the proposal is that it accounts for the results observed in the conducted experiment, results that are problematic for previously available analyses. Specifically, the proposed AP analysis is able to predict and explain the observed acoustic difference between non-alternating *e* and *e* alternating with the diphthong *ea*. The proposed representation of the diphthong predicts recoverability of its components under certain conditions and a blending of its components under other conditions, and it is this blending that causes the reported acoustic difference between alternating/ blended *e* and non-alternating *e*.

The theoretical advantage of the proposal is that it does away with any need for syllable hierarchy to derive complex nucleus effects. Complex nucleus effects (like other syllable effects, previously studied, cf. Browman

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<sup>10</sup> Just by accident the articulatory differences between “blended” and non-alternating *e* could have had no acoustic consequences, i.e. the result of blending could have been acoustically not distinct from non-alternating *e* (in which case, the two competing analyses could not have been distinguished). The acoustic significant difference is even more compelling an argument for the articulatory analysis proposed, given this observation.

and Goldstein 1995a-b, 2000) can be explained by a specific pattern of gestural organization – synchronous coupling, and by lawful consequences predicted by such coupling. On a larger scale, this proposal addresses the century-old notion of syllables and what syllables are, and adding to work done on (complex) onset and coda effects, it comes to complete, from the complex nucleus effects perspective, the hypothesis that what defines syllables is not an arbitrary hierarchy between segments, but rather a specific mode of coordination between gestures.

An additional important advantage of the proposed analysis is that it explains complex nucleus effects in a speech production theory that needs no translation between units of representation and their execution, as opposed to other phonological theories that would need a set of arbitrary rules for phonetic implementation.

APPENDIX

One-way ANOVA	Speaker M1	Speaker F	Speaker M2
'serə - 'searə - se'ratə	F= 5.35, p= 0.01	F=12.19, p= 0.000	F= 5.48, p= 0.01
'temə - 'teamə - temə'tor	F=19.44, p= 0.000	F= 5.32, p= 0.012	F= 3.06, p= 0.063
'berile - be'rikə	F=0.64, p= 0.44	F= 0.000, p= 0.996	F= 1.69, p= 0.210

Table i: *One-way ANOVA statistics*

Post-hoc comparisons		Speaker M1	Speaker F	Speaker M2
'serə “greenhouse” (non-alternating e)	'searə “evening” (diphthong e)	p=0.023	p=1	p=0.880
'serə “greenhouse” (non-alternating e)	se'ratə “evening party” (alternating e)	<b>p=0.021</b>	<b>p=0.005</b>	<b>p=0.009</b>

Table ii: *Comparison for the serə - searə - seratə experimental series*

Post-hoc comparisons		Speaker M1	Speaker F	Speaker M2
'temə “homework” (non-alternating e)	'teamə “fear” (diphthong e)	p=0.000	p=0.699	p=0.280
'temə “homework” (non-alternating e)	temə'tor “fearful” (alternating e)	<b>p=0.000</b>	<b>p=0.010</b>	<b>p=0.072</b>

Table iii: *Comparison for the temə - teamə - temətor experimental series*



Speaker	'teakə "pod"	'takə "be silent"
42	16	16
52	23	19
54	23	21
61	23	20
63	16	15
65	14	13
67	15	15
73	20	21
Mean	18.75	17.5
One-way ANOVA: F= 0.499, p= 0.492		

Table iv: Duration of ea vs. a. Data from Rosetti et al. 1955a.

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# PHONETIC CUES TO SPECIAL CASES OF LIAISON LOOKING FOR A PROSODIC DOMAIN<sup>\*</sup>

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## 1. Introduction

Liaison in French, although complex, can be simplified in these terms: latent word-final consonants, if realized, emerge before a vowel within some prosodic domain larger than the word. In such cases, which we will call ‘common’ cases of Liaison, *enchaînement* “linking” also occurs, i.e. the final consonant is syllabified across the word boundary as the onset of the following syllable (Table 1).

Isolated word	Word in <i>liaison</i> context	Gloss
petit [pəti]	petit enfant [pətitãfã]	“small child”
nous [nu]	nous avons [nuzãvõ]	“we have”

Table 1: *Common cases of Liaison with enchaînement*

While Liaison has been analyzed by numerous studies using many theoretical approaches (see *infra*), its phonetic aspects have been largely understudied. A possible reason is that actual realizations of Liaison might have appeared to lack phonetic variability, as it was believed that all cases of Liaison were, in fact, common cases of Liaison (Rialland 1988:134). Thus phonological models dealt predominantly with obligatory Liaisons occurring in what was perceived as “informal speech” (Nespor & Vogel 1986:41). What we will further call ‘special’ cases of Liaison, if reported at all, has been routinely dismissed from formal consideration. *Liaison sans enchaînement* “Liaison without linking”, where a latent consonant pronounced without being

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resyllabified to the beginning of the following word, first reported by Encrevé in 1983 as typical of political speech, was long considered outside the realm of phonological investigation. It was perceived either as a “conscious epiphenomenon”<sup>1</sup> or as the ‘wrong’ speech style.<sup>2</sup> Although Encrevé’s (1988) autosegmental approach was recognized as the first study “bringing to light new data” on Liaison (Rialland 1988:134), the challenge that variable realizations of Liaison represent for theoretical models was not taken seriously until recently.

And yet, such cases call into question some of the basic tenets of syntactically-constrained models of prosodic hierarchy in French. Specifically, they challenge the assumption that Liaison motivates the existence of the phonological phrase ( $\phi$ ) (Nespor & Vogel 1986). Morin & Kaye (1982), for instance, show that pauses, considered possible correlates of the intonational phrase ( $I$ ), can occur before and after a Liaison consonant.<sup>3</sup> Nespor & Vogel (1986), quoting personal communication with Y.-C. Morin, report cases of Utterance ( $U$ ) restructuring involving Liaison: “Liaison in French, in part a morphophonological rule, may apply across speakers when, for example, one speaker hesitates and another speaker resumes his sentence” (idem: 240). Thus the question is: how to account for the fact that a phonological process like Liaison, which supposedly motivates the phonological phrase, is not stopped by the boundary of a prosodic domain larger than that phrase?

Not analyzing Liaison as a purely phonological rule, which can be subjected to  $U$  restructuring under certain pragmatic conditions, provides a ‘temporary fix’ to the problem. But the possibility of a major prosodic break in the vicinity of a Liaison consonant remains “a potentially fatal argument” (Post 2000:137) against the representation of Liaison as the property of a lower-level prosodic phrase.<sup>4</sup> So much so that based on production data from a laboratory-style reading experiment it was established that “Liaison did not apply within the phonological phrase as predicted”, and that “the variability [...] cannot be accounted for by means of the restructuring rules proposed in Prosodic Phonology” (idem: 149).

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<sup>1</sup> “Consequently, it need not be accounted for in a phonological analysis” (Scullen 1997:56).

<sup>2</sup> “We will restrict our attention to the colloquial style of speech, since it is only in this style that Liaison applies in a purely phonological environment” (Nespor & Vogel 1986:179).

<sup>3</sup> [...] the intonational phrase is the domain of an intonation contour and [that] the ends of intonational phrases coincide with the positions in which pauses ‘may be’ inserted in a sentence (Nespor & Vogel 1986:188).

<sup>4</sup> The other solution is to suppose that Liaison violates the Strict Layer Hypothesis, which poses even greater problems for the theory.

Then what is the appropriate prosodic phrasal domain, if any, for Liaison? Following up on Tranel's (1990) observation that obligatory Liaison may cut across major prosodic boundaries (as in *J'en ai un, ami* "I have one, friend", separating right-dislocated syntactic constituents from their main sentence), one could turn to models of French intonation for an answer. Mertens (1987), among others, would consider such a prosodic break to be just below the utterance, similar to Nespor & Vogel's *I* domain. On the other hand, both metrical and autosegmental-metrical (henceforth AM) approaches would propose an intermediate domain between Nespor & Vogel's *I* and  $\phi$  domains: *segment d'Unité Intonative* in the former case (Di Cristo 1998), *intermediate phrase* (ip) in the second (Ladd 1996; Jun & Fougeron 2000). Thus, rather than looking for a syntactically-based prosodic phrase in which the role of phonetic correlates (e.g. pause) remains unclear, one could try to evaluate if a prosodic constituent defined on the basis of prosodic patterns could be a more suitable domain of application for Liaison.

Such work has been recently undertaken. Replicating Post's (2000) experiment, Brown & Jun (2002) found that the Accentual Phrase (AP), a tonally-defined prosodic constituent in Jun & Fougeron's (2000, 2002) phonological model of intonation, yields a slightly better diagnosis (92%) of all cases of Liaison tested in the experiment than does the syntactically-defined phonological phrase (PhP) (80%). In other words, although neither the AP nor the PhP could predict the occurrence of Liaison, both could diagnose it. Similar conclusions were reached by Fougeron & Delais-Roussarie (2004) who found, based on data from French radio corpora, that 97% of all Liaisons realized occurred within the boundaries of an AP, and 78% within the boundaries of constituents that could be analyzed as a PhP. Neither constituent could, however, be considered obligatory domains of application of Liaison, as 49% of Liaison occurring within an AP, and 24% occurring within a PhP, were not realized.

In this article, we propose to address the question of the prosodic domain of Liaison by analyzing prosodic cues to special cases of Liaison. This examination of phonetic correlates will be couched in a proposal to consider latent final consonants moraic, as already suggested by Scullen (1997). Our prosodic analysis follows an AM model of intonation (Jun and Fougeron 2000, 2002), assuming a tonally rather than syntactically-derived hierarchy of prosodic constituents.

## **2. Formal representations of Liaison consonants**

Encrevé (1988) describes Liaison as the association of a floating consonant to an empty floating onset position. That process, following an autosegmental

model, is illustrated in Figure 1, with the sentence *j'avais un rêve* [ʒavɛzɛ̃ʁɛv] "I had a dream", in which [z] is the Liaison consonant. (A = attack/onset, R = rime, N = nucleus).

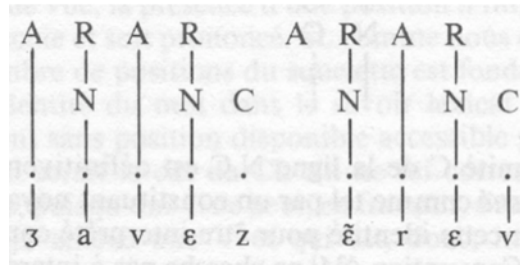


Figure 1: *Encrevé's (1988:177) representation of the last step in the linking process in 'common' cases of Liaison*

In his model, any element that is to be phonetically realized has to be linked to a higher-level node. Encrevé accounts for latent silent final consonants by stipulating that they are not linked to such nodes. In Liaison, however, the latent consonant is associated to the null onset of the following word, and can therefore be realized. The coda node is then deleted. His interpretation differs from generative accounts in that, first of all, it is not based on rules, but rather the regularities of a language are explained through principles applied to lexical representations. Secondly, these representations contain skeletal points that may or may not be linked to the phonemes, as well as syllable constituents that may or may not be filled. In her review of Encrevé's approach, Rialland (1988) nevertheless questions the motivations for the need of empty syllable-constituent positions, suggesting that the Liaison consonant could merely be syllabified with the following word, without having to refer to empty positions.

In her own paper, after analyzing phonetic data, Rialland (1994) concludes that some final consonants that do not coarticulate closely with following segments are extrasyllabic. An extrasyllabic consonant is also extrametrical, as it is excluded from the metrical grid.<sup>5</sup> As we know since Clements and Keyser's study (1983) an extrametrical element is a prosodic constituent to which phonological rules do not apply, as if it was invisible. Only constituents such as segments, syllables, feet, phonological words, and affixes can be

<sup>5</sup> Rialland's suggestion that "extrasyllabic consonants in French are not totally extraprosodic, but are linked to higher-level nodes in prosodic organization, such as the (phonological) word and the phrase" (157) is noteworthy, but cannot be addressed in this paper.

extrametrical. In addition, a constituent can be extrametrical only if it is located at the edge of a domain, the right edge being the unmarked one. Finally, if a constituent composes the whole domain, it cannot be extrametrical, so as to avoid the loss of an entire domain (Hayes 1995). This description applies to French final consonants, and consequently it can be used to account for Liaison as shown in *petit* “small” and *petit enfant* “small child” in Figure 2 and Figure 3.



Figure 2: *Moraic representation of the citation form petit “small” with a final silent extrametrical consonant*

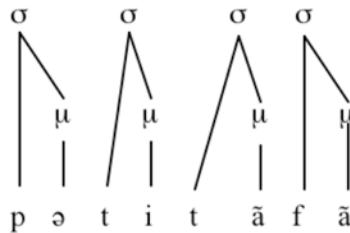


Figure 3: *Moraic representation of petit “small” in the sequence petit enfant “small child”, in which the Liaison consonant [t] is realized and linked to the following word-initial syllable*

We would like to offer a representation of Liaison within moraic theory, which satisfyingly treats special cases of Liaison, as illustrated in this paper. Moraic theory differs from Encrevé’s interpretation in that weight is assigned to the nucleus and coda of a syllable, which are dominated by moras (Hayes 1989). We follow Scullen (1997) who proposed such an interpretation with evidence from prosody, vowel lengthening, abbreviations, acronyms and reduplication. She also claimed that “the related issues of final consonants and



Liaison in French can be insightfully analyzed within the framework of moraic phonology” (56), as the latter assigns a different status to fixed (those always realized) and latent consonants (those realized only in Liaison contexts). According to her, “fixed final consonants are underlyingly associated to a mora while latent consonants are not” (56). However, Scullen also comes across complications with special cases of Liaison, which she considers “potentially the most serious” problem for a moraic account of final consonants in French.<sup>6</sup> The phonetic data analyzed in the present article will show that these cases are in fact not problematic, but on the contrary support her view that Liaison consonants are not dominated by a mora, and are therefore extrametrical.

### 3. A special case: *Liaison sans enchaînement*

Encrevé’s representation of *Liaison sans enchaînement* is not much different from the one in Figure 1. Instead of associating to the following empty floating onset, the Liaison consonant attaches to the floating coda, and the floating onset is deleted, as shown in Figure 4.

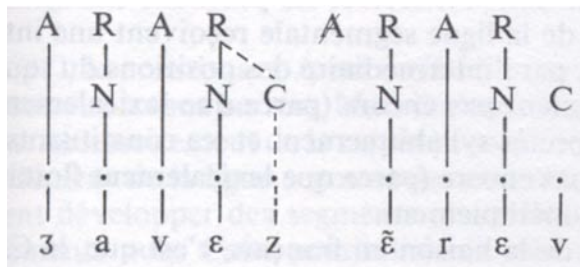


Figure 4: *Encrevé's (1988:183) representation of the linking process in a case of Liaison sans enchaînement*

Encrevé discusses several such special cases of Liaison taken from a corpus of political speeches. We are providing two of his examples here, summarized in Table 2. These would be cases of *Liaison sans enchaînement* in that, Encrevé claims, there is a pause between *faut* and *en* (first row in Table 2) and between *son* and *interprétation* (second row in Table 2).

<sup>6</sup> For the treatment of other potential problems with such an account (e.g. gemination), see Scullen (1997:38-54).

Production level	Spelling	Gloss
[ilfotʔə̃nɛtʁ]	Il faut en être	“one must be so”
[dasɔ̃nɛtʁɛpʁɛtasjɔ̃]	Dans son interprétation	“in his interpretation”

Table 2: *Encrevé's examples of Liaison sans enchaînement (Encrevé 1988:38)*

However, the spectrograms provided for each utterance (Figures 5 and 6) cast some doubt on the actual presence of a pause, defined as lack of phonation intended for prosodic purposes (e.g. marking a boundary). In Figure 5, the blank portion of the spectrogram labeled as a glottal stop in fact reads as the silent closure phase of the Liaison consonant [t]. Since [t] is a voiceless stop, it shows no visible signs of voicing on the spectrogram. As a result its relatively long closure phase could be – and probably was – taken for a silent pause. The closure is followed by a clearly visible full release of [t], and very likely not a glottal stop, as claimed by Encrevé.<sup>7</sup>

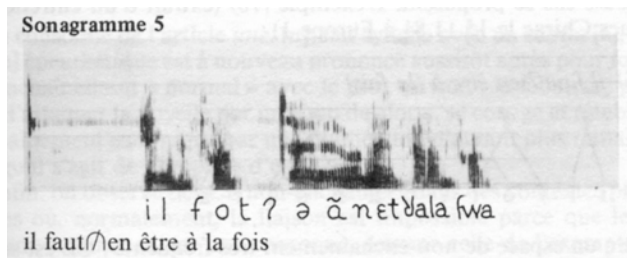


Figure 5: *Spectrogram of il faut en être “one must be so” (Encrevé 1988:37)*

In Figure 6, the labeling is also dubious, as the glottal stop is indicated underneath a portion of the spectrogram that shows continued voicing, and even a weak formant structure. Thus this portion is still likely to belong to the schwa that is lengthened, but probably with considerable drop in amplitude (wiping out most of the higher formants). The onset of the following nasal vowel, on the other hand, seems to bear the marks of a glottal stop: it appears

<sup>7</sup> The vertical bar preceding the formants of the following (schwa) vowel is typical of a fully released intervocalic [t] with a locus in higher frequencies. It is unlike a glottal stop that appears on spectrograms as a continuous vertical bar, sharply demarcating the left edge of the following vowel.

on the spectrogram as a continuous vertical bar, sharply demarcating the left edge of the vowel. Although to be entirely sure of our reading we would need to listen to these utterances, we strongly suggest that there are no silent pauses demarcating some kind of a large boundary in these examples. The schwas, as Encrevé also states (1983), seem to be a mark of hesitation inserted after the Liaison consonant.

The schwa insertion in these examples is still very much worth of attention. First of all, even though the schwas separate the two words that should be linked, they also solve the problem of resyllabification by becoming the nucleus to the Liaison consonants [t] and [n]. *Enchaînement* does occur, but in this situation it is between the Liaison consonants and the schwa. Secondly, schwa-like fillers are well-known cues to prosodic boundaries in unrehearsed spontaneous speech (Swerts 1994) and political speech (Duez 1991); they are called ‘filled’ pauses. Therefore, as in cases mentioned earlier, we are probably dealing here with some kind of major prosodic boundary in the vicinity of the Liaison consonant.

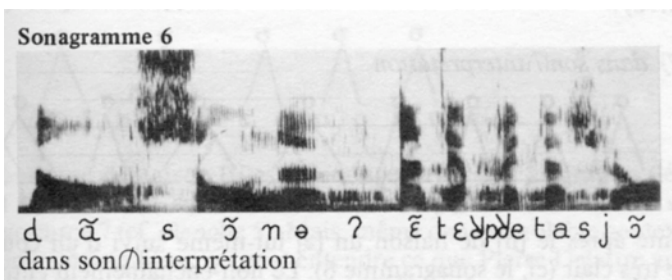


Figure 6: *Spectrogram of dans son interprétation “in his interpretation” (Encrevé 1988:37)*

We will now illustrate what we think is truly a case of *Liaison sans enchaînement*, and bring empirical support for a moraic representation of latent final consonants. In a speech delivered in front of the *Assemblée Nationale*, and recorded on television in 1998, French President Jacques Chirac realizes one such Liaison in the sequence *qu’il faut interdire le clônage* “that one must forbid cloning” (Figure 7). The Liaison consonant appears before a 300 ms silent pause and a schwa is inserted, but contrary to Encrevé’s examples, the schwa in Figure 7 is clearly produced before the silent pause.

We suggest that a moraic representation provides a satisfying account of the Liaison case illustrated in Figure 7. As we established earlier, the silent pause prevents the latent final consonant from resyllabifying as a word-initial

onset. Because the latent consonant is extrametrical, and thus not dominated by a mora, it cannot become a coda, and faces a release problem: to be realized, it must be associated with a vowel. That opportunity is provided by the schwa, which is inserted regardless of the fact that there is no such underlying vowel in the lexical representation of the verb form *faut* “must”. These phonetic details matter because the insertion of a schwa before the pause enables the Liaison consonant to become an onset, and extrametricality within a moraic framework accounts quite well for that phenomenon. Contrary to the filled pauses in Encrevé’s examples, the schwa in Figure 7 is short, and perceptually does not give the impression of hesitation. It is followed by a silent pause, a considerable drop in amplitude, and a clear pitch reset after the break, all jointly signaling the presence of a major prosodic boundary.

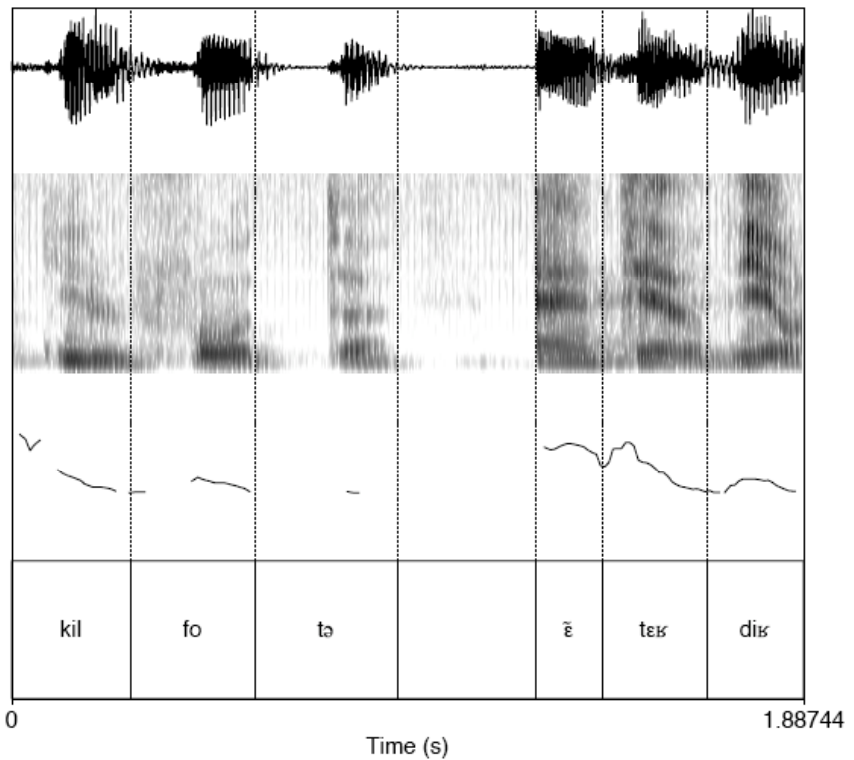


Figure 7: *Waveform, spectrogram, and pitch contour of Chirac’s utterance of qu’il faut interdire “that one must forbid”*

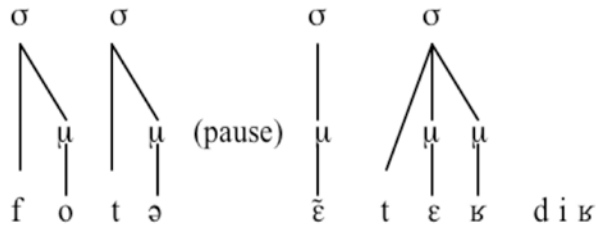


Figure 8: *Moraic representation of the sequence faut interdire “one must forbid” with Liaison sans enchaînement*

Several sociophonetic studies have independently noted the emergence of such schwas after a consonant at the end of major prosodic units (Hansen 1997; Fagyal 1998; Carton 1999). It has also been established independently from contexts of Liaison that these so-called ‘pre-pausal’ schwas are not hesitation phenomena (Candea 2002), and that they can acquire the pragmatic meaning of soliciting the hearer’s approval when uttered with a characteristically rising-falling intonation pattern (Hansen & Moosegard 2003). This could mean that pre-pausal schwas, when they emerge, provide an extra phonetic cue to the full release of a latent or a stable final consonant, and thus signal a major prosodic boundary.

#### 4. *Looking for a prosodic domain*

To come back to our introductory remarks, the previous special cases of Liaison raise the question of the nature of the prosodic domain of Liaison. In this section, we provide a prosodic analysis of other illustrations of such cases, and present more data showing that Liaison does occur and can resyllabify across major prosodic boundaries.

##### 4.1 *An intonationally-defined prosodic hierarchy*

We will follow the AM model of Jun & Fougeron (2000, 2002), in which prosodic domains are intonationally-defined. In a more recent version of the model, the largest prosodic unit below the utterance is the Intonation Phrase (IP), directly dominating the Accentual Phrase (AP) that is above words and syllables, as illustrated in Figure 9.

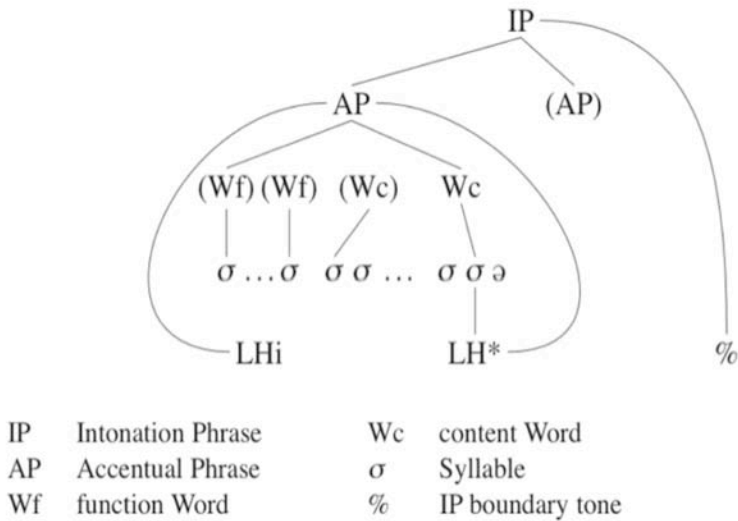


Figure 9: Hierarchical structure of French intonation following Jun & Fougeron (2002)

The full tonal configuration of an AP has a LHiLH\* (low, high-initial, low, and high star) tonal configuration, in which the L tone is optional. The Hi phrasal tonal is realized on the first or second syllable of the first lexical word in the AP, and the LH\* AP-final pitch accent is associated with the stressed, i.e. the final full (non schwa), syllable of an AP. IP boundaries are marked by either a L% or a H% boundary tone, relatively greater pre-boundary lengthening than word and AP boundaries, and are optionally cued by a drop in amplitude, changes in voice quality, and the presence of a pause (for further detail, see Jun & Fougeron 1995, 2000, 2002; Fougeron & Jun 1998). An utterance exemplifying this prosodic structure and illustrating the appropriate tonal labels is shown in (1).<sup>8</sup> And now let us apply this framework to special cases of Liaison.

- (1) *Le mauvais garçon ment à sa mère.*  
 {L Hi      L H\*}<sub>AP</sub>    {Hi LL% }<sub>AP</sub> }<sup>IP</sup>

“The bad      boy      lies   to his   mother.”

<sup>8</sup> From Jun and Fougeron (2002:154); the labeling of the second AP was done by us.

#### 4.2 *Special cases of Liaison in light of the model*

Our position concerning the type of prosodic boundary in illustrations shown in this paper is as follows. In the utterance in Figure 7, the relatively long silent pause, and the lowering and subsequent resetting of the pitch in the vicinity of the pause appear to support the hypothesis that the words *faut* and *interdire* are separated by an IP boundary. The utterance in Figure 10 also shows an occurrence of such a boundary between *des* “DET pl.” and *allocations* “benefits” in a recording of former Prime Minister Lionel Jospin.

Here, however, the Liaison consonant [z] is syllabified across the silent pause to the onset of the next syllable. Unlike the example with Chirac, and in support of the hypothesis that the silent pause does not necessarily block the linking process, *enchaînement* does occur here. For that reason it is not a case of *Liaison sans enchaînement*. The pause, again, can be a correlate of an IP boundary, and the falling pitch contour that accompanies *des* with the resetting of pitch on *allocations* also strengthens the hypothesis that *des* is IP-final. But before we conclude that these, and only these, acoustic correlates characterize prosodic boundaries in special cases of Liaison, let us see cases that might contradict this analysis.

The case illustrated in Figure 11 resembles the previous one, with the important difference that there is no silent pause cueing the presence of an IP boundary. In Lionel Jospin’s utterance *le travail du gouvernement est un effort que je veux puissant* “the work of the government is an effort that I want powerful” there is no silent pause between *un* and *effort*, but [ɛ̃] appears to be considerably lengthened. Furthermore, as in the previous examples, a noticeable fall in pitch is associated with [tɛ̃] and followed by a clear pitch reset on *effort*. Pre-boundary lengthening, pitch lowering and reset taken together can also indicate a major boundary.

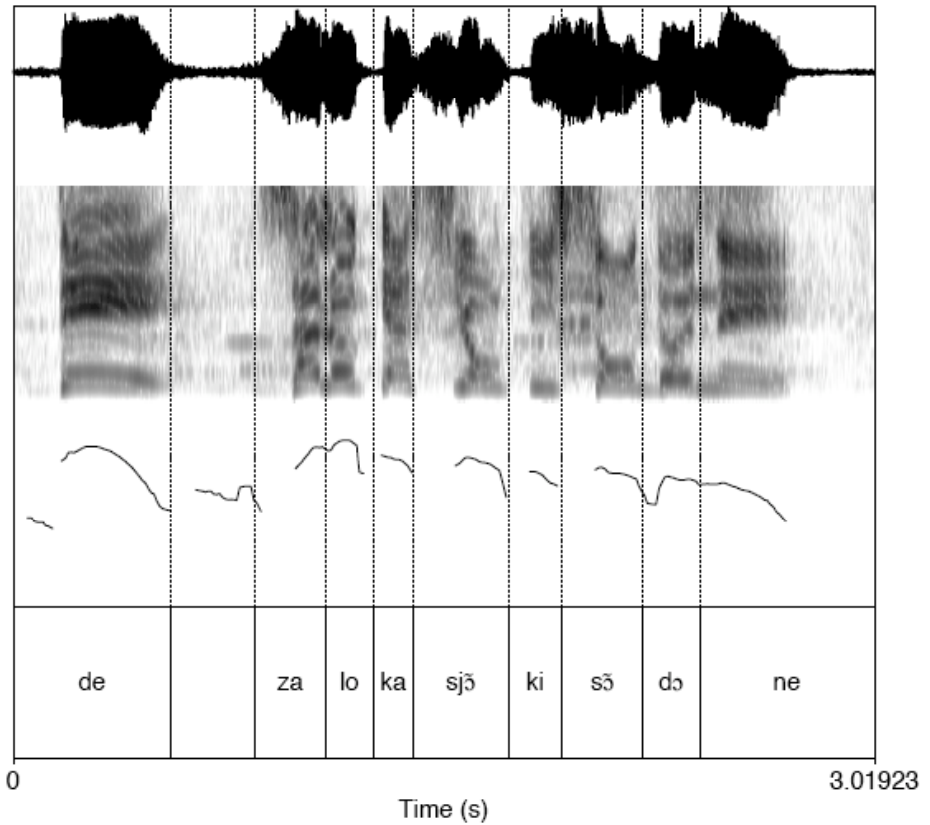


Figure 10: *Waveform, spectrogram, and pitch contour for Jospin’s utterance of des allocations qui sont données “benefits that are provided” (NB: The faulty detection of pitch during the silent pause is due to background noise)*

But do these cues, even in the absence of a silent pause, indicate an IP boundary? This brings us to the final question: exactly what type of boundary(ies) is/are cued by the acoustic correlates identified so far?



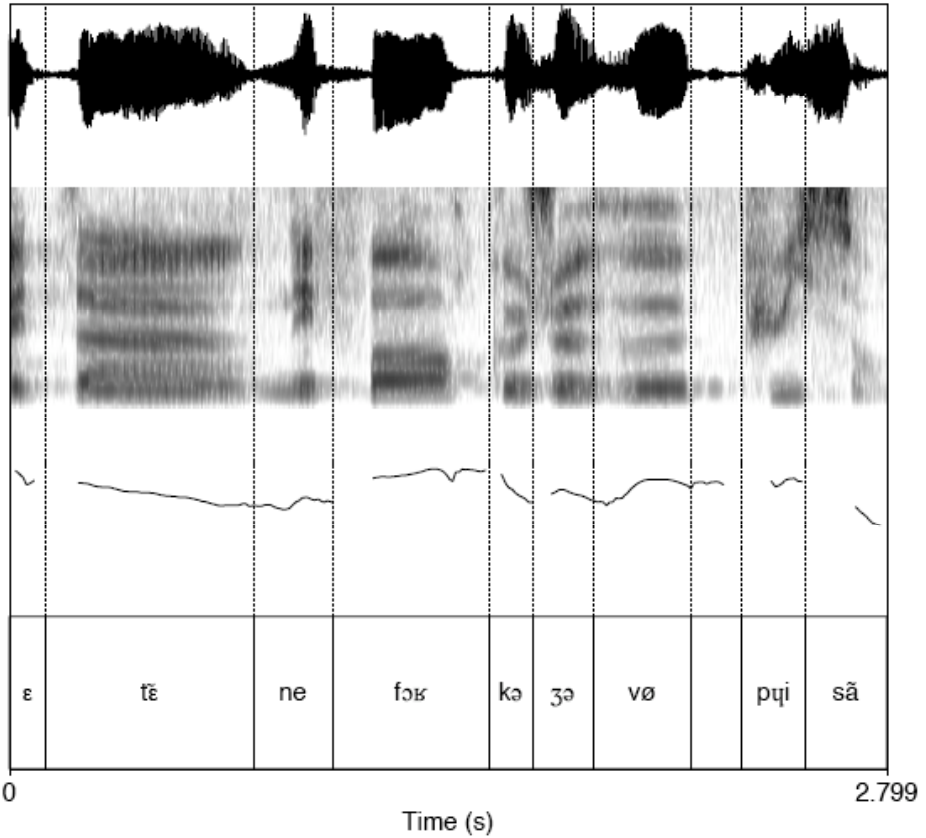


Figure 11: *Waveform, spectrogram, and pitch contour for Jospin's utterance of est un effort que je veux puissant "is an effort that I want powerful"*

## 5. Discussion

It seems obvious to us that we are dealing here with some kind of prosodic boundary. In some cases we have a silent pause, pitch lowering and reset but no pre-boundary lengthening, while in others we have pre-boundary lengthening, pitch lowering and reset but no silent pause between the two words that should be linked. Furthermore there is always a tight syntactic connection between the words separated by these boundary cues, as all examples shown so far involve elements of a VP (*il faut interdire* "one must forbid") or an NP (*des allocations* DET + "benefits"). These are words that typically form a single AP, and between which one would not predict any important prosodic breaks... at least not based on syntactic information alone.

However, the model we used is based on intonationally-defined prosodic constituents that take in syntactic information, but are not determined by it. Thus speaker intent, stylistic effects, lack of fluency, and even slip of the tongue-type accidents in the realizations of Liaison can be expected to alter the prosodic organization observed in citation forms or carefully controlled laboratory-style experiments.

Within the intonational model that we followed, we can see three possible solutions to the problem of identifying a prosodic domain for Liaison in light of the special cases presented in this paper. The first one would be to attribute the acoustic cues that we regarded as boundary features to a special type of emphasis affecting the Hi tone-bearing syllable within an AP. Therefore, instead of supposing a major prosodic boundary, for instance between *il faut* and *interdire* (Figure 7), we could suggest that the acoustic cues we identified are in fact a way of putting strong emphasis on [ɛ̃] (the first syllable of the infinitive *interdire*) without focusing on the word, and consequently restructuring the entire utterance (see Fougeron & Jun 2000 for the tonal structure of focus utterances). In this particular case, this could loosen the AP's tightly-knit syntactic bonds such as those of the VP. It could also explain the Hi tone or pitch reset on the following word-initial syllable, and could justify the optional glottal stop at the onset of the vowel of this syllable. As far as the silent pause insertion is concerned, there is independent evidence of emphatic accent production in French (Dahan & Bernard 1996), which could be checked against patterns of acoustic realization identified in special cases of Liaison.

The other possibility could be to consider the prosodic boundary identified in our examples prototypical of an intermediate phrase tone (ip), whose existence has been alluded to in one of the earlier models of Jun & Fougeron (2000). As the authors say, however, "further evidence is needed to prove that there exists a categorically distinct intermediate prosodic unit in terms of perception data [...] the interaction with other tonal or segmental rules [...] and /or durational cues..." (237). Thus, acoustic features of this boundary still await further research.

The third and most radical view would be to side with Post (2000) and conclude that for Liaison, "it seems impossible to formulate an adequate prosodic definition of its domain of application" (156). Liaison is "a lexical insertion process that takes precompiled forms from the lexicon" (127), possibly syntactic frames or maybe 'constructions', but it is not a post-lexical process (see also Bybee 2001). This could explain why some words can surface with Liaison, while others cannot, and why Liaison is not stopped even by the strongest prosodic boundaries (e.g. an IP or an utterance). In other words, it could be the case that it is "the very notion of a prosodic constituent

as the domain for Liaison that needs to be revised” (Brown & Jun 2002).

One may finally wonder why in some environments a Liaison consonant can go through a major prosodic boundary, but is prevented to do so in others. At this point of our analysis, we can only offer interpretations drawn from sociolinguistic studies indicating that variable realizations of Liaison now function as socio-indexical features. All speakers have access to a wide range of choices in realizations of Liaison, but each makes his/her selection according to criteria that correspond to various social, pragmatic and/or individual speaker-dependent parameters.

## 6. Conclusion

To this date, and to the best of our knowledge, no systematic acoustic analyses have been carried out on special cases of Liaison. The examples reported here are also only illustrations of this complex phenomenon. They are drawn from television broadcasts, as we have not conducted research on spontaneous speech, which requires further study. Although these instances seem relatively rare and belong to a particular speech style, they are nonetheless part of native speakers’ inventory of realizations, and must be accounted for by phonological models.

In this study, we have demonstrated that moraic theory manages to explain simple cases of Liaison as well as complex ones, such as *Liaison sans enchaînement*, by positing that latent Liaison consonants are not dominated by a mora, and are therefore extrametrical. These realizations show the presence of a schwa-like vowel which provides the extra mora of the syllable formed by the unlinked Liaison consonant. Independent evidence from sociophonetic studies on such vowels supports this hypothesis. Through the prosodic analyses of what we have called special cases of Liaison, we also have raised the issue of the prosodic domain of Liaison, and have shown phonetic evidence that Liaison consonants may be stopped by or may go through major prosodic boundaries within the same speech style. This suggests that the prosodic domain of Liaison, all styles and realizations taken together, cannot be restricted to the AP or the PhP. But further research is needed to collect more empirical evidence in support of this hypothesis.

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# LICIT AND ILLICIT NULL OBJECTS IN L1 FRENCH<sup>\*</sup>

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## 1. *Introduction*

The general phenomenon of omission in child language raises important questions regarding the initial syntactic representation of lexical and functional categories, stages in child language development and the relationship between child grammar and target grammar. In this article we offer a contribution to this line of research by looking closely at so-called illicit direct object omission in early child French. We develop a seemingly minor methodological point that bears on the issues outlined above, namely that the determination of what counts as illicit omissions in child speech is a function of the particular grammar we assume for the adult; it is therefore essential that the grammar that underlies adult production be as detailed and accurate as possible, taking into consideration the range of variation observed in adult production. This will ultimately help in deciding whether various instances of object omission in child speech are licit or illicit.

The paper is organized as follows. Section 2 is essentially a description of the types of null objects found in contemporary French and includes a discussion of the implications of this typology for L1 French. In Section 3, we look at null objects from an L1 acquisition perspective, including previous work on the topic. Section 4 is a discussion of some of the conclusions to be drawn from our observations. More specifically, this study leads to the following general conclusions:

- 1) Variation among adult native speakers regarding the illicit and licit use of null objects should make us very cautious in setting firm boundaries between licit and illicit null objects in child language;

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- 2) The two methods generally used to determine whether null objects are licit or illicit, i.e. adult judgments and lexical transitivity, are not reliable.
- 3) A detailed typology of the null objects found in adult French must serve as the basis for comparing child and adult uses of null objects. The data involved is such that an experimental setting may be the only way to control for the variables involved.

