Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012)
International Journal of Basque Linguistics and Philology

PAPERS IN LINGUISTICS BY THE *BIDE* GENERATION

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(eds.)

Gipuzkoako Foru Aldundia
Diputación Foral de Gipuzkoa

eman ta zabal zazu
Universidad del País Vasco
Euskal Herriko Unibertsitatea

ISSN: 0582-6152
Depósito legal / Lege gordailua: BI - 794-07

INDEX

Preface ix

Lobke Aelbrecht, Ellipsis in Negative Fragment Answers 1

Irina Agafonova, On Category Restrictions in Across-the-Board and Parasitic Domains: Evidence from Russian 17

Young-ran An, The Gradient OCP: Evidence from Korean Reduplication 33

Alexander Andrason, A non-unidirectional movement in the verbal system? 55

Irene Barberia, Vowel quality effects on hiatus resolution in Spanish 73

Rebeka Campos-Astorkiza, Lengthening and Prosody in Tuscan Italian 83

Naiara Centeno, Determiner Sharing in Spanish: DET & DET_{Foc} 109

Marijke de Belder, The distribution between the Old Dutch present perfect and preterit 125

Jon Franco & Susana Huidobro, Postverbal subject agreement in SVO languages 137

Carolina González, Laryngeals and prosody in Panoan 151

Jana Häussler, Interference during Subject Retrieval in Sentence Comprehension. An Interference-Based Checking Account for Object Attraction. 169

Lior Laks, The Hebrew Binyan *nifʿal:* Two Patterns of Verbal Passivization? 183

Paolo Lorusso, The Acquisition of Aspect in Italian 195

Jonathan E. MacDonald, Aspectual Interpretation and Calculation. 213

Iván Ortega-Santos, On Incrementality, Overt Agreement, the Duality of Merge and the Duality of Semantics 227

Veronika Pulai, Reanalyzing the Theme Vowel in Portuguese. 241

Sergio Robles-Puente, Two Languages, Two Intonations? Statements and Yes/No Questions in Spanish and Basque 251

Julia Romanchuk-Weisenberg, Mouthing: a discourse strategy in spoken language-to-signed language interpretation 263

Ainhoa Sáinz Gorbea, How does grammar emerge for children simultaneously acquiring Basque and Spanish as L1s?. 277

Susan Schweitzer, Uniqueness and pertainedness in genitive constructions. 285
Bàrbara Soriano, Andalusian Vowel Harmony and morphology-phonology interface. 295
Attila Starčević, Was Middle English a templatic language?. 309
Inma Taboada, Definite, Expletive and Silent Articles: [+Ref] Elements Heading the DP 337

PREFACE

This special issue contains a selection of papers written by a generation of linguists, whose careers started blossoming at the same time as the conference series BIDE International Student Conference in Linguistics held at the University of Deusto, Bilbao reached its peak during the years of 2006 and 2007. All of the authors were involved with BIDE in different capacities: presenting papers, organizing or attending the event. Thus, the unifying thread in choosing these articles was that they all resulted or benefited from the environment that BIDE created in the Basque Country during the years when it took place. The selection includes a wide range of approaches and methodologies to a diverse number of topics from almost all of the linguistic subfields, going from laboratory phonology to formal syntax. The group of authors has an international identity, representing first-class academic institutions from Spain, USA, Europe including University of Southern California, Ohio State University, Florida State University, Georgetown University, University of Maryland, University of Illinois, Chicago, University of Illinois, Urbana-Champaign, Universidad Autónoma de Barcelona, Eötvös Loránd University, University of Konstanz and University of Deusto, to mention some.

The editors would like to thank the leading organizers of BIDE 2006 and 2007, Irene Barberia and Susana Huidobro for their hard work and encouragement with this project. Furthermore, we also want to thank all the invited speakers that took part in BIDE and Francesc Roca, Jon Ortiz de Urbina and Alazne Landa, faculty members who were supportive of the conference series.

Joseba Lakarra deserves a special mention for all his help and invaluable work as Chief Editor of this series. We would not have published this volume without his help. We are also indebted to Susana Huidobro for her technical aid with the formatting of some of the articles.

This work has been partially supported by the Basque Government Research Project Grammar and Linguistic Variation - HM-2009-1-1 the UPV/EHU unit, UFI11/14, and by the Basque Government Research Grant for Consolidated Research Groups at Basque universities Ref. GIC07/144-IT-210-07.