## 2. *A grammar of null objects in adult speech*

We concentrate on null direct objects in contemporary French. We adopt Cummins & Roberge's (2004) modular approach to null objects, which takes into account the contributions from various components of the grammar in order to determine the types of null objects that are available in French. Their study is based on attested data from various informal corpora.<sup>1</sup>

### 2.1 *Theoretical assumptions and typology*

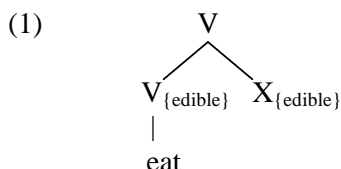
We review the main components involved in the licensing and interpretation of null objects. Transitivity, i.e. a verb's ability to appear with a direct object, is attributed to both syntax and lexical semantics. Most previous studies assume that it is specific properties of a given verb that determine whether an object can be merged with this verb or not. In traditional generative terms, a verb both subcategorizes for and selects an object, where subcategorization relates to the object position and selection provides a semantic relation between the verb and the object such that certain restrictions are imposed on the type of object acceptable in the context of that relation. Note that for the subject of a clause, subcategorization and selection are dissociated. The EPP (or equivalent) provides an external subject position but the verb provides the interpretation of the role (if any) of the subject in the clause. For direct objects, we adopt a similar view within a Minimalist framework (Chomsky 1995): the direct object position is merged independently of the lexical properties of the verb. The lexical semantics of the verb serve to provide an interpretation for the element merged in direct object position. Under this approach, the traditional verb classes based on transitivity (transitive, unergative, unaccusative, etc.) are no longer to be attributed to whether the verb requires an object or not but rather to the type of

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<sup>1</sup> In particular: Authier (1989), Fonágy (1985), Lambrecht & Lemoine (1996), Larjavaara (2000), Noailly (1997), Roberge (1991). Rizzi (1986) and Raposo (1986) discuss some of the basic issues raised by null object constructions in other Romance languages.

interpretation provided by the verb to the object.<sup>2</sup> This approach is based on the common observation that transitive verbs in French can appear quite freely without an overt direct object and that unergative verbs are often used transitively; see Blinkenberg (1960) and Larjavaara (2000).

Lexical semantics thus plays a crucial role in restricting the possible interpretations of the direct object. When the direct object has phonetic content, the verb's semantics impose a certain interpretation. For instance, with the verb *eat* the object will be considered 'edible', a property that varies with the nature of the agent involved. Thus a DP object such as *the house* can appear with certain agent types (termites, for example) or if the house was made of some edible material. This can be represented as follows:



This general approach corresponds to that proposed by Hale & Keyser (2002:88-94) but in the more limited context of denominal verbs; see (2).



The restrictive identification relation assumed here seems to differ from theta-identification or valency. We thus assume that verbs are also specified as to the roles played by the participants involved in their denotation. For our purposes, it is sufficient to maintain some version of theta theory.

Cummins & Roberge's analysis relies crucially on the accepted distinction between sense and reference. Direct object positions within VPs are licensed by syntax and receive an interpretation based in part on verbal semantics. But, when a particular object is referential, the reference must be determined independently. To account for the referential properties of certain null objects,

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<sup>2</sup> See also Borer (2004), who argues that the projection of arguments is independent of the properties of substantive vocabulary items and Hale & Keyser (2002), who treat denominal unergative verbs as belonging to a transitive VP.



they note that some coreference relations are syntactically governed. This is the case of the coreference between a clitic pronoun and the corresponding argument position as in:

- (3) Tu  $I_i$ 'as lu  $\emptyset_i$  hier.  
 "You read it yesterday."

Yet other instances of coreference are established pragmatically, including the one holding between the underlined DP and the clitic in (4).

- (4) Bien sûr que tu connais ce livre<sub>i</sub>. Tu  $I_i$ 'as lu  $\emptyset_i$  hier!  
 "Of course you know this book. You read it yesterday."

Because it is pragmatically determined, this coreference corresponds to a preferred interpretation on the part of the hearer and as such is defeasible if a modified context allows a shift in the possible interpretation, as shown in (5):

- (5) On parlait d'un bon livre dans le journal<sub>i</sub> hier. Bien sûr que tu connais ce livre. Tu  $I_i$ 'as lu  $\emptyset_i$  hier!  
 "They talked about a good book in the paper yesterday. Of course you know this book. You read it yesterday."

Thus, it is not the syntactic context in (4) that is responsible for the fact that the clitic and the DP *ce livre* are coreferential. Levinson's (2000) I-principle – developed independently of the issues that concern us here – can be used to account for this type of coreference relation. In its simplest formulation, the I-Principle states that a speaker will produce the minimal linguistic information sufficient to achieve his or her communicational ends. Therefore, seen from the point of view of the hearer, the I-Principle leads to an amplification of the informational content of the speaker's utterance, which can imply finding the most specific interpretation and assuming stereotypical relations and coreference if possible. This accounts for the preferred interpretation of (4).

This view is directly applicable to null objects in the following manner. Because of the I-Principle, a referential null object will seek coreference in the linguistic context or reference in the extralinguistic environment while a non-referential null object will be interpreted as more or less stereotypical given the context in which it is found. Cummins & Roberge (2004) thus assume the existence of 4 different types of null objects in French based on the interactions between various modules. They are represented in Table 1; note that the non-

referential null object is further divided into two types depending on the its more or less stereotypical interpretation.

Reference	referential			non-referential	
Antecedent	reference to antecedent		no reference to antecedent		
Contextual recovery	recovered by clitic	clitic-drop	deictic	contextual clues present	contextual clues absent
Syntax	<i>pro</i>		N		
Semantics	Φ features of clitic	via antecedent	via deixis	lexical semantics of V	
Pragmatics	N/A	I-principle on linguistic context	I-principle on extralinguistic context	I-principle (less stereotype, more context)	I-principle (more stereotype, less context)

Table 1: A Typology of Null Objects (Cummins & Roberge 2004)

Each type is exemplified with the verb *lire* ‘to read’. First, a null object can be identified by a clitic as in (6). A stylistically marked but widely attested clitic-drop construction also exists in contemporary French and is illustrated in (7). In this case the null object is referential and seems to correspond exactly to the one found in the corresponding construction with overt clitic.

- (6) A : Tu veux ce livre ?  
 B : Oh ! Mais je l’ai déjà lu Ø.  
 A: “Do you want this book?”  
 B: “Oh! I’ve already read it.”

- (7) A : Tu veux ce livre ?  
 B : Oh ! Mais j’ai déjà lu Ø.  
 A: “Do you want this book?”  
 B: “Oh! I’ve already read Ø.”

Another referential null object is shown in (8); here there is no linguistic entity that can act as the antecedent of the null object. Thus, reference is to a specific entity in the extralinguistic context and is determined deictically.

- (8) (A hands a paper to B and says):  
*Tiens, lis Ø.*  
 “Here, read Ø.”

Finally, (9a,b) are examples of non-referential null objects. There is no specific entity acting as antecedent in the linguistic or extralinguistic contexts. This object realizes the basic restrictive identification relation discussed above. As such, it looks very much like a null cognate object.

- (9) a. Pendant mon congé sabbatique j'ai surtout l'intention de lire Ø.  
 "During my sabbatical I mainly intend to read Ø."  
 b. Je vais acheter un magazine au kiosque, et je lirai Ø en t'attendant.  
 "I'll buy a magazine at the stand, and I'll read Ø while I'm waiting for you."

Note that the I-Principle can account for the more (9a) or less (9b) stereotypical interpretations of the non-referential null object.

To summarize, we adopt a view of null objects in adult French which makes a clear distinction between licensing and interpretation. The direct object position is merged automatically in syntax to all Vs as a property of Universal Grammar. The object can be null or lexical. Lexical semantics restrict the potential interpretation of the null direct object. Finally, both syntax and pragmatics handle the referential properties (if any) of the null object.

## 2.2 *Implications for acquisition*

If we assume that verbal transitivity is given by UG then it must also be assumed that what a child needs to learn is not that a given verb can appear with an object or not but rather the particular semantic relation that holds between that verb and the object position. In other words, what kind of object is compatible with that verb? The question of determining whether an object can be lexical or empty should be secondary to that of determining the type of restriction imposed on it by the lexical semantics of the verb.

With respect to null objects more specifically, this approach predicts: 1) that they should be widespread in the first stages of acquisition. Since an object position is universally available, the absence of an overt object with a given verb does not indicate that this verb is used intransitively but rather that a null object of a certain type has been merged with it; 2) that the learning process will be centered on the identification mechanisms needed for null objects; 3) that most of the null objects found in the adult grammar should be present in early stages, except those whose identification involves additional grammatical elements that must develop independently, such as clitics; 4) that the child's grammar should differ from the adult's grammar not in the types of null objects available but in how (i.e. how often and where) they are used. This last point is the one that leaves room for some discontinuity between adult and

child grammars in the treatment of null objects. Furthermore, development from target-deviant to target-like should be gradual rather than abrupt. While this may seem like a general phenomenon in acquisition, the accounts given so far for object omission seem to predict abrupt changes since, under a lexical approach, once a verb's transitivity is learnt then it should no longer be used without an object.

### **3. *The L1 acquisition perspective***

The goal of this section is to discuss the methods used to classify the null objects in child language as illicit. We begin with a short overview of the literature on null objects in L1. Section 3.2 discusses the concepts that serve as the basis for this classification: lexical transitivity and the notion of obligatory context. We argue that the types of null objects that appear in child language are also found in adult language. Therefore, a question that must be asked is what exactly is illicit in the appearance of null objects in child language when compared with adult language. We discuss the use of adult judgments in distinguishing between licit and illicit null objects in Section 3.3.

#### *3.1 Previous work on null objects*

Studies on omissions in child language focus more on subject omission than object omission. Different explanations are provided for the omission phenomena, particularly for the omission of subjects, ranging from performance accounts (Bloom, 1990, Valian, 1991) to competence accounts (Hyams, 1986, Rizzi 1994, Wexler 1994). It has been observed that, for French at least, object omission is more restricted than subject omission. As with subject omission, researchers have tried to establish whether object omission is a performance or a competence phenomenon. Recent studies argue for a competence explanation (Fujino & Sano, 2002, Müller & Hulk 2001) at various levels of the grammar. Studies of spontaneous speech of monolingual French children, either longitudinal or cross-sectional, report a rate of illicit null objects between 11% and 20% (cf. Hulk, 1997, Jakubowicz et al. 1997, van der Velde 1998 ). The rate of illicit omissions seems much higher in the spontaneous speech of a bilingual French-German child (longitudinal study), going from 100% in the early stages to 25% later on (cf. Müller & Hulk 2001, Müller 2004).

Experimental studies have also been conducted, for French and other Romance languages, to test the acquisition of direct object clitics. More significant object omission rates were found in experimental setting in French and other romance languages: specifically clitic omissions as high as 60% in a group of French children with MLU between 2.94 and 3.5 (cf. Jakubowicz et

al. 1996, 1997); for other Romance languages, cf. Schaeffer (1997) for Italian, Wexler et al. (2003) for Spanish and Catalan.

### 3.2 *Illicit object omission in obligatory context*

In this section we argue that the notion of “obligatory context” as a function of lexical transitivity of the verb, when applied to the study of object omission, might lead to conclusions that do not reflect the child’s true competence. We do this on the basis of the adult model proposed in Section 2.1. Studies of early child grammar document omissions of grammatical elements that result in non-adult-like syntactic constructions. For French, the most salient ones involve missing pronominal subjects (10a), determiners (10b) and objects (10c).

- (10) a. *\_\_ veux pas lolo.* (Pierce 1992, cf. Hoekstra & Hyams 1996)  
 “Don’t want milk.”
- b. Mother: *Qu’est-ce que tu vas manger?* (Hulk, 2004)  
 “What will you eat?”  
 Child: *\_\_ pain*  
 “bread”
- c. *Il met \_\_ dans le bain.* (Müller, 2004)  
 “He puts in the bathtub.”

Spoken French does not allow omission of nominative clitics, therefore a construction such as (10a) is ill-formed in the adult grammar. The same is true for (10b): a nominal cannot generally appear without a determiner in French. Several studies have also identified illicit object omissions as cases that presumably always show a lexical object in the adult speech. Illicit null object constructions have been identified mostly on the basis of the verb’s lexical transitivity: obligatory/optional transitives (Müller et al. 1996, Müller & Hulk 2001), objects of transitive verbs (van der Velde et al. 2002, Jakubowicz et al. 1997), objects of obligatory transitive verbs with native judgments (Fujino & Sano, 2002 for Spanish). Müller et al. (1996, 2001), while also starting from the lexical transitivity of the verb, takes the linguistic context into consideration for transitive verbs that may also be used intransitively.

Attested illicit null object constructions seem to be of three kinds. First, those that violate the lexical transitivity of the verb, as in (10c). In this case, in the absence of the description of the linguistic and extralinguistic context, we infer the assumption that the verb *mettre* should obligatorily appear with a lexically realized object. We can, however, easily find similar uses of the verb *mettre* ‘to put’ in adult speech, as in (11):

- (11) (speaking about a password)  
*Moi je mets \_ dans les derniers chiffres de telephone, et j'ajoute 2.*  
 (www.trucsmaison.com/forum/message.php?id=7963&categorie=1)

Furthermore, we have already pointed out that Larjavaara (2000) provides extensive empirical support for the claim that, in French, almost any verb can appear with a null object; (11) is not an isolated or exceptional example.

The second type of illicit construction involves a missing reflexive clitic:

- (12) *Habille* (Müller, 2004:283)  
*dresses*  
 “He puts his clothes on.”

In this case the verb requires an obligatory reflexive object (and a subject). Note that, although (12) can be considered illicit in adult speech, the child's utterance need not necessarily be attributed to an intransitive use of the verb *habiller* ‘dress’. In fact, it has been noted that a single verb can be used by the child with or without objects (Müller et al., 1996); this implies that a more general mechanism is at work. Another hypothesis to account for (12) is that it is an example of a missing clitic and that it is the omission of the clitic that makes the example infelicitous in context. We return to this question below.

Finally, the third type of illicit null object construction identified in child speech is the following:

- (13) Adult: *On peut le manger, l'oeuf?* (Müller et al., 1996)  
 “Can we eat it, the egg?”  
 Ivar: *Tu peux manger, oui.*  
 “You can eat, yes.”

We see here an optionally transitive verb used by Ivar without an overt object or clitic, although there is a definite linguistic antecedent. This would presumably force the use of the clitic in the answer, in order to recover the null object. Note, however, that this is not obligatorily so in adult language, since clitic-drop constructions, i.e. null objects that should have been licensed by a clitic, are well attested in adult speech; see (14).

- (14) Larjavaara (2000: 64)  
 A: *Maîtrisez-vous vos interviews? C'est capital, les interviews.*  
 “Do you control your interviews? Interviews are very important.”

B: *Je maîtrise \_\_\_\_* .  
 “I control \_\_\_\_.”

Comparing these types to the ones established in Table 1 for adults, the one that seems to be common to both children and adults is the clitic-drop construction. However, as just stated, previous studies take this construction in child speech to be illicit. If so, then it must be shown that the construction actually differs from the one established for adults. We return to this possibility in Section 4.

Next, it is not obvious how a construction such as (10c) with the verb *mettre* fits in the typology of null object constructions. To be able to identify it, we should include it in one of the types proposed in Table 1.

An examination of a corpus of spontaneous child French (Champaud corpus, from CHILDES database) suggests that all the types of null objects discussed in Section 2 appear at various points in child speech:

- (15) Clitic identified null object: the referent is the topic of the discussion; it is contained in the question/assertion in the immediately preceding discourse:

Adult: *ben tu le connais pas le livre*  
 “Well, you don’t know the book”

Child: *mais si je le reconnais* (Grégoire, 2.5.13)  
 “but yes, I recognize it”

- (16) Clitic-drop: the referent is the topic of the discussion; it is contained in the question/assertion in the immediately preceding discourse:

Adult: *la pièce elle est dedans, oui.*  
 “The coin it is inside, yes.”

Child: *enlever*  
 “Take out.” (Grégoire, 1.11.2)

- (17) Deictic null object: the referent is physically present in the context:

Child: *remonte tout seul* (he is trying to pull up his pants)  
 “Pull up myself” (Grégoire, 2;5.13)

- (18) Non-referential null object: no specific entity as potential referent in the linguistic or extralinguistic context:

Child: *pique pomme de terre un peu* (the potato is the subject)  
 “Stings the potato a little” (Grégoire, 2.1.25)

What remains to be determined is whether the different uses of null objects coexist from the earliest stages or whether there is a developmental sequence involved. An experimental paradigm may be better suited to answering this kind of question, as it allows manipulation the different types of constructions (cf. Pérez-Leroux, Pirvulescu & Roberge, in prep.).

### 3.3 *Adult judgments*

The second point we want to make is that the use of adult judgments to decide between licit and illicit null objects (cf. Fujino and Sano 2002) is not a reliable method. This is expected under a model that incorporates variation and we provide evidence from four adult judgments applied to a French corpus. Therefore, adult judgments should not be used.

We used the Champaud corpus (CHILDES database McWhinney 2000). We extracted all transitive contexts and, within those contexts, all cases of null objects. For clarity, we retained only cases of null objects in clitic-drop contexts, this context being defined as in the previous section. We gave these null object constructions to four French native speakers. They were asked to judge whether the constructions were grammatical or not. In Table 2, we give the percentage of constructions that were judged ungrammatical; the results are those of convergent three out of four judgments, i.e. at least three speaker's judgments were the same:

Recordings	1	2	3	4	5	6	7	8	9	10
Null objects	-	-	100%	40%	-	20%	66%	66%	-	30%

Table 2: *Null objects in clitic-drop contexts judged illicit by native speakers*

The table shows more null objects judged illicit in early speech (recordings 3, 4, 6 and 7 when the MLU is lower than 2.6), a new finding with respect to previous results that were based on utterances starting at an MLU of greater than 2.6. However, these findings are compromised by the low rate of agreement among the adult native speakers:

Agreement rate	50%	75%	100%
% items	41%	41%	16%

Table 3: *Agreement rate of native speakers judgments*



As we see in Table 3, all four speakers (100%) agreed on only 16% of the items presented. The results show that agreement rates drop drastically when several adult judgments are consulted.

#### 4. *Discussion*

Are the examples of null objects from child language licit or illicit? The examples in (6) to (9) from adult speech provide evidence that we should not automatically consider these null objects illicit in child language, and in fact we propose that they are not illicit in the sense assumed in previous studies. In particular, given the account of null objects in adult French proposed in Section 2, based on the hypothesis that verbal transitivity results from the obligatory Merge operation that constructs the VP as a transitive V-Object structure, we predict a strong continuity between child grammar and adult grammar. If the transitive structure is given by UG, it should be available to the child from the earliest grammar. This excludes the possibility of the child using transitive verbs intransitively in an “illicit” way as assumed in (10c); in fact such examples are not useful taken out of their context, since they cannot be identified with respect to the typology of Table 1. In other words, since there are no such elements as obligatory transitive verbs, one should not try to identify conventionally transitive verbs without an overt object, out of context, as illicit cases in child language.

The vast majority of null objects should therefore be licit from the point of view of adult grammar. We adopt the null hypothesis that in fact they are licit, i.e. the child is dropping the object according to the same UG-based licensing mechanism: dropping the object is free in this sense. What the child learns is that the object needs to be recovered according to language-specific mechanisms, as stated in Section 2.

One of these mechanisms for French is the need for the null object with linguistic antecedent to be identified by a clitic, as in (6). French children seem to go through a stage where they do not use object clitics. We pointed out that similar cases (what has been called “clitic-drop”) exist in adult language; however, this usage is optional and stylistically marked. The difference between children and adults resides therefore in the general character of clitic omission in child language, for a certain period of time. There is thus some level of discontinuity involved. The question is: why is the child omitting object clitics? One proposal points towards a computationally different mechanism from that of adults. It has been proposed that at the stage when the child omits clitics obligatorily, a Chinese-like recoverability mechanism is in place, where the null object is recovered from the discourse through an empty IP-adjoined topic (cf. Müller et al. 1996, Müller & Hulk 2001, Müller 2004):

- (19) [<sub>IP</sub> PRO<sub>i</sub> [<sub>IP</sub> Ivar répare t<sub>i</sub> ]  
 “Ivar fixes.”

According to this proposal, the change from a Chinese-type grammar to a French-type grammar is triggered by the lexical instantiation of the CP domain, which makes PRO illicit in the adjoined IP position.

A different proposal points to a PF problem in the Spell-out of the clitic features, which are morphosyntactically present in the computational module (cf. Fujino & Sano 2002). In this approach, framed in the Principles and Parameter Theory, if there is a parameter to be set for the use of null objects, then the children begin with the correct setting.

The adult grammar we proposed and the expected continuity between child and adult grammar point towards the possibility of reconciling both positions, by taking into account both ideas: the early pragmatic strategy of discourse licensing and the correct setting, from the outset, of the null object parameter. The null object in clitic-drop constructions could be *pro* as in the case of adults, which is recovered either through the morphosyntactic features of the clitic or directly from the antecedent NP. The difference between the restricted use of clitic-drop null objects in adults and its general use in early French grammar would stem from a PF problem (as in Fujino & Sano, 2002). Alternatively, the null object in the clitic-drop construction might be in fact a deictic bare N. The child recovers this null object through the extralinguistic context and not through the discourse. This would be in line with findings from the analysis of adult-child conversations: “adults anchor their conversational contributions to objects or events physically present [...] they rely heavily on here and now in many exchanges with children.” (Clark, 2003). To decide between the alternatives, it is crucial to study all null object uses in child language in an experimental setting that allows some control over all the variables involved.

## 5. Conclusion

In this article we have proposed that a detailed adult grammar, including all observed variation, is the starting point for the study of the phenomenon of object omission in child language. On the basis of this adult grammar, we questioned the use of the notion of “obligatory context” as applied to object omission in spontaneous child speech. While this notion is helpful for omissions of clear grammatical elements (verbal inflections, determiners, subject clitics) required independently of variables such as the context of utterance, the range of object omission constructions found in adult speech, including the omission of clitics, cast doubts on its usefulness. Moreover, adult

judgments are also quite variable and, we hoped to have shown, not empirically reliable. Questions remain about the nature of object omission and the explanation for the phenomena but we have proposed that the differences observed between French child and adult utterances may not involve different grammars of null objects but may be attributable to other independent factors, such as the development of object clitics.

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# SLUICING WITH COPULA\*

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## 1. Introduction

Sentences like (1) illustrate the construction known as *Sluicing* (Ross 1969):

- (1) He bought something, but I don't know what.

According to Ross, the wh-phrase *what* in (1) (the “remnant”) heads an interrogative clause (the “sluiced” clause) where the underlined overt string in (2) has been elided (“TP-deletion”, in current terms):

- (2) He bought something, but I don't know what he bought.

In (1), the only element left in the sluiced clause after TP-deletion is a wh-phrase. However, some languages (Chinese, Japanese, Korean, Spanish, among others) may also exhibit embedded clauses identical to the one in (1), differing only in the fact that an (optional) copula adjacent to the wh-phrase shows up: I will call this construction “Sluicing with Copula” (SwCop). (3) is an illustration of SwCop in Spanish, and (4) is an example from Japanese (the copula, *fue/da*, is in bold type):

- (3) Jugó con alguien, pero no sé con quién **fue**  
played-3.s. with somebody, but not know-1.s. with whom was  
“(S)he played with somebody, but I don't know with whom.”

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- (4) Dareka-ga            sono hon-o            yon-da            rashii    ga,  
 someone-NOM    that book-ACC    read-PAST    I-heard    but  
                           watashi-wa    dare            **da**    ka    wakaranai.  
                           I-TOP            who            COP Q    don't know  
 "I heard that someone read a book, but I don't know who."  
 (Kizu 2000:143)

Kizu (2000) proposes that, in Japanese, both the examples of SwCop like (4), and the examples of Sluicing without copula (Sw/oCop) like (5) derive from a cleft with *wh*-in-situ; (6) is the structure of this cleft, according to Kizu (the "focal pivot" is in bold type):

- (5) Dareka-ga            sono            hon-o            yon-da            rashii    ga,  
 someone-NOM    that            book-ACC    read-PAST    I-heard    but  
                           watashi-wa    **dare**            ka    wakaranai.  
                           I-TOP            who            Q    know-not  
 "I heard that someone read a book, but I don't know who."

- (6) [CP<sub>2</sub> [TP [CP<sub>1</sub> Op<sub>i</sub> [C' [TP t<sub>i</sub> sono hon-o yon-da ] C° ] ] ]  
 [T' [VP [V' [NP<sub>1</sub> **dare** ] da ] ] T° ] ] ka ] ]

In (4), only the "presuppositional clause" (the constituent CP<sub>1</sub>) has been deleted. In (5), two deletion processes intervene: on the one hand, the presuppositional clause has been deleted, as in (4); on the other hand, copula deletion, an operation independently attested in Japanese, has taken place. Notice that, although only the *wh*-phrase *dare* (the "focal pivot" of the cleft) remains in the embedded question of (5), no TP-deletion operates here. For this reason, the configuration in (5) has been called "Pseudosluicing" (Merchant 2001). Obviously, the existence of Japanese SwCop is a strong piece of evidence supporting this sort of derivation for Sw/oCop in this language.

I will show that, as in Japanese, a basic cleft-like configuration underlies Spanish SwCop. The embedded question in (3), for example, derives from a previous step like (7a), whose word order matches that of clefts like (7b):

- (7) a. ...fue    con    quién    que    jugó.  
       was    with    whom    that    played-3.s.  
       "...who it was that (s)he played with."  
       b. Fue    con    él    que    jugó.  
       was    with    him    that    played-3.s.  
       "It was with him that (s)he played."

However, in spite of the apparent similarity between Japanese and Spanish in this respect, I will argue that, in contrast to Japanese, the existence of Spanish SwCop does not support the existence of Pseudosluicing in this language. Rather, I will show that the opposite is true: Spanish SwCop itself is an instance of true Sluicing (that is, TP-deletion). Two facts conspire for this to be possible: on the one hand, the well-known fact that Spanish wh-phrases, unlike Japanese ones, do move to COMP; on the other hand, the SwCop copula targets the head of a functional projection located in the Left Periphery (LP) (Rizzi 1997).<sup>1</sup> Both movements explain that TP-deletion can proceed without affecting the wh-phrase and the copula. More specifically, I will show that *a*) (8a) is the basic structure of (3) and (7b); *b*) (8b) is an intermediate derivational step of (3) (see (7a)) and the final step of (7b); and *c*) (8c) is the final step of (3) (the elided string corresponds to the TP in bold type):

- (8) a. [<sub>LP</sub> [<sub>TP</sub> fue [<sub>CP</sub> que jugó [<sub>PP</sub> con quién/con él]]]]  
 b. [<sub>LP</sub> fue<sub>i</sub> [<sub>PP</sub> con quién/con él]<sub>j</sub> [<sub>TP</sub> t<sub>i</sub> [<sub>CP</sub> t<sub>j</sub> que [<sub>TP</sub> jugó t<sub>j</sub> ]]]]]  
 c. [<sub>LP</sub> [con quién]<sub>j</sub> fue<sub>i</sub> t<sub>j</sub> [<sub>TP</sub> t<sub>i</sub> [<sub>CP</sub> t<sub>j</sub> que [<sub>TP</sub> jugó t<sub>j</sub> ]]]]]

I will argue that the landing site of the copula in (8) is an Event Topic head (EvTop°), a functional head related to the one put forth by Basilico (2003) for English small clauses. The resulting LP will explain two sharp contrasts between Japanese SwCop and Spanish SwCop, one concerning Sloppy Identity (section 3), the other concerning Island violations (section 4).

## 2. Spanish SwCop derives from a cleft

Some evidence exists that Spanish SwCop, unlike Sw/oCop, derives from a cleft.

The first piece of evidence is based on the fact that, while Spanish Sw/oCop can exhibit multiple wh-remnants, this is not possible for SwCop. See, for instance, the contrast in (9) (wh-phrases are in bold type); this contrast can be explained if SwCop derives from a cleft, since clefts cannot have multiple focal pivots, as shown in (10):

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<sup>1</sup> From now on, I will use the abbreviation LP, rather than COMP or CP, except when structures proposed by other authors are faithfully reproduced in the text.



- (9) Todos bailaron con alguien pero no sé  
 everybody danced-3.pl. with somebody, but not know-1.s.  
**quién con quién** (\*fue).  
 who with whom was  
 “Everybody danced with somebody, but I don’t know who danced  
 with whom.”
- (10) \*Fue **Paco con Luis** que bailó.  
 was Paco with Luis that danced-3.s.  
 “Paco danced with Luis.”

My two remaining pieces of evidence are based on two tests Merchant (2001:120) puts into practice in order to differentiate English Sluicing from clefts. We will see that Spanish clefts and SwCop behave in the same way when these tests are applied; by contrast, Spanish Sw/oCop behaves like English Sluicing.

The first test concerns “exhaustivity”. Focal pivots of English clefts entail exhaustivity, which makes them incompatible with a modifier of wh-phrases like *else*:

- (11) Harry came. I don’t know who **else** (\* it was that) came.

This also holds for Spanish clefts, as illustrated in (12):

- (12) Jugó con Luis. No sé con quién **más**  
 played-3.s. with Luis. not know-1.s. with whom else  
 (\*fue que) jugó.  
 was that played-3.s.  
 “(S)he played with Luis. I don’t know who else (s)he played with.”

Wh-phrases in Spanish Sw/oCop accept *más* “else” (see (13a)), but they do not in SwCop (see (13b)); therefore, we can conclude that Spanish SwCop (unlike Spanish Sw/oCop) necessarily derives from a cleft:

- (13) a. Jugó con Luis, pero no sé con quién **más**.  
 played-3.s. with Luis, but not know-1.s. with whom else  
 “(S)he played with Luis, but I don’t know who else (s)he played  
 with.”

- b. \*Jugó con Luis, pero no sé con quién más fue.  
 played-3.s. with Luis, but not know-1.s. with who else was  
 “(S)he played with Luis, but I don’t know who else (s)he played  
 with.”

The second test concerns “Aggressively non-D-linked wh-phrases” (Pesetsky 1987). Whereas Spanish Sw/oCop rejects the presence of this kind of phrases, as shown in (14a), both Spanish clefts and SwCop accept them, as illustrated in (14 b,c) (the “Aggressively non-D-linked wh-phrases” figure in the examples in bold type):

- (14) a. \*Jugó con alguien, pero no sé **con quién**  
 played-3.s. with somebody, but not know-1.s. with whom  
**diablos.**  
 devils  
 “(S)he played with somebody, but I don’t know who the hell it  
 was.”
- b. Jugó con alguien, pero no sé **con**  
 played-3.s. with somebody, but not know-1.s. with  
**quién diablos** fue.  
 whom devils was  
 “(S)he played with somebody, but I don’t know who the hell it  
 was.”
- c. ¿**Con quién diablos** fue que jugó?  
 with whom devils was that played-3.s.  
 “Who the hell did (s)he play with?”

Therefore, it is reasonable to conclude again that Spanish SwCop, unlike Sw/oCop, derives from a cleft.<sup>2</sup>

Two types of clefts can be distinguished in Spanish. The first type is illustrated in (15a), where a relative pronoun *quien* “who” introduces the presuppositional clause (I will call this kind of cleft “Relative Cleft”); the second type is illustrated in (15b), where the presuppositional clause is introduced by the complementizer *que* “that”, not to be mistaken for the homophonous relative pronoun *que* “which” (cf. Brucart 1994):

<sup>2</sup> Hoyt & Teodorescu (2004), working on data from Romanian, offer further arguments against deriving Sw/oCop from a cleft in this language.

- (15) a. Fue con él con **quien** jugó.  
 Was with him with whom played-3.s.
- b. Fue con él **que** jugó.  
 Was with him that played-3.s.  
 “It was with him that (s)he played.”

The cleft type in (15b) was called “Relative Periphrasis with *que-galicado*” (RPQG) by Cuervo (1954).<sup>3</sup> As observed in (8b), the focal pivot of a RPQG is extracted from inside the presuppositional clause and moved successive–cyclically to the LP of the main clause. Therefore, I am assuming an idea first advanced by Brucart (1994:157), according to which the presuppositional clause of a RPQG is not a Relative at all, but just a regular subordinate clause headed by the complementizer *que* and lacking any sort of operators (wh or null). This assumption will have far-reaching consequences later on. Moreover, I claim that it is a RPQG like (15b), and not a Relative Cleft, that underlies (3); that is, (3) derives from (16):

- (16) Jugó con alguien, pero no sé con quién  
 played-3.s. with somebody, but not know-1.s. with whom  
 fue que jugó.  
 was that played-3.s.  
 “(S)he played with somebody, but I don’t know with whom (s)he played.”

I will offer two pieces of evidence in favor of the proposal that Spanish SwCop derives from RPQG.

The first piece of evidence is obtained from the contrast between RPQG’s and Relative Clefts concerning the acceptability of AP’s as focal pivots. As shown by (17), an AP (*verdes* “green”) can function as a focal pivot in a Relative Cleft, but not in an RPQG:

- (17) Es verdes **como/??que** tiene María los ojos  
 is green how that has María the eyes  
 “María has GREEN eyes.” Fernández Leborans 2004)

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<sup>3</sup> Cuervo thought that this construction was an imitation of French clefts; this is the reason he uses the term *galicado* (related to Gallic).

(18) shows that Spanish SwCop, but not Sw/oCop, behaves like RPQG's in this respect:<sup>4</sup>

- (18) El        tiene    las    manos    pequeñas,    pero    no    sé  
 He        has        the    hands    small        but    not    know-1.s.  
           cómo     de    pequeñas    (\*es).  
           how     of    small        is  
 “He has small hands, but I don't know how small.”

The fact that the SwCop of (18) and RPQG in (17) obey the same restriction is predicted if Spanish SwCop (unlike Spanish Sw/oCop) necessarily derives from a RPQG.

The second piece of evidence in favor of my claim that (16) underlies (3) is based on the fact that, in (3), the focal pivot contains a question word *quién* “who”. As pointed out by Gutiérrez (1985), question words cannot appear as focal pivots in Relative Clefts; the examples in (19) are from Gutiérrez (1985) (the question words are in bold type):

- (19) a. \*¿Hasta **cuándo** será hasta cuando duermas?  
           until    when    be-Fut    until    when    sleep-2.s.  
           “Until what time will you sleep?”  
       b. \*¿Para **qué** fue para que la enviaste?  
           for        what    was    for    what    her    sent-2.s.  
           “**What** did you send her for?”

By contrast, the examples in (20), the RPQG alternatives to (19), may exhibit question words as focal pivots:

- (20) a. ¿Hasta **cuándo** sera que duermas?  
       b. ¿Para **qué** fue que la enviaste?

Since SwCop also exhibits a question word, I conclude that it is a RPQG, and not a Relative Cleft, that underlies such constructions.

### 3. *The Left Periphery of SwCop in Spanish*

In spite of the similarity between Spanish and Japanese as far as SwCop is concerned, a contrast between these two languages must be highlighted.

<sup>4</sup> For a focus-related analysis of certain ungrammatical instances of attributive adjectival Sluicing in English, see Merchant (2001:167).

Nishiyama (1995) observes Sloppy Identity is available both in SwCop and Sw/oCop in Japanese. This is illustrated in (21); no matter whether the copula (in bold type) is present or not, this sentence, according to Nishiyama, can mean either that Mary knows why John was scolded, or that Mary knows why Mary was scolded:

- (21) John-wa [zibun-ga naze sikarareta ka] wakaranai ga,...  
 John-Top self-NOM why was.scold Q know-not but...  
 Mary-wa naze (**da**) ka wakatteiru.  
 Mary-Top why Cop Q knows (Nishiyama 1995)  
 “John doesn’t know why he was scolded, but Mary knows why.”

Spanish Sw/oCop accepts Sloppy Identity, as shown in (22), where both reading (23a) and (23b) are available:

- (22) Ana no ha revelado a Freud con quién  
 Ana not has told to Freud with whom  
 soñó, pero Pedro sí le ha dicho con quién  
 dreamed 3.s. but Pedro yes him has told with whom.  
 “Ana didn’t tell Freud with whom she dreamed, but Pedro did.”

- (23) a. Pedro told Freud with whom Ana dreamed.  
 b. Pedro told Freud with whom he (=Pedro) dreamed.

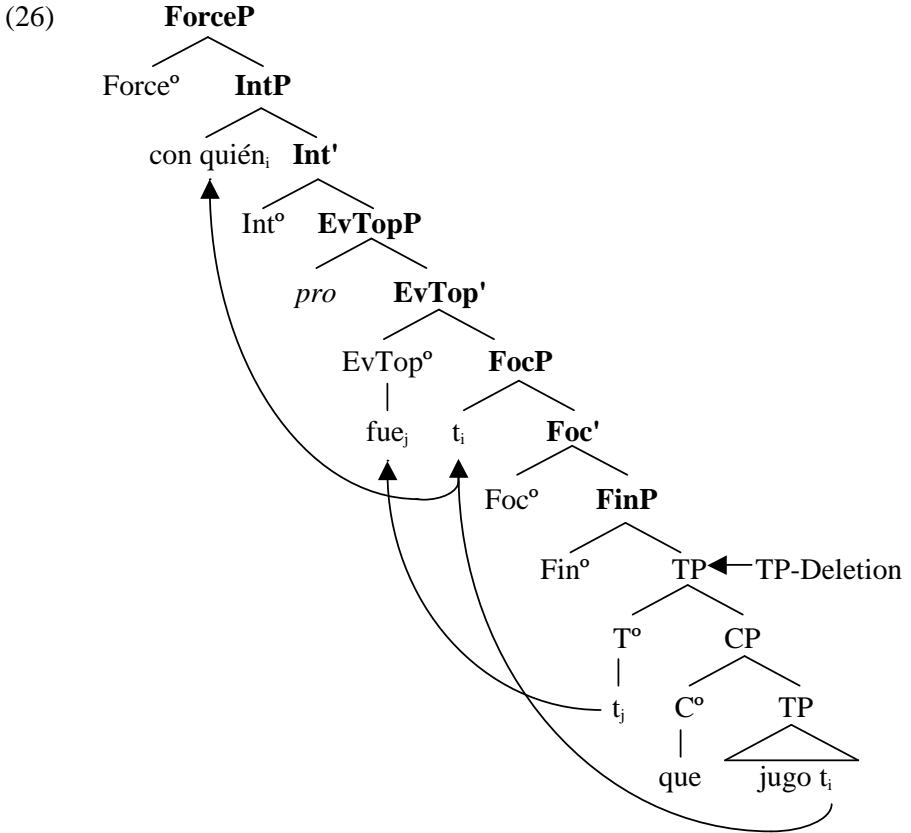
However, Spanish SwCop clearly rejects Sloppy Identity; (24) can be interpreted as (25a), but not as (25b):

- (24) Ana no ha revelado a Freud con quién  
 Ana not has told to Freud with whom  
 soñó, pero Pedro sí le ha dicho con  
 dreamed-3.s. but Pedro yes him has told with  
 quién fue.  
 whom was  
 “Ana didn’t tell Freud with whom she dreamed, but Pedro did.”

- (25) a. Pedro told Freud with whom Ana dreamed.  
 b. \*Pedro told Freud with whom he (=Pedro) dreamed.

In this work I propose that, in Spanish SwCop, the loss of the sloppy reading is due to the presence of an additional functional projection, Event

Topic Phrase (EvTopP), hosting an event *pro*. This EvTopP is located in an LP which, as a consequence, will necessarily differ from Rizzi's (1997) LP. In (26), which outlines the whole structure of (3) that I will defend later, the LP functional projections (in bold type) belonging to Spanish SwCop are included:



A second functional projection in (26), IntP, is also absent in Rizzi's standard LP. In the next two sections I will justify the existence both of EvTopP and IntP. These projections will be essential for an account of several properties of Spanish SwCop.

### 3.1 Event Topic Phrase (Basilico 2003)

The EvTopP in (26) is conceptually based on Basilico (2003). This author proposes that a Topic Phrase (TopP) hosting an event *pro* introduces English eventive verbal small clauses like (27a) (the structure is given in (27b)):

- (27) a. We saw the guard leave.  
 b. We saw [<sub>TopP</sub> *pro* [<sub>Top'</sub> [<sub>VP</sub> the guard leave]]]

The reason why an event *pro* is generated in Spec-TopP in (27) is that verbal small clauses lack Inflection. Inflection is necessary in regular clauses in order to saturate the event argument of the verb. When Inflection is missing, an event *pro* must appear in TopP in order to saturate such argument. Event *pro* lacks  $\varphi$ -features, so it does not require identification and may exist in English.

In Spanish SwCop (where Basilico's TopP counterpart is labeled "EvTopP"), the reason why event *pro* has to appear does not derive from the need to bind an event argument in the predicate. The copula *ser* "to be" found in SwCop lacks an event argument, that is, it is not the same *ser* as the quite different eventive *ser* also existing in Spanish.<sup>5</sup> Spanish eventive *ser* shares the meaning of verbs like *pasar/sucedder/ocurrir* "happen". As illustrated in (28), these verbs are compatible with spatio-temporal complements, as well as complements meaning manner, cause, purpose or condition (Fernández Leborans 1999) (the eventive verb *ser* is in bold type):

- (28) Eso pasó/sucedió/ocurrió/**fue** hoy / por tu culpa  
 "that happened today / because of your fault"

The verb *ser* found in SwCop behaves in a completely different way. For instance, many focal pivots available in SwCop cannot co-occur with the verbs in (28), as shown by the contrast between (29a) and (29b):

- (29) a. El se olvidó de algo, pero no sé de qué fue.  
 he forgot-3.s. of something but not know-1.s. of what was  
 "He forgot something, but I don't know what."  
 b. El se olvidó de algo. \*Eso pasó/ocurrió/**fue** de las llaves.  
 he forgot-3.s. of something. that happened of the keys  
 "He forgot something: the keys."

Therefore, the reason why *pro* appears in SwCop does not have anything to do with binding of an event argument, since the *ser* in SwCop is not eventive. The copula found in SwCop is rather an equative copula. Equative copulas

<sup>5</sup> As pointed out to me by Ignacio Bosque, there is no interpretable Tense in RPQG/SwCop. This correlates with the fact that there is no event argument in the copula. See also Brucart (1994).

relate two individuals or two events by establishing an equation between them. In SwCop, two events have to be equated: the one contained in the presuppositional clause (later deleted by identity with the event in the antecedent clause), and the one referred to by the event *pro*. As a consequence, the EvTopP functional projection must be activated in LP in order to meet the equation requirements (two events or two individuals must be present).

As said above, the event *pro* put forth by Basilico lacks  $\varphi$ -features. As shown in (30), this *pro* cannot be substituted for by an overt eventive demonstrative like *that.*, since this demonstrative owns  $\varphi$ -features and, moreover, needs  $\theta$ -role and Case:

- (30) \*We saw **that** the guard leave.

Crucially, the Spanish demonstrative *eso* cannot appear in Spanish SwCop either:

- (31) \*El se olvidó de algo, pero no sé de qué fue **eso**.  
 he forgot-3.s.of somethingbut not know-1.s. of what was that  
 “He forgot something, but I don’t know what.”

The reason for the ungrammaticality of (31) is that the event *pro* in SwCop is directly generated in LP, that is, this *pro* is Basilico’s event *pro*, rather than the null subject of an eventive *ser*. The null subject of an eventive *ser* can be replaced by the eventive demonstrative *eso* (see (28)), which obtains a  $\theta$ -role from that verb.

The presence of an EvTopP in the SwCop LP has three important consequences.

The first consequence has to do with the presence of an event *pro* in Spec-EvTopP. As was observed in the previous section, Spanish SwCop cannot exhibit Sloppy Identity (see (24)), in contrast to Sw/oCop, which can (see (22)). This contrast derives from a main property of event *pro* pointed out by Basilico (2003): just as happens with subject *pro*-drop in Romance (Grimshaw and Samek-Lodovici 1998:197), event *pro* must be related to the topic of the discourse. The fact that event *pro* is never included in the deleted string of the sluiced clause, coupled with the fact that it requires a topic antecedent, explains that a sloppy reading will always be impossible in SwCop. Instead, in Spanish Sw/oCop, but also in Japanese SwCop, no EvTopP shows up, hence the sloppy reading will be possible.

The second consequence of the presence of an EvTopP in the Spanish SwCop LP is that the antecedent clause has to contain an event predicate.



Again, this is due to the eventive nature of the *pro* located in Spec-EvTopP, which anaphorically refers to the event of the antecedent clause. This explains the contrast between (29a) above, which has an antecedent clause containing an event predicate, and (32), which has an antecedent clause containing an Individual-level predicate:<sup>6</sup>

- (32) Esta casa se parece a otras dos, pero no  
 This house SEseem-3.s. to other-pl. two, but not  
 te dire a cuáles (\*es).  
 CL-2.s. say-FUT-1.s. to which-pl. is  
 “This house resembles two other houses, but I will not tell you  
 which ones.”

The third consequence of the presence of an EvTopP in Spanish SwCop is that the copula will occupy a higher position there than in Japanese SwCop. It is worth noting that the copula, which does not bind any event argument, has tense morphemes that obligatorily match the tense morphemes corresponding to the topic antecedent referred to by the event *pro*. This is illustrated by the grammaticality contrast in (33), which results from replacing the copula perfective past form (*fue*), which matches the past morpheme in the antecedent clause with the imperfective (*era*) and present (*es*) forms which do not:

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<sup>6</sup> An anonymous reviewer pointed out to me that the “event” *pro* actually distinguishes between Stage and Individual-level predicates, rather than between eventive and non-eventive predicates. The reason is that “event” *pro* is fully compatible with (non-eventive) Stage-level states, as illustrated by (i):

- (i) Juan estaba enfadado con tres personas, pero no sé con quiénes era.  
 Juan was annoyed with three people but not know-1.s. with whom-pl. was  
 “Juan was annoyed with three people, but I do not know with which ones.”

According to Felser (1999: 43), verbal small clauses, the same that motivated Basilico’s (2003) proposal of an event *pro*, are also compatible with Stage-level states, as shown in (ii):

- (ii) a. I saw the man lie on the bed.  
 b. I saw Bill stand in the corner.

This means that Basilico’s “event” *pro* should probably be reinterpreted as covering these facts also. For the sake of simplicity, I will continue using Basilico’s term “event *pro*”.

- (33) Ana habló con alguien, pero no sé con  
 A. talked-PERF with somebody but not know-1.s. with  
 quién fue/ \*era/ \*es  
 whom was-PERF/ was-IMPERF/ is  
 “Ana talked with somebody, but I do not know with whom.”

Therefore, I propose that the copula tense morphemes need to be licensed in EvTop<sup>o</sup>, in the same way I proposed that event pro was licensed in Spec-EvTopP, following Basilico’s (2003) proposal for verbal small clauses in English.

In Japanese SwCop, no EvTopP exists, and no copula movement takes place. Notice that the Japanese copula does not obligatorily exhibit tense morpheme matching with the previous clause. For instance, the SwCop clause in (4) may show a copula *da*, translatable as a present form “is”. This lack of matching with the tense morpheme in the topic antecedent is impossible in Spanish SwCop, as was illustrated in (33). The fact that the copula does not bear any relation with an EvTopP and, as a consequence, does not undergo any raising, will be essential to understand why Japanese SwCop, unlike Spanish SwCop, lacks TP-Deletion and shows Island-sensitivity (see section 4).

Before drawing this section to a close, I will focus on one last prediction made by the copula movement hypothesis concerning Spanish SwCop. If the copula moves in these constructions, this movement will be sensitive to restrictions typically experienced by other V-to-LP movement configurations in Spanish. For instance, according to Rivero (1994), V-to-LP movement happens in sentences with true imperatives. She claims that the ungrammaticality of (34), an example with a true imperative *comed* “eat”, derives from the fact that the negative adverb *no*, being a head base generated between VP and LP, is blocking the mandatory V-to-LP movement:

- (34) \*<sub>i</sub>No comed!  
 not eat-IMPER-2.p.  
 “Don’t eat!”

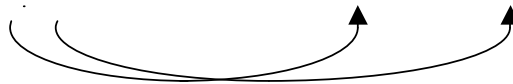
If my proposal is right, that is, if the copula in Spanish SwCop must raise to LP (more specifically, to EvTop<sup>o</sup>), it is predicted that sentential negation cannot take place in SwCop either. This prediction is borne out:

- (35) Juan no habló de algunos de los libros,  
 Juan not talked-3.s. about some of the books,  
 pero no recuerdo de cuáles (\*no) fue.  
 but not remember-1.s. about which (not) was  
 “Juan didn’t talk about some of the books, but I don’t remember  
 which ones he did not talk about.”

3.2 Interrogative Phrase (Lee 2001)

There is a second aspect in which (26) differs from Rizzi’s standard LP: the presence of a functional projection Interrogative Phrase (IntP). This projection has been put forth by Lee (2001). This author, working on San Luis Quiavini Zapotec data, convincingly concludes that interrogative wh-phrases check their focus feature in a lower Focus Phrase (FocP), and their interrogative feature in a separate IntP. In (26) I treat the wh-phrase *con quién* “with whom” according to Lee’s proposal. (36) is an example where the focal pivot, lacking an interrogative feature, remains in the specifier of FocP; the related structure is (37):

- (36) Jugó con alguien, pero no sé si  
 played-3.s. with somebody, but not know-1.s. whether  
 fue con él.  
 was with him  
 “He played with somebody, but I don’t know whether it was him  
 that he played with.”
- (37) [<sub>ForceP</sub> [<sub>IntP</sub> [<sub>Int'</sub> *si* [<sub>EvTopP</sub> *pro* [<sub>EvTop'</sub> *fue* <sub>j</sub> [<sub>FocP</sub> *con él* <sub>i</sub> [<sub>Foc'</sub>  
 [<sub>FinP</sub> <sub>t</sub> <sub>j</sub> <sub>t</sub> <sub>i</sub>]]]]]]]]]]



Notice that, if the embedding particle *si* is removed, (37) also represents the LP structure of a RPQG like (15b) (see (8b)). This is natural, since I have claimed that this sort of Spanish cleft underlies SwCop.

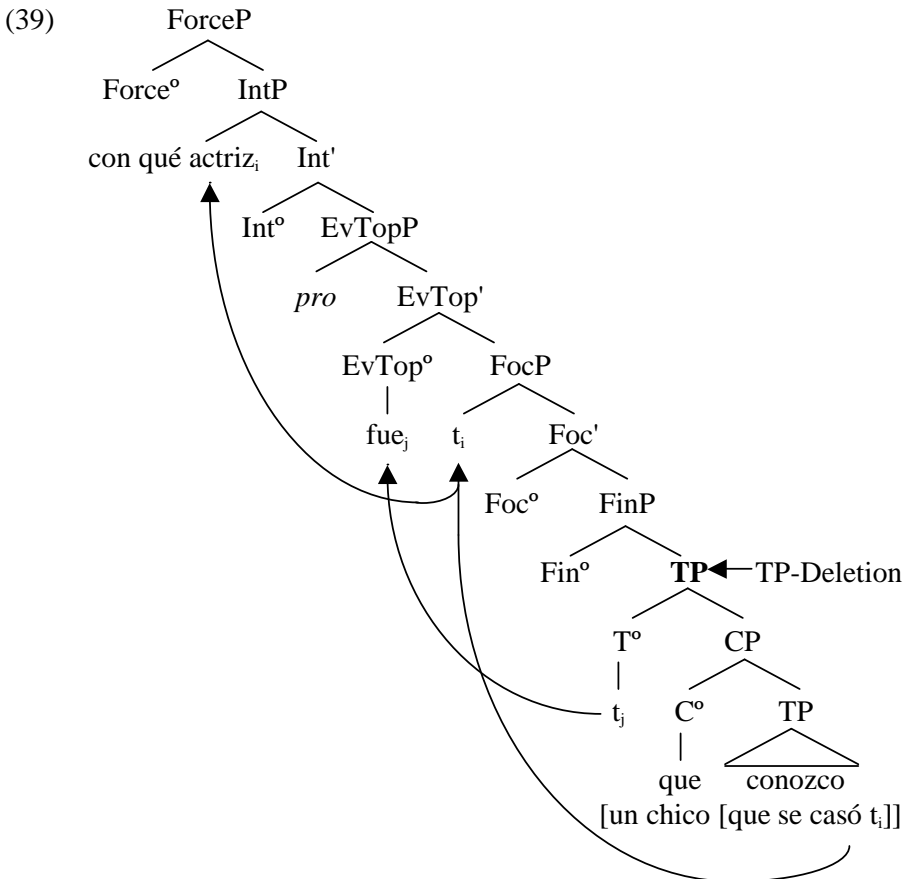
4. Spanish SwCop shows true Sluicing (TP-deletion)

Notice that, since both the wh-phrase and the copula in Spanish SwCop have vacated their original position (see (26)), full TP-deletion (true Sluicing) can proceed without affecting those constituents. Moreover, since true Sluicing makes Island insensitivity possible (Ross 1969), I predict that both Spanish Sw/oCop and SwCop allow Island violations. By contrast, as will be argued

later, Japanese SwCop and Sw/oCop do not show TP deletion; therefore, I will predict that this language is Island sensitive in these contexts. Both predictions happen to be borne out by the data.

The correctness of my prediction concerning Spanish SwCop and Sw/oCop is illustrated by data like (38),

- (38) Conozco un chico que se casó con una actriz,  
 know-1.s. a guy who married-3.s. with an actress  
 aunque no sé con qué actriz fue  
 although not know-1.s. withwhich actress was  
que conozco [un chico que se casó ].  
 that know-1.s. a guy who married-3.s.  
 “I know a guy who married an actress, although I don’t know  
 which actress.”



where the wh-phrase remnant *con qué actriz* “with which actress” is the complement of the verb *se casó* “married” in a Complex NP island (in square brackets); in turn, this Complex NP island is contained in the deleted TP (underlined). The structure of the sluiced clause in (38) is detailed in (39) (the underlined string in (38) corresponds to the TP in bold type).

In order to explain in more detail the legitimate island violations illustrated by (38), I will rely on a recent proposal made by Fox and Lasnik (2003) (F&L).

#### 4.1 *The Parallelism condition (Fox and Lasnik 2003)*

F&L develop an account for legitimate island violations in Sluicing and other deletion constructions. They claim that, if some deletion operation has to take place (say, VPE or Sluicing), a strict Parallelism condition between antecedent clause and deletion clause must hold in three respects. The next three sections will be devoted to each of these respects ((38)-(39) will be used as illustration).

4.1.1 *Parallelism between Indefinites and wh-copies.* First of all, in Sluicing constructions Parallelism should hold between the indefinite in the antecedent clause (*una actriz* in (38)) and the copy of the wh-element (*qué actriz*, in (38)), since they occupy the same position. Parallelism is obtained by assuming Reinhart’s (1997) proposal according to which both the wh-copy and the indefinite contain a choice function variable. Each choice function variable must be bound by an existential null quantifier over choice functions located in the LP of each clause. The logical form of (38) is (40) (the choice function variables are in bold type):

- (40)  $\exists \mathbf{f}$ =choice function conozco [un chico que se casó con una  $\mathbf{f}$  (actriz)]  
 aunque no sé  
 con qué  $\mathbf{g}$ =choice function conozco [un chico que se casó con una  $\mathbf{g}$   
 (actriz)]

4.1.2 *Parallel chains lack intermediate links.* There is a second respect in which Parallelism must hold in deletion environments. As shown in (40), the first clause of (38) contains a choice function variable in the indefinite *una actriz*, bound by an existential operator in LP; this chain involves no movement, that is, no intermediate links. Therefore, in order to respect Parallelism, the relation between the wh-phrase and its dependency in the sluiced clause cannot exhibit intermediate links either: this chain must be formed by one-fell-swoop movement, dispensing with successive cyclicity. In

non-elliptical structures, this one-fell-swoop movement would lead to illegitimately crossing several barriers. According to Chomsky (1972), a special mark \* is assigned to each of them. An output operation forbidding \*'s in surfaces structures will explain the ungrammaticality of the resulting configuration. However, no ungrammaticality arises if all these \*'s are phonologically deleted (“island repair”), as is the case in TP-deletion configurations like (38) (see (39)). Therefore, this sentence fulfills the second Parallelism requirement (the chain in the main and sluiced clause both lack intermediate links) while avoiding the ungrammaticality resulting from \*'s.

According to F&L, in (41), where a constituent smaller than TP (VP, underlined) has been deleted, some crossed barriers (TP and AspectP, for instance) remain undeleted between the operator and the choice function variable in the VPE clause:

- (41) \*They want to hire someone who speaks a Balkan language, but I don't know which (Balkan language)<sub>i</sub> they do[VP want to hire someone who speaks t<sub>i</sub>]

This situation triggers ungrammaticality after application of the output condition on \*'s. On the other hand, circumventing the intermediate barriers by successive cyclicity (intermediate links), in order to avoid \* marks, would violate the Parallelism necessary for VPE to proceed: recall that the chain in the antecedent clause lacks intermediate links.

For this reason also, an alternative analysis of (38) assigning the copula a position lower than EvTop<sup>o</sup>, say T<sup>o</sup>, would wrongly predict that island violations in Spanish should not be allowed, just as it is the case in VPE sentences like (41): both in (38) and (41), the one-fell-swoop movement to LP would cross TP, and the \* on this barrier would not be deleted later, thus triggering ungrammaticality.

4.1.3 *The choice function binders must occupy parallel positions.* A third Parallelism requirement establishes that, in Sluicing constructions, the choice function variables in the indefinite and wh-copy must be bound from parallel positions. This common position is located in LP, according to F&L.

Let us first check whether this requirement is fulfilled in Japanese SwCop and Sw/oCop configurations. To begin with, it is important to point out that

Japanese SwCop and Sw/oCop are island sensitive .The Sw/oCop (42) illustrates this fact:<sup>7</sup>

- (42) ?\*[TP<sub>2</sub> Taroo-ga [NP [CP [TP<sub>1</sub> Hanako-ga nanika-o  
 Taroo-NOM Hanako-NOM something-ACC  
 kat-ta] toyuu] uwasa]-o shinjiteiru] ga,  
 bought COMP rumor-ACC believe but  
 watashi-wa [nani-ka] wakaranai. (Kizu 2000: 154)  
 I-TOP what-Q don't.know  
 “Taro believes the rumor that H. bought something, but I don’t  
 know what.”

Island sensitivity suggests that no island repair is actually taking place in these configurations. Recall Kizu’s (2000) aforementioned proposal on Japanese SwCop and Sw/oCop, according to which these constructions derive from clefts with *wh*-in-situ. (43) represents the basic configuration of the sluiced clause in (42), before the presuppositional clause (the constituent CP<sub>1</sub> in (43)) is deleted:

- (43) [CP<sub>1</sub> Op<sub>i</sub> [TP<sub>2</sub> Taroo-ga [NP [CP<sub>2</sub> [TP<sub>1</sub> Hanako-ga t<sub>i</sub> kat-ta] to-yuu]  
 Taroo-NOM Hanako-NOM bought COMP  
 uwasa]-o shinjiteiru]-no<sub>i</sub>]-wa [nani-ka] wakaranai.  
 rumor-ACC believe-NM-TOP what-Q know-not  
 “...I don’t know what it is that Taro believes the rumor that Hanako  
 bought.”

In (43) there is no binding relation between the *wh*-remnant *nanika* and the copy inside the presuppositional clause; the copy is actually bound by a null operator coindexed at LF with the remnant (Kizu 2000:144)). This means that the chain parallelism, required for ‘island-repair’ deletion to take place, does

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<sup>7</sup> However, for the sake of fairness, I must also point out that Fukaya and Hoji (1999) have reported the Japanese Sluicing facts in a different way. They claim that Island sensitivity must be respected only when the focal pivot possesses a case marker, as illustrated in (i):

- (i) John-wa [[otooto-ni nanika-o okutte kita] hito]-o  
 John-TOP brother-DAT something-ACC sent person-ACC  
 syootaisita rasiiga, boku-wa [nani(\*-o) ka] siranai.  
 invited seem:but, I-TOP what -ACC Q know-not  
 “It seems that J. invited a person who had sent something to his brother, but I don’t  
 know what.” (Fukaya and Hoji 1999: 146)

not actually hold in (43). In fact, referring to the process operating in (43), Merchant (2001:117) makes the following claim in connection with related examples in English: “the nature of this ellipsis is quite different from the head-licensed ellipsis generally discussed in the literature (NP-ellipsis, VP-ellipsis, IP-ellipsis), consisting as it does of a CP.” Therefore, I conclude that the kind of deletion illustrated in (43) does not have anything to do with island repair, thus being unable to eliminate the \*-marks arisen after the operator crossed the Complex NP barrier in the presuppositional clause.

By contrast, as shown in (38)-(39), in Spanish SwCop the wh-phrase targets LP by “one-fell-swoop movement”.<sup>8</sup> Therefore, the wh-copy hosting the choice function variable can be bound from a position parallel to the position where the existential null operator is located in the antecedent clause. It is important to emphasize that this parallelism between both chains has been made possible in Spanish by the existence of RPQG constructions. Recall that, in Spanish clefts like (15a) (repeated below for convenience), there is a relative pronoun introducing a relative clause; however, in RPQG’s there is no relative pronoun, and actually there is no relative clause at all. In other words, the embedded CP in (39) is headed by a regular complementizer *que*, and no relative (null or non-null) operator is at work; otherwise, it would be this operator, rather than the wh-phrase, that would bind the copy, thus violating the aforementioned parallelism requirement on the positions hosting choice function binders.

- (15) a. Fue con él con **quien** jugó.  
 Was with him with whom played-3.s.  
 “It was with him that (s)he played.”

#### 4.2 Further discussion on the position of copula ‘da’ and wh-phrases in Japanese: Hiraiwa & Ishihara (2002)

I have shown that a structure like (39) explains Island insensitivity in Spanish SwCop. In this structure, both the copula and the wh-phrase target LP, which allows TP-deletion to take place, since all the three subconditions forming the general Parallelism requirement on chains are fulfilled. However, my analysis of Spanish SwCop happens to be very similar to a recent proposal made by Hiraiwa and Ishihara (2002) (H&I) for SwCop, Sw/oCop and cleft constructions in Japanese.

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<sup>8</sup> This means that the trace in the Spec of the presuppositional CP of (8b) and (8c), which was motivated by successive cyclic movement in RPQG’s, is not actually present in SwCop configurations.



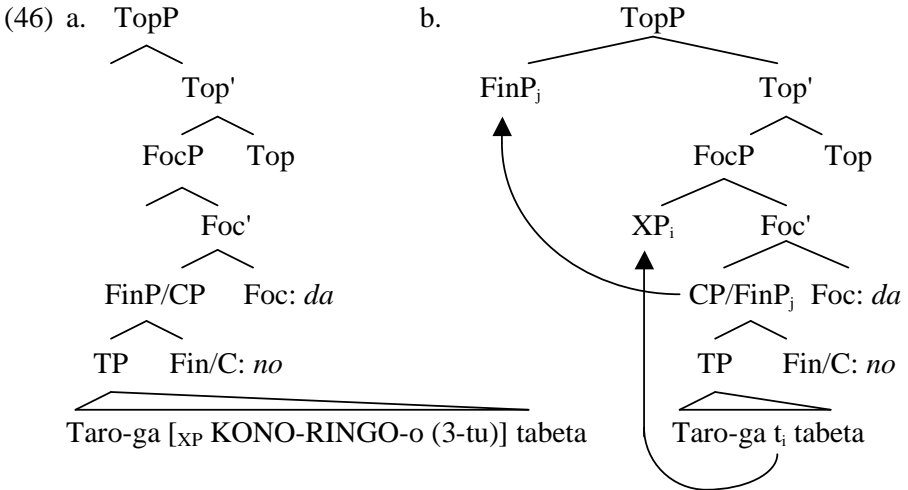
H&I claim Japanese cleft (illustrated in (44)) derives from the *no da* in-situ focus construction (illustrated in (45)); notice that both constructions exhibit a nominalizer *no* and a copula *da* (both in bold type).

(44) [Taro-ga e tabeta **no**]-wa kono-ringo-o (3-tu) **da**  
 Taro-NOM ate C-TOP these-apples-ACC 3-CL COP  
 “It is (three of) these apples that Taroo ate.”

(45) [Taro-ga KONO-RINGO-o (3-tu) tabeta **no**] **da**  
 Taro-NOM these-apples-ACC 3-CL ate C COP  
 “It is (three of) these apples that Taroo ate.”

H&I, assuming Rizzi’s LP, assign (45) the structure (46a), and (44) the structure (46b) (the focussed *kono-ringo-o (3-tu)* has raised to Spec-FocP and the presuppositional clause has raised to Spec-TopP); finally, they explain the SwCop and Sw/oCop in (47) by proposing the analysis in (48) for the sluiced clause (the deleted string is underlined).

Notice that the structure I propose for RPQG ((37) with the particle *si* removed) bears significant similarities with (46b): first, a focus phrase escapes a clause selected by a copula, and targets Spec-FocP; second, no relative operator is at work since, unlike the structure proposed by Kizu (2000), the embedded clause is not a Relative. It must be pointed out, however, that (48) raises important problems.



- (47) Taro-ga            nani-ka-o            tabeta    rasii    ga    boku-wa  
 Taro-NOM    something-ACC    ate    seem    but    I-TOP  
           nani-o            Taro-ga    tabeta no    (da)    ka    wakara-nai  
           what-ACC    Taro-NOM    ate    C    COP Q    know-not  
 “It seems that Taro ate something, but i don’t know what (Taro ate).”

- (48) [<sub>FocP</sub> nani-O<sub>i</sub> [<sub>FinP</sub> Taro-ga t<sub>i</sub> tabeta no] (da) ] ka wakara-nai.

First, it has been observed in the literature (Poletto 2000:5) that one of the main features distinguishing LP from the functional projections inside the TP layer is the fact that the head of a functional projection in LP cannot be activated by direct merging of a verbal element, whereas this is a possibility available inside TP. Therefore, since the Japanese copula is a verb, a representation like (48) would be a very unusual LP.<sup>9</sup>

Second, (48) should allow Island insensitivity in Japanese, since all the Parallelism subconditions mentioned in the previous sections are respected and, therefore, deletion of FinP/CP should have the same properties as TP-deletion: the binder of the copula occupies LP, and there is no relative operator intervening between the wh-phrase and the copy. However, as we know, Japanese is island sensitive. H&I themselves admit (cf. their fn. 4) that, in the way it is implemented, their hypothesis cannot explain Island sensitivity in Japanese.

Since it is not the purpose of this paper to make a detailed proposal for Japanese SwCop, I will just suggest that the otherwise appealing analysis proposed by H&I might surmount these problems by assigning the copula a position inside TP: the copula would no longer be part of LP, in accordance with the mainstream characterization of LP as well as with the regular distribution of the copula *da* in Japanese; on the other hand, no TP-deletion would be possible, which would explain Island sensitivity in Japanese.<sup>10</sup> The focus phrase might target Spec-FocP in LP, as H&I propose, but the head Foc<sup>o</sup>

<sup>9</sup> Bosque (1999) argues that a Spanish *ser* exists which is base generated as the head of a FocP. Interestingly, Bosque claims that this FocP is not part of an LP, since it is VP-internal.

<sup>10</sup> Merchant (2004) suggests a similar modification for H&I’s configuration. Although he defends a theory on repair effects that is different from F&L’s and offers a different LP than the one defended in this paper, he also proposes that H&I’s configuration should be modified so as to keep the copula *da* in a lower position. Merchant’s proposal is also motivated by the need to explain Island sensitivity in Japanese. I thank an anonymous reviewer for calling my attention to Merchant’s work.

need not be activated by the copula: as Rizzi (1997:299) proposes for Foc° in Italian, for instance, an inherent focus feature in Foc° is enough.

### 5. Conclusion

To sum up, in this paper I have shown that, both in Spanish and Japanese, a cleft is the basic configuration for SwCop constructions; specifically, an RPQG underlies the Spanish case. However, two main differences arise between these languages due to the presence of the functional projection EvTopP in the LP of Spanish SwCop: first, the presence of event *pro* in Spec-EvTopP explains the absence of Sloppy Identity in Spanish SwCop; second, copula movement from RPQG into EvTop° leaves TP ready for true Sluicing to apply, which accounts for Island insensitivity in Spanish SwCop.

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**BARE NOMINALS IN PAPIAMENTU AND BRAZILIAN  
PORTUGUESE  
AN EXO-SKELETAL APPROACH\***

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**1. Introduction**

There are two ways of dealing with the cross-linguistic variation in the interpretation and distribution of bare nominals. Either the variation is encoded in the way nouns are mapped into different semantic types (individuals or properties) or the variation is encoded in the functional domain. Chierchia's Nominal Mapping Parameter (1998) exemplifies the first approach. According to him, languages may choose between (i) mapping N to individual kinds, in which case they can be arguments; (ii) mapping nouns into predicates; or (iii) mapping N to both kinds or predicates. In his system, bare singular count nouns in argument position are predicted to be impossible in languages that have plural morphology and a well-defined determiner system.

Schmitt and Munn (2003), exemplifying the second approach, argue that Chierchia's semantic parameter makes the wrong predictions for Brazilian Portuguese, a language in which bare singulars can appear in argument position, in spite of the fact that this language has plural morphology and a well-defined determiner system. They propose a morpho-syntactic parameter involving a split between number and agreement functional nodes. Languages that can split number and agreement may have bare singulars in argument position. Languages that have Agr and Number fused cannot. Such an approach provides a way to account for argumental bare singulars in Brazilian Portuguese and its absence in English (except in lexically restricted contexts) and also extends to the distribution of number in predicative nominals.

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In this paper we expand the empirical domain of the research on bare nominals by examining the properties of argumental bare nominals in Papiamentu, an Iberian-based creole spoken in the Netherlands Antilles. Empirically our goal is to compare bare nominals in Papiamentu to Brazilian Portuguese bare nominals, since this language also allows argumental bare singulars and also has plural morphology and a determiner system.

Although we will preserve Schmitt and Munn's main intuition, a treatment of bare nominals in Papiamentu in terms of split Number and Agreement is problematic, since Papiamentu has no evidence for number agreement. Instead, on a par with other proposals designed to minimize the role of lexical semantic information from lexical items in the syntax (Marantz 1997, Embick and Noyer 2001), we will explore Borer's (2004) framework for dealing with intra- and cross-linguistic variation. In her system, all variation is to be encoded in the functional elements. Content lexical items do not project in the syntax. Rather functional items are projected independently from an array of universally given functional heads. What varies is what grammatical formatives encode what in each language.

We argue that bare singulars in both languages can receive a unified treatment: syntactically, bare singulars should be analysed as DPs with a Classifier Phrase (CIP) understood here as a divider of mass into countable units. What bare singulars lack is a number projection (#P) whose function is to actually count units. Semantically, bare singulars are compatible with a treatment in which they are individual kinds which can get existential readings via Derived Kind Predication, as proposed by Chierchia (1998).

Bare plurals, however, must have a different syntax and semantics since they do not share the same distribution and interpretations. In BrP bare plurals can also be analysed as DPs with CIP but no #P, akin to bare singulars and English bare plurals. Papiamentu bare plurals, however, are actually "disguised bare plurals" and should be treated as specific DPs with CI information.

We hope to show that Borer's system provides an interesting and elegant way of dealing with bare nominals in both languages. However, to deal with bare singulars, we need to modify her assumption that the classifier singular and number have always the same function associated to count "one", which makes plural the unmarked member of this impoverished classifier system.

The structure of this paper is as follows: Section 2 introduces the basic facts. Section 3 summarizes Borer's (2004) exo-skeletal approach to nominals and in Sections 4 and 5 we analyse bare singulars and bare plurals in both languages. Section 6 provides a summary of the paper.

## 2. *The basic patterns and the problems for previous bare nominal analyses*

In this section we briefly describe the basic properties of the nominal system in both languages and outline the basic issues that need to be addressed when accounting for bare nominals in both languages in comparison to English, for example.

### 2.1 *The basic patterns*

Table 1 summarizes the basic possible types of noun phrases in argument position for Papiamentu, Brazilian Portuguese and English.

	<i>Bare singular</i>	<i>Bare plural</i>	<i>Definite</i>	<i>Indefinite</i>
Papiamentu	buki	bukinan	e buki e bukinan	un buki
Br. Portuguese	livro	livros	o livro os livros	um livro uns livros
English	*book	books	the book the books	a book

Table 1: *Nominals in argument position*

As the table indicates, both Papiamentu and Brazilian Portuguese allow bare singulars and bare plurals in argument position. The plural is marked in Papiamentu by *-nan*, which is homophonous with the third person plural pronoun. Both languages have a definite determiner and an indefinite determiner. The singular indefinite determiner, as far as we call tell, behaves in the same way in both languages: indefinite noun phrases can have wide and narrow scope and generic and existential readings. As for the definite, we can say that they have similar but not identical properties. The definite determiner in Brazilian Portuguese has a wider distribution than the definite in Papiamentu. The definite in Brazilian Portuguese is accepted in all the so-called expletive uses (generics, inalienable possessive constructions and also proper names) but the Papiamentu definite is not.<sup>1</sup> With respect to the interpretive properties of bare nominals, we summarize their interpretive possibilities in Table 2. A cursory examination of the table, shows that, while the bare singulars have identical properties in both languages, the bare plural interpretive properties

<sup>1</sup> It should be noted that both languages have a demonstrative series, as illustrated below:

- |                          |   |                      |    |
|--------------------------|---|----------------------|----|
| (i) a. <i>e buki aki</i> | P | b. <i>esse livro</i> | BP |
| the book here            |   | this book            |    |



are partially in complementary distribution. The bare plurals in Brazilian Portuguese and the bare singulars in both languages have basically the same interpretive properties of bare plurals in English, namely generic and existential readings and scopelessness with respect to other operators. Bare plurals in Papiamentu, however, do not have the typical bare argument properties. They are impossible in generic contexts and also impossible in existential sentences. They only allow D-linked readings.

Interpretations	Bare Singulars	Bare Plurals	
	<i>livro</i> and <i>buki</i>	<i>livros</i> and <i>bukinan</i>	
	Br. Portuguese & Papiamentu	Br. Portuguese	Papiamentu
generic and kind	yes	yes	<b>no</b>
Existential (new)	yes	yes	<b>no</b>
D-linked	no	no	<b>yes</b>
scope	narrow only	narrow	narrow
plural or singular	singular or plural	plural	plural
count	yes	yes	yes
allow telic readings	no	no	no

Table 2: *Basic properties of bare nominals in both languages*

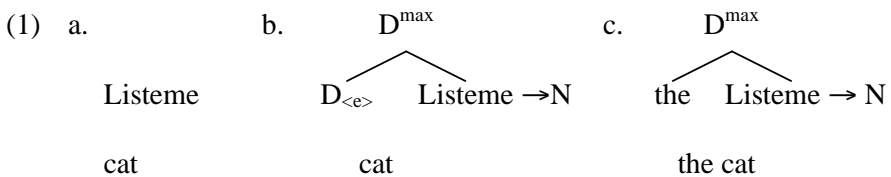
Ideally the analysis of bare nominals should account for both their similarities and their differences in the two languages in a unified manner. The questions we would like to address are the following: what is the internal structure of bare nominals in both languages, and what accounts for the differences in interpretation between bare plurals in Brazilian Portuguese and Papiamentu.

**3. The *exo-skeletal* approach (Borer 2004)**

3.1 *Basic assumptions*

In Borer’s system variation is uniquely a property of functional items and not of lexical items. Cross-linguistic and intra-linguistic variation is to be found in the functional items and not in the Encyclopædic lexicon. The Encyclopædic lexicon contains a list of listemes. A listeme is a pair of sound and meaning with no grammatical information, not even category information. For example, the listeme “cat” is neither mass or count and is neither a noun or a verb. The functional structure associated to it will determine independently whether it should be treated as a N or a V, count or mass.

The functional lexicon consists of a functional vocabulary (including all grammatical formatives and affixes) and functional nodes. Functional nodes determine the category of the listeme. The category D in (1b), for example, forces the listeme to be realized as a noun. Functional heads are underspecified. They behave as open variables that need to be associated to some grammatical formative that shares with it their category. Such a formative has also other important features that will contribute to its interpretation. In the case of the D head, for example, the association of D with a particular determiner such as *the* or *a* will determine definiteness in English.



Insertion of a free standing element is not the only way to assign range to a functional head. Abstract features, which require support of some head, and other indirect means, such as operators elsewhere in the clause, are also ways to specify the functional node. In Borer's system the assignment of range to a functional head and the projection of the functional head are two independent steps. One way of understanding this departure from bare phrase structure (Chomsky 1995) is to assume that, while there is a universal order in which functional projections can be combined (with such ordering probably semantically determined), the specific items that can fill each position are language specific. In other words, the task of the learner and of the linguist interested in the cross-linguistic variation is not to determine the order of functional projections but rather which elements can fill each position.

An important constraint imposed onto this system is that no functional head can be assigned a range twice. On the other hand, the same grammatical formative can assign a range to more than one functional head, since it may contain features that can serve both functions. For example, some languages will allow Ds to be assigned a value by perhaps an existential operator outside the DP while others will force D to be filled by a free morpheme, but there can be no language that simultaneously assigns a range internally and externally to the same D head. On the other hand, the same grammatical formative can assign a range to both D and to some other nominal functional head inside the DP, if it has the features to do so. We will come back to this point since it will constitute part of the machinery that will explain the differences between the plural morphemes in Brazilian Portuguese and Papiamentu.

### 3.2 *Basic functional structure for nominals*

The functional structure of nominals in argument position consists of a DP, which may contain a #P (Number Phrase) and a CIP (Classifier Phrase). Listemes are mass by default. In other words, the mass/count distinction of isolated listemes, or in grammatically undetermined contexts, is the reflection of salient world knowledge and is grammatically inert.

In order to be interpretable as count, listemes need to be portioned out, i.e., divided into countable units. A CIP performs this function. Classifiers divide listemes into countable units. Importantly, for Borer, singular and plural just represent an impoverished classifier system. They are merely two ways of dividing mass into countable units. Once a classifier is added to the structure, the result is a count noun and the distinction between count and mass becomes structural. Count nominals have classifiers and mass nominals have no classifiers.

If we treat plural as a classifier, then plural is not necessarily a function from singulars to pluralities, as usually assumed in the literature. Rather, both singular and plural are on a par and portion out mass predicates into countable units. According to Borer, evidence that we should treat singular/plural as classifiers comes from languages that have plural morphology and classifier morphology, which can be used interchangeably but can never co-occur, as in Armenian, for example (see Megerdumian 2002). This would follow if they are competing for the same functional node, namely a classifier head, since no head can be assigned range by two different elements.

Once a CIP receives a value, the predicate will be interpreted as Count. As such, it can be the domain of a restrictor which assigns specific quantity to the mass divisions created by the plural marking. This function of counting is performed by the #P. In other words, number is not the locus for singular and plural, but rather the locus for indefinites (cardinals and other indefinite determiners).

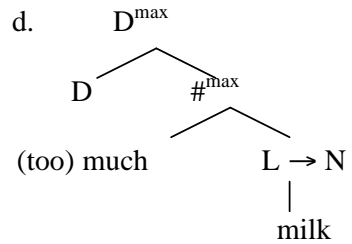
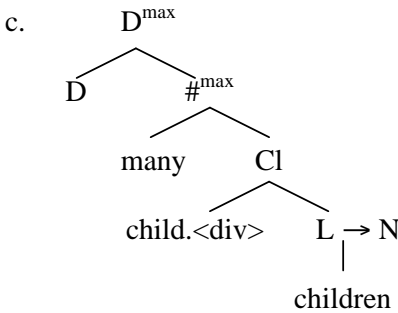
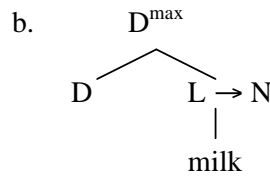
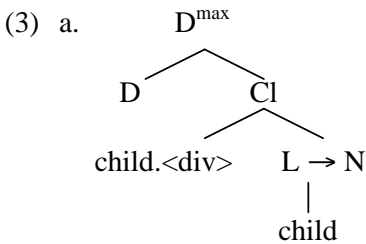
Before we analyse bare singulars in Papiamentu and Brazilian Portuguese, it is important to see how Borer deals with English nominals.

### 3.3 *English according to Borer*

According to Borer, noun phrases must be divided in two major groups according to their role in creating terminative and durative VP predicates, as illustrated in (2). Bare plurals and mass DPs in the complement position of verbs such as *drink* and *draw* produce durative VPs, which, being homogeneous, are compatible with *for x time* adverbials (2a,b). In (2c,d), on the other hand, the DPs *many children* and *the milk* with the same verbs produce non-homogeneous or terminative VPs, which are incompatible with

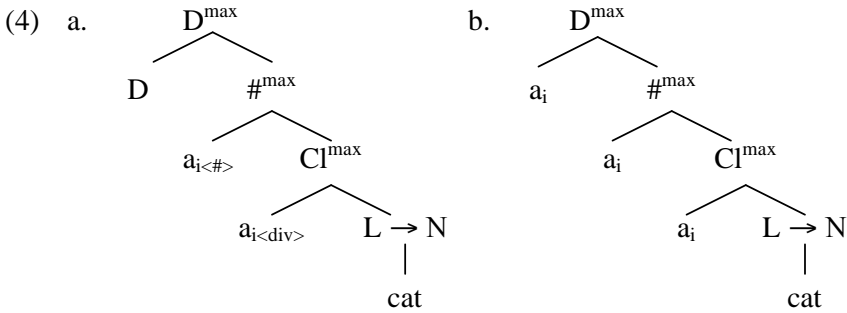
for *x time* adverbials. This big division is, according to Borer, partially structural. DPs of the first type share the property of lacking a #P. DPs of the second type always have a counter, i.e., a #P, even if this counter produces a very vague quantity (*some, more than three*, for example).

- (2) a. Bill drew children for three hours. Homogeneous
- b. Bill drank milk for three hours.
- c. Bill drew many children #for three hours. Non-Homogeneous
- d. Bill drank too much milk #for three hours.



The structures for the numberless DPs are illustrated in (3a,b) and the structures for the numbered/counted DPs are illustrated in (3c,d). In (3a) *child.<div>* is spelled out phonologically as *children*.

According to Borer, singular and number *one* have the same function and therefore the indefinite *a* will assign range to both classifier and #, as illustrated in (4a) and (4b), below. The result will be a count singular interpretation.