This volume is a tribute to the great enthusiasm that a group of young people shown towards linguistic research in the first decade of the 21st century. Their enthusiasm spread around the intellectual university community, and they made Linguistics rock at the time like no other areas of humanities have ever done it before.

Rebeka Campos-Astorkiza & Jon Franco

ELLIPSIS IN NEGATIVE FRAGMENT ANSWERS

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1. Introduction

In certain dialects of Belgian Dutch, for instance Asse Dutch, fragment answers of the type in (1B) occur:

(1) A: Wie eit'em gezien? – B: Niemand nie.
who has.he seen no-one not
'Who did he see?' – 'No-one.' [Asse Dutch]

This example displays negative concord: B's answer contains two negative elements (*niemand* 'no-one' and *nie* 'not'), but it expresses only one semantic negation.

Merchant (2004) analyzes fragment answers as involving movement of the fragment to the left periphery of the clause, followed by ellipsis of TP. I claim that the fragment answer *niemand nie* 'no-one not' is derived in a similar manner from the sentence in (2), as is schematically represented in (3) and (4):

(2) B: Ij ee niemand nie gezien.
he has no-one not seen
'He didn't see anyone.' [Asse Dutch]

(3) *Step 1:* fronting of *niemand nie*
[[Niemand nie] [$_{TP}$ ij ee $t_{niemand\ nie}$ gezien]]
no-one not he has seen

(4) *Step 2:* ellipsis of TP
[[Niemand nie] [~~$_{TP}$ ij ee gezien~~]]

For this analysis to work the fragment must be a constituent, however, and I will show later on, in section four, that this is indeed the case. First, the next section introduces the basic data, while section 3 provides some background on negative concord. The actual analysis of negative fragment answers is presented in section 5. In the sixth section, this analysis is extended to another kind of negative concord called negative spread, and I round off with some open questions and problems (section 7) and a conclusion (section 8).

* I would like to thank Marijke de Belder, Jeroen van Craenenbroeck, Dany Jaspers, Luis Vicente and Guido Vanden Wyngaerd for their useful comments and their support, as well as the audience of the Bilbao/Deusto Student Conference in Linguistics 2006 for their questions. All errors are mine.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 1-15.

2. The basic data

N-words are words expressing negation, like *no-one*, *nothing* or *not*. I will call not a negative marker or negator here, however, because it only marks negation, in contrast with the other n-words, which also express person (*no-one*) or time (*never*), for instance. As can be seen in the examples above, these n-words sometimes co-occur. The combination of the n-word *niemand* 'no-one' and the negator *nie* 'not' is not restricted to fragment answers, however. It can also occur IP-internally and sentence-initially:

(5) a. Ij ee niemand nie gezien.
he has no-one not seen
'He didn't see anyone.'
b. *Niemand nie* eit'em gezien.
no-one not has.he seen
'He hasn't seen anyone.' [Asse Dutch]

When *niemand nie* occurs at the beginning of a sentence, it has to be stressed. In the Standard Dutch variant with only *niemand*, however, stress is also needed. The same pattern is observed with other n-words, such as the negative adverbs *nerges* 'nowhere' and *noet* 'never'.

(6) a. A: Waor zijde geweist? – B: Nerges nie.
where are.you been nowhere not
'Where have you been?' – 'Nowhere.'
b. Ik zen nerges nie geweist.
I am nowhere not been
'I haven't been anywhere.'
c. *Nerges nie* zen ik geweist.
nowhere not am I been
'I haven't been anywhere.'

(7) a. A: Wanneir got'em na 'tschoel? – B: Noet nie.
when goes.he to the.school never not
'When does he go to school?' – 'Never.'
b. Ij got noet nie na 'tschoel.
he goes never not to the.school
'He never goes to school.'
c. *Noet nie* got'em na 'tschoel.
never not goes.he to the.school
'He never goes to school.' [Asse Dutch]

In all these examples the n-word and the *nie*-negator express a single semantic negation. This phenomenon, generally known as negative concord, is present in a lot of natural languages and it is widely discussed in the literature. The next section provides some background on this matter.

3. Background: Negative concord

A lot has been said about negative concord already, among others by Giannakidou (2000, 2002), Haegeman (1995) and references cited there. Giannakidou

(2000: 458) defines the term as follows: 'situations where negation is interpreted just once although it seems to be expressed more than once in the clause', as was the case in the examples discussed above in that they contained a combination of an n-word plus the negation marker *nie* 'not'.