(4a) differs from (4b) in that, in (4b), the indefinite *a* is also associated to D, which, for Borer, is a pre-requisite to a specific reading. As for the definite determiner in English, the idea is that it is also a portmanteau morpheme with number and D features.

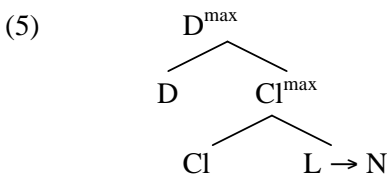
It is important to note that, if the choice of singular classifier triggers the selection of a grammatical formative that is at the same time a range assigner for #, then plural is the unmarked classifier in the sing/plural classifier. Singular, according to Borer, will always mean “one”.

Before we move on the analysis of bare singulars, we should summarize the basic points: first, mass is the default interpretation of a classifier-less DP. Singular and plural are classifiers, but singular has the same function as the # *one*. This identity in function between division and quantity for singulars forces the same element to assign the range to both Cl and #, as illustrated by the indefinite *a* in English. In the next section, we will show that it is necessary to modify this assumption in order to account for bare singulars in Brazilian Portuguese and Papiamentu.

#### 4. *Bare singulars*

As Table 1 and 2 illustrated, bare singulars in Papiamentu and Brazilian Portuguese can appear in argument position with generic and existential readings. In this section we address the issue of what the internal structure of bare singulars in both languages is, which will allow us to capture their interpretative and distributional properties.

We propose the structure in (5) for the analysis of bare singulars:



We argue that they are DPs that contain a Classifier Phrase, but no #P. They contain a divider of mass into countable units, but these units are not actually counted. As it will become clear as we proceed, bare singulars in the two languages provide strong evidence for the assumption that the classifier singular does not always have the same function as # *one* in these languages, contra Borer (2004). Furthermore, we will argue that, semantically, it is possible to treat these DPs as names of kinds, in spite of the fact that they are not inherently a plurality of individuals.

In this section we will first provide evidence for the structure in (5) and then we will discuss how these DPs can be interpreted.

#### 4.1 Support for bare singulars as DPs with CIPs

4.1.1 *Support for DP.* Ladusaw (1994) has argued that individual-level predicates can only combine with subjects that have independent reference. Bare singulars in BrP and Papiamentu can appear as subjects of individual level predicates and be interpreted as generics. If we assume that reference is a property of DPs, then the subjects in (6) must be DPs. This fact militates against an analysis of bare singulars as having no D projection and being licenced via some sort of syntactic incorporation, as suggested by Masullo(1992) for Spanish bare nominals.

- |        |   |    |
|--------|---|----|
| (6) a. | Mucha ta inteligente.<br>child is intelligent<br>“Children are intelligent.”  | P  |
| b.     | Criança é inteligente.<br>child is intelligent<br>“Children are intelligent.” | BP |

Further support for the proposal that bare singulars are DPs comes from the interpretation contrasts in (7) and (8). The examples in (7) and (8) demonstrate a contrast that is compatible with the idea that bare singulars are DPs in both languages. In (7), two noun phrases are conjoined under the same D. In such cases the only interpretation is that the NPs are associated to one and the same individual. However, in (8), we have a case of conjoined bare singulars. The interpretation we obtain is an interpretation in which both nominals refer to different individuals or plurality of individuals. Again, if reference is to be associated to a DP projection, the interpretations are to be expected, as proposed by Schmitt and Munn 2003.

- (7) a. Mi a topa ku e amigu I kolega na Curaçao P  
 I PAST meet with the friend and colleague in Kòrsou  
 b. Eu encontrei o amigo e colega em Curaçao BP  
 “I met the friend and colleague in Curaçao.”
- (8) a. Mi a topa ku amigu I kolega na Kòrsou P  
 I PAST meet with friend and colleague in Curaçao  
 b. Eu encontrei amigo e colega em Curaçao BP  
 I met friend and colleague in Curaçao.  
 “I met friends and colleagues in Curaçao.”

4.1.2 *Support for CIP*. The function of a CIP is of a divider of mass predicates into countable units. Evidence for the presence of a classifier comes from the fact that bare singulars are not interpreted as mass unless coerced into a mass reading. Instead, bare singulars allow individuation, unlike mass terms, as illustrated in (9) which contrasts with the mass nominal in (10).

- (9) a. Mucha ta pesa 20 kilo n’e edad aki. P  
 b. Criança pesa 20 kilos nesta idade. BP  
 child PRES weighs 20 kilos on-this age  
 “Children weigh 20 kilos at this age.”
- (10) a. \*Oro ta pesa dos gram. P  
 b. \*Oro pesa duas gramas. BP  
 “Gold weighs two grams.”

(9) shows that bare singulars can occur with predicates that require individuation, while (10) shows that bare mass nominals cannot. Example (11) illustrates that, in existential constructions, a count reading is not only possible, but preferred.

- (11) a. Tin computer riba mi mesa. P  
 b. Tem computador na minha mesa. BP  
 have computer on my desk  
 “There is a computer/computers on my desk.”

The plural or singular interpretations of bare singular count nominals are very much dependent on the predicate. In (12), the most likely reading is that

Maria wants to marry a single Brazilian but in (13), the predicate “collect” forces a plural interpretation of “stamps”.<sup>2</sup>

- (12) a. Maria kier kasá ku brasileiro. P  
 b. Maria quer casar com brasileiro. BP  
 Maria wants marry with Brazilian  
 “Maria want to marry a Brazilian.” (any Brazilian)
- (13) a. Pedro ta kolekshoná stampía. P  
 b. Pedro coleciona selo. BP  
 Pedro PRES collect stamp  
 “Pedro collects stamps.”

In other words, bare singulars are systematically interpreted as count and not mass. In Borer’s framework systematic count interpretations are to be correlated with the presence of a classifier phrase creating countable units. If bare singulars in Brazilian Portuguese and Papiamentu had no classifier, they should be interpreted as mass, as English count nouns must be interpreted in cases such as (14). The contrast between (14a) and (14b) illustrate that, when it is hard to infer homogeneous pieces, as is the case with computers, the result is quite awkward. If singular count readings were the result of an inference process depending on our knowledge of the world, (14b) should allow us a count reading, but it does not in English. In Brazilian Portuguese and Papiamentu, count interpretations are trivially obtained in sentences equivalent to (14).

- (14) a. There was pencil all over the floor.  
 b. ??There was computer all over the floor.

4.1.3 *Support for lack of #P*. So far we have argued that bare singulars should be analyzed as DPs with Classifiers, in order to account for their non-mass interpretation and their ability to refer independently. Now we argue that bare singulars do not show any evidence of containing a number phrase, i.e. the countable units are not actually counted.

As briefly discussed in Section 3, Borer distinguishes two types of DPs: DPs with a number phrase and DPs without a number phrase. While DPs with number produce telic predicates which are incompatible with a time-span adverbial such as *for two hours*, DPs without number produce atelic predicates

<sup>2</sup> These examples are modeled on similar data in Farkas and de Swart 2003.



which are compatible with *for two hours*. The contrast between (15) and (16) show that, while the singular indefinite behaves as a counted DP, the bare singular does not. In (15) the VP with a bare singular is compatible with *for two hours*, because the resulting predicate is homogeneous. Example (16), on the other hand, is anomalous, since an iterative reading of killing one iguana, is pragmatically odd.

- (15) a. Mi a mata yuana pa dos ora largu. P  
 b. Eu matei iguana por duas horas. BP  
 I killed iguana for two hours  
 “I killed iguanas for two hours.”
- (16) a. Mi a mata um yuana #pa dos ora largu. P  
 b. Eu matei um iguana #por duas horas. BP  
 I killed an iguana #for two hours  
 “I killed an iguana for two hours.”

The contrast is implemented in Borer’s system as simply absence versus presence of a #P with a specified value. So, for Borer, it is no surprise that the bare singular does not have the same properties of the singular indefinite.

Further evidence to distinguish the bare singular from the indefinite comes from its scopal properties with respect to negation and intensional verbs. We exemplify here the negation facts, showing that the bare singular only has narrow scope, as in (17), whereas the indefinite can also have wide scope over the negation, as in (18). (See Kester and Schmitt (to appear) for further evidence.)

- (17) negation > bare singular; \*bare singular > negation  
 a. Mi no a mira mancha riba suela. P  
 b. Eu não vi mancha no chão. BP  
 I not saw spot on-the floor  
 “I didn’t see spots on the floor.”
- (18) negation > indefinite; indefinite > negation  
 a. Mi no a mira un mancha riba suela. P  
 b. Eu não vi uma mancha no chão. BP  
 I not saw a spot on-the floor  
 “I didn’t see a spot on the floor.”

As noted by Dayal (2004), contrasts of the sort exemplified here in (17) and (18) show that the bare singular cannot be interpreted as a simple narrow scope indefinite. Rather, the bare singular has a reading that the indefinite singular does not have. This is something that can be easily incorporated into Borer's analysis, if numberless elements cannot enter scope interactions.

However, in both languages the singular is not obligatorily being interpreted as *one*. In fact the data shows quite clearly that bare singulars allow both singular and plural interpretations. To account for that, we have to assume that in some languages singular does not equate with # *one*. Rather singular in some languages is the underspecified default classifier. All it does is to guarantee a count reading. Plural, on the other hand, forces plural partitions of the mass stem.

#### 4.2 *Deriving the interpretations*

We know that the classifier singular marks "count" readings. We need to sketch how to account for the range of interpretations that bare singulars can have, more specifically kind, generic and existential readings, illustrated below in (19) to (21) and in (22) and (23) respectively.

- (19) a. Kabritu ta mashá komun na Kòrsou. P  
       goat is very common in Curaçao  
       b. Cabrito é muito comum em Curaçao. BP  
       goat is very common in Curaçao  
       "Goats are very common in Curaçao."
- (20) a. Dinosaurus ta un sorto/un bestia extingi P  
       b. Dinossauro é um animal extinto. BP  
       dinosaur is a species/an animal extinct.  
       "The dinosaur is an extinct species."
- (21) a. Mi ta gusta pushi. P  
       I PRES love cat  
       b. Eu adoro gato. BP  
       I love-PRES cat  
       "I love cats."
- (22) a. Tin computer riba mi mesa. P  
       b. Tem computador na minha mesa. BP  
       have computer on my desk  
       "There is a computer/computers on my desk."

- (23) a. *Mi a kumpra kas/computer.* P  
 I PAST buy house/computer
- b. *Eu comprei casa/computador.* BP  
 I bought house/computer  
 “I bought a house/houses/a computer/computers.”<sup>3</sup>

In Borer’s system there are three ways of assigning range to a functional head. We clearly do not have an overt morpheme in D. Therefore we are left with two options: (i) an external operator assigns range to D or (ii) a head feature that is associated with the noun assigns range to D in the bare nominals. If we adopt (i) we could make use of an analysis in which the empty D can be assigned range either by a Generic operator or by the same Existential quantifier that guarantees existential closure of the VP. A problem that may arise with such an account is that it is hard to guarantee that existential closure will not apply to (21). Alternatively, we can assume that D is assigned range by a phonologically empty kind-creator head feature, as in Chierchia’s (1998) semantics for kinds. Existential readings, as in (22) and (23) arise through Derived Kind Predication as in Chierchia (1998) and Dayal (2004).

The latter account allows us to distinguish Brazilian Portuguese and Papiamentu bare singulars from Spanish bare singulars. Spanish does not have a kind-creator head feature. Its bare singulars, in fact, do not seem to be DPs, since they cannot appear as subjects of ILPs. Rather, their distribution is restricted to the object position of certain verbs, strongly supporting an incorporation of a nominal projection smaller than DP at least in some dialects. English, on the other hand, lacks the ability to create singulars that are not, at the same type, interpreted as *one*. In other words its morphology does not allow singular without number, which explains the lack of bare singulars with the Brazilian Portuguese and Papiamentu interpretations.

Before we move to the analysis of bare plurals, we should note that the implementation we are proposing here is very similar in spirit to the one proposed in Schmitt and Munn (2003), but refines it in avoiding the use of agreement nodes. In both analyses, though, English forces singular to be necessarily associated with an interpretation of “one”, while Brazilian Portuguese and Papiamentu do not.

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<sup>3</sup> For reasons we don’t quite understand, bare singulars are basically impossible as preverbal subjects of eventive predicates in both languages. This may be related to the way existential readings of kinds can be derived. They differ from bare plurals which can appear as preverbal subjects of eventive predicates in Brazilian Portuguese.

## 5. Bare plurals

### 5.1 Main differences

In the domain of bare plurals, Papiamentu and Brazilian Portuguese are radically different from each other. In Brazilian Portuguese the bare plural has almost exactly the same properties as the bare singular and can be analyzed in the same way as the bare singular. It differs from the bare singular by having a plural classifier forcing a reading of more than one partition. Thus, the plural version of (12), illustrated in (24) below, forces a reading in which Maria wants to marry many Brazilians.<sup>4</sup>

- |      |                                   |    |
|------|-----------------------------------|----|
| (24) | Maria quer casar com brasileiros. | BP |
|      | Maria wants marry with Brazilians |    |
|      | “Maria want to marry Brazilians.” |    |

In Papiamentu, the use of the bare plural is extremely restricted. It is excluded from generic as well as existential sentences, as illustrated in (25) and (26) respectively. In Papiamentu only a bare singular can be used in these cases, whereas the presence of a bare plural in Brazilian Portuguese is fully grammatical.

- |         |  |    |
|---------|--|----|
| (25) a. | *Muchanan ta inteligente.              | P  |
|         | “Children are intelligent.”            |    |
| b.      | <i>Crianças são inteligentes.</i>      | BP |
|         | “Children are intelligent.”            |    |
| (26) a. | * <i>Tin computernan riba mi mesa.</i> | P  |
|         | have computers on my desk              |    |
| b.      | <i>Tem computadores na minha mesa.</i> | BP |
|         | “There are computers on my desk.”      |    |

The bare plural in Papiamentu is only possible in episodic sentences when the interpretation is somewhat specific. This is illustrated in the examples in (27). In (27a), the speaker is reporting an episode he witnessed in a movie theatre. In this case the bare plural is not generic and the use of *-nan* is obligatory. Notice that the use of the bare singular is ungrammatical in this example. The example in (27b), however, is generic and calls for the use of a bare singular. The presence of a bare plural yields an ungrammatical result. In

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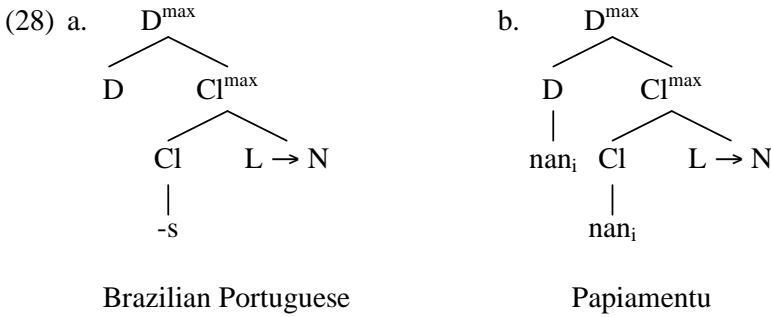
<sup>4</sup> It remains to be seen whether the obligatory plural interpretation is an implicature (as Borer would argue) or part of the semantics of the classifier.

Brazilian Portuguese, the use of the bare plural is awkward in the non-generic context, as illustrated in (27c).

- (27) a. *Después* *ku hendenan/\*hende a keha*  
 after that person-PL/person PAST complained,  
*nan a drecha e película.* P  
 they PAST fix the film  
 “After some people complained, they fixed the film.”
- b. *Si hende/\*hendenan keha, no wori ku*  
 if person/person-PL complain, don’t worry with  
*nan.*  
 them  
 “If people complain, don’t worry about them.”
- c. *Depois que ??pessoas reclamaram, eles consertara*  
 After that person-PL complained, they fixed  
*o filme.*  
 the film.

### 5.2 Proposal

We assume that the different properties of the bare plurals in the two languages follow from the two structures exemplified in (28). In Brazilian Portuguese the bare plural is a DP with no number (that is, no counter), but with a plural classifier, which is compatible with multiple divisions of the mass stem. The so-called bare plural in Papiamentu, however, calls for a very different analysis. We analyse *-nan* as a portmanteau morpheme which not only divides the mass stem into countable units of a plural nature, but also contains a D-feature that prevents it from appearing in generic contexts and existential sentences. For descriptive purposes we will refer to this as a specificity-feature. All we mean by that is that this feature imposes a discourse condition forcing a somewhat D-linked reading. In Borer’s framework, specific readings of an indefinite expression force the indefinite to raise to D and this is illustrated in (28) for the bare plural in Papiamentu.



5.3 *The plural readings*

As the structures in (28) show, the so-called bare plurals in the two languages share only one characteristic: the presence of the plural classifier. Contra Borer, we assume that the plural classifier in these languages always picks out divisions that are somewhat complex and do have more than one portion in them. Thus, in (29a) and (29b) we can interpret the bare singular *book* as one or more books, but the bare plurals in (29c) and (29d) always pick plural partitions. In these particular cases the plural partitions can coincide with plural individuals.

- (29) a. *Mi a kumpra buki.* P  
 I PAST buy book  
 b. *Eu comprei livro.* BP  
 “I bought a book/books.”  
 c. *Mi a kumpra bukinan mashá karu.* P  
 I PAST buy books very expensive  
 “I have bought (some) very expensive books.”  
 d. *Eu comprei livros muito caros.* BP  
 I bought books very expensive-PL  
 “I have bought very expensive books.”

5.4 *Advantages of treating -nan as a portmanteau morpheme*

The analysis of *-nan* as a Classifier (Cl) that raises to D accounts for its incompatibility with quantifiers and cardinals: if number is filled Cl *nan* cannot raise to D. In Papiamentu, cardinals and quantifiers cannot appear with *-nan*, as in (30a); whereas cardinals and quantifiers do co-occur with bare plurals in Brazilian Portuguese, as shown in (30b).<sup>5</sup>

<sup>5</sup> The data is somewhat more complicated and we refer the reader to Schmitt & Kester’s presentation at the *Linguistic Perspectives on Numerical Expressions workshop* in Utrecht,

- (30) a. *Mi a kumpra dos/hopi buki(\*nan).* P  
 I PAST buy two/many book (\*PL)
- b. (*Eu*) *comprei dois/muitos livros.* BP  
 I buy-PAST two/many book-PL  
 “I bought two/many books.”

The proposal that *-nan* raises to D (or agrees with D) basically means that the result is a specific numberless DP. This accounts for its inability to appear in generic and existential contexts. Being numberless, however, these DPs in object position allow durative readings of the VP in examples such as (31):

- (31) *Mi a mata yuananan grandi pa dos ora largu.*<sup>6</sup> P  
 I PAST killed iguanas big for two hours  
 “I killed some big iguanas for two hours.”

The assumption that *-nan* is not a simple indefinite and rather should be analysed as an element with a D-feature, is further supported by the fact that it is homophonous with the third person plural pronoun, as exemplified in (32a). Furthermore it is also used in the so-called associative constructions formed with proper names as in (32b).<sup>7</sup>

- (32) a. *Nan ta kome sópi.* P  
 they. PRES eat soup  
 “They are eating soup.”
- b. *Marianan* P  
 Maria-3rd /pl  
 “Maria and her family/her group of friends.”

In summary, by treating *-nan* as a portmanteau morpheme, we can account not only for its contribution to the VP aspect, its D-linking properties and its inability to co-occur with cardinals and quantifiers.

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June 2004, for an analysis of the interaction between cardinals, quantifiers and number in Papiamentu.

<sup>6</sup> For reasons we do not completely understand, bare plurals in object position require modification. We suspect that the reason is their D-linked properties and the information structure of Papiamentu.

<sup>7</sup> For a descriptive overview concerning the distribution of *-nan* see Dijkhoff (1983, 1990) and Muller (1989).

## 6. Conclusion

In this paper we have proposed a unified account for the similarities and differences between bare nominals in Papiamentu and Brazilian Portuguese along the lines of the exo-skeletal approach of Borer (2004), which guarantees that cross-linguistic and intra-linguistic variation must be associated to functional items. We argued that Brazilian Portuguese bare singulars and bare plurals have the same syntax: they are DPs with classifiers and no number. In Papiamentu, however, bare plurals are very different. They are indefinite specific DPs with classifier but no number projection. This account forced us to depart from Borer and allow singular classifier in these languages to not always be associated to “counted one”, unlike English. Needless to say that more has to be said about the plural in Papiamentu, specially with respect to its interpretive properties and its relation with the third person plural pronoun.

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**RADDOPPIAMENTO SINTATTICO (RS) AND WORD-MEDIAL  
GEMINATION IN ITALIAN  
ARE THEY THE SAME OR ARE THEY DIFFERENT? THE EVIDENCE FROM  
SPONTANEOUS SPEECH**

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**1. Introduction**

In this study we compare RS word-boundary geminates with word-medial (WM) geminates in Italian. We investigate whether they are the same, or different, in naturally occurring speech. We refer specifically to the unexpected glottal phenomena, including preaspiration, that we uncovered in the vowel-consonant transition during acoustic phonetic segmentation. We discuss the acoustic appearance, frequency, duration and potential role of these phenomena in gemination before considering more broadly whether, based on our natural speech data, RS geminates should be considered phonologically equivalent to WM geminates.

**2. *Raddoppiamento sintattico (RS) and word-medial gemination***

*Raddoppiamento sintattico* (RS) is a well-known sandhi process in Italian in which word-initial consonants are lengthened post-lexically when preceded by certain trigger words, for example, *tre* [kk]ani “three dogs”. Originally due to word-boundary consonant assimilation in late Latin, RS occurs (with differing distributions) in most varieties of Romance spoken in Central and Southern Italy (Loporcaro 1997). In Standard Italian and the closely related Sieneese variety upon which this investigation is based, RS consonant lengthening is today triggered by all final-stressed words and stressed monosyllables for example, *parlo* [b]ene “I speak well” vs. *parlò* [bb]ene “s/he spoke well”.<sup>1</sup> From a synchronic perspective, most recent phonological accounts (for example, Bullock 1992; Repetti 1991 and many others) claim the phenomenon of RS is motivated by the need to maintain heavy syllable weight

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<sup>1</sup> RS is also triggered by a small number of unstressed monosyllables and penultimate stressed words for example, *come* [vv]a? “how’s it going?” (see for example, Canepari 1991; Loporcaro 1997). However, we restrict discussion here to stress-conditioned RS geminates.

in stressed position. As final vowels are reputedly always short in Italian, but stressed syllables are obligatorily bimoraic, or heavy, right-to-left consonant spreading (i.e. RS) occurs across the word boundary to satisfy the stress to weight requirement (see Figure 5).

In addition to RS post-lexical geminates, Italian also has lexically contrastive geminates in word-medial (WM) position for example, /fato/ ‘‘fate’’ vs. /fatto/ ‘‘fact’’. This paper compares the acoustic appearance and duration of WM lexical geminates with RS post-lexical geminates in our spontaneous speech data.

The primary phonetic correlate of gemination in Italian – within and across words – is accepted in the relevant phonetic and phonological literature to be a marked increase in the duration of consonant closure or constriction relative to non-geminate consonants (for example, Pickett, Blumstein & Burton 1999, Repetti 1991). From a phonological perspective this increased duration is treated as a moraic length difference. The weight-bearing nature of geminate or long consonants is consistent with the frequently noted interaction between bimoraic syllable weight and consonant and vowel duration in stressed position, for example, /fato/ [‘fa:to] ‘ $\mu\mu.\mu$  v. /fatto/ [‘fatto] ‘ $\mu\mu.\mu$ .

### 3. *Background*

The traditional descriptive and phonological standpoint (for example, Nespor & Vogel 1982 and many others) is that RS is regular, predictable and categorical. As a consequence, geminates are assumed to be the same phonologically and phonetically within and across words. Experimental evidence provided by Korzen (1980) and Marotta (1986) supports this position where, based on controlled speech data, the duration of WM and RS geminates is reported to be very similar.

However, this traditional view of full word-initial and word-medial geminate isomorphism has recently been put in doubt. In the first instance, the results of two recent experimental studies using controlled speech recordings of Tuscan Italian point to unexpected phonetic variability in the duration of geminates, especially in RS contexts. Campos-Astorkiza (2004) who looked only at RS gemination in a sample of four speakers suggests that RS ‘might be better viewed as a gradient lengthening phenomenon’. Although she recognizes RS is still some kind of a phonological process, by implication its status is not identical to that of WM gemination. In a separate study using 5 speakers, Payne (2000) investigated the duration of geminate and non-geminate consonants in both RS and WM positions. She reported unexpected gradient variability in the duration of geminates in both WM and RS contexts, with the extent of consonant lengthening varying significantly according to a

range of phonetic and prosodic contextual factors. The effects, however, were less evident in WM position. Payne attributes the greater stability of WM geminates to their “elevated structural status and semantic importance” in Italian (2000:278). The possibility of some kind of isomorphic or phonological relationship between RS and WM gemination is weakened on two further counts. The first is, according to Payne, that WM gemination is paradigmatic/lexical in nature, while RS is prosodic/syntagmatic. The second is that “not having any semantic function, there is no reason to view word boundary gemination [= RS] as a binary contrast [of length]” (2000:277). On the question of the semantic function of RS, we note only that such a negative position appears to be too strong: RS doubling, like WM gemination, can in fact be lexically/semantically contrastive, for example, [lo.'da:to] *lodato* “praised” vs. [lod.'d ato] *l'ho dato* “I have given it” (Posner 1996: 236).

Matters are further complicated by reports that RS, unlike WM gemination, competes with other phenomena: it can be blocked by pauses, pitch breaks, and vowel lengthening at word<sub>1</sub>-word<sub>2</sub> juncture (Absalom et al. 2002 and references therein). These observations, along with Campos-Asatorkiza's (2004) and Payne's (2000) findings, combine to cast further doubt on the uniformity of both RS and WM gemination in Italian. Instead, they suggest that different explanations and mechanisms of accounting for the two kinds of gemination may be needed. In the case of WM gemination (regular, stable, categorical), phonological accounts that appeal to syllable weight would still apply. But if RS is in fact so different in nature, for example, more irregular, unstable and gradient, then it may be more appropriately accounted for as a phonetic, rather than a phonological phenomenon.

#### 4. *Aims*

The purpose of this study is to determine whether either of the two standpoints outlined above can be supported by phonetic evidence of RS in naturally occurring spontaneous speech. Since all previous experimental investigations of gemination in Italian have relied on controlled read speech recorded in a laboratory setting, it is possible that the categorical behaviour of RS geminates reported by Korzen (1980) and Marotta (1986) is an artefact of the data collection method. If RS is in fact a gradient phonetic phenomenon, it is more likely to appear as such in spontaneous speech. We examine the phonetic appearance of RS and WM geminates in Sieneese Italian, and whether other phenomena interact or compete with geminates in either context. If RS geminates prove to be less phonetically robust than WM geminates in this context, this may provide evidence in support of the position that RS is not a phonological phenomenon, as has been normally assumed by phonologists.

## 5. Methods

### 5.1 The data

The data are taken from a corpus of spontaneous Sieneese speech, recorded in Siena, Tuscany in 1997. Descriptions of RS are typically based upon secondary data (for example, Borrelli 2002), or at best use highly controlled recordings. Instead, we base our ongoing investigation (for example, Absalom et al. 2002; Absalom et al. 2003; Stevens & Hajek 2004) on spontaneous speech data. Results for this paper are taken from 4 speakers, two male and two female, who all live and work in Siena. All speakers spoke on a subject of their choice for 5-10 minutes. Sieneese Italian closely resembles the standard language apart from the *gorgia toscana*, a well-known process in which singleton consonants are spirantized or even deleted (see for example, Hajek 1996; Giannelli 1976; Giannelli & Cravens 1997) as in for example, *la patata* [laɸa'θa:θa] “potato”; *la coca cola* [la 'ho:ha'ho:la] “Coca Cola”. The presence of the *gorgia toscana* complicates any comparison between consonants in RS environments and their corresponding singletons, and is the primary reason why, in the present study, we compare RS consonants with WM geminates instead.

Given the importance of the stress to weight principle in Sieneese Italian, as in Standard Italian, we need also to report briefly on how vowel length interacts with consonant length and gemination: vowels are predictably lengthened in stressed word-medial open syllables, for example, /fato/ ['fa:to] ‘fate’ but are otherwise always short before geminates, other clusters and in other positions, for example, /fatto/ ['fatto] “fact”, and /sepolto/ ~ /seppellito/ [se'polto] ~ [seppel'lito] “buried”.<sup>2</sup>

### 5.2 Methodology

For the purposes of this paper we examine only the voiceless stops /pp tt kk/ that occur in our spontaneous data set. For the RS tokens, we listed all 66 final-stressed words that preceded word-initial /p/, /t/ or /k/ in the data. 23 cases where potential RS was blocked at the word boundary were eliminated.<sup>3</sup>

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<sup>2</sup> Absalom et al (1997, 2002) note that vowel length is in fact contrastive in word-final position, for example, /fi'ni:/ “I finished” and /fi'ni/ “he finished”. As it is a marginal phenomenon and is not germane to discussion here, it will not be referred to again.

<sup>3</sup> For example RS is blocked in the following case: *mia madre mi ha portato il caffè, come ogni mattina* “my mother brought me coffee, as [she does] every morning” (s4:3). While *caffè come* is a potential RS sequence, doubling is blocked by the pause that falls between the two words.

Using the Praat program, we analysed the remaining 43 +RS /p t k/ sequences, and 115 WM /pp tt kk/ that appeared in the data.<sup>4</sup>

We measured the duration of the closure period (from the offset of voicing to the onset of the burst) and the release period (from the onset of the burst to the onset of formant activity for the following vowel) and inspected the nature of the V-C transition.<sup>5</sup> It became clear that there was significant acoustic variation in the appearance of individual sequences, with evidence of a range of glottal phenomena preceding consonant closure. These most typically took the form of preaspiration, but also involved breathy voice and occasional creak. The duration of this glottal region (measured from the offset of modal voice to the onset of closure) was also recorded for /VC(:)/ sequences in which it occurred. Previous reports of a breathy offset for vowels in preconsonantal position in Italian are found in van Santen & D'Imperio (1999) and Gobl & Ni Chasaide (1999). Discussed in more detail below, the primary difficulty associated with these phenomena, aside from maintaining consistent segmentation at the phonetic level, is determining whether they should be assigned to either the phonological vowel or consonant portion of the /VC:/ sequence.

### 5.3 Results

5.3.1. *Acoustic appearance of WM and RS geminates.* The glottal phenomena observed in the V-C transition consist of preaspiration, breathy voice, and creak – although the last was relatively rare across tokens. Only briefly exemplified here, the considerable fine-grained variation of geminates in these data is discussed in more detail in Stevens (2004). For the purposes of comparison, we first provide an example of a ‘normal’ geminate sequence, without any glottalization in the V-C transition in which only the vowel, closure and release were measured and recorded (Figure 1). In contrast with the clear vowel to consonant transition in Figure 1, a period of breathy voice, labelled as [ɦ], precedes full closure in Figure 2. On the spectrogram breathy voice shows a loss of definition in the individual formants and increased energy around F4, corresponding to the increased airflow through the glottis.

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<sup>4</sup> WM geminates can occur in both pre- and post-tonic position in Italian, for example, *abbáte* ‘abbot’ and *ébbi* ‘I had’. In our data set 75 of the total 115 tokens of WM /pp tt kk/ are post-tonic.

<sup>5</sup> The duration of the release portion varies considerably, and is often unexpectedly fricated and long (see eg Figures 3 and 4 in particular).

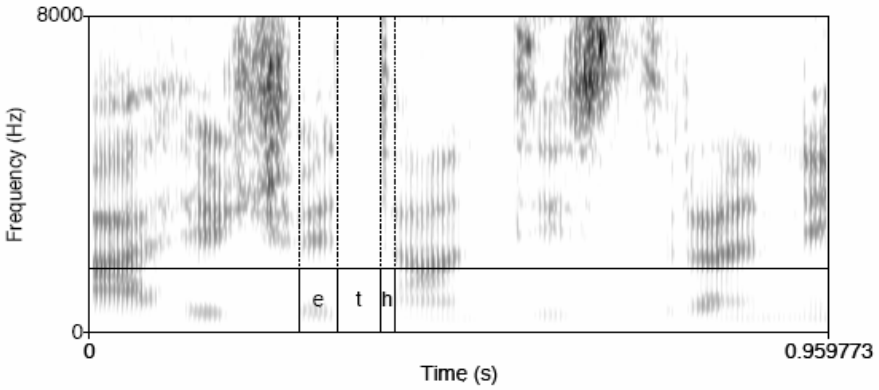


Figure 1: *The RS sequence /e#t/ in the phrase ...c'è tanti stranieri, tantissima gente “there’s a lot of foreigners, a lot of people” (speaker 3)*

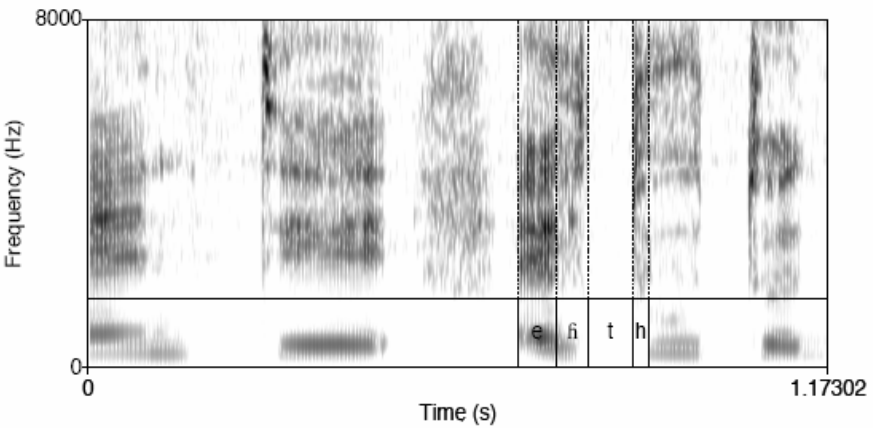


Figure 2: *Breathy voice in the RS sequence /e#t/ in the phrase non vedi niente, è tutto deserto ‘you don’t see anything, it’s all deserted’ (speaker 3). Breathy voice, labelled as [fi] precedes consonant closure for [t]*

In Figure 3 preaspiration, labelled as [h], precedes closure. Preaspiration resembles breathy voice on the spectrogram except that voicing associated with the preceding vowel does not continue throughout the frication energy seen in the region of the higher formants. From a cross-linguistic perspective preaspiration is an extremely rare phenomenon, most often associated in the literature with Scandinavian languages (see for example, van Dommelen 1998

for Norwegian; and Helgason 1998, 2001 for Swedish). Unlike ‘normal’ voiceless consonant closure, in which the timing of the laryngeal and supralaryngeal closures is aligned, in preaspirated stops the opening at the glottis widens preceding supralaryngeal closure. This typically results in a breathy vowel offset and some voiceless glottal frication preceding full consonant closure, i.e. [hC], as in Figure 3.

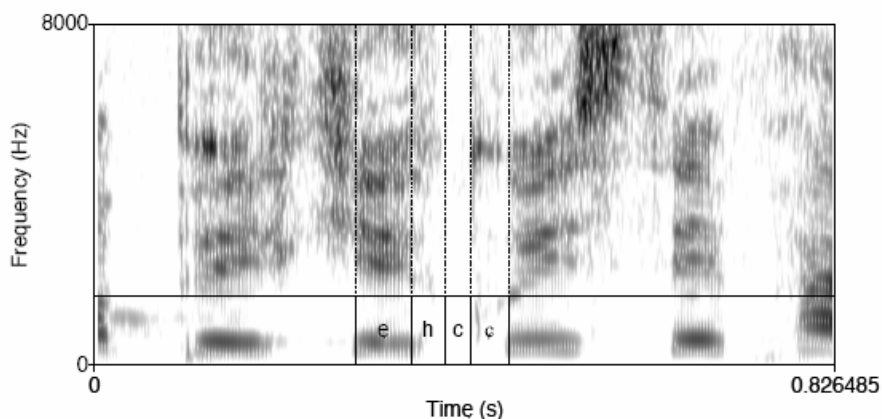


Figure 3: The RS sequence /e#k/ in the phrase *perché queste palline...* ‘because these little balls...’ (s3), showing both pre- and postaspiration

Of particular interest to the present discussion is the fact that preaspiration and the other glottal phenomena occur preceding both WM and RS consonants in the data. We might reasonably expect, based upon reports (for example, Payne 2000), that RS consonants should display more phonetic variability than their WM counterparts and that preaspiration (and related phenomena) would be limited to RS geminates. However, no such differentiation occurs. In Figure 4 a similar region of preaspiration preceding consonant closure to that seen above in the RS sequence /e#k(:)/, is seen in the corresponding WM /ek:/ sequence.

In terms of an initial comparison between the acoustic appearance of RS and WM geminates, insofar as the occurrence of glottal phenomena is concerned, RS geminates are seen to resemble their WM counterparts. It is clear however that in naturally occurring Siense Italian speech, both types of geminate show a range of articulations (in particular preaspiration) that have not been previously reported.

While we acknowledge the acoustic variation that occurs, we refer hereafter to the glottal phenomena as preaspiration (given that it is by far the



most frequent type) and for the purposes of this paper the tokens were divided into: (1) ‘preaspirated’ tokens, for example, Fig. 2, 3 & 4; and (2) ‘normal’ tokens without glottal phenomena in the /VC:/ sequence, for example, Fig. 1. Having established these two broad groups, we now investigate the frequency, duration and possible role of preaspiration in both RS and WM sequences.

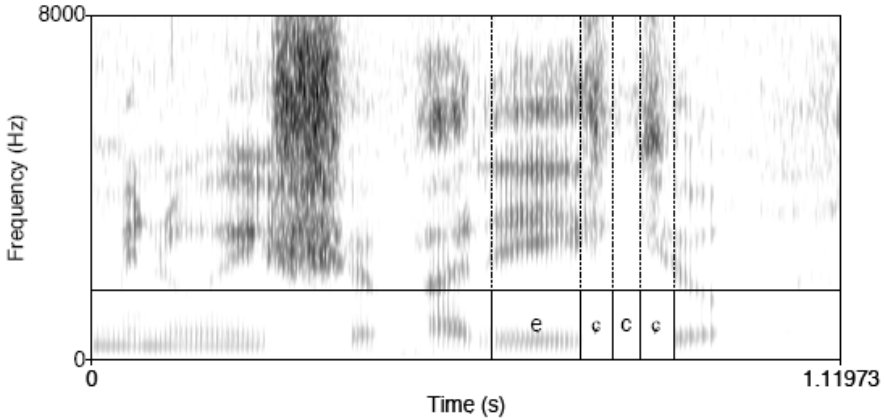


Figure 4: *The WM /ek:/ sequence in parecchio ‘quite a lot’ (s3) with pre- and postaspiration (labelled as [ç]) on the geminate /kk/*

5.3.2. *Preaspiration: Frequency.* We first examine the frequency of preaspiration in the data. Table 1 shows the number of preaspirated voiceless geminate stop tokens out of the total number of tokens, for each consonant place of articulation.

	RS		WM	
K	15/20	(75%)	12/17	(71%)
T	3/6	(50%)	48/88	(55%)
P	1/17	(6%)	2/10	(20%)
Total	19/43	(44%)	62/115	(49%)

Table 1: *Actual number of occurrences of preaspiration (and percentages), out of all /VC:/ sequences examined, for consonant place of articulation and geminate type (RS & WM)*

We see in Table 1 that preaspiration occurs at all consonant places of articulation examined. Additionally, glottal phenomena occur for both types of geminate examined, that is, both RS and WM geminates, at a similar frequency across each place of articulation. Overall 44% of RS and 49% of WM geminate sequences have glottalization phenomena preceding closure. Other data shows that preaspiration also occurs in the speech of all four speakers at a relatively high frequency (approx. 40 ~ 60% of tokens). Such elevated frequency of occurrence also confirms that preaspiration is not a marginal phenomenon in spoken Sieneese.