There are two varieties of negative concord. The first type is negative concord proper, where an n-word obligatory co-occurs with a negative marker. The Hungarian sentences in (8) illustrate this:

(8) a. Balázs *(nem) látott semmit.
Balázs not saw.3sg nothing
'Balázs didn't see anything.'
b. Senki *(nem) jött el.
no-one not came *preverb*
'No-one came along.'
c. Balázs *(nem) beszélt senkivel semmiről.
Balázs not spoke no-one nothing
'Balázs didn't talk about anything to anyone' [Hungarian, Giannakidou (2000: 458-461)]

A second type of negative concord is called negative spread. Here the negative meaning is 'spread' over two or more n-words, but the negative marker is absent.

(9) *Nada* (*no) le ha dado Juan a nadie.
nothing not cl has given Juan to no-one
'Juan has not given anything to anyone.' [Spanish, Luis Vicente p.c.]

I will come back to this second kind of negative concord in section 6. Now I turn to the main prerequisite for my analysis of negative fragment answers.

4. Prerequisite for the analysis: 'n-word + *nie*' = 1 constituent

Following Merchant (2004) I will claim that the fragment answer *niemand nie* has moved to a position in the left periphery, with subsequent ellipsis of the rest of the clause. This is only possible, however, if the fragment forms one constituent. Several arguments, which are presented below, confirm that this is indeed the case.

4.1. Supporting evidence

Verb second

The first piece of evidence is provided by verb second sentences. Since Dutch is a verb second language, the finite verb always sits in the second position in declarative main clauses. Exactly one constituent must precede it, as is shown in (10).

(10) a. Ik em em gisteren gezien.
I have him yesterday seen
'I saw him yesterday.'
b. Gisteren em ik em gezien.
yesterday have I him seen
'I saw him yesterday.'

c. *Gisteren ik em em gezien.
yesterday I have him seen
d. *Ik gisteren em em gezien.
I yesterday have him seen [Asse Dutch]

In sentences (10)c,d two constituents precede the finite verb *em* 'have', yielding an ungrammatical result. As is illustrated in (11), however, the n-word and *nie* can co-occur to the left of the finite verb, a clear indication that they form one constituent.

(11) a. Niemand nie em ik gisteren gezien.
no-one not have I yesterday seen
'I didn't see anyone yesterday.'
b. Noet nie zou ik da doen.
never not would I that do
'I would never do that!' [Asse Dutch]

One could claim that (11) is just a case of movement of *niemand* or *noet* with a sentence negator base generated in a high position. The example in (12)b, however, shows that this analysis must be rejected: the sentence has a non-negative matrix clause. Both *niemand* 'no-one' and the negator *nie* 'not' have undergone long distance movement from their base position in the subclause to the left-peripheral position of the matrix clause:

(12) a. Ij zou dat'em niemand nie gezien aa
he said that.he no-one not seen had
'He said that he hadn't seen anyone.'
b. Niemand nie zou'em dat'em $t_{\text{niemand nie}}$ gezien aa.
no-one not said.he that.he seen had
'He said that he hadn't seen anyone.' [Asse Dutch]

Coordination

Another argument in favor of the claim that 'n-word + *nie'* is one constituent involves coordination. Two sequences of an n-word plus *nie* can be coordinated, as can be seen in (13). As only constituents can be coordinated (cf. Chomsky 1957, see also Williams 1978), this once again suggests that 'n-word + *nie'* is one constituent.

(13) a. Ij ei mou noet nie of nerges nie golpen.
he has me never not or nowhere not helped
'He didn't ever help me anywhere.'
b. Noet nie of nerges nie eit em mou golpen.
never not or nowhere not has he me helped
'He didn't ever help me anywhere.' [Asse Dutch]

Complement of extraposed PPs

The negator *nie* 'not' cannot by itself occur in extraposed position, as is illustrated in (14)a, but when a PP containing *niemand* 'no-one' is extraposed, *nie* is extraposed with it (cf. (14)b). This shows that *nie* must be part of the DP complement of PP, or at least be part of the PP.

(14) a. *Ij zoet da veu niemand doen nie.
he would that for no-one do not
b. Vruuger deet'em da nog veu zen vrienden, ma nou zoet'em da
Previously did.he that still for his friends but now would.he that
doen veu niemand nie.
do for no-one not
'He used to do that for his friends, but now he wouldn't do it for anyone.'
[Asse Dutch]

Position to the left of definite DP arguments

In Dutch the sentence negator *nie* 'not' cannot easily occur to the left of definite DP arguments, unless the DP has a contrastive reading (De Hoop 1992, Haegeman 1995).