5.3.3. *Preaspiration: Duration.* Given these frequencies, we decided to investigate the possible role of preaspiration in Sieneese Italian by determining the impact of preaspiration (and other associated glottal phenomena) upon the duration of surrounding segments.<sup>6</sup>

	A	B	C	D	E	F	G
/CC/	Vowel	Pre	Closure & release	(B+C)	(A+B+C)	No. tokens	Ratio C:VC
WM +pre	66	54	78	132	197	62	68%
-pre	87	0	113	113	200	53	58%
RS +pre	50	45.3	68.7	114.3	157.7	19	70%
-pre	66.3	0	99.3	99.3	165.7	24	60%

Table 2: *Duration measurements in ms. for WM and RS geminate /VC(:)/ sequences. ‘+/-pre’ refers to whether preaspiration (and/or other glottal phenomena), occur in the /VC(:)/ sequence*

In Table 2 we see that in both contexts the duration of preaspiration (45.3~54 ms.) is segment-like in Sieneese (Column B), and that the duration of the closure period is much shorter when preaspiration occurs in the /VC(:)/ sequence (Column C).<sup>7</sup> These two observations combine to suggest that phonetically long [C:] alternates with preaspirated [hC] in the spontaneous speech data. Statistical analysis (ANOVA) shows that the presence of preaspiration has a highly significant effect on the duration of the following consonant ( $p < 0.05$ ). While vowels are also shorter when preaspiration occurs, the effect was not found to be significant ( $p = 0.053$ ). Given these results, we

<sup>6</sup> Elsewhere we note that in Sieneese Italian, the incidence of preaspiration cannot be attributed to stress, as has been suggested for other languages (for more details, see Stevens & Hajek, 2004).

<sup>7</sup> At greater than 30ms this difference is also, on average, perceptually salient.

include preaspiration in the overall duration of the phonological consonant rather than the vowel. We suggest that preaspiration is a gesture intended by the speaker to maintain, if not enhance, the perception of voiceless geminate consonants as long and voiceless albeit with reduced supralaryngeal effort. Motivation for partial articulatory reduction results from the obvious conflict between production requirements and reduced time at fast speech rates which are typical of spontaneous spoken Siense. This interpretation is supported by figures in Columns D and E. In the former, we see that the overall duration of the preaspirated consonant is longer than its normal congenor in both RS and WM positions. In the latter we see that despite the phonetic variation that occurs, there is relative stability in the overall duration of /VCC/ sequences between +/-pre tokens in both RS and WM categories. Leaving preaspiration aside for the moment, we turn now to the original comparison between RS and WM geminates in the data.

5.3.4. *RS vs WM geminates: durations.* In order to more broadly compare WM and RS geminates in Table 3 we have collapsed the data from Table 2. That is, with preaspiration included in the overall duration of the consonant, we combined preaspirated and normal tokens for both geminate types.

	A	B	C	D	E
/CC/	Vowel	Cons.	(A+B)	No. tokens	Ratio C/VC:
WM	77	123	200	115	62%
RS	58	107	165	43	65%

Table 3: *Average duration measurements in ms. for both WM and RS sequences. Preaspiration is included in the overall consonant duration (i.e. column B), that is, +/- preaspirated tokens are combined*

We can see in Column B of Table 3 that the average duration of word-boundary (RS) vowels and consonants is 19ms and 16ms shorter respectively than that of WM geminates, and that the duration of the entire RS /VC:/ sequence is 35ms shorter than for WM sequences. However, this does not necessarily suggest that WM geminates are more robust than word-boundary RS geminates. In the first instance, the overall reduction in vowel and consonant duration in RS contexts is too small to be perceived and does not appear to be statistically significant. We need also to emphasize that the data are taken from spontaneous speech and therefore prosodic context could not be controlled for. Apart from prosodic phrasing effects, the slightly lower RS

consonant duration value for our Sienese data is also conditioned by the frequent destressing of stressed RS triggers in connected speech, for example, *tre capre* /'tre 'kapre/ → [tre k'ka:ɸre] 'three goats'. This process leads to a reduction in the overall phonetic duration of the pretonic RS syllable, when compared to the lexically and phrasally stressed initial syllable of the following word. Our results are in this regard consistent with Ladd & Scobbie's (2003: note 9) finding for Sardinian, a related Romance language, that "[i]t is precisely because the prosodic contexts for initial and medial consonants are not typically comparable that, *on average*, Sardinian post-lexical geminates are shorter than lexical geminates". They conclude, however, that RS and WM geminates in this language are phonologically the same, and hence they should be accounted for with the same unified phonological treatment.

Furthermore, rather than being signalled by consonant duration alone (Table 3, Column B), it is well known that the duration of the preceding vowel also contributes significantly to the perception of geminates and of overall rhyme weight ([V:] v. [VC]) in stressed position in Italian. Recent experimental evidence (for example, Pickett et al. 1999) also confirms that across different speaking rates relative ratios of consonant and vowel durations, rather than the individual duration values themselves, are the most reliable indicators of the long v. short consonant contrast in Italian.<sup>8</sup> Therefore, given the inherent durational variability of vowels and consonants in our spontaneous data set, we compare RS and WM geminates with respect to the duration of the overall /VC:/ sequence. Column E shows that the percentage of /VC:/ duration occupied by the phonetic consonant segment (i.e. Column B/Column C), is very similar for WM and RS geminates. Therefore, while the average duration of RS sequences is slightly less than their WM counterparts, the similar consonant to overall duration ratio values provide support for the notion that RS and WM sequences do resemble each other. Congruity between RS and WM geminates is further confirmed when we consider the specific impact of preaspiration on consonant to rhyme duration ratios. As seen in Column G of Table 2, ratio values in both preaspirating and non-preaspirating contexts are essentially the same for each in RS and WM position. But we note too the effect of preaspiration: the overall C/VC ratio increases by 10% in both positions. Such a finding supports the view put forward above that speakers may be using preaspiration as an enhancement strategy in difficult

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<sup>8</sup> Pickett et al. (1999) actually find the C/V ratio to be a reliable measure of the singleton/geminate contrast across speaking rates. However here we refer only to the ratio between consonant duration and the entire /VC:/ sequence, since overall syllable rhyme weight is so important to gemination in Italian.

circumstances (i.e. fast speech) to improve the perceptibility of voiceless gemination, despite the evident articulatory supralaryngeal reduction.

## 6. Discussion

Results presented here show that RS geminates do resemble WM geminates in naturally occurring speech according to the following criteria: (1) shared acoustic appearance, (2) frequency of preaspiration and related phenomena, and (3) percentage of the /VC:/ sequence occupied by the postvocalic consonant. Consonant duration differences occur but are minor and can be accounted for. Therefore, at least from these initial results, RS geminates should be considered phonetically and phonologically equivalent to their WM counterparts, *contra* the alternative view discussed previously. In terms of the two conflicting views of RS initially outlined, our phonetic evidence supports the traditional descriptive position that geminates are essentially the same within and across words, i.e. they are regular, predictable, categorical and hence phonological to the same degree.

Aside from the phonological status of RS, a major outcome of this investigation was the uncovering of the phonetic complexity of geminates in natural Sieneese Italian speech. In addition to the expected straightforward increase in closure duration, we also found preaspiration and a range of associated glottal phenomena to occur frequently preceding consonant closure. Although we did not expect to find preaspiration when we began this study, we are nonetheless able to account for it.

Given its pervasiveness in our natural speech data, preaspiration needs also to be incorporated into phonological accounts of RS and WM geminates in Italian. Our results are compatible with a moraic/stress to weight account of gemination, but some fine-tuning is required.

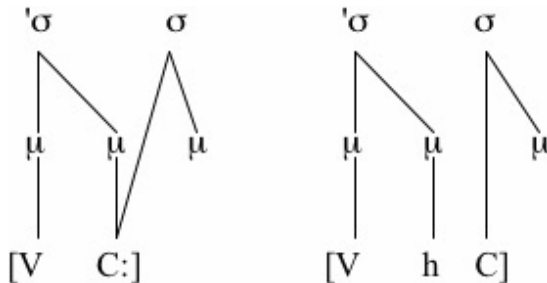


Figure 5: Moraic diagrams showing how the final mora in stressed closed syllables can be filled by either long [C:] (left) or by preaspiration (given as [h], on the right)

According to moraic or stress to weight accounts of gemination in Italian (for example, Repetti 1991), in all geminating contexts, the second mora of the stressed syllable always surfaces with a long consonant simultaneously attached to it and to the weightless onset of the following syllable. However, in Figure 5 we present two alternative structures that better reflect our findings and allows us to model preaspiration as a phonological process: the final mora of the stressed closed syllable is filled by either longer consonant closure (as in the spectrogram in Figure 1) or be preaspiration (for example, Figures 2, 3 & 4). This alternative interpretation is supported by the fact that preaspiration has on average a segment-like duration (cf. Table 2), and also by the fact the duration of preaspirated consonants [hC] is seen to resemble that of ‘normal’ [C:].

Overall results in this paper have shown that post-lexical and lexical geminates are phonetically the same in Sienese Italian, in line with Ladd & Scobbie’s conclusions (2003) for Sardinian. While the acoustic appearance of RS geminates varies considerably in naturally occurring speech, WM geminates show a similar degree of phonetic variation. We consider therefore that both types of geminate are phonetically variable in natural speech, but share the same phonological status. Given these findings, we should continue to investigate the phonetics of RS and at the same time continue to understand and describe the phenomenon in phonological terms.

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# ROMANIAN N-WORDS AND THE FINITE/NON-FINITE DISTINCTION\*

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## 1. Introduction

In Romanian, one or more so-called n-words (Laka 1990), such as *nimic* ‘nothing’ or *nimeni* ‘nobody’, can follow sentential negation without contributing any negative meaning of their own. In other words, even though a Romanian clause may contain what looks like more than one negation morpheme, the clause is understood as having only one negation.

- (1) a. N-a           zis **nimic nimănu**.  
not-PAST.3S said n-thing n-body.DAT  
“S/he didn’t say anything to anybody.”

This phenomenon, in which multiple occurrences of negative items within the same clause yield only one logical negation, is known in the literature as ‘negative concord’ (NC) (Labov 1974; Ladusaw 1992) and has been studied in a variety of languages.

In this paper I will examine the NC structures in Romanian and provide an account for the behavior of n-words in this language. It is shown that Romanian shares properties with both Slavic and Romance languages. In finite, subjunctive and imperative clauses Romanian n-words behave like polarity sensitive existentials (EQ), just like their counterparts in Polish (Błaszczak 1998; Przepiorkowski and Kupsc 1997) and Russian (Pereltsvaig 1998, 1999)<sup>1</sup>. In non-finite contexts they seem to be ambiguous between a negative quantifier (NQ) and an EQ reading, similarly to n-words in Spanish and Italian (Laka 1990; Zanuttini 1997; Herburger 2001; Alonso-Ovalle and Guerzoni 2003, among others).

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\* I am grateful to Rajesh Bhatt and Bernhard Schwarz for input and discussion. Thanks also to the anonymous reviewers for their helpful comments and to Lisa Green, Frederick Hoyt and Junko Shimoyama for discussion and suggestions.

<sup>1</sup> This pattern is actually not unique to Slavic languages; it can also be observed in some Italian dialects of the North-eastern area (Zanuttini 1997).

The resemblance to Spanish and Italian is only partial though, as Romanian pre-verbal n-words cannot license post-verbal ones, in spite of being able to occur by themselves in non-finite contexts<sup>2</sup>.

The problem then in characterizing Romanian n-words is to capture the contrast between the interpretation of n-words in finite vs. non-finite clauses on the one hand, and the ungrammaticality of two n-words in the absence of negation in non-finite contexts, on the other hand.

The proposed solution builds on Alonso-Ovalle and Guerzoni's (2003) analysis for Spanish and Italian. It assumes that a silent negation is present in non-finite environments, which is responsible for the licensing of pre-verbal n-words in these contexts. I show that this licensing is subject to locality constraints, which explains why a post-verbal n-word cannot be licensed in the presence of a pre-verbal one. Moreover, I argue that the so called double negation reading in non-finite environments involves partial reconstruction. The pre-verbal n-word does not reconstruct to its base position but rather to a site below the silent negation and above the overt non-finite negation.

The paper is organized as follows: Section 2 presents the distribution of n-words in Romanian while contrasting it to that of n-words in other languages. A number of possible analyses and their caveats are discussed in Section 3. Subsection 3.4 introduces the proposed solution. Section 4 concludes.

## **2. The distribution of Romanian n-words**

As mentioned in the introduction, Romanian n-words have a curious distribution: they behave differently depending on whether they occur in finite or non-finite environments.

### *2.1 Finite environments*

In finite, as well as subjunctive and imperative clauses, n-words exhibit a uniform pattern: both pre-verbal and post-verbal n-words need to co-occur with negation and the sentences that contain them have NC interpretations (2 - 5).

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<sup>2</sup> Given that infinitivals pattern with finite clauses, this generalization is not entirely accurate. However, for lack of a better descriptive terminology, I will refer to finite, subjunctive and imperative clauses using the term *finite* and to participles and supines by using the term *non-finite*.

## (2) Indicative

- |  |  |
|--|--|
| a. <b>Nimeni</b> *( <b>nu</b> ) vine.<br>n-body not comes<br>"Nobody comes." | b. *( <b>Nu</b> ) mănâncă <b>nimic</b> .<br>not eats n-thing<br>"S/he doesn't eat anything." |
|--|--|

## (3) Subjunctive

- |   |   |
|---|---|
| a. <b>Nimeni</b> să *( <b>nu</b> ) plece.<br>n-body SUBJ. not leave.SUBJ.3S<br>"Nobody should leave." | b. Să *( <b>nu</b> ) mănânce <b>nimic</b> .<br>SUBJ not eat.SUBJ.3S n-thing<br>"S/he shouldn't eat anything." |
|---|---|

## (4) Imperative - negative form

- |   |  |
|---|--|
| a. <b>Nimic nu</b> lua de la ei!<br>n-thing not take.IMP.2S from them<br>"Don't take anything from them!" | b. <b>Nu</b> lua <b>nimic</b> !<br>not take.IMP.2S n-thing<br>"Don't take anything!" |
|---|--|

## (5) Imperative - affirmative form

- |   |  |
|---|--|
| a. * <b>Nimic</b> ia de la ei!<br>n-thing take.IMP.2S from them<br>"Don't take anything from them!" | b. * <b>Ia</b> <b>nimic</b> !<br>take.IMP.2S n-thing<br>"Don't take anything!" |
|---|--|

By itself, the pattern in (2 - 5) is not very exciting: Romanian n-words seem to always require the presence of sentential negation, that is of an overt negative licenser, whether they are in-situ or to the left of the verb<sup>3</sup>. Under a popular view (Ladusaw 1992; Giannakidou 1997), this makes them be considered polarity sensitive existentials which are interpreted inside the scope of a negative operator<sup>4</sup>. Similar arguments have been put forth for Polish (Blaszczak 1998) and Russian (Pereltsvaig 1998), where n-words are consistently ungrammatical in the absence of sentential negation (6, 7).

<sup>3</sup> Note that Romanian is considered to be a VSO language.

<sup>4</sup> See however Giannakidou (2000) and Shimoyama (2004) for an analysis of n-words as universals scoping outside negation.

## (6) Polish

- a. Marysia **\*(nie)** dała **nikomu** książki.  
 Mary not gave n-body book  
 “Mary didn’t give anyone a/the book.”  
 (Przepiorkowski and Kupsc 1997:8)
- b. **Nikt** **\*(nie)** przyszedł.  
 n-body not came  
 “Nobody came.”  
 (Błaszczak 1998:4)

## (7) Russian

- |  |  |
|--|--|
| <p>a. Ja <b>ne</b> vizhu <b>nikogo</b>.<br/>         I not see no one<br/>         “I don’t see anyone.”<br/>         (Brown 1999)</p> | <p>b. Ja <b>nikogo</b> <b>*(ne)</b> vizhu.<br/>         I no one not see<br/>         “I don’t see anyone”<br/>         (Brown 1999)</p> |
|--|--|

2.2 *Non-finite contexts*

The story of Romanian n-words becomes more interesting once we look at non-finite clauses. In this context, Romanian displays an asymmetry between the pre-verbal and post-verbal n-words. More precisely, with past participles, present participles and supines<sup>5</sup>, pre-verbal n-words can appear by themselves (8a - 10a) while post-verbal ones cannot (8b - 10b). The latter still need to co-occur with negation.

## (8) Past Participle

- a. o casă de **nimeni** locuită  
 a house by n-body inhabited  
 “a house that is not inhabited by anyone”
- b. o casă **\*(ne)**locuită de **nimeni**  
 a house (not)inhabited by n-body  
 “a house that is not inhabited by anyone”

<sup>5</sup> The infinitival construction is an exception. Here pre-verbal n-words behave like in finite contexts:

- |   |   |
|---|---|
| <p>a. <b>nimic</b> a <b>*(nu)</b> lua<br/>         n-thing to not take<br/>         “not taking anything”</p> | <p>b. a <b>*(nu)</b> lua <b>nimic</b><br/>         to not take n-thing<br/>         “not taking anything”</p> |
|---|---|

## (9) Present Participle

- a. mâncare **deloc** aburindă  
 food at all steaming  
 “food that is not steaming at all”
- b. \*(**ne**)mâncând **deloc**  
 (not)eating n-thing  
 “not eating at all”

## (10) Supine

- a. iubire **nicăieri** de găsit  
 love n-where SUPINE found  
 “a love that cannot be found anywhere else”
- b. de \*(**ne**)găsit **nicăieri**  
 SUPINE (not)found n-where  
 “not to be found anywhere”

Secondly, post-verbal n-words are interpreted as entering into NC, as indicated in the translation of examples (8b - 10b), while pre-verbal n-words in conjunction with negated verbs give rise to the double negation (DN) reading (11).

- (11) a. <sup>DN</sup> o carte **niciodată** **necitată**  
 a book never not-quoted  
 “a book never unquoted” = “a book that is always quoted”
- b. ?? <sup>DN</sup> un film de **nimeni** **nevăzut**  
 a film by n-body not-seen  
 “a film by no one unseen” = “a film seen by everyone”<sup>6</sup>

It should be noted at this point that the negation showing up with the verb differs in form between the finite and non-finite environments. In indicative, subjunctive and imperative clauses it has the form *nu*, while with participles, gerunds and supines, it is instantiated as *ne*. I will get back to this distinction in Section 3.2, where the properties of the two negations are examined more closely.

At first glance, the behavior of Romanian n-words in non-finite contexts coincides with that of n-words in Spanish and Italian (12 - 14).

- (12) Pre-verbal n-words
- |    |   |    |   |
|----|---|----|---|
| a. | <b>Nadie</b> vino.<br>n-body came<br>“Nobody came.”<br>(SP, Herburger 2001:289) | b. | <b>Nessuno</b> ha telefonato.<br>n-body has called<br>“Nobody called.”<br>(IT, Guerzoni 2003) |
|----|---|----|---|
- (13) a. <sup>DN</sup> **Nadie no** vino. (SP, Laka 1990 :104 )  
n-body not came  
“Nobody didn’t come.” = “Everyone came.”
- b. <sup>DN</sup> **Nessuno non** ho incontrato. (IT, Guerzoni 2003)  
n-body not I met  
“Nobody I didn’t meet.” = “I met everybody.”
- (14) Post-verbal n-words
- |    |  |    |   |
|----|--|----|---|
| a. | * <b>(No)</b> vino <b>nadie</b> .<br>not came n-body<br>“Nobody came.”<br>(SP, Herburger 2001:289) | b. | * <b>(Non)</b> ha detto <b>niente</b> .<br>not past.3s said n-thing<br>“She hasn’t said anything.”<br>(IT, Zanuttini 1997:10) |
|----|--|----|---|

Just like in these two languages, Romanian n-words seem to be ambiguous between a NQ and an EQ interpretation. Pre-verbally, they appear to be inherently negative, that is they do not require any (overt) licenser and the clauses in which they occur are interpreted as simple negations. If a second negative item is present, the clause lends itself to a DN reading. Post-verbal n-words, however, do not show any negative quantifier properties; they retain their EQ behavior noted in finite clauses.

### 2.3 An idiosyncrasy of Romanian

So far, it has been shown that the distribution of Romanian n-words is somewhat unusual. In finite clauses Romanian n-words behave like existential quantifiers (on a par with Polish and Russian n-words), while in non-finite clauses they show mixed NQ and EQ properties (similarly to their Spanish and Italian counterparts). Romanian turns out to be even more intricate as in non-finite environments it does not entirely resemble Spanish and Italian. In these two languages a pre-verbal n-word is able to license a post-verbal one (15). This is not the case in Romanian: example (16) is clearly ungrammatical.

- (15) Two n-words
- a. **Nadie** miraba a **nadie**.                      b. **Nessuno** sapeva **niente**.  
     n-body looked at n-body                      n-body knew n-thing  
     “Nobody looked at anybody.”                      “Nobody knew anything.”  
     (SP, Herburger 2001:290)                      (IT, Guerzoni 2003)
- (16) \* un film de **nimeni** văzut **niciodată**  
     a film by n-body seen n-ever  
     “a film that has never been seen by anyone”

The phenomenon is quite puzzling if the pre-verbal n-word had indeed inherently negative properties as the examples in (8a - 10, 11) suggest.

The table in (17) summarizes the behavior of n-words in Romanian.

(17) *Romanian*

	FINITE		NON-FINITE	
	Post-verbal	Pre-verbal	Post-verbal	Pre-verbal
<i>Must co-occur with Neg</i>	yes	yes	yes	no
<i>Interpretation with Neg</i>	NC	NC	NC	DN

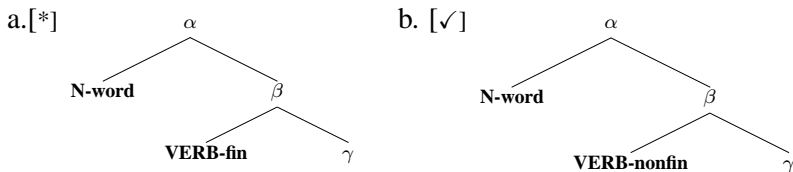
2.4 *Desiderata for an analysis*

Building upon the generalizations presented in the previous three sections, an analysis of Romanian n-words should be able to account for the following three facts.

First, it should explain why in finite environments only the NC reading is possible. Second, it should derive the fact that the DN interpretation is forced in non-finite environments whenever a pre-verbal n-word co-occurs with negation. Third, it should answer the question of why a pre-verbal n-word, in spite of being able to occur by itself in non-finite contexts, cannot license a post-verbal one.

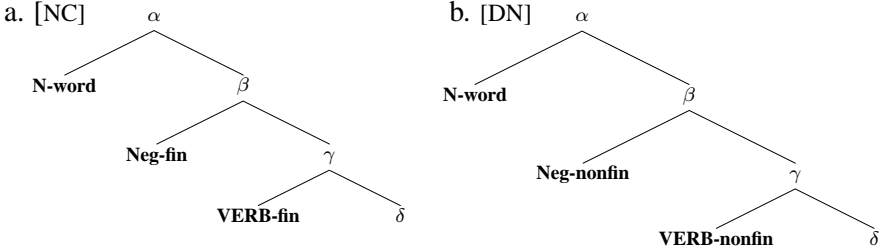
In structural terms that is to say that one should find an explanation for the contrasts in configurations (18 - 20).

(18)

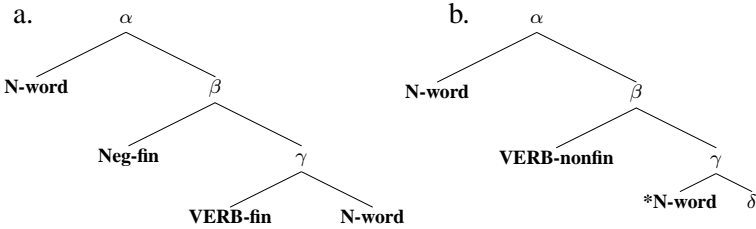




(19)



(20)



Configurations (18) and (19) contain the contrasts that model the behavior of pre-verbal n-words. They are basically two faces of the same coin. First, pre-verbal n-words in finite contexts need an overt licensor (18a), while in non-finite contexts they do not need one; they are fine by themselves as seen in (18b). On the other hand, if an overt negation is added in the non-finite structure in (19b) it yields a DN reading, while in the finite structure in (19a) it merely makes licensing happen. Finally, the third contrast in (20) opposes the behavior of post-verbal n-words in finite and non-finite contexts.

**3. Deriving the behavior of Romanian n-words**

Since Romanian n-words in non-finite contexts behave very similarly to the Spanish and Italian ones, it is reasonable to take as a starting point proposals that have been made for these languages. Subsections 3.1 - 3.3 discuss some of these approaches and test whether they can be extended to account for the Romanian pattern or not. Subsection 3.4 presents the proposed solution.

**3.1 N-words are lexically ambiguous**

It has been shown that Romanian n-words are ambiguous: sometimes, they seem to be NQs, while at other times, they behave like polarity sensitive EQs.

This type of pattern makes it attractive to explore a lexical ambiguity solution to the problems described in Section 2.4.

Herburger (2001) noticed that in Spanish certain sentences are ambiguous between a single and a double negation reading (21). According to her, the availability of this dual interpretation is due to the lexical ambiguity of the n-words involved in those sentences:

- (21) a. **Nadie nunca** volvió a Cuba.  
 n-body n-ever returned to Cuba.  
 “Nobody ever returned to Cuba.” or  
 “<sup>DN</sup>Nobody never returned to Cuba.”
- b. **Dudo que nadie** lo sepa.  
 doubt that n-body it knowSUBJ.3S  
 “I doubt that anybody knows it” or  
 “<sup>DN</sup>I doubt that nobody knows it.”

In (21a), *nunca* can be interpreted as an EQ, ‘ever’ but also as a NQ, ‘never’, thus giving rise to a single or respectively, a double negation reading of the sentence. Similarly *nadie* in (21b) is lexically ambiguous between ‘anybody’ and ‘nobody’.

A closer investigation reveals that in Romanian there are no cases of dual interpretation along the lines of examples in (21). The NQ and EQ readings that Romanian n-words give rise to are always in complementary distribution. N-words look like NQs if they occur pre-verbally in non-finite contexts, but they behave as polarity sensitive existentials everywhere else. Additionally, n-words with a polarity sensitive EQ interpretation are only licensed in the presence of negation, but not by another n-word.

Consequently, extending Herburger’s proposal for Spanish n-words to Romanian doesn’t work very well. The lexical ambiguity analysis is too permissive for Romanian: it predicts ambiguities that are not attested.

### 3.2 NE has a silent variant

A second option to be explored in trying to account for the mixed behavior of Romanian n-words is based on the observation that in this language the negation with which the verb combines has different forms depending on whether it occurs in finite (*nu*) or non-finite environments (*ne*). It is possible that the finite/non-finite variation in the pattern of n-words could be caused by the distinct properties of the two negations.

Romance languages have provided evidence that there are various types of

negation, each with its specific characteristics (Zanutini 1997). In Romanian too the form distinction between the finite and non-finite negation corresponds to a couple of syntactic distinctions. One is adjacency with the finite/non-finite verb form: only pronominal clitics (and intensifiers<sup>7</sup>) can come in between the negation *nu* and the finite verb form. In the case of the non-finite negation *ne*, only the intensifier *mai* ‘more, still, before, again’ can intervene. Secondly, as apparent from the description, the finite negation *nu* requires [+T] complements. This is also proved by the fact that it takes suppletive imperative forms (4, 5). In contrast, the non-finite negation *ne* requires tenseless complements.

Consequently, it is not implausible that the form distinction between the two negations (*nu* vs. *ne*) is associated with different syntactic properties. In order to capture the mixed behavior of n-words in Romanian, let us consider that the non-finite negation *ne* has a silent variant, while the finite negation *nu* doesn’t.

To spell out this hypothesis: the finite negation *nu* is always overt and it can only license the pre-verbal n-word when it is expressed. In contrast, the non-finite negation *ne* is optionally expressed, and it has the ability to license the pre-verbal n-word even in those cases when it is silent. Next I will test whether such a hypothesis accounts for the three contrasts discussed in Section 2.4.

*The licensing contrast:* The pre-verbal n-word occurring by itself in non-finite structures (22b cf 18b) is licensed by the silent *ne*. The ungrammaticality of cases like (22a cf. 18a) correlates with the absence of an overtly realized finite negation.

(22) Licensing

- |                           |          |                                 |
|---------------------------|----------|---------------------------------|
| a.* Pe <b>nimeni</b> a    | păcălit. | b. om de <b>nimeni</b> păcălit  |
| acc n-body                | PAST.3S  | man by n-body                   |
| tricked                   |          | tricked                         |
| “He didn’t trick anyone”. |          | “a person that nobody tricked”. |

*The interpretation contrast:* in (19a) and (19b), the finite and respectively the non-finite negation is overtly expressed and thus both n-words get licensed. However, it is not clear why two overt negations would induce different readings: NC in one case, but DN in the other case. Thus the DN interpretation in non-finite contexts remains unexplained.

*The post-verbal n-words contrast:* There is no justification for why post-verbal n-words are fine in (20a) but disallowed in (20b). If the silent non-finite negation licenses the pre-verbal n-word, which presumably has moved from a post-verbal position after being licensed, why can’t the other post-verbal n-

<sup>7</sup> The term *intensifiers* refers to a set of 5 mono-syllabic adverbs which behave as clitics.

words get licensed too?

A possible answer is to say that the non-finite negation can do only one licensing. The claim would be empirically motivated if examples like (23) were ungrammatical.

- (23) o casă **nelocuită** de **nimeni niciodată**  
 a house not-inhabited by n-body n-ever  
 “a house that was never inhabited by anyone”

However, (23) is perfectly fine, which means that there is no support for arguing that *ne*, or its silent variant for the same matter, can only license a *single* n-word.

Summing up, a simplistic theory that postulates different syntactic properties for the two negations – one always expressed, the other optionally silent – accounts only for the first contrast mentioned in Section 2.4. It undergenerates for the second contrast, as it does not predict any DN readings and it overgenerates for the third, as post-verbal n-words are predicted to be grammatical if they co-occur with a pre-verbal n-word in non-finite contexts.

### 3.3 *Dissociating between NE and the silent negation*

In this section I discuss a more elaborate silent negation analysis (Alonso-Ovalle and Guerzoni 2003) and in the next one I will show how it can be modified to account for the Romanian data.

Alonso-Ovalle and Guerzoni argue that in Spanish and Italian n-words are existential quantifiers that are felicitous only in the scope of negation or of an averidical expression such as ‘without’ or ‘doubt’, but ungrammatical otherwise. Their proposal accounts in a straightforward manner for the distribution of post-verbal n-words. However, in order to explain the behavior of the pre-verbal n-words, an additional device is needed, namely the presence of a silent negation. The abstract negation is situated somewhere below the pre-verbal n-word(s) and above the sentential negation, possibly on the Focus head (24)<sup>8</sup>. The pre-verbal n-word activates the silent negation at the syntactic level. Once activated the silent negation licenses semantically the pre-verbal n-word. The DN readings are derived from the interaction between the abstract negation and the overt negation.

- (24) [<sub>FocusP</sub> n-word<sub>1</sub> [<sub>Focus</sub> [neg] [<sub>IP</sub> t<sub>1</sub> [.....] ] ] ]

<sup>8</sup> A similar analysis was proposed by Isac (2002) for Italian, Spanish and European Portuguese. On the basis of data from finite environments, Isac argues that Romanian n-words differ from their counterparts in these languages in that they are licensed by the sentential negative marker alone and they can check focus independently.

The advantage of extending Alonso-Ovalle and Guerzoni's account to Romanian is that it will explain why the pre-verbal n-word does not need an overt licenser in non-finite clauses and why, in the same contexts, the co-occurrence of negation with a pre-verbal n-word yields a DN reading. Moreover, by placing the silent negation in a different position from the overt one accounts for the interpretation contrast between (25a) and (25b). No structural ambiguities are expected if the abstract negation and *ne* occupy the same position.

- (25) a. o carte [consistent **necitată** de **nimeni**] (consistently >*ne*)  
 a book consistently not-quoted by n-body  
 “a book that is *literally* never quoted”  
 (i.e. there is a consistent behavior where no one quotes the book)
- b. o carte [de **nimeni** consistent citată] (Silent Neg >consistently)  
 a book by n-body consistently quoted  
 “a book such that everyone sometimes fails to quote it”

Nevertheless, nothing is being said as to why in finite contexts, only the NC is possible and why in non-finite contexts a pre-verbal n-word followed by a post-verbal one is ungrammatical. If the pre-verbal n-word reconstructs to a post-verbal position in order to get licensed in the scope of the silent negation, it is very puzzling that other post-verbal n-words cannot get licensed. In other words, configurations (18a, 19a and 20b) in the desiderata section remain unexplained.

### 3.4 *Locality, reconstruction and the silent negation*

I suggest that a silent negation analysis which builds on Alonso-Ovalle and Guerzoni's proposal can explain the pattern exhibited by the Romanian n-words.

Here are the ingredients: first, I assume that Romanian n-words are uniformly polarity sensitive EQs which are licensed morphosyntactically in the scope of a negative operator. Additionally, there is evidence that in Romanian, this operator must be anti-morphic, in the sense of Zwarts (1996)<sup>9</sup>.

Secondly, this licensing is shown to be subject to locality constraints. Thirdly, I argue that the DN reading involves partial reconstruction. Finally, I postulate that the silent negation is present in non-finite contexts but absent in finite ones. Below I illustrate how these ingredients can be put to work in non-finite and

<sup>9</sup> Romanian n-words are grammatical only in the scope of negation or of *fără* ‘without’:

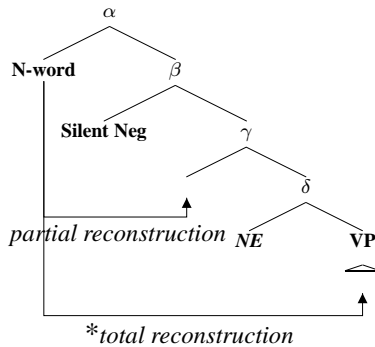
- a. Ion a venit la petrecere **fără nimeni**.  
 Ion PAST.3S come at party without n-body  
 “Ion came to the party without anyone.”

respectively finite clauses.

Non-finite clauses contain an abstract negation which is situated somewhere above the overt negation *ne*. The silent negation becomes active only in the presence of a pre-verbal n-word (cf. Alonso-Ovalle and Guerzoni 2003).

*Licensing and Interpretation:* Being polarity sensitive existentials which are licensed under c-command, pre-verbal n-words need to reconstruct at LF under the scope of the silent negation; otherwise they are ungrammatical. In contrast to Alonso-Ovalle and Guerzoni, I argue that pre-verbal n-words do not reconstruct to their base, post-verbal position, but rather to a site which is below the silent negation and higher than the overt negation *ne*.

(26)



If the pre-verbal n-word were to reconstruct to its base position, namely below *ne* (27a), the interpretation predicted would be the one in (27b).

- (27) a. Silent Neg >*ne* >verb >N-word
- b.  $\neg \neg \exists = \exists$

However, the meaning attested for examples like (28) corresponds to the LF in (29b) below, rather than to the one in (27b). This interpretation proves that the pre-verbal n-word reconstructs to a position situated somewhere below the silent negation and above the non-finite negation *ne* (29a).

- (28) articol **niciodată** **necitat**  
       article n-ever not-quoted  
       “an article that is *always* quoted”

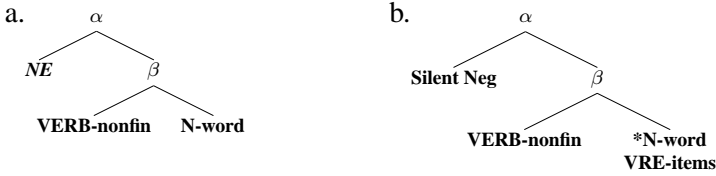
- (29) a. Silent Neg >N-word >*ne* >verb
- b.  $\neg \exists \neg = \forall$

At this point, it becomes apparent that the DN reading does not come about only because of the interaction between the silent and the non-finite negation. Reconstruction has a crucial impact. Partial reconstruction yields universal readings while total reconstruction gives rise to existential interpretations.

*Post-verbal n-words*: Post-verbal n-words are grammatical in the scope of the non-finite negation *ne* (30a, 31a). However, they are ruled out in (30b, 31b), where they occur in the scope of the silent negation. This is quite puzzling since the silent negation was able to license the (reconstructed) pre-verbal n-word.

- (30) a. o casă **nelocuită** de **nimeni**  
 a house (not)inhabited by n-body  
 “a house that is not inhabited by anyone”
- b. \* un film de **nimeni** văzut **niciodată**  
 a film by n-body seen n-ever  
 “a film that has never been seen by anyone”

(31)



In order to account for (30b), I argue that the post-verbal n-word is not in the *local* scope of the silent negation. In other words, it is not enough for n-words to merely be in the scope of a negative operator; they must be sufficiently close to their licenser<sup>10</sup>.

Evidence for this phenomenon comes from the fact that Romanian has two sets of NPIs: n-words and VRE-items. The two series occur in complementary distribution (Teodorescu 2004). Not only do n-words require to be in the presence of negation (2 - 5, 8b - 10b), but they also need to be clausemate with it (32a, 33a). In contrast, VRE-items can occur in the scope of all sorts of downward-entailing operators – be they merely downward-entailing, anti-additive or anti-morphic, in the sense of Zwarts (1996). When co-occurring with negation they

<sup>10</sup> For references on the locality constraints that influence the relation between NPIs in general and their licensers see among others Linebarger (1980); Krifka (1991); Lahiri (1998); Guerzoni (to appear); Szabolcsi (2004); Bhatt and Schwarz (2004).

need to be in a different clause from it. Unlike n-words, VRE-items are averse to clausemate negation (32b, 33b).

(32) *Clausemate SN*

- a. N-a cumpărat **nimic**.  
not-PAST.3S bought n-thing  
“He didn’t buy anything.”
- b. \*N-a cumpărat **vreo carte**.  
not-PAST.3S bought VRE-a.F book  
“He didn’t buy any book.”

(33) *Non-clausemate SN*

- a. \*N-am aflat [că Anca a cumpărat **nimic**].  
not-PAST.1S found out that Anca PAST.3S bought n-thing  
“I didn’t find out that Anca didn’t buy anything.”
- b. N-am aflat [că Anca a cumpărat **vreo loțiune**].  
not-PAST.1S found out that Anca PAST.3S bought VRE-a.F.lotion  
“I didn’t find out that Anca bought any lotion.”

Interestingly now, the example in (30b) becomes grammatical if the post-verbal n-word is replaced with an item from the VRE-series, in this case the time adverbial *vreodată* ‘ever’.

- (34) un film de **nimeni** văzut **vreodată**  
a film by n-body seen ever  
“a film that has never been seen by anyone”

Example (34) together with the property of VRE-items to survive only outside the local domain of negation, indicates that post-verbal n-words are not licensed in structures like (31b) because they are too far from their licenser. The licensing domain of the silent negation extends only as far as the non-finite negation *ne*. Thus the abstract negation can license the reconstructed pre-verbal n-word but not the post-verbal one. In non-finite, as well as in finite clauses, post-verbal n-words are licensed only by the overt negation.

Let us now consider how the silent negation analysis described above operates in finite clauses. The absence of the abstract negation in finite clauses correlates with the fact that in these contexts pre-verbal n-words cannot occur by themselves (18a). Here n-words are always licensed by the overt negation *nu* in-situ, that is post-verbally. Once licensed, n-words have the option of moving



to a pre-verbal position, probably for focus reasons. Given the presence of a single negation and the fact that n-words are polarity sensitive existentials, which means that they do not contribute any negative meaning of their own, only simple negation readings are predicted in finite clauses (19a).

#### 4. *Conclusion*

This study has shown that Romanian n-words behave differently depending on whether they appear in finite or non-finite contexts. In the first type of environments they behave like polarity sensitive EQs, on a par with n-words in Polish and Russian, while in the second type of contexts they sometimes behave like EQs and sometimes like NQs, similarly to their Italian and Spanish counterparts. Additionally, in non-finite contexts, pre-verbal n-words cannot license post-verbal ones.

It has been argued that an analysis which takes n-words to be lexically ambiguous between EQs and NQs does not extend to the Romanian data, since these two interpretations are always in complementary distribution in this language. A simple-minded analysis that allows for the non-finite negation to be silent does not work either, as it fails to account for the DN reading and the ungrammaticality of post-verbal n-words in non-finite clauses.

I have proposed an analysis which treats all n-words as polarity sensitive existentials and posits a silent negation in non-finite clauses. The licensing relation between the silent negation and the post-verbal n-words has been shown to be subject to locality constraints. Additionally, I have argued that the DN reading does not come about only because of the interaction between the silent and the non-finite negation. Reconstruction has a crucial impact. Partial reconstruction yields universal readings while total reconstruction gives rise to existential interpretations.

One more remark is in place. Stipulating that the silent negation is present in non-finite clauses but absent in finite ones captures the licensing and interpretation contrast between the two types of contexts. However, we would ultimately like to derive this contrast from more general properties of the language. One possibility is to relate it to a verb movement asymmetry (see also Zanuttini (1991; 1997)). The intuition is that in finite clauses there is only one negation (hence only NC readings are possible here), while in non-finite clauses there are two negations (hence the DN interpretations). To formalize this idea, one can argue that the silent negation is present in both types of contexts and that in finite clauses, the verb always raises to the overt negation head and then higher up to the silent negation head. In doing so, the two negative heads are ‘conflated’ into one. In contrast, in non-finite environments, the verb cannot reach the ab-

stract negation head; here, it can only raise as high as the overt negation head. Therefore, the prediction would be that in non-finite clauses, the two negations are kept apart. More details as to how such a verb movement analysis works and a discussion of the relevant data are included in (Teodorescu 2004).