(15) a. Ik peis dat'em den auto nie gekocht eit.
I think that.he the car not bought has
'I think that he didn't buy the car.'
b. Ik peis dat'em nie den auto gekocht eit, *?(ma 't ois).
I think that.he not the car bought has but the house
'I think that he bought not the car, but the house.' [Asse Dutch]

In (15)a the sentence negator sits in its regular position right above the VP, while in (15)b it precedes the definite DP argument. Without the contrastive reading 'not the car, but the house', the sentence is odd. The string 'n-word + *nie*', however, can occur to the left of a DP argument without a contrastive reading.

(16) Ik peis da niemand nie den auto gekocht eit.
I think that no-one not the.*masc* car bought has
'I think that no-one has bought the car.' [Asse Dutch]

I claim that *nie* is not a sentence negator in this case, but that it is part of the subject DP containing the n-word. Thus, *niemand* and *nie* form one constituent.

Co-occurrence with indefinite DP arguments

A final argument in favor of the 'one constituent'-hypothesis is the co-occurrence of *niemand nie* with indefinite DP arguments. Normally, when the Dutch sentence negator *nie* co-occurs with an indefinite DP argument, *nie* 'not' and the indefinite article *nen* 'a' "fuse", forming *gien* 'no'.[1]

(17) a. *Ik peis dat'em nie nen boek eit geliezen.
I think that.he not a.*masc* book has read
b. Ik peis dat'em gienen boek eit geliezen.
I think that.he no.*masc* book has read
'I think that he didn't read a book.' [Asse Dutch]

---

[1] When the DP acquires a specific or contrastive reading, the sentence in (17)a is much better:

(i) Ik peis dat'em nie nen boek eit geliezen, ma een toatschrift.
I think that.he not a book has read but a magazine
'I think that he didn't read a book, but a magazine.'

The *nie* which appears in the sequence *niemand nie* in (18), however, does not obligatorily "fuse" with the indefinite article.[2] This suggests that this *nie* is not a sentence negator, but that it is part of the DP containing *niemand*.

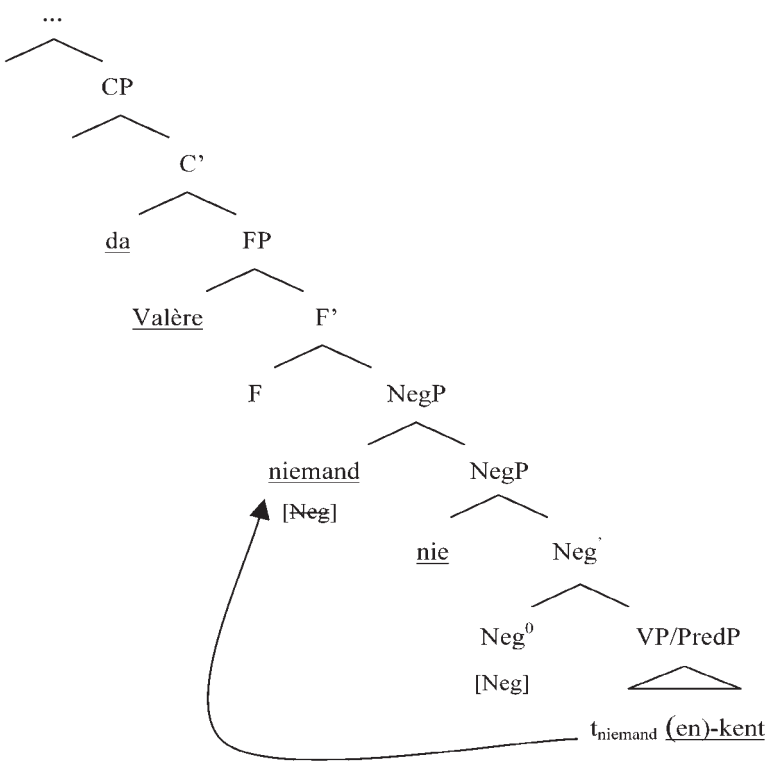
(18) Ik peis da niemand nie nen boek eit geliezen.
I think that no-one not a book has read
'I think that no-one has read a book.' [Asse Dutch]

4.2. The syntactic structure of *niemand nie*

Haegeman (1995) analyzes the *niemand nie* sequence in Lapscheure Dutch (cf. (19)) as in (20).[3]

(19) …da Valère ier niemand nie (en)-kent
…that Valère here no-one not (*neg*)-knows'
'…that Valère doesn't know anyone here.' [Lapscheure Dutch]

(20)



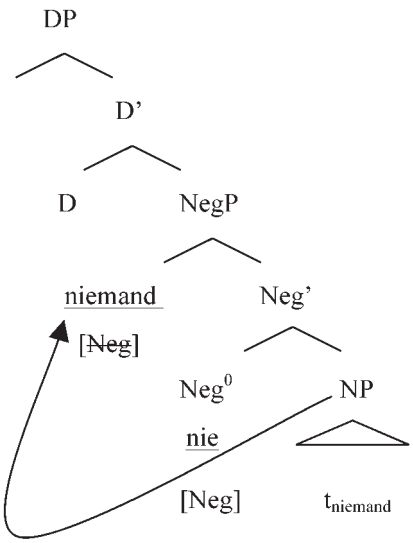
[2] When *niemand nie* is followed by an indefinite DP, *nie* can optionally incorporate into the indefinite. I will argue in section 6.2 that *niemand* and *nie* do not form a constituent in that case, parallel to negative spread.

[3] In Lapscheure Dutch, which is a West-Flemish dialect, a negative clitic *en* can appear on the verb. This clitic rarely expresses negation by itself and I will not discuss it any further here, as it does not change anything about my analysis of *niemand nie*. For more information about *en*, see Haegeman (1995).

In the tree in (20) *nie* is the first specifier of a NegP dominating the VP or PredP, and the n-word *niemand* moves to a second specifier position of NegP to check its Neg-feature. In a second step the n-word and *nie* undergo Neg-absorption, thus yielding a single semantic negation (see Haegeman 1995 for more details).

Haegeman's account does not carry over to Asse Dutch, however. In her analysis the n-word and *nie* do not form one constituent, in contrast to what the data discussed in section 4.1 suggest. Furthermore, this analysis cannot offer a straightforward account of negative fragment answers such as *niemand nie* in example (1) above. As a result, I propose a new analysis in which *niemand* and *nie* do form one constituent. I claim that there is a NegP inside the DP, with *nie* as its head. As in Haegeman's (1995) structure, negative elements move to the specifier position of NegP to check their Neg-feature. For the DP *niemand nie* this means that *niemand* moves from its base position to the specifier position of the DP-internal NegP, which results in the order *niemand nie*. This analysis is illustrated in the tree in (21).[4]

(21)



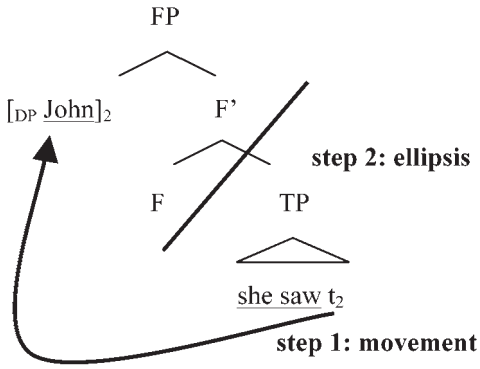
[4] The data in (6) and (7) suggest that this analysis for 'n-word + *nie*' can be extended to the negative adverbs: *noet nie* 'never not' and *nerges nie* 'nowhere not' behave like *niemand nie,* which means that they should also be analyzed as one constituent, with be a NegP inside the AdvP. It is not yet clear to me how this can be implemented; whether Neg would a head taking the AdvP as its complement or the AdvP has a NegP adjoined to it. When we consider constituent negation, however, an issue we have to take into account anyway at some point, it is plausible that all kinds of projections will have to allow a position for an internal NegP. This, too, is something I will look at later on.

5. The analysis: fragment answers

Merchant (2004) assumes fragment answers to be derived from full sentential structures by ellipsis. In his account the fragment first moves from its base position to the left periphery of the clause, followed by ellipsis of TP, so that only the fragment remains. The two steps of the derivation of the fragment answer in (22) are shown in (23).[5]

(22) A: Who did she see?
B: John [$_{\text{TP}}$ ~~she saw t$_{\text{John}}$~~].

(23)



I analyze negative fragment answers such as *niemand nie* in (1), repeated in (24), in the same way: since the n-word and *nie* form one constituent (cf. section 4), they can move to [spec,FP] together. In a second step TP is elided.