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# PERSEVERATIVE PHONETIC EFFECTS IN BILINGUAL CODE-SWITCHING\*

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## 1. Introduction

In their everyday lives, most bilinguals find themselves situated along a continuum that induces different language modes within a bilingual range (cf., Grosjean 1998). At one end of the continuum, bilinguals interact in monolingual mode, activating one language and suppressing the other. At the bilingual endpoint, speakers activate both languages, alternating between them, often within the same segment of discourse, as in the Spanish-English examples in (1):

- (1) a. Sometimes I'll start a sentence in English *y termino en español*.  
"Sometimes I'll start a sentence in English and finish in Spanish."  
(Poplack 1980)
- b. Once upon a time *en un lugar muy lejano ...*  
"Once upon a time in a place far away."  
(Toribio 2001)

To date, research on code-switching has fallen within three distinct approaches: sociolinguistic, syntactic, and psycholinguistic. However, there has been relatively little attention devoted to the phonological/phonetic aspects of code alternation; this lacuna will be redressed here.

Significant research has been dedicated to analyzing code-switched speech and imputing particular functions to the juxtaposition of languages (Gumperz 1976, 1982; Zentella 1997). But for many bilinguals, code-switching is simply another way of speaking, an in-group or community norm, and *not* mixing languages in certain circumstances would be considered irregular and socio-culturally insensitive (Seliger 1996). Parallel to studies focused on the social

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and discursive factors that enter into its use are research efforts that have examined the grammatical properties of code-switched speech. With respect to its linguistic form, code-switching in intra-turn utterances may be inter-sentential or intra-sentential, the latter of interest here, demonstrating grammatical regularities that reflect the operation of underlying restrictions (cf., Lipski 1985 on Spanish-English code-switching). For example, Spanish-English bilingual speakers will agree that the clauses in (1) represent possible code-switches, whereas the sentences in (2) do not, although they may be unable to articulate exactly what accounts for this differential judgment.

- (2) a. \*Have you *visto la nueva película de Almodóvar*?  
 “Have you seen the new Almodóvar film?”  
 b. \*Yes, my friends and I saw I.  
 “Yes, my friends and I saw it on Saturday.”

As expressed by Bhatia and Ritchie (1996:645), the challenge in research on code-switching “is not whether or not it is subject to grammatical constraints but how best to capture these constraints and how to make deeper claims about human language in general and bilinguals’ mixing competence and their language acquisition in particular.” Accordingly, recent years have witnessed considerable attention devoted to exploring code-switching in the context of syntactic theory. The proposals include the Free Morpheme Constraint (Poplack 1980), which rules out word-internal alternations; the Government Constraint (DiSciullo et al. 1984), by which elements in a specific relation (e.g., head-complement) must be drawn from the same language; the Functional Head Constraint (Belazi et al. 1994), according to which function words (e.g., determiners, auxiliaries, complementizers, and negative elements) bear an inviolable relation with their complements, and the broader theoretical treatments of Woolford (1983) and MacSwan (1999, 2000).

Psycholinguists have also investigated code-switching, defined, however, in that disciplinary context, as the insertion of guest words into a base language. What is referred to as the ‘base language’ in the psycholinguistic literature is equivalent to the matrix language (Myers-Scotton 1993). MacNamara and Kushnir (1971) present evidence for a momentary delay in response times when guest words are inserted in a base language. In one experiment, in which participants judged the truth or falsehood of spoken sentences, response times to monolingual utterances were faster than to code-switched utterances such as those in (3a). Furthermore, response times increased with the number of language switches (3b). The base language effect is the reflection of the dominance of base-language units (phonemes,

morphemes, words, etc.) in the processing of the guest language, an effect that has been repeatedly confirmed (cf., Grosjean 1989, Grosjean and Soares 1986, Soares and Grosjean 1984).

- (3) a. Many trees *ont* branches.  
 “Many trees have branches.”  
 b. *Tous les* chickens *sont* grey.  
 “All of the chickens are grey.”

Azuma and Meier (1997) also consider single-word insertions, pursuing the relevance of the dichotomy between open and closed class for language switching. These authors presented bilingual Japanese-English participants with three types of stimulus sentences: Japanese sentences that incorporated no switching (4a), noun switching (4b), and pre/postposition switching (4c). The prediction is that switching of closed class items will impede processing and lead to more errors in sentence repetition. In confirmation of their prediction, the results indicate a processing cost for postposition switching, which produced longer reaction times and more errors (e.g., hesitation, deletion, insertion) than noun switching or no switching.

- (4) a. Kanrinin-wa hinpanni yattekuru hoomonkyaku ni kuruma de ko-naiyoo tanonda.  
 b. Kanrinin-wa hinpanni yattekuru hoomonkyaku ni *car* de ko-naiyoo tanonda.  
 c. Kanrinin-wa hinpanni yattekuru hoomonkyaku ni kuruma *by* ko-naiyoo tanonda.  
 “The manager asked frequent visitors not to come by car.”

Phonologists have remained largely silent on issues of bilingualism, and surprisingly little is known of the phonetic reflexes of code-switching in bilingual speech. Important questions remain unanswered: Are code-switching bilinguals able to immediately and completely alternate from one to another phonology in the same segment of discourse? Lehtinen (1966), as cited in Romaine (1995), impressionistically reports that switching sites are not always precisely established in production; rather, there is a transition, extending approximately one phoneme to either side of the switching point, in which features of the phonology of one language persevere into the morpho-syntactic domain of the other language. Such transition regions may be more common and considerably longer in languages that are more closely related (Romaine 1995). For example, in (5), drawn from Clyne (1987), Dutch *kan* and English

*can* have partial phonetic similarity, and a ‘compromise pronunciation’ may enable one phonetic form to belong to the speaker’s Dutch and English systems simultaneously.<sup>1</sup>

- (5) *Dit kan* be anywhere.  
 “That can be anywhere.”

Grosjean and Miller (1994) consider a smaller unit of analysis – phonation properties – to determine whether the phonetics of a base language blends into the phonetics of the guest language. In two experiments, French-English bilinguals were instructed to rehearse and then read aloud test sentences that included the stimulus guest words *Paul*, *Tom*, and *Carl* inserted into English, French, and code-switched texts, as in (6):

- (6) a. During the last few days we’ll tell him to copy Paul constantly.  
 b. Pendant les derniers jours, il faudra qu’il copie *Paul* constamment.  
 c. Pendant les derniers jours, il faudra qu’il copie *Paul constantly*.

Measurements of voice onset time (VOT) for the initial segments of the stimulus words – the time from the release of articulators to the onset of vocal fold vibration – revealed no statistical differences between the monolingual and code-switched guises; moreover, measurements of the /k/ in *copie/copy* and *constantly/constamment* demonstrated that speakers do not anticipate the switch and do not return to the base language in the words that follow the switch – that is, the shift from one phonological system to another is immediate and complete.

In our opinion, the experiments that purport to investigate the discreteness of a bilingual’s linguistic systems in code-switching, using only single word insertions as stimuli, are methodologically flawed. For example, while Grosjean and Miller interpret their findings as evidence for the ability of bilinguals to activate or suppress the distinct phonetic systems in code-switching, the methodology comprised tasks that tested the lexical insertion of proper names

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<sup>1</sup> Appel and Muysken (1987) recognize the existence of such ‘homophonous diamorphs’ (Clyne 1987) as a strategy of neutrality employed in code-switching, similar to the morphological neutrality achieved with the Turkish pre-verb *etmek* ‘to do’, *yapmak* ‘to do/make’ and *olmak* ‘to become’ in the Turkish/Dutch mixing in (i) from Boeschouten and Verhoeven (1985).

- (i) Fotouraf kijken *yapyorlar*  
 ‘They looked at the photographs’

The auxiliary verb forms a complex with the verb from the other language and neutralizes it.

not specific to one or the other language, rather than wholesale code-switching. In addition, what was defined as code-switching in the processing experiments of MacNamara and Kushnir (1971) and Azuma and Meier (1997), would be better characterized as single word insertions which would be infelicitous in bilingual speech. It is perhaps due to the nature of the experimental design that the results of Grosjean and Miller reveal a categorical and automatic separation between the phonetic systems of these French-English bilinguals. As a result, they are considerably at odds with the extant findings on bilingual phonetics. While the maintenance of phonetically discrete VOT categories has been observed in some bilingual studies (Caramazza et al. 1973, Flege and Eefting 1987), a considerable body of experimental evidence exists that argues that bilinguals often adopt compromised VOT values relative to a monolingual norm when their two languages divide the VOT continuum in different ways (Brière 1966, Obler 1982, Mack 1984, Flege 1991, Watson 1991, Zampini and Green 2001). In fact, in her overview of bilingual phonetic research, Mack (2003:339) remarks that “[a]lthough the data are not yet conclusive, there is mounting evidence that if tests are sufficiently sensitive, very few bilinguals – regardless of age of onset of exposure to a second language – will be found to function at the phonetic level exactly as native monolinguals. This is due at least in part to the inevitable influence, however slight, of one system upon the other.”

There are various factors that can affect and, in our experience, do affect the results in studies of bilinguals’ phonetic productions. For instance, variation in the degree of inter-linguistic influence can be attributable to language dominance, age of acquisition of the second language (Flege 1991), or quality of the input to a bilingual speaker in one or both languages (MacKay, Flege, Piske, and Schirru 2001). A critical and often overlooked factor in bilingual production studies is language mode and whether or not individuals may be observed to perform differently according to the mono- or bilingual nature of the experimental task (cf., Zampini and Green 2001). Bullock, Toribio, Davis and Botero (2004) found that bilingual speakers, regardless of their language dominance, were, by and large, able to produce separate lateral allophones in Puerto Rican Spanish and American English – apico-alveolar in Spanish and velarized in English – when producing in only one language. However, both their phonological processing and their phonetic realization of these lateral allophones could be disrupted when the speakers were required to code-switch or, to produce in a bilingual language mode (Grosjean 1985, 1989, 1998, 2001). This suggests that the simultaneous activation of two languages – incontrovertible in code-switching, but not in single-word insertion – may provoke observable convergence in the linguistic



performance of bilinguals who may ordinarily maintain separate phonetic categories in their component languages. In this investigation, we examine the phonetic consequences of code-switching (rather than single word insertion), with the aim of determining whether the phonetic/phonological features of one language persist when bilinguals truly switch into the other.

## 2. *The present study*

The study examines the perseverative phonetic effects in the speech production of Spanish-English bilinguals by reference to the production of voiceless occlusives, specifically voice onset time (henceforth, VOT), a common metric for the evaluation of phonetic differences between English and Spanish (Lisker and Abramson 1964). We assume that bilinguals cannot be assessed relative to monolingual norms since their two languages are not autonomous (Grosjean 1989, 1998, Mack 2003). This has been amply confirmed for the phonetic domain. For instance, in one pertinent study of Spanish-English bilinguals, Flege and Eefting (1987) report that Spanish-English bilinguals produced VOTs that were significantly different from those of their age-matched monolingual counterparts. The mean VOT for /p,t,k/ observed for one group of bilinguals (the native Spanish speakers who were late childhood bilinguals) was almost perfectly intermediate (57 ms) to the means observed for the monolingual Spanish adults (26 ms) and the monolingual English adults (87ms) (cf., Caramazza et al. 1973, Mack 1984, Flege 1987 for similar results among French-English bilinguals).

Although we do not anticipate monolingual-like phonetic behavior on the part of our bilingual participants, our prediction is that there will nonetheless be manifested measurable phonetic differences between their languages, i.e., speakers will maintain distinct phonologies. We further predict that phonetic features from one language will persist at the point where bilinguals switch into the other. In addition, we predict, on the basis of syntactic research, that the carryover of phonetic properties will be more pronounced in intra-phrasal code-switches, where switching is awkward (and syntactically ill-formed). The research question and predictions of the study are summarized in (7).

- (7) a. General research question  
What are the phonetic consequences of code-switching?
- b. Predictions
  - (i) Despite convergence, there will be manifested measurable phonetic differences between the bilingual's two languages.
  - (ii) Phonetic features from one language will persist at the point where bilinguals switch into the other.

- (iii) Carryover of phonetic properties will be more pronounced in intra-phrasal code-switches, where switching is syntactically infelicitous.

It merits noting that our interest is in the phonetic convergence evidenced in the performance of speakers across monolingual and bilingual code-switching modes, rather than in comparing them to monolinguals. Therefore, both simultaneous and sequential bilinguals were recruited for this pilot study.

We report on ten Spanish-English bilinguals, 5 men and 5 women, between the ages of 20 and 40, who took part in the study; all were remunerated for their participation. The participants' language backgrounds were varied, with roughly equal numbers of late learners of Spanish, late learners of English, and bilinguals whose exposure to and use of both languages was fairly balanced. All subjects reported to engage in code-switching on a regular basis, commensurate with advanced proficiency in the component languages. Four sets of sentences were designed to target particular tokens of voiceless stops across four conditions, shown in examples (8) – monolingual English (8a), monolingual Spanish (8b), English-Spanish code-switching (8c,8d), and Spanish-English code-switching (8e). The code-switched material comprised switches at syntactically felicitous code-switching junctures (between subject and predicate, between verb and direct object, between noun and subordinate clause) and at infelicitous sites (e.g., between auxiliary/negative adverb and main verb, between complementizer and subordinated clause, between determiner and noun).

- (8) a. Monolingual English (15 tokens)  
The sneaky cat caught pudgy mice.
- b. Monolingual Spanish (15 tokens)  
Cada año Patricia pide /p/asta para su cumpleaños.  
“Every year Patricia requests pasta for her birthday.”
- c. English-Spanish code-switching, felicitous (6 tokens)  
The sneaky cat caught /p/ocos ratones.  
“The sneaky cat caught few rats/”
- d. English-Spanish code-switching, infelicitous (9 tokens)  
The student has not /p/ublicado el trabajo.  
“The student has not published the work.”
- e. Spanish-English code-switching, felicitous (6 tokens)  
Cada año Patricia pide /p/uppies for her birthday.  
“Every year Patricia requests puppies for her birthday.”

- f. Spanish-English code-switching, infelicitous (9 tokens)  
*Todavía no he /p/assed the truck.*  
“I still have not passed the truck.”

Target phonemes located at the switch point were equally balanced across tokens of /p,t,k/ in both languages. The test sentences were randomized, and the material was printed and given to the participants at the time of the study. Spanish language phrases in code-switched texts were rendered in small caps to facilitate differentiation between the two languages. The participants were instructed to read aloud each sentence, and the entire set was repeated three times. Production was recorded using a Shure SM10A unidirectional, dynamic head-mounted microphone onto a Marantz PMD 690 digital recorder, with a 44 kHz sampling rate. Acoustic measurements of VOTs for the targeted consonants /p,t,k/ was achieved via Praat©.

### 3. Results and discussion

A box-and-whisker plot summarizing our array of data is presented in Figure 1. The box describes the middle 50% of the distribution of VOT across all subjects. The whiskers extending above indicate the maximum VOT per condition; those below the box indicate the minimum VOT per condition. The median VOT is represented by the line bisecting the box; the mean is represented by a plus (+). What is made visually apparent by this plot is that the mean English VOTs (the first three boxes from the left) are greater than the mean Spanish VOTs, regardless of the type of mode (monolingual or bilingual) in which they were produced. It is also apparent that the difference between the minimum and maximum VOT in English varied much more than in Spanish. That is, in monolingual English the VOT ranged from 35 to 80 ms. whereas in monolingual Spanish it ranged only from 13 to 35 ms. Thus, the production of English voiceless stops among these bilinguals was phonetically more variable than their Spanish voiceless stops.

The mixed effects ANOVA indicates that there are significant overall mean differences among the six conditions ( $F=21.90$ ,  $p<.0001$ ). In addition, we conducted a follow-up test for five contrasts to see whether there were significant mean differences between the conditions of interest. To adjust for experiment-wise error rate due to multiple comparisons, we used a Bonferroni correction for p-value. As a result, with 95% confidence, we conclude that the

first three contrasts are significantly different from zero, while the last two contrasts are not, as shown in Table 1.<sup>2</sup>

The results from this pilot study confirm the trend towards convergence in the domain of phonetics: VOT values for Spanish-English bilinguals differ from the monolingual norms for Spanish and English reported in Lisker and Abramson (1964) and Flege and Eefting (1987). In particular, our participants' mean VOT values for monolingual Spanish were 25 ms., longer than the 14 ms. of Lisker and Abramson's participants, but equivalent to that reported in Flege and Eefting, and 58 ms. for monolingual English, considerably shorter than the monolingual norms of approximately 70 ms. reported by Lisker and Abramson and 87 ms. reported by Flege and Eefting. However, the mean VOT measures for their monolingual English stops were significantly different from those of their monolingual Spanish stops, as shown in Figure 1 and Table 1.

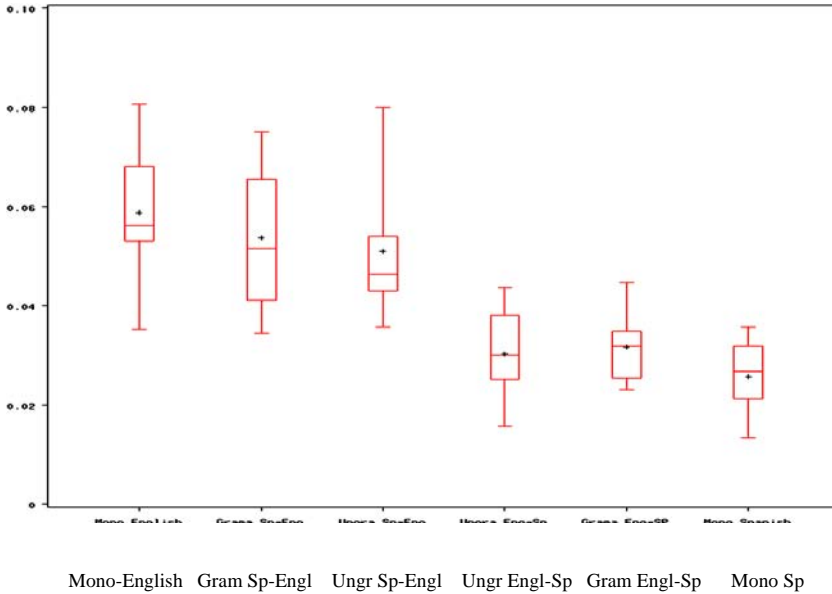


Figure 1: *Box plot of mean VOT (vertical axis: 0 - 0.10) across Spanish and English monolingual and bilingual conditions (horizontal axis)*

<sup>2</sup> In addition, the fixed effects ANOVA revealed that there were significant mean differences across individuals ( $F=3.11, p=.0055$ ). A Tukey Test shows that two of ten subjects have significantly different VOT mean from eight subjects of which one has a significantly different mean from nine subjects; the outlier shows evidence of overall convergence—his VOT ranged from 23ms. to 35ms., values too high for Spanish yet too low for English.

Condition	DF	DF F Value	Pr > F
MonoEnglish – MonoSpanish	1 45	20.27	p<.0001
MonoEnglish – Spanish-English switching	1 45	43.64	p<.0001
English-Spanish switching – MonoSpanish	1 45	38.37	p<.0001
Gram – UngramSpanish-English switching	1 45	1.38	0.2456
Gram – Ungram English-Spanish switching	1 45	1.09	0.3017

Table 1: *Contrasts between conditions – mixed-effects model ANOVA (fixed effect = condition; random effect = participants)*

Furthermore, as hypothesized, convergence is enhanced as bilinguals code-switch between their languages: the mean VOT values for voiceless stops in monolingual English productions differed significantly from the mean VOT values of English voiceless stops as subjects code-switched from Spanish into English, and the mean VOT values for voiceless stops in monolingual Spanish productions differed significantly from the mean VOT values of Spanish voiceless stops in English-Spanish code-switched productions. Note, however, that contrary to our predictions, the differences between grammatical and ungrammatical switches were not found to be significant for switching in either direction in this pilot. Nevertheless, there was a trend towards significance in the monolingual English versus the ungrammatical Spanish-English condition ( $p=0.0775$ ). These results are summarized in (9):

(9) Results

- (i) The measures of VOTs for our Spanish-English bilinguals differ from the established monolingual norms for Spanish and English.
- (ii) The mean VOT values for monolingual English stops were significantly different from those of monolingual Spanish stops.
- (iii) The mean VOT values for voiceless stops in monolingual English productions differed significantly from the mean VOT measures of English voiceless stops as subjects code-switched from Spanish into English
- (iv) The mean VOT values for voiceless stops in monolingual Spanish productions differed significantly from the mean VOT values of Spanish voiceless stops in English-Spanish code-switched productions.

- (v) The differences between grammatical and ungrammatical switches were not found to be significant for switching in either direction, though there was a trend towards significance for English.

Although by and large confirming our predictions, this pilot research invites scrutiny of materials and procedures. First, because of the relatively small participant pool ( $n=10$ ), the statistical analysis combined the VOT measures for all subjects. However, a follow-up study of speakers who rate their Spanish language speaking skills as better than or equal to their speaking skills in English showed that Spanish L1 speakers were found to significantly lower their English VOTs when code-switching but that switching had no effect on their Spanish language productions, which remained consistent across all conditions (Bullock et al. 2005). It remains to be determined whether this result is due to the stability of the participants' L1 phonetic system, to the fact that there is a wider variation in English VOT values than in Spanish and, thus, less need for "fine-tuning" the coordination of phonation with articulator release, or to flaws in the experimental design or procedures. That the current study shows convergence effects in both languages could possibly be attributed to generalizing across all subjects regardless of their language dominance. Thus, individual differences are obscured in the present study. Another oversight with the present study was our failure to measure the pauses that might have accompanied a code-switch; this is especially important since pauses could circumvent the operation of syntactic constraints (and therefore account for the lack of difference in switch sites).<sup>3</sup>

Finally, in randomizing the sentences across conditions, we conflated bilingual and monolingual modes. (Recall that a mode is a state of activation of the bilingual's languages and language processing mechanisms.) Thus, the differences between monolingual and bilingual production could have been further exacerbated if bilinguals actually had suppressed one language; i.e., we cannot know whether these bilinguals activated both languages in anticipation of stimuli.

In spite of the aforementioned limitations, the predictions posed are valid and have been largely empirically confirmed in this pilot study: despite the presence of inherent convergence in their monolingual productions, speakers demonstrated significantly greater convergence in code-switching. This

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<sup>3</sup> In a reading aloud task reported in Toribio (2001), grammatically-sanctioned intra-sentential switches proceeded smoothly, while others, representing potential ill-formed intra-sentential switches, gave rise to disfluency.

implies that the simultaneous presence of languages in code-switching further favors the searching for parallels between them, and hence promulgates the striving towards phonetic convergence. Such a finding may be interpreted as arising as a consequence of the demands of on-line processing of two language systems. Since our data show that bilinguals maintain two separate phonologies, their representational systems remain autonomous (although not identical to those of monolinguals). This conclusion parallels that of researchers in bilingual syntax (Muysken 2000, 2002, Silva-Corvalán 1994/2000, Sorace 2004), who maintain that convergence may be interpreted by reference to processing costs rather than to altered representations.

Our findings allow for the formulation of principled predictions and directions for future work. For example, since at least some inter-lingual influence may be attributable to converged *input* (Clyne 2003, MacKay et al. 2003), future studies must consider the language context that surrounds the speaker. Similarly, we can outline consequences for general perspectives on contact-induced language change as related to bilingual *usage* in diverse settings; we predict that phonetic convergence will be more pronounced in communities in which code-switching is practiced (Toribio 2004). Finally, the present study has much to offer by way of informing our understanding of language variation and change in the context of language contact. In particular, the findings support the observation that languages in contact can sustain incursions and nevertheless remain robust and stable at the core. The bilinguals' speech samples may exemplify a 'composite' language system (most keenly evidenced in the convergence of VOT measures, especially when both systems are activated), but this composite system need not signal a 'turnover' from one system to another (cf., Myers Scotton's 1998 'matrix language turnover' hypothesis). In other words, converged VOT measures are not attributable to changes in a speakers' bilingual competence, but rather are a reflex of bilingual usage, most significantly of code-switching.

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# THE PREPOSITION'S PREPOSITION IN ITALIAN EVIDENCE FOR BOUNDEDNESS OF SPACE\*

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## 1. Introduction

As observed by Rizzi (1988), there are certain “adverbial” prepositions in Italian (e.g., *dietro* ‘behind’ or *dentro* ‘inside’) that may occur with or without the grammatical preposition *a*. This can be seen in (1a) vs. (1b), respectively (examples from Rizzi 1988:522):<sup>1</sup>

- (1) a. *Gianni era nascosto dietro all' albero.*  
G. was hidden **behind** **at** the tree
- b. *Gianni era nascosto dietro l'albero.*  
G. was hidden **behind** the tree

I have not provided translations for this set of examples, because their (previously unexplored) subtle difference in meaning requires some discussion. P. Benincà notes (p.c.) that (1a) can refer to an event that takes place in a “wider” space, while (1b) can only refer to an event taking place in a “punctual” space.

The ultimate purpose of this paper is to lay the groundwork for a formal analysis of these two types of structure, and to investigate its consequences for

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<sup>1</sup> For convenience, I gloss the Italian preposition *a* as ‘at’ (in spite of the fact that, depending on its use, it can be translated into English either as ‘at’ (*essere a scuola* ‘be at school’), as ‘to’ (*andare a scuola* ‘go to school’), or as ‘in’ (*abitare a Londra* ‘live in London’). As we will see in section 4.1.1, it also gets used as a prepositional complementizer). Thus, the translation ‘at’ is by no means intended to suggest that in the particular constructions under investigation in the text, *a* actually means what *at* means in English.

an analysis of preposition constructions in other Romance languages. As a corollary, however, this paper provides a fundamental contribution which does not depend on a particular formal analysis. In particular, it pursues the proposal that *space* is linguistically conceptualized as either bounded or unbounded, much in the way *entities* (count vs. mass) and *events* (delimited vs. undelimited) are.

The paper is organized as follows: in Section 2 I explain exactly which types of adverbial preposition I am concerned with here. In Section 3, I present and discuss various sets of examples with these adverbial prepositions, with an eye towards gaining an understanding of their semantics with and without *a*. In Section 4 I discuss in detail the idea of boundedness of space, and provide a formal analysis of the structures discussed in Section 3, which finds support from the behavior of preposition-taking verbs in Italian. I also show that the proposal provides a promising vehicle for an analysis of other types of adverbial PP constructions in Romance (in particular, Portuguese/Spanish). In Section 5 I conclude.

## 2. *Adverbial and Grammatical Prepositions*

The purpose of this section is to clarify exactly which elements and which constructions the remaining sections of this paper are concerned with.

It is well known that language exhibits two kinds of preposition: one which I will refer to as *grammatical* (also called *colorless* by Zribi-Hertz 1984 and *light* by Terzi 2002), and the other which I will refer to as *adverbial* (also called *substantive* by Campos 1991 and *secondary* by Rizzi 1988). These are exemplified for Italian in (2) and (3):

(2) **grammatical:** *a, con, da, di, in, per*

(3) **adverbial:** *accanto, davanti, dietro, fuori, verso...*  
 “next to, in front of, behind, outside, towards...”

Roughly distinguishing between the two types, we can say that grammatical prepositions are “smaller” and tend to be semantically vague (consider, e.g., footnote 2 above, and Zribi-Hertz’s 1984 use of the term “colorless”), while adverbial prepositions tend to be polysyllabic (and/or polymorphemic, at least in terms of their etymology, if not in terms of their synchronic analysis), and have specific and rich semantic content. Many of the latter can be used intransitively, while the former always occur with an apparent NP complement. In the following subsection, I discuss their ability to occur with adverbial prepositions as well.

### 2.1 Grammatical *P* with Adverbial *P*

As noted by Rizzi (1988), adverbial prepositions in Italian occur in various combinations with or without different types of grammatical prepositions. In this section I briefly summarize the possibilities, again with an eye towards pin-pointing the exact possibility this paper focusses on.

Some adverbial prepositions obligatorily appear without a grammatical preposition (except when they appear with pronouns; see (13) below). These can be seen in (4):

- (4)     *verso,      dopo,      circa,      entro,      senza*  
           “toward,   after,      around,   within,   without”

Given that this paper is concerned with adverbial prepositions that occur with a grammatical preposition, I put aside the type found in (4) (except, however, for the discussion revolving around (13) in Section 3.1 below). I will also be ignoring the type of adverbial preposition that obligatorily occurs with the grammatical preposition *di*, seen in (5):

- (5)     *invece,      prima,      fuori*  
           “instead,   before,   outside”

Rather, I will be focussing on the type of adverbial preposition which occurs with *a*. Of this category, there are two types. The type that obligatorily appears with *a* (as in (6)) will not be of immediate interest to us (although see footnote 10 below):

- (6)     *accanto, adosso, davanti,      incontro, insieme, intorno, vicino*  
           “next to, on,      in front of, towards, together, around, near”

Instead, I focus on the adverbial prepositions that optionally appear with *a*, seen in (7):

- (7)     *contro, dentro, dietro, lungo, oltre,      rasente, sopra, sotto*  
           “against, inside, behind, along, beyond, close,   above, below”

As discussed in the introduction, while the adverbial prepositions in (7) can occur with or without *a* (see (1a) and (1b)), the *a*-less examples are not semantically equivalent to the examples that contain *a*. In the following section, I provide a detailed discussion of this difference.

### 3. Presence vs. absence of *a*

Regarding the type of adverbial preposition found in (7), Rizzi (1988:522) notes that in some cases there is a semantic variation which depends on the presence or absence of the grammatical preposition; he gives a few sets of examples, one of which is that seen in (1), repeated here as (8):

- (8) a. *Gianni era nascosto dietro all' albero.*  
 G. was hidden behind at.the tree
- b. *Gianni era nascosto dietro l' albero.*  
 G. was hidden behind the tree

While he reports that there is a difference between (8a) and (8b) (indicating with a '?' for (8a) that (8b) is preferred), he does not state what that difference is. As noted in the introduction, however, P. Benincà reports (p.c.) that (8a) (with *a*) can refer to an event that takes place in a "wider" space, while (8b) (without *a*) can only refer to an event taking place in a "punctual" space<sup>2</sup> (it is important to note that (8a) can also refer to an event taking place in a "punctual" space; the difference is that the *a*-less PP allows only the "punctual" interpretation). In what follows, I present and discuss various pairs of examples with different adverbial prepositions which allow us to isolate this semantic difference more precisely.<sup>3</sup>

#### 3.1 The adverbial preposition *dietro*

The examples in (9) isolate the semantic difference between (8a) and (8b) more precisely:

- (9) a. *Vai a giocare/correre dietro a quell'albero.*  
 go.2SG at play/run behind at that tree  
 "Go play/run behind that tree."
- b. *\*Vai a giocare/correre dietro quell'albero.*  
 go.2SG at play/run behind that tree

<sup>2</sup> I thank an anonymous reviewer for noting that G. Cinque (in his *tesi di laurea*, 1971) discusses the distinction between wide and punctual space as exhibited by the Italian morphemes *qua* 'here' and *là* 'there' versus *qui* and *lì* (also meaning 'here' and 'there'). In particular, the latter (*qui* and *lì*) refer to a specific point in space, while the former (*qua* and *là*) refer to a space that is wide. These facts are also discussed in detail in Vanelli (1995).

<sup>3</sup> Provision of the non-Rizzi examples and interpretations of all of the examples in this section are due to P. Benincà, whom I thank.

The ungrammaticality of (9b) can be readily understood in light of the semantic difference noted for (8a) and (8b). That is, predicates such as ‘play’ and ‘run’ denote activities that require a wide, open-ended, unbounded space, which is something that the structure in (9a), with the grammatical preposition *a*, denotes. The *a*-less prepositional phrase in (9b), on the other hand, denotes a bounded (or punctual) space, and as such is incompatible with such predicates. Of course, the predicate in (8) (‘be hidden’) denotes a state that is compatible either with a wide or a punctual space, which is why both prepositional phrases (with and without *a*) are possible.<sup>4</sup>

Understanding the semantic difference between the two possibilities allows us to grasp another set of examples provided by Rizzi (1988:522) (the interpretation of which he does not discuss):

- (10) a. *Vai **dietro** al postino, che è appena passato.*  
 go.2SG **behind** at the postman, that is just passed  
 “Go after the postman, he just passed by.”
- b. \**Vai **dietro** il postino, che è appena passato.*  
 go.2SG **behind** the postman, that is just passed  
 “Go after the postman, he just passed by.”

As can be seen by the translation, the salient interpretation of (10a) is that the hearer should pursue the postman; this is highlighted by the phrase ‘he just passed by’ (which explicitly suggests that the postman is moving along). It is precisely the presence of *a*, which denotes an unbounded space (i.e., a space that is allowed to flexibly expand and change shape, size, or dimension), that suggests the postman’s onward movement. The example in (10b), on the other hand, cannot be interpreted as ‘follow the postman’; that is, the absence of *a* forces an interpretation in which the space behind the postman is bounded (and hence not allowed to expand or change shape or size). This is why adjunction of the phrase ‘he just passed by’ is nonsensical, yielding ungrammaticality.

In this regard, it is worth considering the grammaticality of the *a*-less PP in (10b) without adjunction of the phrase ‘he just passed by’:

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<sup>4</sup> It is important to note that the structure with *a* in (9a) does not have any directional meaning; the event is interpreted only as an activity that takes place in a particular location. Thus, the “running” activity is interpreted as “running around,” and not as “running toward” (i.e., there is no interpretation of the location as a goal).



- (11) *Vai* **dietro** *il postino.*  
 go.2SG **behind** the postman  
 “Go behind the postman.”

The sentence in (11) is interpretable (and grammatical) in, say, a picture-taking event, where the hearer is being asked to place himself directly behind the postman in the photo line-up. Again, here we see that the *a*-less PP is compatible with an event (or state) that takes place in a bounded (circumscribed) space.

The above discussion should allow us to grasp the difference in interpretation between the examples in (12a) and (12b) as well, also provided by Rizzi (1988:522):

- (12) a. *Vai* **dietro** **a** *quella macchina.*  
 go.2SG **behind** **at** that car  
 “Get behind that car.” (can mean “Follow that car.”)
- b. *Vai* **dietro** *quella macchina.*  
 go.2SG **behind** that car  
 “Get behind that car.”

According to Rizzi, the sentence in (12a) favors an interpretation in which the car is moving (hence the translation ‘Follow that car’), while that in (12b) favors an interpretation in which the car is stopped. Under the terms being discussed here, this makes sense: if the ‘behind-space’ associated with the complement is interpreted as punctual with the *a*-less PP (12b), then such an event does not lend itself to an interpretation in which the car is moving (which would involve an ever-widening and changing of the space behind the car). The PP with *a*, however, does allow for an interpretation of the behind-space as flexible, or expandable and contractible (unbounded), which is why the event can be interpreted as a ‘following’ event.

Here I discuss one final fact regarding the adverbial preposition *dietro* which confirms that it is specifically the presence of the grammatical preposition *a* which yields the interpretation of the space in question as unbounded. In order to do this, however, I have to very briefly deviate from the main point in order to establish an independent fact.

As discussed by both Giorgi (1990) and Rizzi (1988), adverbial prepositions that otherwise appear obligatorily without a grammatical preposition (i.e., those in (4)) must insert the grammatical preposition *di* when its complement is a pronoun. This can be seen, for example, with *verso*



be interpreted as taking place directly behind the referent of the pronoun, in a single-file manner. In the terms being presented here, the ‘behind-space’ of the referent of the pronoun is interpreted as punctual or bounded (as is the case with (11) and (12b)). When *a* is used, on the other hand, we get the same interpretation we get for (10a) and (12a). That is, the ‘behind-space’ is interpreted as unbounded in (15a), there-fore promoting the ‘run after’ sense.

The case in (15) thus confirms that it is the presence of *a* (and not the presence of any-old grammatical preposition) that allows the unbounded interpretation. It is worth stressing here (see footnote 4) that the presence of *a* does not promote a directional reading (with the location interpreted as some kind of goal). I raise this because there may be some danger in the reader being led to this conclusion, given (i) that the grammatical preposition *a* in Italian does get used for location-goals in other constructions (see footnote 1), and (ii) that the examples in (15a), (12a), and (10a) all involve the idea of movement after something (in apparent contrast with (12b) and (11)). In this regard I remind the reader that the presence of *a* in (8a) and (9a) does not involve any directional sense, and furthermore, the ‘single-file’ movement reading of (15b) suggests that a movement reading is actually also possible for the *a*-less (12b) and (11) (as long as there is a ‘single-file’ sense). In other words, the referent of the preposition’s object in (15a), (12a) and (10a) is not a goal (nor is it in any of the other cases, including those involving *dentro* ‘inside’, to be discussed immediately below).

### 3.2 *The adverbial preposition dentro*

The semantic difference between (16a) and (16b) is subtle but discernable:

- (16) a. Vai            **dentro**        **a**lla        stanza.  
           go.2SG        **inside**        **at**.the     room  
           “Go inside the room.”
- b. Vai            **dentro**        la        stanza.  
           go.2SG        **inside**        the     room  
           “Go inside the room.”

The use of *a* with *dentro* ‘inside’ is preferred if one wishes to refer to the entire internal space of the container (considering all points of the contained space); thus, (16b) is preferred in describing an event in which there is a simple passage from the outside to the inside of the room, without any reference to the internal space of the room.

It is difficult to find tests that allow us to distinguish between the unbounded and bounded interpretations.<sup>5</sup> For the present purposes, then, I simply provide three more examples involving *dentro* that highlight which kind of circumstance calls for the presence of *a*, and which kind of circumstance calls for its absence:

- (17) a. *Mettilo* ***dentro*** *la scatola.*  
 put.2SG.it **inside** the box  
 "Put it inside the box."
- b. *Guarda bene* ***dentro*** ***alla*** *scatola.*  
 look.2SG well **inside** **at**.the box  
 "Take a good look inside the box."  
 ("...maybe you'll find it in there.")
- c. ***Dentro*** ***alla*** *mia stanza ci sono delle piante.*  
**inside** **at**.the my room there are of.the plants  
 "Inside my room there are plants around."

Consider (17b) and its translation. Here we have a situation in which the hearer is being asked to consider the box's entire inner area (which may be obstructed by other objects in it), as the object being looked for could be in any part of that space. In this case, the adverbial preposition requires presence of *a* (which allows us to flexibly consider all the space inside the box). This is similar to the case in (17c), where the room is being described as having plants all around in it; thus, the entire inner area of the room is being considered (hence the use of *a*). This contrasts with the example in (17a), which does not contain *a*; here instead we have a situation in which the hearer, being asked to place an object inside a box, will naturally have to choose a specific, circumscribed spot in the box's inner area.

In the following section, I discuss the notion of boundedness of space (which I believe offers a unified account of all of the examples discussed thus far), and provide a formal analysis of the cases under discussion which appeals to this notion. Before I proceed, however, I would like to note here that this section's discussion obviously raises a number of questions that must remain a matter for future research. One question in particular that remains is what the facts are concerning the adverbial prepositions in (7) that I have not discussed (*contro*, *lungo*, *oltre*, *rasente*, *sopra*, *sotto*). If the idea being pursued here is on

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<sup>5</sup> This is in contrast with (un)bounded events and entities, which are distinguished via various tests (e.g., the "in an hour/ for an hour" test for events and the "countability" test for count/mass nouns; see section 4 and footnote 7 for further discussion).

the right track, then it is predicted that the presence of *a* will affect the interpretation of the location (something that has yet to be verified). Another question which remains is what the facts are concerning the adverbial prepositions in (6) (which take *a* obligatorily). Does the obligatoriness of this *a* mean that these adverbial pre-positions can never refer to spaces that are strictly bounded (see footnote 9 below)? Again, answers to these questions remain a matter for further research.

#### 4. *Spatial (un)boundedness*

In the preceding section, I discussed various pairs of examples with the adverbial prepositions *dietro* ‘behind’ and *dentro* ‘inside’. For each pair of examples, I showed that the location of each event (or state) was conceptualized differently, depending whether or not the grammatical preposition *a* was present. I have used terms like “punctuality” and “width” of space, and have appealed to the idea of a space’s flexibility/extension or to its specificity/circumscription, in order to characterize the different interpretations that obtain in all these examples. As already stated, however, I would like specifically to appeal to the notion of *boundedness* in order to account for the various interpretations discussed above. In particular, I would like to suggest that *space* is conceptualized in the same way that *entities* and *events* are.

Consider the fact that entities are grammaticalized as either bounded or unbounded (i.e., the *count/mass* distinction; e.g., *book* vs. *gravel* ). Similarly, events, which are distributed over a time interval, are also linguistically conceptualized as either bounded or unbounded (and in fact, since Bach 1986, there has been a move to unify entities and events in this way). It would seem, then, that it is at the very least logically possible that grammar treats *space* in the same way.