(24) A: Wie eit'em gezien? – B: Niemand nie.
who has.he seen no-one not
'Who did he see?' – 'No-one.' [Asse Dutch]

Step 1:

(25) [Ij eit niemand nie gezien]
he has no-one not seen
→ [*Niemand nie* [$_{\text{TP}}$ ij eit t$_{\text{niemand nie}}$ gezien]][6]
no-one not he has seen

Step 2:

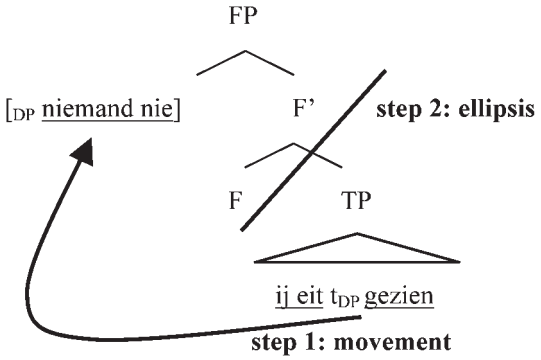
(26) [Niemand nie [$_{\text{IP}}$ ~~ij eit t$_{\text{niemand nie}}$~~ ~~gezien~~]]

---

[5] I adopt Merchant's terminology here: FP is a functional projection dominating TP or 'tense phrase' in the left periphery of the clause.

[6] Note that normally the finite verb would have to move from T to C in order to get the verb-second order. This movement can be bled by ellipsis, however; cf. Merchant (2001: 62-74) and Lasnik (1999a, 1999b and 2001) for possible approaches and analyses; see also Kim (1997: 183-185). Cf. also Baltin (2002) and Boeckx & Stjepanović (2001) for discussion.

(27)



Some of Merchant's (2004) arguments in favor of his analysis of fragment answers also apply to these *niemand nie* cases, for instance island sensitivity. As fragments move to the left periphery, the prediction is that they are sensitive to islands. This is not easy to show, however: normally, the question which the fragment would be an answer to would itself involve movement of the wh-element out of an island and thus be ungrammatical. Therefore, Merchant uses questions with an intonation rise on the questioned constituent *in situ*, such as the example in (28).[7]

(28) A: Eit'em me *eur* geklapt? – B: Nië, me *niemand nie*
has.he with her.*foc* spoken – no with no-one not
'Did he talk to *her*?' – 'No, to *no-one*.' [Asse Dutch]

Since there is no need to move a wh-element in these questions, the accented constituent can be embedded in an island, providing a test for island sensitivity of the fragment answers: if fragment answers involve movement of the fragment to the left periphery, a fragment answer to a question containing an island should be impossible, while the full sentential answer is grammatical.[8] This prediction is borne out, as (29) and (30) illustrate. As can be seen, *niemand nie* and other fragment answers behave alike.

(29) A: Eit'em geklapt me da maske da *Thomas* graug eit?
has.he talked with the girl that Thomas.*foc* gladly has
'Did he talk to the girl *Thomas* likes?'
B: *Nië, {*Bert*/ *niemand nie*}.
no Bert no-one not
B: Nië, ij eit geklapt me da maske da {*Bert*/ *niemand nie*} graug eit.
no he has talked with the girl that Bert no-one not gladly has
'No, he talked to the girl {*Bert*/*no-one*} likes.

(30) A: Is ze weggegon omda *Luka* me eur wou dansen?
is she away.gone because Luka.*foc* with her wanted dance
'Did she leave because *Luka* wanted to dance with her?'

---

[7] The sentence in (28) is mine, for more examples see Merchant (2004).

[8] This statement simplifies things, as in sluicing the ellipsis can repair island violations (cf. Merchant 2001a&b, 2004). In this paper I am abstracting away from these cases.

B: *Nië, {*Stijn/ niemand nie*}.
no Stijn no-one not
B: Nië, ze is weggegon omda {*Stijn/ niemand nie*} me eur wou dansen
no she is away.gone because Stijn no-one not with her wanted dance
'No, she left because {*Stijn/no-one*} wanted to dance with her.' [Asse Dutch]

6. Extension of the analysis: negative spread

In this section I extend my analysis of *niemand nie* to the phenomenon of negative spread, which is also attested in certain dialects of Belgian Dutch. In a first subsection I take a look at some data, comparing the negative spread cases to that of *niemand nie*. From these data it follows that the string 'n-word + *nie'* is structurally ambiguous in a number of contexts. Subsection 6.2 provides an analysis for this structural ambiguity.