Before I discuss the concept of boundedness of space, however, it is necessary to say two words about *space* itself. I would like to pursue the idea, put forth by Jackendoff (1983, chapter 9), that grammar encodes two kinds of space: PATH and PLACE. Of course, conceptually these two kinds of space differ in that the former is linear, while the latter is two- or three-dimensional.<sup>6</sup> However, there is no reason to rule out the possibility that in other

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<sup>6</sup> This difference translates into a linguistic difference between the two. That is, because an event’s time interval is linear, it maps onto a *path* (which is also linear), if there is one present in the structure. Thus, if an endpoint is specified in the path, then necessarily the time interval of the event has an endpoint, and hence the event is bounded (such that the end of the time interval corresponds to the endpoint of the path). So for example, in (18a), the end of the time interval which corresponds to the activity of running coincides with the end of the path. This mapping of the time interval cannot obtain with a *place*, because a *place* is not linear.

(grammatical) respects, they are similar. In fact, Jackendoff makes a lot of headway in understanding the semantics of PPs by treating these two categories as similar types of object; in particular, he proposes that they both head their own phrases. This is exemplified in (18), where (18a) contains the PATH category, and both (18a) and (18b) contain the PLACE category (examples from Jackendoff):

- (18) a. The mouse ran into the room.  
           [<sub>Path</sub> TO ([<sub>Place</sub> IN ([<sub>Thing</sub> ROOM]) ] ) ]  
       b. The mouse is under the table.  
           [<sub>Place</sub> UNDER ([<sub>Thing</sub> TABLE]) ]

The idea that PATH and PLACE are two different ontological categories has most recently been pursued (and executed in elaborate syntactic structures) by Koopman (1997) and den Dikken (2003), who argue that the syntax of locative PPs in Dutch can only be understood if such PPs involve PATH and/or PLACE as projecting syntactic categories (see Section 4.1).

Now, for the present purposes, we must consider Jackendoff's (1983) observation that the representation of PATH does not necessarily involve motion, or "traversal" of the path. Contrast, for example, (19a) with (19b) (from Jackendoff 1983:168).

- (19) a. John ran into the house.  
       b. The highway extends from Denver to Indianapolis.

While both (19a) and (19b) involve a path, only the former denotes an eventuality that involves any temporal succession (i.e., (19b) is a state, and not an event, in Bach's 1986 terms). Crucially, however, it is important to note that paths which participate in states (i.e., non-motion eventualities) are still conceptualized as either bounded or unbounded. Compare the stative sentence in (19b), which contains a bounded path, with the stative example in (20b), which involves an unbounded path (much like the event example in (20a); examples from Jackendoff):

- (20) a. The train rambled along the river (for an hour).  
       b. The sidewalk goes around the tree.

Sentences such as those in (19b) and (20b) thus illustrate that the linguistic concept of *path*, which is a kind of space, does not have to be associated with any temporal succession. These examples further illustrate, though, that even

such non-temporally organized paths are treated as either bounded or unbounded (regardless of the fact that they denote states).

Thus, we have evidence that PATH, a kind of space, is conceptualized as bounded or unbounded (independent of whether the eventuality that it is a part of is stative or not). What I would like to suggest here, then, is that the category PLACE (which is the other type of linguistic space) is likewise conceptualized as bounded or unbounded. What this means is that any PLACE specified in a stative eventuality (such as *Gianni was hidden behind the tree*, or (18b) for that matter) is either bounded or unbounded, much like PATH (which is bounded in (19b) and unbounded in (20b)).

As stated right before footnote 5, it is difficult to come up with tests that determine whether a particular *place* in a stative eventuality is bounded or unbounded; this is a bit disconcerting, since we can easily find such tests for boundedness in the domain of entities (e.g., countability) and events (e.g., durative/delimiting phrases), as in (21) and (22), respectively:

- (21) a. There are two books on the table. (countability: COUNT noun)  
 b. \*There are two gravels on the table.(non-countability: MASS noun)  
 (cf. There is gravel on the table; \*There is book on the table).
- (22) a. Mary ran to the station \*for an hour / in an hour. (bounded)  
 b. Mary ran along the tracks for an hour / \*in an hour. (unbounded)

However, I believe it is important to note that this difficulty in finding such a test for the boundedness of *place* in a stative eventuality also holds for the boundedness of *path* in a stative eventuality. That is, although boundedness of *path* can be tested for in an *event* using durative/delimiting phrases, as in (22), such a means is not available to us when the *path* participates in a state; thus, the test cannot be used for (19b) and (20b):

- (23) a. The highway extends from Denver to Indianapolis (\*in 3 days).  
 b. The sidewalk goes around the tree (\*for 20 seconds).<sup>7</sup>

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<sup>7</sup> It seems that these durative/delimiting phrases are not compatible with these examples because they pick out times, while statives are in a sense atemporal (i.e., they do not unfold over time, as they refer to eventualities that are non-dynamic). However, use of spatial (rather than temporal) durative/delimiting phrases seems to give mixed results:

- (i) \*The highway extends from Denver to Indianapolis in 1,500 miles.  
 (ii) ?The sidewalk goes around the tree for 7 feet.

For now, then, I will simply accept the fact that finding an appropriate test for the boundedness of SPACE (be it PLACE or PATH) in a stative eventuality must be a matter for future research.

One last comment is in order before I proceed with a development of a formal analysis of the data discussed in Section 3. In this paper, I pursue the idea that we conceptualize two- and three-dimensional space as either bounded or unbounded, similar to the way we conceptualize paths.<sup>8</sup> In terms of a visual representation of the latter, it is simple enough to draw a horizontal line (=the path) and include (or leave out) a boundary (in the form of a vertical line) at its right end. However, how do we provide a visual representation of the former? How do we include (or leave out) the boundaries of a two- or three-dimensional space? While I am not inclined to draw a visual representation, it is not unreasonable to suggest that we conceptualize space in one of these two ways. Either we take it to be a flexible, amorphous, vague area with no salient, observable, or conceptualized edges (unbounded space), or we take it to be a circumscribed region, conceptualized as having edges and/or borders (bounded space). This is not unlike the fact that we can conceptualize events as either having finality or as being ongoing, and that whatever way we subjectively choose to conceive of events, and whatever aspects of the event we choose to highlight, we have a linguistic means to express these choices (by using, say, perfective vs. imperfective aspect).<sup>9</sup>

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The sentence in (ii) gets better with the addition of *...and then continues in a straight line* (and is bad with *in 7 feet*). However, given the ungrammaticality of (i), it does not seem that these spatial *in-* and *for-*phrases pick out bounded and unbounded paths (otherwise (i) would be grammatical); consider in this regard (iii) compared to (i):

(iii) ?The highway extends from Denver to Indianapolis for 1,500 miles.

Here we see compatibility of a bounded path with a spatial *for-*phrase, something that should be unexpected if it were the case that spatial *for-* and *in-*phrases picked out unbounded and bounded paths, the way temporal *for-* and *in-*phrases pick out unbounded and bounded events (thanks to P. Benincà for helpful discussion here, and for reporting that (iii) is only felicitous in Italian if the highway goes in the direction of Indianapolis (but does not arrive there)). Ultimately, though, compatibility of a bounded path with a spatial *for-*phrase is unsurprising, given the fact that, although we are dealing with bounded space, we are also dealing with a *state*, which is temporally durative (cf. *We sat on the porch for hours*). Furthermore, the state in question is individual-level (the extent of the highway is a property of the highway), and so has duration.

<sup>8</sup> Aside from grammatical evidence such as that discussed in this paper, it would be nice to find perceptual evidence that this conceptual distinction between bounded and unbounded space exists.

<sup>9</sup> Sometimes lexical semantics (i.e., achievement vs. accomplishment vs. activity vs. state) may restrict the ways in which we can conceptualize events (and hence restrict use of perfective or



#### 4.1 A Syntactic Analysis

In the previous section I suggested that the temporal aspectual concept of *boundedness* be extended to the spatial domain. In this section, I would like to develop an analysis which instantiates this idea syntactically, and which allows us to account for the data in Section 3.

In particular, I adopt the idea, developed by Koopman (1997) and den Dikken (2003) (following work by van Riemsdijk 1990) that locative prepositions, like verbs, nouns, and adjectives, are dominated by a series of functional projections. As argued by these authors, whose goal is to explain the complex semantic and syntactic behaviors of prepositions, postpositions, and circumpositions in Dutch, these extended projections of the preposition parallel (at least loosely) the functional structure of DP and CP.<sup>10</sup>

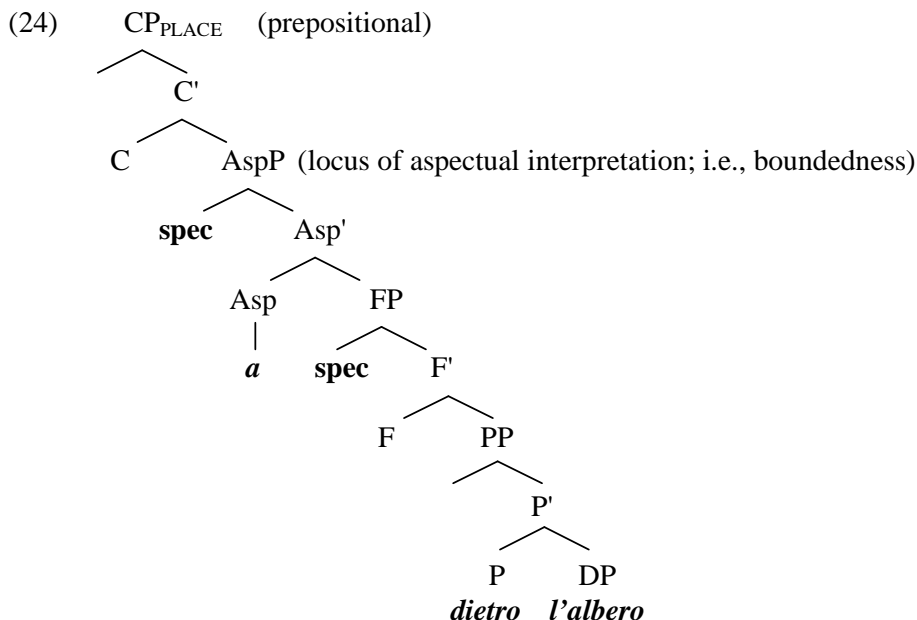
I propose for Italian that it is the adverbial preposition that projects the PP, while the grammatical preposition, when present, heads an AspP which is among the extended projections of the PP. This is sketched in (24), which is the underlying structure for the PP *dietro all'albero* in (1a/8a). I would like to suggest that the Aspectual Phrase is the locus of the aspectual feature [bounded]. To account for the data discussed in Section 3, I propose that the presence of *a* reflects the presence of the underspecified feature [bounded], which, when applied to an adverbial preposition that denotes *place* (such as *dietro* 'behind'), yields the interpretation of the location in (1a/8a), (9a), (10a), (12a), (15a), (16a), (17b), and (17c) either as spatially unbounded or bounded. The absence of *a*, however, reflects the presence of the (positively valued) [+bounded] feature; this, in turn, accounts for the interpretation of the location in (1b/8b), (11), (12b), (13b), (15b), (16b), and (17a) as necessarily spatially bounded.<sup>11</sup>

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imperfective). This may turn out to be the case for the adverbial prepositions in question, with respect to boundedness. That is, the semantics of each preposition may impose restrictions on its use, such that in Italian, for example, some of the prepositions in (7) may not appear with or without *a* as readily as others. This issue may also bear on the fact that the adverbial prepositions in (6) obligatorily appear with *a*, and on the fact that those in (4) and (5) never appear with *a*. I leave this question of the lexical semantics of adverbial prepositions as a matter for future research.

<sup>10</sup> In what follows, I simplify their proposals a great deal for the sake of argument. The structures den Dikken (2003) proposes for directional PPs, for example, are highly articulated and involve two types of preposition, P<sub>loc</sub> and P<sub>dir</sub>, each projecting its own functional architecture (ending in CP<sub>place</sub> and CP<sub>path</sub>, respectively; in this regard, his proposal is an extension of Jackendoff's 1983 idea that PATH embeds PLACE in directional PPs).

<sup>11</sup> An anonymous reviewer rightly raises the question of why the unmarked case ([bounded]) would be marked with a morpheme, while the marked case ([+bounded]) would lack the morpheme (something unexpected, given that generally an overt element expresses the marked



It is worth noting that this previously unexplored semantic difference between pairs like (8a) and (8b) reveals that the grammatical preposition *a* is arguably merged to the left of the adverbial preposition, despite surface indications to the contrary. A question that arises of course is how the surface order exhibited in (8a) is derived; this will be discussed in Section 4.1.2. As a preview, though, I mention here that this proposal is reminiscent of Kayne's (1999) recent interpretation of *a* (and *di*) as infinitival complementizers. In what immediately follows, then, I say a few words in support of the idea that grammatical prepositions do not project their own PPs, but rather reside as heads of functional projections.

4.1.1 *The complementizers a and di*. It is well known that in Italian (as well as other Romance languages), grammatical prepositions appear in places other than prepositional phrases. In particular, depending on the matrix verb, they may or may not introduce embedded infinitivals. Some infinitival-embedding

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value of a functional projection). I have nothing to offer here, except to note that this problem has also been traditionally noted regarding the presence of *-s* in the English third person singular present (a person/number/tense which generally lacks a morpheme in other languages).

verbs, i.e., modal verbs, do not occur with a grammatical preposition at all. These can be seen in (25):

- (25) *dovere, volere* (Gianni *deve* mangiare. “Gianni must eat.”)  
 must, want

However, some verbs that take infinitival complements obligatorily appear with the grammatical preposition *di*; these can be seen in (26):

- (26) *sperare, tentare, dimenticare, cercare...*  
 hope, try, forget, seek  
 (Gianni *spera di* cantare. “Gianni hopes to sing.”)

Still other verbs which take infinitival complements obligatorily appear with the grammatical preposition *a*; these can be seen in (27):

- (27) *venire, andare, continuare, cominciare, provare...*  
 come, go, continue, begin, try  
 (Gianni *prova a* cantare. “Gianni is trying to sing.”)

If we look at the three groups of verbs in (25), (26), and (27), we see a parallel with the three groups of adverbial prepositions in (4), (5), and (6/7). In other words, Italian employs  $\emptyset$ , *di*, or *a* with embedded infinitivals, just as it does with adverbial prepositions.<sup>12</sup> Given this parallel, we can hypothesize that *a* and *di* are structurally similar in both domains.

Independent support for the idea that *a/di* are similar types of creature in both cases comes from an observation made by Manzini (1991). She notes that certain verbs that take infinitival complements, such as *convincere* ‘convince’ and *persuadere* ‘persuade’, select either *a* or *di*. She further reports that the choice of grammatical preposition (*a* or *di*) determines the temporal interpretation of the embedded infinitive; in particular, when these verbs take *a*, the embedded infinitive is interpreted as future. Compare (28) and (29):

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<sup>12</sup> This is something also noted by Starke (1993), who takes the grammatical prepositions that occur with adverbial prepositions to be Complementizers within the DP complement of the adverbial preposition.

- (28) *Ho convinto/convincerò Gianni ad andarsene.*  
 have.1SG convinced/convince.FUT.1SG Gianni **at** go.SE.NE  
 "I convinced / I will convince Gianni to leave."  
 (convince=induce a decision to do something)
- (29) *Ho convinto Gianni di essermene andato.*  
 have.1SG convinced Gianni **of** be.ME.NE gone  
 "I convinced Gianni that I had left."  
 (convince=induce a belief in the existence of an event )
- (30) \**Ho convinto/convincerò Gianni di andarsene.*  
 have.1SG convinced/convince.FUT.1SG Gianni **di** go.SE.NE

Both (28) and (29) contain the verb 'convince' with an embedded infinitival. Only the infinitival preceded by *a*, however, can be interpreted as a future (this is confirmed by the ungrammaticality of (30), with *di*, which can only mean that "I convinced (or will convince) Gianni that he left" (which is strange, since Gianni should know whether he left or not).

Given the hypothesis that tense (like aspect) is instantiated by a functional head, it is not unreasonable to conclude that *a* instantiates a temporal functional head. The facts in (28-30) thus suggest that *a* has a similar function in both the extended projections of the Verb and the extended projections of the (adverbial) Preposition. It also suggests that Kayne's (1999) proposal that such "complementizers" are morpho-syntactic instantiations of functional heads in the extended projection of the verb is on the right track.<sup>13</sup>

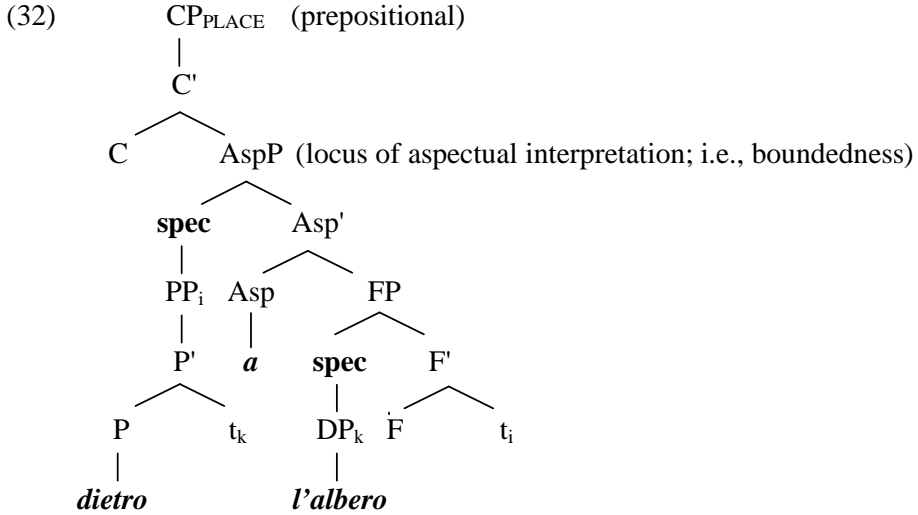
4.1.2 *Deriving the word order.* Thus, the configuration proposed for the Italian preposition's preposition in (24) is consistent with the proposal offered by Kayne (1999) for such grammatical prepositional complementizers; his proposal is roughly sketched in (31) (which is a structure for the example in (27), *Gianni prova a cantare* 'Gianni is trying to sing.').

- (31) [ ... [ *a* [ *provare* [ <sub>IP</sub> *cantare* ] ] ] ]

Given the similarity of the proposals, it would not be unreasonable to pursue a derivation for the surface word order found with the adverbial PP

<sup>13</sup> R. Kayne observes (p.c.) that French lacks the possibility of *a* both with the equivalent of *convincere/persuadere* and with the equivalent of *dietro*, further suggesting that *a* in Italian has the same status in both the adverbial PP and in the verbal domain.

(*dietro all'albero*) that is similar to the remnant movement derivation Kayne proposes for (31). In particular, I propose that first, the DP *l'albero* moves to the specifier of the FP in (24) (perhaps for reasons of Case), leaving  $t_k$  in (32). Then, subsequent movement of the remnant PP (headed by *dietro*) to the specifier of AspP obtains, leaving  $t_i$ . Thus, the surface order *dietro all'albero* is derived:



Perhaps PP movement obtains for interpretive reasons; i.e., the locative PP receives the unbounded interpretation by virtue of landing in the specifier of the aspectual head.<sup>14</sup>

Before I conclude, I would like to point out that the proposal that *a* is merged to the left of the adverbial preposition (and that it is the reflex of the unspecified feature [bounded] in Asp) may find support from languages like Spanish and Brazilian Portuguese. Plann (1988) discusses sets of Spanish examples (*trás, atrás* (cf. *detrás*) ‘across’; *bajo, abajo*, (cf. *debajo*) ‘below’; (*en*), *dentro, adentro* ‘in(side)’) which to me seem to exhibit a pattern whereby a monomorphemic adverbial preposition (e.g., *dentro*) corresponds to a bimorphemic adverbial postposition with *a* (e.g., *adentro*). The bimorphemic examples could be taken simply to be cases where the grammatical preposition

<sup>14</sup> For reasons of space, I unfortunately cannot review the fact that movement of PP to a higher spec is independently argued for by Koopman (1997) and den Dikken (2003), in order to explain a cluster of facts revolving around the behavior of circumpositions and directional and locational Ps in Dutch and German.

*a* precedes the adverbial preposition (as in the d-structure for Italian *dentro a* 'inside', which is *a dentro*; see (24)). Interestingly, in the case of Spanish, the adverbial prepositions with *a* are syntactically postpositions, with the complement necessarily a bare noun. According to C. Schmitt, this is also the case for Portuguese, where she notes that the pairs differ in meaning. Consider the following example with *fora/afora*:

- (33) a. *Correu fora do parque.*  
 run.1SG outside of.the park  
 b. *Correu (\*o) parque afora.*  
 run.1SG (\*the) park a.outside

According to Schmitt, (33a) (without *a*) denotes running outside the boundaries of the park. The sentence in (33b) (with *a*), on the other hand, does not consider the boundaries of the park. This difference in meaning can be understood in the terms discussed in this paper: the presence of *a* yields an unbounded interpretation, while the absence of *a* indicates presence of the positively valued feature [+bounded], forcing for three-dimensional space (e.g., PLACE) an interpretation in which there are boundaries. As for the syntactic derivation of such adverbial postpositions (with *a* to the left rather than to the right), if we consider the structure in (24), it seems that the (bare) NP moves to the left of *a* (to the specifier of AspP), in place of the PP, which remains in situ (in contrast with Italian), yielding the order grammaticalP+adverbialP.

## 5. Conclusion

In this paper I have discussed a previously unexplored pattern regarding Italian PPs that contain an adverbial preposition with an optional grammatical preposition *a*. The interpretive facts led me to conclude that the presence of *a* is the reflex of the unspecified feature [bounded] within the adverbial preposition's functional structure, pointing to the more general conclusion that grammatical prepositions do not head PPs at all, but rather only serve to instantiate functional heads (cf. Kayne 1999; and as we have seen, support for this hypothesis is provided by the behavior of control verbs such as *convincere*, where choice of the grammatical P determines the temporal interpretation of the embedded infinitive). The Portuguese data additionally suggest that the idea that *a* is merged to the left of the adverbial preposition may indeed be correct. Of course, further investigation of the semantic and syntactic patterns with adverbial *a*-postpositions and *a*-less adverbial prepositions in Spanish and Portuguese is necessary, but the preliminary review provided above seems

promising as support for the direction proposed in this paper. Needless to say, the proposal in this paper does raise many questions that have been left unanswered. In addition to that regarding the Spanish/Portuguese postpositions, there is the question of how adverbial prepositions that obligatorily occur with *di/de* in Italian, Spanish, and French are to be analyzed under this framework. Likewise, what is the semantic behavior of the adverbial prepositions in (7) that we have not discussed? And what is the nature of those in (6), which obligatorily appear with *a*? I believe that the approach offered in this paper promises to lead to a unified understanding of all of these cases.

Last but not least, a fundamental contribution of this paper which does not depend on the formal analysis provided in 4.1 is the idea that *space* is grammatically treated like *entities* and *events* in terms of the concept of boundedness. "Space" is taken to consist of two types, PATH and PLACE (following Jackendoff 1983), and evidence that non-temporal *paths* are bounded is taken as support for the idea that *places* (which are non-temporal) are treated in the same way.

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**THE YO-YO EFFECT**  
**PRIMING IN SUBJECT EXPRESSION IN COLOMBIAN SPANISH\***

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**1. Introduction**

Subject expression is one of the most widely studied features of Spanish, yet it remains one of the least understood; factors that are argued to affect subject expression in one study are argued not to do so in others. The most robust and consistent finding across a range of different studies and dialects is in relation to switch reference: subjects are more likely to be unexpressed or implicit when they are also the subject of the preceding clause, and are more likely to be expressed or explicit when there is a switch in subject from that of the preceding clause. While this also holds true for first-person singular subject expression in the conversational Colombian Spanish data to be reported on here, it is only a partial explanation, as even in cases where there is no switch reference, subjects are still explicit close to 40% of the time. Similar results have been obtained in other studies, and it is generally found that subjects are explicit between 20 and 40% of the time in contexts of same reference (Bentivoglio 1987:55, Cameron 1995:25, Flores-Ferrán 2004:63, Silva-Corvalán 1994:158). The following two examples illustrate this phenomenon, where we have continuity of subject across adjoining clauses, and yet the second clause occurs with an explicit subject. (Unexpressed subjects in the Spanish are presented in parentheses in the English translation.)

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- (1) M: **Yo** no sabía cuánto **yo** quiero a mi hermano.  
 “I didn't know how much I love my brother.” [Calima2 642]<sup>1</sup>
- (2) S: Mañana voy. **Yo** dejé diez paquetes allá.  
 “(I) will go tomorrow. I left ten packets there.” [cooking 100-101]

Note that in (1), we have an expressed subject followed by another expressed subject, and in (2), an unexpressed subject followed by an expressed subject. These two patterns do not have equal distribution in the data, and while that presented in (1) is very frequent that presented in (2) is relatively rare. What is much more common following an unexpressed subject is a subsequent unexpressed subject, as illustrated in the following example re a computer virus.

- (3) N: Ahí, tengo uno, tengo dizque el capa, ahora, y tengo que bajar el Macafi por internet, y sinceramente, no he tenido tiempo.  
 “(I) have one, (I) have so-called capa now, and (I) have to download MacAfee over the internet, and honestly, (I) haven't had time.” [estudios 101-107]

That is, what we tend to find in the data is strings of expressed and unexpressed first-person singular subjects clustering together, and this does not occur randomly: the realization of the preceding coreferential subject as expressed or unexpressed was found to have a statistically significant effect on the realization of the following subject. This can be described as a kind of *yo-yo* effect, where the form of one subject bounces on to another: one *yo* leads to another *yo*, and one implicit first-person singular subject leads to another implicit subject. This phenomenon has been called “parallel processing” (Poplack 1980), “perseverance” (Cameron & Flores-Ferrán 2003) and “structural priming” (Bock 1986), which is the term that will be used here. Structural priming is manifested when the use of one syntactic structure in an utterance functions as a prime on a subsequent, target, utterance, such that that same structure is repeated.

This paper will investigate in detail the way structural priming comes into play in first-person singular subject expression in conversational Colombian Spanish. It will be shown that although the effect is evident regardless of the

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<sup>1</sup> This information gives the name of the conversation from which the example is drawn, and the line number(s) of this excerpt.

distance between the two coreferential mentions (measured in terms of the number of intervening clauses), it is only statistically significant in contexts where the prime occurred in the immediately preceding clause (illustrated in (1) and (3) above), or where there was just one clause intervening between the prime and target. This means that for subject expression, speakers orient to syntactic structures recently used in the discourse, and adopt these structures as partial models for the syntax of subsequent utterances. This finding has important implications for syntax, providing strong evidence that grammar emerges from discourse (cf. Bybee, Perkins & Pagliuca 1994, Hopper 1998, Ono & Thompson 1995), rather than being an abstract entity fully contained in the mind of speakers which is accessed independently for each utterance.

## 2. *Structural priming*

Research on structural priming has been carried out in two main areas, sociolinguistics and psycholinguistics. The first study to observe such an effect in sociolinguistic research was that by Poplack (1980) on plural expression in Puerto Rican Spanish. Basing her analysis on a series of sociolinguistic interviews conducted with Puerto Ricans residing in the United States, she found that in this dialect with variable (s) expression, one factor that affects the realization of plural -s in the noun phrase is its expression on preceding elements in the same noun phrase: "Presence of a plural marker before the token favors marker retention on that token, whereas absence of a preceding marker favors deletion" (1980:63).

Scherre and Naro (1991, 1992) and Scherre (2001) found something similar for subject/verb agreement and subject/predicate adjective agreement in Brazilian Portuguese. They also studied plural marking, which, as in Puerto Rican Spanish, is variably expressed. Using a corpus of sociolinguistic interviews, they found that plural is more likely to be morphologically marked in the case of both verbs and predicate adjectives if it is marked on preceding elements in the clause, or in the preceding clause. While Poplack (1980) identified priming effects at the clausal level, Scherre and Naro (1991, 1992) thus found such effects both at the clausal and at the discourse level. They note that in their data, plural marking is "decidedly uneconomical. Markers tend to occur precisely when they are not needed and tend not to occur when they would be useful, at least from the point of view of the listener" (Scherre & Naro 1991:30).

These studies investigated priming at the level of morphology. Similar findings have been made for syntactic variables. In Weiner and Labov's (1983) study on the use of the agentless passive in sociolinguistic interviews in English, they found that one of the strongest factors to account for the use of a

passive was the occurrence of another passive anywhere in the preceding five clauses (Weiner & Labov 1983:52). This shows that priming effects can “persist” in the discourse for at least five clauses.

Priming has also been observed for subject expression in Spanish in research by Cameron (1994), working with sociolinguistic interviews from Madrid, Spain, and San Juan, Puerto Rico, and Flores-Ferrán (2002), working with sociolinguistic interviews from Puerto Ricans living in New York City. Cameron looked at the subject of the immediately preceding clause, regardless of coreferentiality, and found that “pronouns lead to pronouns and null subjects lead to null subjects” (1994:40), though the effect was stronger in contexts of same reference. Flores-Ferrán (2002) looked at priming between coreferential subjects at a distance of up to ten clauses, and found a similar effect: pronouns were most likely to be used in contexts where the preceding mention of that same subject anywhere in the last ten clauses was also pronominal, and unexpressed subjects were most likely where the preceding mention was unexpressed (2002:69-71). She did not, however, consider any possible variation in the effect at different degrees of distance between prime and target.

In a more recent paper, Cameron and Flores-Ferrán (2003) draw together research from sociolinguistics and psycholinguistics to consider what might motivate this phenomenon. They argue that it can be accounted for in terms of activation: the use of a certain structure activates that structure in the mind, leading to its subsequent use. This is supported by research in psycholinguistics, particularly that of Pickering, Branigan and colleagues (Branigan, Pickering & Cleland 2000, Pickering, Branigan, Cleland & Stewart 2000). These scholars argue that the fact that this effect is short-lived supports an activation account, as activated forms weaken over time, either through the use of competing forms or simply due to the passing of time (Cameron & Flores-Ferrán 2003:55, Pickering et al. 2000:212). However, until now the interaction between distance and priming outside of experimental settings has only been considered up to five clauses (Weiner & Labov 1983), and thus its life span in natural discourse remains to be tested.

The leading research in structural priming in the field of psycholinguistics is that by Bock and colleagues (Bock 1986, Bock & Griffin 2000, Loebell & Bock 2003, *inter alia*). In particular, Bock has examined two types of constructions, passive vs. active and prepositional vs. double-object dative constructions in experimental settings. She has consistently found that participants tend to repeat the structure they have just used at a statistically significant level. Bock suggests that this may serve to “ease the demands of message formulation and actually contribute to fluency” (1986:380). By the same token, it may also reduce processing demands on the listener (*cf.*

Branigan et al. 2000, Cameron & Flores-Ferrán 2003:61), in contradiction to Scherre and Naro's observation that this is uneconomical for the listener (1991:30).

Bock and Griffin (2000) argue that activation may not fully account for priming, because they have observed that it can be maintained over large degrees of distance. In one study, they found no reliable drop in priming even after ten sentences intervened between the prime and target (2000:186). They propose instead that priming must be accounted for in terms of an implicit- or procedural-learning model, whereby the cognitive mechanisms for producing a certain structure are strengthened through use, and this in turn leads to subsequent use of that same structure.

Further support for the procedural-learning model is found in cross-linguistic priming: Loebell and Bock (2003) analyzed the speech of fluent German-English bilinguals, and found that priming took place across languages where the two languages use similar structures (for active clauses and for prepositional and double-object datives), but did not take place where the languages use different structures (for the passive). They conclude that "whenever languages share common procedures for building sentence structures, the use of the shared procedure in one language makes it more accessible to the other" (2003:809). Though this has not been tested for Spanish-English contact, Toribio (2004) presents some compelling evidence when she observes that Spanish-English bilinguals use higher rates of expressed subjects in Spanish in "bilingual mode" (i.e. when code switching) than in "monolingual mode". She suggests this is because the "bilingual mode" draws on structures from both languages, and thus is more susceptible to English influence (2004:8). It may be that part of this susceptibility is attributable to structural priming: the use of expressed subjects in English primes subsequent expressed subjects in Spanish (Toribio, p.c.).

The focus of this paper is priming in monolingual discourse, and it is beyond its scope to address in detail the activation vs. procedural-learning accounts of priming. However, this is clearly something which warrants further research, and which could be meaningfully pursued by investigating the duration of priming effects. In this study, priming was found to have a statistically significant effect only at low degrees of distance, suggesting that an activation account may be appropriate for these data.

### **3. Data**

The data used here were taken from a corpus of spontaneous conversation recorded in the city of Cali, Colombia, in 1997. A total of four and a half hours of conversation (approximately 42,500 words) were analyzed for this study.

These four and a half hours comprise fifteen conversations of between two and four participants, and involve 22 speakers (14 women and eight men). All speakers are middle-class, native Colombians, ranging between the ages of 20 and 60. The data were collected by two native speakers, who recorded spontaneous conversations between themselves and their husbands, family and friends over a period of two months. These data are therefore as natural as is possible in a situation where participants are aware they are being recorded. The conversations have been transcribed in accordance with the approach developed at the University of California, Santa Barbara (cf. Du Bois, Schuetze-Coburn, Cumming & Paolino 1993). The transcription conventions are given in the appendix.<sup>2</sup>

#### 4. Methodology

##### 4.1 *First-person singular subjects*

This study analyzes subject expression for first-person singular subjects only. It is limited in this way because it is believed that different persons are subject to different interactional pressures, and therefore it may not be possible to generalize over all persons. Unlike third-person subjects, first- (and second-) person subjects are not affected by issues related to information flow: they can always be considered given information because they are present in the context (cf. Chafe 1994). First-person subjects also play an important role in expressing epistemicity, as it is through use of the first person that speakers can weaken or strengthen their stance towards an utterance, by using expressions such as *(yo) creo* and *(yo) pienso* 'I think'. And finally, first person only has two forms, namely lack of expression, or use of the pronoun *yo*, while second person in this dialect has three different pronominal forms (*tú*, *vos*, *usted*), and third person can also be expressed by full noun phrases.

Limiting the study to first-person singular subjects alone gives us a more homogeneous set to work with, and allows us to eliminate variation in relation to these factors which are not yet fully understood.

##### 4.2 *Coding*

All finite verbs with first-person singular subjects in the four and a half hour corpus were coded, giving a total of 1125 verbs. Of these, 264 verbs were excluded because: the context did not allow variation (where the subject is obligatorily expressed or unexpressed); the subject was clearly playing a pragmatic role, such as being used for emphasis (for example if it was

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<sup>2</sup> For more details on the corpus, see Travis (2005).

followed by *sí*, e.g. *tú no ves esas cosas en tu familia, pero yo sí las veo* ‘you don’t see those things in your family by I do see them.’ [Restaurant 663-664]; or it was not possible to determine whether a priming effect was involved (for example for first mentions and following a truncated utterance in which there is a first-person singular subject but no verb). This left a total of 861 verbs for analysis, of which 50% occurred with expressed subjects.<sup>3</sup>

These tokens were coded in excel for the following factors: semantics of the verb; tense / aspect / mood; distance from previous mention (up to ten clauses); realization of previous mention (expressed or unexpressed); clause type (main or subordinate); relationship with previous verb (if the same TAM was maintained and if the verb was repeated); and position in the turn (turn initial or medial). Each of these factors will be explained below. The results of the coding were subjected to a variable rule analysis, using the program Goldvarb 2001 (cf. Rand & Sankoff 1990). This program calculates which factors contribute a statistically significant effect to the realization of a variant (in this case, an expressed subject) when a set of factors are considered together.

4.2.1 *Verb type*. A number of studies have found that subject expression interacts with the semantics of the verb. For example, Bentivoglio (1987:60), Enríquez (1984:240) and Silva-Corvalán (1994:162) report that verbs that express the opinion of the speaker, such as *creer* ‘think, believe’, and *suponer* ‘suppose’, favor explicit subjects more than other verb types. This may be particularly important for first person, given the epistemic role it can play with such verbs.

The categories applied here are adapted from Bentivoglio (1987:50) and Enríquez (1984:151-153), with some modifications to better suit the data. Table 1, below, lists the categories used with examples of the most commonly occurring verbs (presented in order of frequency) in each category.

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<sup>3</sup> There was a degree of variability between speakers in terms of the rate of subject expression, with the percentage of expressed subjects ranging from 40% to 60% for the majority of speakers. A statistical test for speaker variability run on a subset of these data found that this was not statistically significant.



Psychological	<i>saber</i> 'know', <i>creer</i> 'believe', <i>pensar</i> 'think', <i>acordarse</i> 'remember', <i>imaginarse</i> 'imagine', <i>entender</i> 'understand', <i>dar secuenta</i> 'realize', <i>estar seguro</i> 'be sure', <i>estar de acuerdo</i> 'agree' <sup>4</sup>
Speech act	<i>decir</i> 'say', <i>llamar</i> 'call', <i>pedir</i> 'ask, request', <i>contar</i> 'tell', <i>preguntar</i> 'ask'
Copula	<i>ser, estar</i> 'be', <i>quedar(se)</i> 'be, stay'
Motion	<i>ir</i> 'go', <i>venir</i> 'come', <i>llevar</i> 'take', <i>traer</i> 'bring'
Other	all verbs that do not fit into the above categories; <i>tener</i> 'have', <i>hacer</i> 'do', <i>querer</i> 'want', <i>dar</i> 'give', <i>conocer</i> 'meet', <i>poner</i> 'put', <i>comer</i> 'eat', <i>trabajar</i> 'work'

Table 1: *Categorization of verb types*

4.2.2 *Tense/aspect/mood*. One factor that has been widely tested in the literature on subject expression is that of potential ambiguity in the verb form. It is often assumed that unexpressed subjects are allowed in Spanish because verbs carry person and number marking, and therefore in many contexts an explicit subject is redundant (cf. discussion in Toribio 1996:409-411). There are, however, some cases where the verb form is ambiguous. For example, in the imperfect and the subjunctive, first-person and third-person singular take the same form. It has been proposed that explicit subjects may be used in order to resolve this ambiguity (Hochberg 1986). This is supported by a number of quantitative studies, where a correlation between ambiguity of the verb form and expressed subjects has been observed (Bayley & Pease Alvarez 1997, Cameron 1994, Hochberg 1986, Silva-Corvalán 1994). Other studies, however, have found that ambiguity of verb form did not affect subject expression to a significant degree (Bentivoglio 1987, Enríquez 1984, Ranson 1991).

It has also been noted that cases of true ambiguity are rare in natural discourse, as even with unexpressed subjects the ambiguity is generally resolved by context (Ávila-Shah 2000:242, Bentivoglio 1987:45). This suggests that the function of the subject is something other than resolving the ambiguity of the verb, as has been argued in formalist (Toribio 1996) as well as functionalist frameworks (Silva-Corvalán 1997, 2001).

Silva-Corvalán (1997, 2001) has proposed that the correlation between expressed subjects and ambiguous verb forms is due to the discourse function of those verb forms. She observes that those TAMs that are not

<sup>4</sup> This represents an exhaustive list of all psychological verbs with first-person singular subjects that occurred in the corpus.

morphologically ambiguous (such as the preterit and the present) are factual and assertive and mark foregrounded events, while those that are ambiguous (such as the imperfect, conditional and subjunctive) are non-factual, non-assertive and mark backgrounded events. Explicit subjects are more likely with imperfect, conditional and subjunctive verbs not because of their ambiguity, she argues, but because of their backgrounded nature. This is supported by Bayley and Pease Alvarez who argue that the discourse function of these verb forms better accounts for their data than does the notion of morphological ambiguity which they also found to be significant (1997:363).

TAM was included in the current study to investigate whether ambiguous and non-ambiguous forms behaved differently. Thus, a broad-based, two-way distinction was made between ambiguous TAMs (imperfect, pluperfect and subjunctive) and unambiguous TAMs (present indicative, preterit, present perfect and future).

4.2.3 *Distance from previous mention.* This factor group measures the number of clauses since the previous coreferential first-person subject, that is, a first-person singular subject produced by the same speaker. This allows us to study the effects of switch reference, which is the single factor that has been found to affect subject expression in all dialects studied and for all persons: in contexts of continuity of reference, subjects are consistently found to be expressed less often (Ávila-Shah 2000, Bayley & Pease Alvarez 1997, Bentivoglio 1987, Cameron 1994, 1995, Enríquez 1984, Flores-Ferrán 2004, Hochberg 1986, Morales 1986, Silva-Corvalán 1982, 1994). Concomitant with this, we would expect that the greater the distance between mentions, the greater the likelihood that the subject will be expressed, and this is precisely what was observed in the data.

As well as allowing us to test the effect of switch reference, this factor group allows us to investigate the interaction between priming and distance, and to determine whether the effect is maintained or weakened over large stretches of discourse, and if it is weakened, at what point.

Distance was counted up to ten clauses, with no distinction made beyond this. That is, eleven categories were used, from one to “eleven and over”. Preliminary Varbrul results revealed natural breaks in the data, with certain degrees of distance patterning similarly, and therefore the eleven categories were collapsed into four: one clause; two clauses; between three and six clauses; over seven clauses.

Examples (1) to (3) above illustrate coreferential subjects at a distance of one clause. Below are some more examples to illustrate the coding of this factor group, demonstrating a distance of two, (4), three, (5), and four clauses,

(6). First-person singular verbs have been double underlined and other verbs making up the intervening clauses have been single underlined.

- (4) S: si hay algun apartamento, Entonces, lo miro<sub>2</sub>,  
 si tiene<sub>1</sub> alcoba del servicio, .. entonces te -- .. Te aviso.  
 “if there’s an apartment, then (I) will look at it,  
 if it’s got a service room, .. then (I) will let you know.”  
 [pizza 1293-1297]
- (5) A: **Yo** no creo<sub>3</sub>, pues, que eso sea<sub>2</sub> lo mejor.  
 “I don’t think that that is the best.”  
 S: (2.0) Yo no sé<sub>1</sub> mi amor.  
 “I don’t know, my love.”  
 A: No=, no=. .. De verdad. **yo** quiero que hable=mos, negro.  
 “No, no. Really. I want us to talk, sweetheart.”  
 [restaurant: 1149-1157]
- (6) S: *No he comido*<sub>4</sub>.  
 “(I) haven’t eaten.”  
 A: *No has probado*<sub>3</sub>? .. *Ay, pero ya estoy*<sub>2</sub> *llena, ya no -- Ya no me cabe*<sub>1</sub> *más*.  
 “(You) haven’t tried it? .. Oh, (I) am so full, nothing more will fit in.”  
 S: *Eh=, dejé casi todo el almuerzo*.  
 “.. Oh, (I) left almost my whole lunch.”  
 [almuerzo 472-478]

As these examples show, both main and subordinate clauses were included, as were clauses produced both by the same speaker and by the interlocutor. Excluded from the clause count were fixed expression such as *es que* ‘it’s that’, *será que* ‘could it be that’ and *mira* ‘look’ because they function as discourse markers, and thus have partly lost their verbal status.

4.2.4 *Realization of previous mention.* Each subject was coded for the realization of the previous coreferential first-person subject as either expressed or unexpressed, in order to test for a priming effect.

Only fully coreferential subjects were included. Thus, first-person subjects produced by another speaker were not considered (illustrated in examples (5) and (6)). First-person plural subjects were also excluded, even though they are partially coreferential with first-person singular subjects, because it is unclear

how such subjects might enter into the priming relations. Likewise, a second-person singular subject produced by another speaker that referred to the current speaker (e.g. *no has probado?* 'you haven't tried it?' in (6)) was not considered. (See Cameron (1995) for a detailed discussion of the notion of switch reference and the non-coreferentiality of these forms.)

4.2.5 *Clause type*. Following Bentivoglio (1987), Enríquez (1984) and Silva-Corvalán (1994), I coded for main and subordinate clauses (including relative clauses). It was hypothesized that as subordinate clauses present background information (cf. Thompson 1987), they may accord with the pattern observed for imperfect, subjunctive, and conditional clauses (also proposed to present background information, Silva-Corvalán 1997, 2001), and have a higher rate of subject expression. Subordinate clauses did occur with a slightly higher rate of subject expression, but this was not found to be significant.

4.2.6 *Relationship with previous verb*. This factor group measured the relationship between verbs with coreferential subjects. I considered both the identity of the verbs and of the TAM. Research conducted within the framework of Discourse Connectedness Theory (Ávila-Shah 2000, Bayley & Pease Alvarez 1997, Paredes Silva 1993) has found that along with a change in subject, a change in TAM can create discontinuity in the discourse as it represents a change in temporal events in narrative. Thus, a change in TAM can have an effect similar to a change in subject, and lead to an expressed subject. As applied here, this factor is only relevant at a distance of one clause (that is, in contexts of continuity of reference), and it was not selected as significant either overall or in cases of continuity of reference.

Identity of the verb was also tested, following research by Pickering and Branigan (1998) who found that priming effects were strengthened by lexical repetition. However, neither continuity of the verb and TAM nor of the verb alone had a significant effect.

4.2.7 *Position in the turn*. Position in the turn was investigated to test if subject expression plays a role in turn-taking, as may be manifested by a distinction between turn-initial and turn-medial subjects. Davidson has argued that one role of explicit subjects may be to signal the speaker's intention to take the floor, by highlighting their role in the speech event (1996:561). Also working under this assumption, this factor was investigated by Bentivoglio (1987) and Silva-Corvalán (1994), though neither found it to be significant, and nor was it found to be significant in this study for the overall results.

### 5. Results

Four factor groups were selected as statistically significant. These were verb type, distance from previous mention, TAM and previous realization. The results are presented in

Table 2. I will discuss the results for each factor group individually below, but first I will explain the presentation of the table.

<b>Total N</b>	<b>861</b>		
<b>% expressed S</b>	<b>50%</b>		
<b>Corrected mean</b>	<b>.50</b>		
	<b>weight</b>	<b>%</b>	<b>% of data</b>
<b>verb type</b>			
psychological	.67	68	19
copula	.61	60	6
speech	.51	52	16
other	.43	42	47
motion	.37	34	9
<i>Range</i>	<i>30</i>		
<b>Distance</b>			
7 <sup>+</sup> clauses	.61	60	35
3 – 6 clauses	.52	52	17
2 clauses	.45	45	13
1 clause (= same ref.)	.39	38	33
<i>Range</i>	<i>22</i>		
<b>TAM</b>			
ambiguous TAM	.65	64	10
unambiguous TAM	.48	47	89
<i>Range</i>	<i>17</i>		
<b>Previous realization</b>			
expressed	.58	57	49
unexpressed	.42	41	50
<i>Range</i>	<i>16</i>		

Table 2: Variable rule analysis of the contribution of factors selected as significant to the probability of expressed subjects ( $p < .01$ )

The factor groups are given in the left-most column, with the individual factors within each group presented in order from those that most favor to those that least favor an expressed subject (or to those that most favor an unexpressed subject).

The weight, presented in the second column, represents the probability that the variant will occur in this context; in this case, the probability that the subject will be expressed, for example with psychological verbs, or at a distance of over seven clauses, etc. A weight of .50 indicates a favoring, and below .50 a disfavoring, of the variant. The greater the distance from .50 (and the closer to .99 or to .01), the stronger the effect.

The point spread within each factor group, or the range between the weight of the factor that most favors realization of the variant and that that least favors realization of the variant, represents the magnitude of effect of this factor group. As can be seen in Table 2, verb type has the strongest effect with a range of 30, followed by distance from previous mention (range = 22), TAM (range = 17), and then previous realization (range = 16). I will discuss why the effect for previous realization is so low below.

The third column gives the percentage of subjects that are expressed in each context. (In this case, the percentage and the weight are almost identical because of the even distribution of expressed and unexpressed subjects, but this is not always the case.)

The fourth column represents the distribution of the data within each factor group; for example, what proportion of the verbs is accounted for by each verb type.

We will now go on and consider these results. We will first briefly review verb type and TAM, and then will look in more detail at distance from previous mention and previous realization.

### 5.1 *Verb type*

As can be seen in Table 2, psychological verbs and copulas most favor explicit subjects, followed by speech act verbs and “other”, with motion verbs most disfavoring explicit subjects. These findings are consistent with those of Bentivoglio (1987:60), Enríquez (1984:240) and Silva-Corvalán (1994:162), who found a high rate of subject expression with psychological verbs. This could possibly be accounted for by the epistemic nature of these verbs, where the expression of the subject serves to further assert the speaker’s role in the utterance.

The finding that copulas also favor subject expression is in accordance with Enríquez (1984:240), who found that stative verbs in general favor subject expression.

The fact that speech act verbs favor explicit subjects slightly more than “other” verbs can be explained by the use of just one verb, *decir* ‘say’: *decir* accounts for over two thirds of the speech act verbs and it favors subject expression while the other speech act verbs do not. This verb is often used as a marker of epistemic stance (e.g. in the expression *yo digo* ‘I say’, to introduce the speaker’s opinion), which may explain why it patterns similarly to the psychological verbs. Furthermore, *decir* is overwhelmingly the most frequent verb to occur with first-person singular subjects in the corpus, and thus it clearly warrants an independent analysis in the future.

### 5.2 *Tense / aspect / mood*

Ambiguous TAMs were found to occur more frequently with expressed subjects, and thus these results partly support the notion that ambiguous TAMs favor subject expression, be that due to the discourse function of these verb forms as proposed by Silva-Corvalán (1997, 2001), or due to their ambiguity as proposed by Hochberg (1986). These results, however, must be interpreted with caution for two reasons: (1) ambiguous verbs represent just 10% of the data, and (2) this factor group has only a weak (though statistically significant) effect, with a range of just 17. Thus, the effect of TAM would need to be investigated in a larger data set.

### 5.3 *Distance from previous mention*

The results for distance from previous mention were as predicted: the greater the distance from the previous coreferential subject, the greater the probability that the subject will be explicit. However, even at a distance of one clause, that is, in contexts of same reference, an expressed subject is only slightly disfavored with a weight of .39. Also note that the range for this factor group is only 22 points, compared with that of 30 for verb type, demonstrating that verb type has a stronger effect than distance. This indicates that, despite the consistency of the findings in the literature in regards to switch reference, it cannot be considered a defining feature of subject expression for these data.

### 5.4 *Realization of previous mention*

The results demonstrate a clear priming effect: we are more likely to get an explicit subject in contexts where the previous subject was also explicit, and are less likely to get an explicit subject in contexts where it was not. However, this effect is the weakest of those that were found to be significant, and thus it requires further investigation. Interesting findings emerge in comparing the results individually at different degrees of distance, as will be discussed in the following section.

### 5.5 *Priming and distance*

A problem that arises in considering priming in natural discourse is that we have no base rate against which to measure the priming effect. That is, there is no way to determine what might be a “neutral” rate of subject expression because each verb is susceptible to influence from a preceding verb. One measure that does give an indication of the strength of the effect is the difference between the rate of subject expression in the two environments considered, that is, between the rate of expression where the preceding subject was expressed and where it was unexpressed. This is illustrated in Figure 1 which gives the percentage of expressed subjects in the four categories of distance used in three different breakdowns: the total of expressed subjects; expressed subjects when the previous subject was expressed; and expressed subjects when the previous subject was unexpressed.

An important point to bear in mind in interpreting Figure 1 is that, as we have seen, subject expression interacts with distance such that at low degrees of distance, unexpressed subjects are favored while at high degrees of distance, expressed subjects are favored. In the case of expressed subjects, this works against the priming effect: if priming effects do indeed weaken over time, we would expect that a preceding expressed subject will be more likely to lead to a subsequent expressed subject at low degrees of distance, and less likely to do so at high degrees of distance. This is precisely the opposite of what is predicted by distance. Were we to disregard the effect of distance, Figure 1 would give the mistaken impression that priming is only relevant for unexpressed subjects. Note that there is a gradual increase in expressed subjects (and therefore a decrease in unexpressed subjects) in the environment where the preceding subject was unexpressed from 24% to 58% as distance between mentions increases (showing gradual weakening of the priming effect). This can be contrasted with an increase in expressed subjects in the environment where the preceding subject was expressed, suggesting that the priming effect is in fact strengthening as distance increases, though the rise is only from 53% to 63% and does not follow a consistent pattern. Although it is beyond the scope of this paper to resolve the issue of the strength of the effect for expressed as opposed to unexpressed subjects, I hypothesize that the effect is evident for both, but due to the interaction with distance it is much less readily observable in the case of expressed subjects.

What we are able to address in detail, however, is the strength of the effect at different degrees of distance. As Figure 1 shows, at a distance of one clause, subjects are expressed 29% more of the time in contexts where the previous subject was also expressed (53% vs. 24%).



At a distance of two clauses, the difference is almost the same as that observed at one clause, 28% (59% vs. 31%). However at a distance of between three and six clauses, the difference decreases greatly to just 8% (56% vs. 48%), and beyond seven clauses it is just 5% (63% vs. 58%). Thus, we can see that while the same general pattern is maintained at all degrees of distance, it diminishes enormously beyond a distance of two clauses: at low degrees of distance, priming is a major factor affecting subject expression, but at high degrees of distance the priming effect is greatly weakened as other factors come in to play.

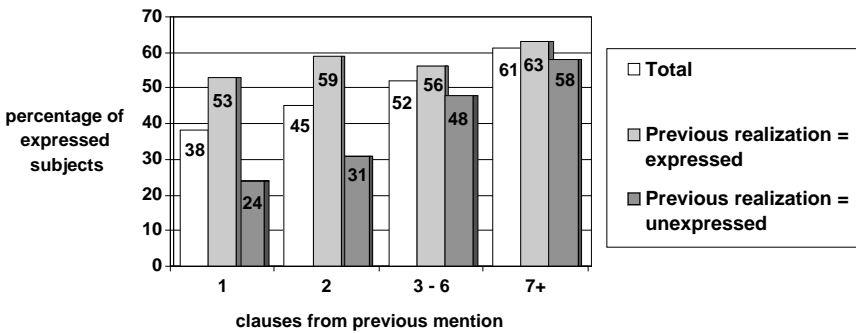


Figure 1: *Expressed and unexpressed subjects according to previous realization and distance*

Having observed the general pattern, we now need to determine whether this pattern is statistically significant. In order to test this, I conducted separate Varbrul runs for subjects that were coreferential with a subject at different degrees of distance.

Table 3 presents a summary of the results. As this table illustrates, subject expression behaves differently depending on the distance from the preceding coreferential subject, with no factor maintaining a significant effect at all degrees of distance.

Significant factor group	Distance			
	1 clause	2 clauses	3 – 6 clauses	7+ clauses
Verb type			✓	✓
Previous realization	✓	✓		
TAM		✓		
Clause type		✓		
Position in turn			✓	

Table 3: *Factors selected as significant at different degrees of distance ( $p < .01$ )*

Previous realization is only selected as significant at a distance of one and two clauses. Furthermore, at a distance of one clause, it is the only factor to reliably affect subject expression. At a distance of two clauses, previous realization remains significant, but TAM and clause type are also selected (with subordinate clauses favoring, and main clauses disfavoring, subject expression). It is interesting that although TAM was selected as significant overall, when looking individually at the different degrees of distance it is only significant at a distance of two clauses. This can explain the low magnitude of effect observed. At a distance of between three and six clauses, verb type and position in the turn are selected as significant (with turn-medial position favoring and turn-initial position disfavoring subject expression, the opposite of what is predicted by Davidson (1996:559)). And finally, at a distance of over seven clauses, only verb type is selected as significant. Although this factor was found to be the strongest overall, it in fact only plays a significant role beyond three clauses of distance.

In sum, we can see that at low degrees of distance, the strongest factor to affect subject expression is priming, while at higher degrees of distance, where expressed subjects are favored, the strongest effect is observed for verb type, and the priming effect is minimal.

## 5. Conclusions

This paper has demonstrated that first-person singular subject expression in conversational Colombian Spanish undergoes a priming effect. While this effect is evident regardless of the distance from the preceding coreferential subject, it is only statistically significant at a distance of one and two clauses. That is, for these data, priming does not persist over large chunks of discourse; it comes into play immediately or is greatly weakened. An activation model

would therefore appear to account for the priming effect in these data, where speakers are more likely to use a recently used structure because it is more activated than an alternative structure.

The finding that structural priming plays a role in discourse has profound implications for our understanding of grammar. The priming effect observed is evidence that speakers use syntactic structures that are “out there” in the discourse as a basis to produce subsequent utterances. Far from producing each utterance independently, preceding utterances are adopted as models for subsequent utterances, and syntactic forms are reused and repeated. This lends strong support to the notion of “emergent grammar” (Hopper 1998), in the sense that it shows that each utterance does not represent an independent application of the “rules” of grammar, but rather is a response to and a reflection of what precedes in the discourse.

## APPENDIX

### Transcription Conventions (Du Bois et al. 1993)

LETTER:	speaker label	--	truncated intonation contour
.	final intonation contour	=	lengthened syllable
,	continuing intonation contour	..	short pause (about 0.5 secs)
?	appeal intonation contour	...	medium pause (> 0.7 secs)
		...(N)	long pause (of N seconds)

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# TONAL LEVELS IN PUEBLA MEXICO SPANISH DECLARATIVES AND ABSOLUTE INTERROGATIVES\*

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## 1. *Introduction*

Since Navarro Tomás' (1944) classic characterization of Spanish intonation, it has been claimed and understood that Spanish interrogatives are produced at a higher tonal level from the onset of the utterance compared to declaratives (Navarro Tomás 1944). This claim was echoed in several papers (Cunningham 1983, Quilis 1987, 1993, Sosa 1991); however, repeated data in a controlled setting were lacking to identify tonal level as exclusive to signaling interrogativity.

Later experimental studies did not find evidence for Navarro Tomás' original claim of an increased initial tonal level to signal "interrogativity" (Sosa 1992, Prieto 2004). Rather, these quantitative studies found that although significant differences in tonal level occurred between declaratives and absolute interrogatives, this difference primarily affected the tone of the first prenuclear pitch accent of the utterance. Prieto (2004) reports that interrogatives are distinguished from declaratives by an earlier tonal prominence associated with a prenuclear pitch accent tone based on laboratory data from two speakers of Peninsular Spanish.

This paper examines Spanish intonational signaling of declaratives and interrogatives in a previously unexamined dialect of Spanish, Puebla Mexico Spanish (hereafter PMS). The examination is based on an evaluation of the intonational differences in declaratives and absolute interrogatives through a comparison of tonal levels of five potential targets.

The current research intends to address questions concerning the intonational cues that are employed to signal differences between PMS declaratives and absolute interrogatives, the reality of an utterance initial higher tonal level, as claimed for other dialects, and the variation that may exist among dialects of Spanish to signal utterance types in syntactically

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\* I wish to acknowledge the helpful comments and observations of José Ignacio Hualde, Erin O'Rourke and three anonymous reviewers. Any mistakes or shortcomings are my own.



ambiguous declarative/absolute interrogative sentences. The phonological interpretation of the phonetic facts reported in the current paper is left for future studies.

## 2. Procedure

The corpus is a controlled experimental data set consisting of read speech of sentences in contexts of broad focus. The comparisons are based on an examination of tonal levels of particular tonal targets. The speakers for the present study were three educated females at the Universidad de las Américas Puebla in Puebla, Mexico.<sup>1</sup> The informants were all native speakers of the PMS dialect and recorded within the dialectal region. Finally, these speakers were all within a range of 19-24 years of age and came from homes where at least one of the parents had obtained a university education.

The phonological structure of stimuli of the target test utterances was controlled to permit the realization of boundary tones at both the beginning of the utterance as well as the end with at least one unstressed syllable between the utterance boundaries and pitch accents as illustrated in (1).<sup>2</sup> Each target utterance contained two lexical words, each with penultimate stress (see Appendix for a complete list of the sentences used in this study).

- (1) Mi *ra* ba la *lu* na. ‘S/he was looking at the moon.’

The target utterances were embedded within a naturalistic context/response reading task that intended to prompt a broad focus interrogative or declarative (see 2). In the corpus there were twelve declarative sentences repeated three times each for a total of 36 broad focus declaratives (12 broad focus decl. x 3 repetitions x 3 speakers = 108 declaratives total). The absolute interrogative corpus was based on eight target sentences (see 2b) repeated four times each (8 abs. interr. x 4 repetitions x 3 speakers = 96 abs. interrogatives total).

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<sup>1</sup> Recording facilities for this research were facilitated by Dr. Christopher Hall of the Universidad de las Américas, Puebla.

<sup>2</sup> While there may be limitations to tonal alignments imposed by stimuli consisting of two intervening stressed syllables between pitch accents, the tonal targets are not in a direct tonal clash environment and are consistent for all the stimuli. This potential limitation was preferred to contexts with a higher number of intervening syllables with prepositional phrases such as *Mi-ra-ba- la- lu-na- en- el- cie-lo* ‘S/he was looking at the moon in the sky’; a common strategy in other studies (Face 2002, Prieto 2004). A previous pilot study showed that speakers from this dialect often inserted an intermediate phrase boundary tone at prepositional phrases, thereby potentially adding another confounding variable. Therefore, this construction was avoided for the present study.

- (2) Context response pattern
- a. Declarative pattern model  
*Miraba la luna.* “S/he was looking at the moon.”  
 Contexto: ¿Qué hacía Elena ayer cuando la viste?  
 Respondes: *Miraba la luna.*  
 Context: Your friend asks you, “What was Elena doing when you saw her yesterday?”  
 You respond: “She was looking at the moon.”
  - b. Absolute interrogative model  
*¿Miraba la luna?* “Was he looking at the moon?”  
 Contexto: Tu mamá quiere saber qué hizo tu hermano porque no lo vió ayer.  
 Te pregunta: “¿Miraba la luna?”  
 Context: Your mother wants to know what your brother did because she did not see him yesterday.  
 She asks, “Was he looking at the moon?”

The target context/response passages were placed on 3x5 index cards and pseudo randomized with distracters that included declaratives with variable placements of contrastive focus, pronominal interrogatives, and imperatives. The cards were grouped into sets of 25 cards each and passed to the informant by the researcher. The speech was recorded using a Sony DAT recorder and Optimus head mounted boom microphone in a radio station recording studio at the *Universidad de las Américas, Puebla*.

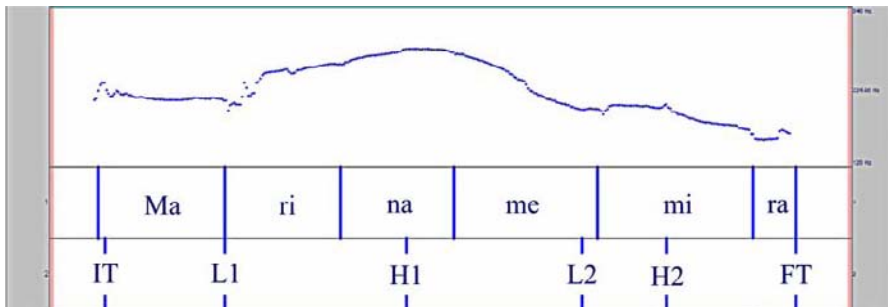


Figure 1: Tonal level targets of PMS declarative. *Marina me mira.* ‘Marina looks/is looking at me.’

The five tonal targets illustrated in Figure 1, measured for comparison between the PMS declaratives and absolute interrogatives, are: Initial tonal

value (IT); low tone of prenuclear pitch accent (L1); high tone of prenuclear pitch accent (H1); low tone of nuclear pitch accent (L2); final tonal value of the utterance (FT).

### 3. Findings

#### 3.1 PMS Declaratives

The examination of the declarative corpus revealed two basic broad focus declarative intonational patterns for PMS. Both patterns occurred in identical context/response tokens among the repeated productions, and both PMS declarative contours had a final falling tonal configuration. The more frequently occurring pattern for all speakers is a “standard downstepped declarative” pattern similar to the contour described in Peninsular dialects (Face 2002, Hualde 2003) and in Mexican Spanish by Prieto et al. (1995) (see Figure 1). From the utterance onset there is typically a slight tonal fall to the Low tone near the onset of the tonic syllable. Following the Low tone, there is a tonal rise that typically extended beyond the boundaries of the tonic syllable, followed by a tonal fall to a point near the onset of the final tonic syllable. After the Low tone associated with the final stressed syllable, there was either a small tonal rise or plateau to a point past the midpoint of the tonic syllable, which then began a tonal fall through the end of the utterance.<sup>3</sup> It should be noted that the tonal fall of the “standard downstepped declarative” was often cut short due a strong tendency to devoice utterance final syllables in this dialect of Mexican Spanish (Quilis 1993, Perissinoto 1975).<sup>4</sup>

The second PMS declarative pattern, referred to here as the “Mexican prominent toneme” contour with a final prominent tonal pattern, is similar in description to the *circumflex* contour mentioned in the literature on the intonation of Mexico City, D.F. (Matluck 1952, 1965; Kvavik 1974; Sosa 1999).<sup>5</sup> The nuclear pitch accent and final boundary, the toneme in Navarro

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<sup>3</sup> The declaratives utterances were also marked for the presence of a second High tone, in this case likely a downstepped tone.

<sup>4</sup> The tendency to devoice a final syllable raises additional questions related to the role, realization, and reality of a final boundary tone in this dialect of Spanish that cannot be addressed in the present study. However, the tendency to final devoice while theoretically interesting, does not seem to impede communication among the speakers of this dialect and argues that the acoustic reality of the contour is a valid object to be studied as it is produced and used.

<sup>5</sup> The term “circumflex” as used in the literature on Spanish intonation is problematic because it has multiple references in the literature; it has been used to refer to virtually any rise-fall, from the current description (see above references) to the fall of a Caribbean interrogative (Quilis 1993, Hualde et al. 2001), thereby, rendering the term ambiguous at best. The label

Tomás' taxonomy, in this contour is not only perceptually the most salient due to containing the nuclear or final pitch accent, but it is also acoustically the tonal movement with the greatest tonal magnitude and general tonal height of the utterance. Concerning this dialect, Sosa (1999) observes that the initial peak is the highest and that successive peaks are not as high, except in the case of the “circumflex” pitch accent (189,195-6). The current data indicate that the use of this Mexican prominent toneme contour is not exclusive to a Mexico City dialect.

The Mexican prominent toneme was typically realized as a tonal plateau from the onset of the utterance until the definite article associated with the final/second lexical word. The initial Low tone of the pitch accent was as high as or slightly higher than the initial tonal value of the utterance (see Figure 2) and the tonal High was the highest of the utterance.

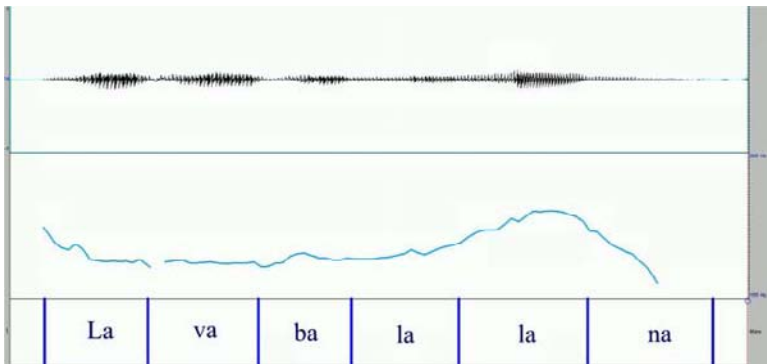


Figure 2: PMS “Mexican prominent toneme” declarative contour, Speaker 3.  
Lavaba la lana. ‘S/he was washing the wool.’

The tendency to devoice the final vowel or syllable of the utterance noted in the description of the “standard downstepped declarative” was reduced in the “Mexican prominent toneme” utterances which tended to maintain a high degree of voicing through the end of the utterance.

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Mexican prominent toneme” with a final prominent tonal pattern refers only to an utterance prominent nuclear pitch accent and final boundary tone.

Speakers	Pattern 1: “Standard downstepped”	Pattern 2: “Mexican prominent toneme”
Speaker 1	32	4
Speaker 2	27	9
Speaker 3	23	13
<b>Total</b>	<b>82</b>	<b>26</b>

Table 1: *Distribution of declarative intonational contour productions in the declarative corpus*

There were individual preferences in the use of the two described declarative patterns. The two patterns were found in all context/target prompts; therefore differences in pattern choice are not the result of a distinct pragmatic intent in the context/target prompts. The distribution of usage by speaker is presented in Table 1.

### 3.2 PMS interrogatives

The PMS interrogative contours were produced with one general pattern (see Figure 3). From the initial utterance tone, there was a plateau or slight fall until the onset of the tonic syllable rise that began at the syllable onset and continued rising into the posttonic syllable. After the High tone or peak, there was a dramatic fall to a Low tone near the onset of the second lexical word. Typically, from the Low tone associated with the nuclear pitch accent, there was a tonal plateau until a tonal rise that began at the tonic offset. The final tonal value was consistently the highest of the utterance. The PMS absolute interrogatives were consistently produced with a final rising boundary tone.

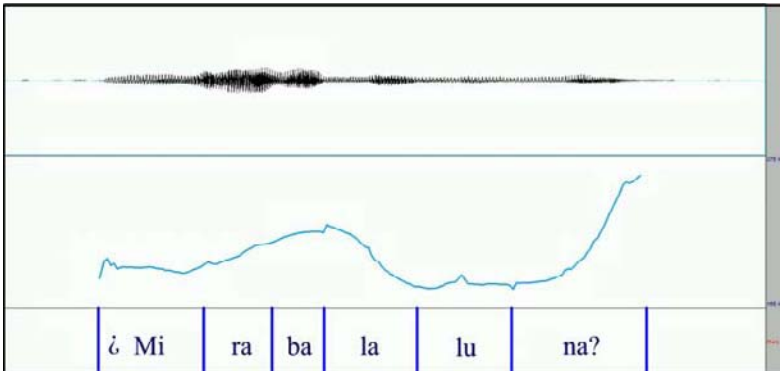


Figure 3: *Representative PMS absolute interrogative contour. Speaker 3.*  
 ¿Miraba la luna? *Was he looking at the moon?*

### 3.3 Declaratives and absolute interrogatives

To examine the role of tonal levels across the utterance types, tonal targets from the declaratives were compared with the absolute interrogatives. The 82 “normal downstepped” declarative productions discussed in Table 1 were used for comparison with the absolute interrogatives. Box plots for all of these values are shown in Figure 4.<sup>6</sup> The most noticeable difference between the utterance types for all speakers is the final tonal movement. The declaratives were produced with a final tonal fall, while the absolute interrogatives were produced with a dramatic final tonal rise at the end of the utterance concluding with the highest tonal value of the utterance. A second clear difference in declaratives is that there are two peaks, corresponding to the two accented syllables, while the absolute interrogatives have only a single accentual peak associated with the prenuclear accent. From this we can conclude that there are distinct nuclear pitch accents used for declaratives and absolute interrogatives.

<sup>6</sup> The size of the box reflects the range in the productions. The solid line in the plots represents the median production, often overlapping the dotted line that represents the mean.

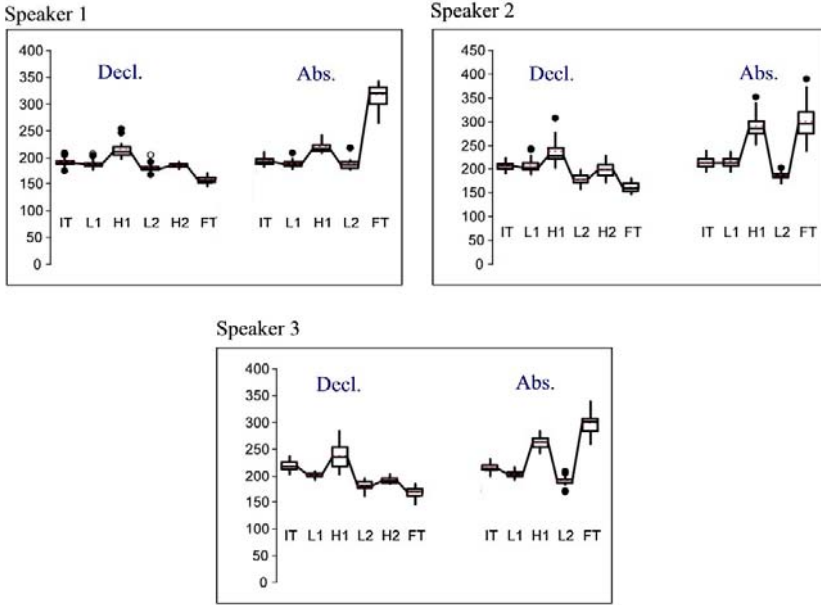


Figure 4: Declarative and absolute interrogative tonal values of five tonal targets in Puebla Mexico Spanish.

Spkrs	IT		L1		H1		L2		FT	
	M.d.	t-Test	M.d.	t-Test	M.d.	t-Test	M.d.	t-Test	M.d.	t-Test
Spkr 1	2 Hz	ns	0	ns	7 Hz	sig.	6 Hz	sig.	155 Hz	sig.
Spkr 2	6 Hz	sig.	7 Hz	sig.	52 Hz	sig.	10Hz	sig.	137 Hz	sig.
Spkr 3	3 Hz	ns	2 Hz	ns	24 Hz	sig.	9 Hz	sig.	128 Hz	sig.

Table 2: Statistical comparison of tonal levels between PMS declaratives and absolute interrogatives. Column M.d refers to the Mean difference between the two sets of productions of the two utterance types. Column t-Test refers to the results of a two sample t-Test; sig. = significant results at the .05 significance level, while ns = no statistical difference at the same level.

A two-sample t-Test analysis was performed for each of the tonal target comparisons, declarative and absolute interrogative. The differences between the means and results of the analysis are shown in Table 2.

The findings of the analysis indicate that tonal variations between the two utterance types were not consistent for all speakers. Additionally, in several cases, the level of difference is arguably below a perceptual threshold for the tonal ranges employed by these speakers, and therefore may not necessarily be as a reflection of a categorical difference (Rietveld 1985).

#### **4. Discussion**

The first question this paper proposed to address concerned the role of the initial tonal value as a signaler of “interrogativity” in PMS. This claim follows the earlier “levels analysis” for intonation, and can be considered phonological in that there are distinct pragmatics involved in the different levels, though they are not specified. Sosa (1991) originally echoes the claim of initial tonal level differences; however, he motivates this difference with an initial boundary tone within an autosegmental metrical approach. Later, Sosa (1992, 1999), changes the claim to reflect that the initial tone does not serve as a boundary tone target, but rather, the second tone of a bi-tonal LH pitch accent. Sosa’s (1999) claim of a spreading boundary tone and its implications for a phonetic/phonological interface are discussed in Willis (2003, 2004) for Dominican Spanish. The results of the tonal comparisons in the present study indicate that initial tonal values (IT) do not serve as a target for categorical distinctions between declaratives and absolute interrogatives in the PMS dialect.

The next point of the paper concerns the reality of intonational cues to disambiguate between declaratives and absolute interrogatives in PMS. The data indicate that there are consistent differences in tonal levels between PMS declaratives and interrogatives suggestive of some type of phonological process such as scaling, upstepping, an intermediate phrase boundary, or a distinct pitch accent with a lower tonal manifestation. However, the current paper seeks to present the “phonetic” facts of tonal levels that argue for a phonological distinction between the utterance types in this dialect, and encourage additional dialectal descriptions. It is reasonable to contend that empirical data from a number of dialects is necessary in order to characterize the intonational differences among Spanish dialects that are so readily discernable to native listeners.

As discussed previously, differences in tonal levels between declaratives and absolute interrogatives in PMS do not occur at the utterance initial boundary tone as claimed by Navarro Tomás and others. The Low tone of the



prenuclear pitch accent, typically characterized as the *starred tone* of a bi-tonal pitch accent (Sosa 1999, Face 2002, Hualde 2003), did not reveal consistent or appreciable differences in tonal level for the three speakers. The results of the tonal level of the High tone of the first pitch accent was not as categorical as previous reports (Prieto 2004, Sosa 1992). Only two of the three speakers revealed appreciably significant differences in target tonal levels between the utterance types. A deviation of one speaker is enough to question the systemic reality of the proposed difference when dealing with such small samples. For example, a variation of one speaker in Prieto's (2004) study, based on only two speakers, would suggest significantly different conclusions than those argued. Clearly, more studies with additional informants are required before categorical claims can be made for the role of a prenuclear pitch accent trailing High tone as a conveyor of interrogativity in any particular dialect, or across all Spanish dialects.

An examination of the other potential tonal targets for tonal differences did not yield conclusive evidence. The nuclear Low tones showed statistically significant differences; however, these differences are not likely to be appreciable or categorical. However, the type of pitch accent employed was different. The PMS declaratives were produced with an L+H\* tone, while the interrogatives had a single Low tone, L\*.

Contrasting with the results of the prenuclear High tone, the data on the final rising boundary tone is uniform and significant. All speakers in all productions of absolute interrogatives produced final rises with a mean in excess of 125 Hz. Furthermore, the tonal level of the final boundary tone was consistently the highest of the utterance. The degree of final tonal rise may reflect a dialectal difference, but will require further corroboration. While there may be secondary cues to interrogativity, the primary cue to signal differences between the PMS declaratives and absolute interrogatives appears to be the final boundary tone and the type of nuclear pitch accent.

Another point of this paper relates to the dialectal differences observed in Spanish intonation to signal utterance type. Caribbean dialects are generally reported to employ a final falling contour in absolute interrogatives (Quilis 1993, Sosa 1999). However, Willis (2003, 2004) finds that Dominican Spanish absolute interrogatives in broad focus are distinguished from their counterpart declaratives, both produced with final tonal rises, at the tonal level of the nuclear pitch accent, which is claimed to be due to an upstepping process in absolute interrogatives.

Including the data from the current study and previous accounts from Peninsular and Caribbean dialects, it is clear that the different dialects of Spanish employ tonal cues in distinct manners to convey utterance type.

Absolute interrogatives in Peninsular dialects are reported to have a higher prenuclear High tone due to a boundary tone (Sosa 1999) or as an effect of scaling (Prieto 2004), Dominican Spanish absolute interrogatives in broad focus have a higher nuclear pitch accent due to upstepping, and the current dialect, Puebla Mexico Spanish absolute interrogatives are differentiated by the type of nuclear pitch accent and the final tonal rise. It should be noted that the examples of Peninsular Spanish absolute interrogatives from Sosa (1999:209-211) and Beckman et al. (2002, Figure 6a), illustrate a nuclear pitch accent, L\*, similar to the PMS data, and not the L+H\* rising pitch accent reported in Peninsular declaratives.

Finally, the current PMS data indicate that in contexts of broad focus, the nuclear pitch accent and final boundary tone form the consistent and operative cues used to distinguish between utterance types. Since the final tonal movement carries the weight of the utterance signal in PMS, it was consistently present, unlike Peninsular Spanish in which the final tonal movement appears to be a secondary cue of “interrogativity”, or to fulfill some other pragmatic function such as politeness (Navarro Tomás 1944).

## 5. *Conclusion*

Puebla Mexico Spanish employs intonational cues to distinguish between broad focus declaratives and absolute interrogatives in broad focus. The principal cue used to distinguish an absolute interrogative from a declarative is a L\* nuclear pitch accent and a rising final boundary tone. The initial boundary tone did not reveal significant differences. The data concerning the High tone of the first pitch accent suggests some role for the tonal target; however, additional studies are needed to determine the scope of its role as an interrogative cue.

The findings for PMS, taken with the results from other dialects of Spanish, suggest that there is considerable intonational variability across Spanish dialects in the signaling of utterance type. However, these variations need not interfere in the basic communication task. Sosa (1999) notes the same basic contours are found in various dialects of Spanish but with a different pragmatic value and frequency. While there are dialectal differences, we can reasonably expect that a PMS broad focus question intonation may be understood as a question in Madrid, for example, but with a slight variation in pragmatic value. What is still unknown is whether an absolute interrogative from a Peninsular dialect and lacking a final rise will be interpreted as a question in PMS, or if a distinct L\* pitch accent is sufficient.

The current paper adds to our knowledge of Spanish intonational patterns by empirically characterizing tonal differences between PMS declaratives and

interrogatives at key tonal targets. The current findings also challenge long-held assumptions concerning the intonational signaling of utterance types in Spanish at the beginning of an utterance. Finally, this paper highlights the dialectal variability present in the Spanish intonational system and our need for additional quantitative studies to understand these processes and variation.

## APPENDIX

### *Declarative and absolute interrogative target sentences*

#### Declarative sentences with gloss.

Marina me mira.	'Marina looks at me.'
Manena lo lava.	'Amalia washes it.'
Elena lo gana.	'Elena wins it.'
Lenini me mima.	'Lenini mimics me.'
Lorena me roba.	'Lorena steals from me.'
Lavaba la lana	'I was washing the wool.'
Miraba la luna.	'She was looking at the moon.'
Amaba la nena.	'He loved the girl (description).'
Alaba la mula.	'He praises the mule.'
Emula a la niña.	'He/she emulates the little girl.'
Lamina la luna.	'She is laminating the moon.'

#### Absolute interrogative sentences with gloss.

¿Lavaba la lana?	'Was s/he washing the wool?'
¿Miraba la luna?	'Was he watching the moon?'
¿Amaba a la nena?	'Did he love the little girl?'
¿Alaba la mula?	'Is he praising the mule?'
¿Emula a la niña?	'Is s/he emulating the girl?'
¿Adora la mina?	'Does s/he love/adore the mine?'
¿Lamina la luna?	'Is s/he laminating the moon?'
¿Mimaba a la niña?	'Did s/he spoil the girl?'

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