6.1. Negative spread in southern Dutch

Negative spread is distinguished from negative concord proper by Giannakidou (2000, 2002). In negative spread contexts two or more n-words co-occur, expressing one semantic negation. Normally, a negation marker does not occur in negative spread but in certain Southern Dutch dialects *nie* 'not' optionally appears together with two or more n-words:

(31) Ik em niemand niks (nie) gegeiven.
I have no-one nothing not given
'I didn't give anything to anyone.'[Asse Dutch]

The string *niemand niks nie* 'no-one nothing not' in (31) differs from the combination 'n-word + *nie'* discussed above. First of all, it cannot occur to the left of the finite verb in a declarative matrix clause:

(32) *Niemand niks (nie) em ik gegeiven.
no-one nothing not have I given [Asse Dutch]

A second difference between the two constructions has to do with coordination. Sequences of two n-words plus *nie* cannot be coordinated.

(33) *Ij eit noet niks (nie) en nerges niks (nie) gezien.
he has never nothing not and nowhere nothing not seen

(34) *Ij eit noet niemand (nie) en nerges niks (nie) gezien.
he has never no-one not and nowhere nothing not seen [Asse Dutch]

Furthermore, *niemand niks nie* is disallowed as the complement of an extraposed PP (35) and cannot easily precede definite DP arguments (36), unlike *niemand nie*:

(35) *Ij zoet $t_{\text{voor niemand niks nie}}$ doen veu niemand niks (nie).
he would do for no-one nothing not [Asse Dutch]

(36) ??Ij eit noet niemand nie dienen boek gegeiven.
he has never no-one not that.*masc* book given [Asse Dutch]

The fifth argument that showed *niemand* and *nie* to be one constituent in section 4.1 once again yields the opposite result for *niemand niks nie* either: when the

string occurs with an indefinite DP argument, *nie* must 'fuse' with the indefinite article to form *gien* 'no'.

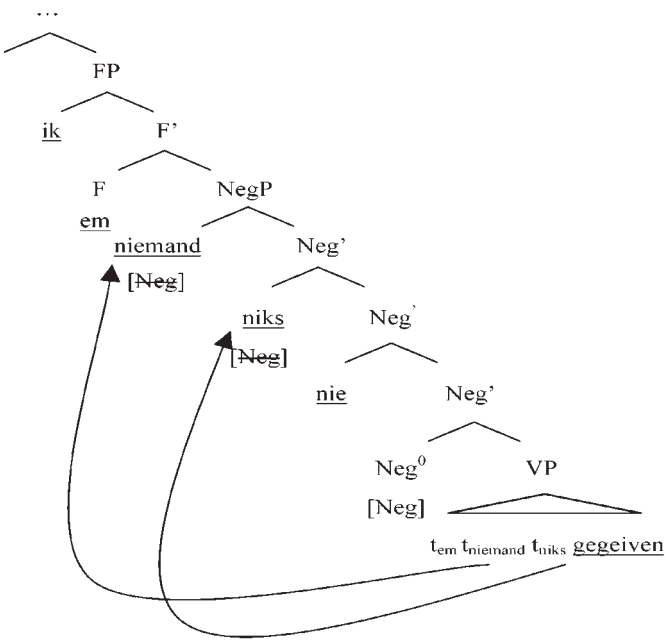
(37) a. *Ij eit noet niemand nie nen boek gegeiven. (NC)
he has never no-one not a.*masc* book given
b. Ij eit noet niemand gienen boek gegeiven.
he has never no-one no.*masc* book given
'He never gave anyone a book.' [Asse Dutch]

Finally, the string with two n-words and *nie* is disallowed as a fragment answer:

(38) A: Wie eit'em wa gegeiven? – B: *Niemand niks nie.[9]
who has.he what given no-one nothing not [Asse Dutch]

These 6 empirical tests show that the string *niemand niks nie* does not form a constituent, and that *nie* is a sentence negator here, which I assume occupies a position in a NegP preceding the verb phrase. I therefore adopt Haegeman's (1995) proposal for these negative spread phenomena. In her analysis both n-words move from their base position to a specifier position of NegP dominating the VP, checking their Neg-feature:

(39)



[9] Without *nie* the fragment answer is much better. This is expected, since the DPs *niemand* and *niks* should be allowed to move separately as two constituents in fragment answers to multiple questions, parallel to the answer in (i).

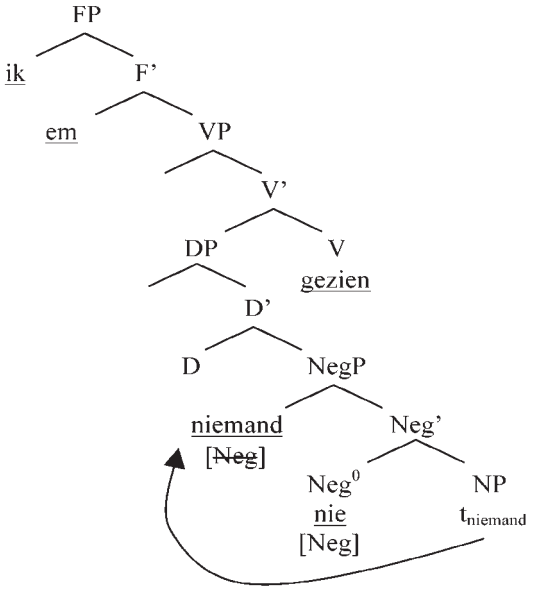
(i) A: Wie eit'em wa gegeiven? – B: Reiner een boek en Jessica een cd.
who has.he what given Reiner a book and Jessica a cd
'Who did he give what?' – 'Reiner a book and Jessica a cd.'

The exact analysis of these kinds of answers I defer to future research.

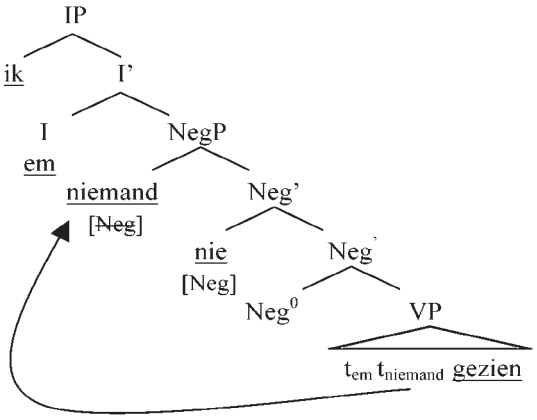
6.2. The structural ambiguity of 'n-word + *nie*'

It is clear from the previous subsection that a string with two n-words and an optional *nie* has a different structure than the *niemand nie* we find in fragment answers. The latter is one constituent, a DP with an internal NegP, while in the former the n-words and *nie* are all specifiers of a NegP dominating the VP. This account predicts, however, that the structure used for two or more n-words should in principle also be available for sentences with only one n-word plus *nie*. Nothing in the structure in (39) forces the sentence to contain more than one n-word. That means that a sentence such as *Ik em niemand nie gezien* 'I have no-one not seen' is structurally ambiguous: *niemand* and *nie* can form one DP (40), or they can both be specifiers of a sentential NegP (41).

(40)



(41)



Fronting of the constituent containing *niemand* yields different results for the two structures: when *niemand* and *nie* form one DP, *nie* is fronted as well, while in the case of (41) it stays behind.

(42) a. Niemand nie em ik gezien.
no-one not have I seen
b. Niemand em ik nie gezien.
no-one have I not seen
'I didn't see anyone at all.' [Asse Dutch]

The structural ambiguity is also visible in sentences with indefinite DP arguments. As *nie* is inside the DP in (40), it is not a sentence negator and does not "fuse" with an indefinite article ((43)a). In the structure in (41), however, *nie* is a specifier of a clausal NegP, and *nie* and *nen* 'a' must form *gien* 'no' ((43)b).

(43) a. Ik peis da niemand nie nen boek gelezen eit.
I think that no-one not a.*masc* book read has
b. Ik peis da niemand gienen boek gelezen eit.
I think that no-one no.*masc* book read has
'I think that no-one has read a book.' [Asse Dutch]

Summing up, the structure of 'n-word + *nie'* is ambiguous in sentences such as *Ik em niemand nie gezien* 'I have no-one not seen'. *Niemand nie* can either be one constituent or it can be part of a NegP dominating the VP, parallel to negative spread.

7. Open questions and problems

The analysis of negative fragments presented above still leaves open some questions. First of all, not all n-words combine equally easily with *nie*. The examples in (44) and (45) show that *gienien* 'not a single one' excludes *nie* for practically all speakers of Asse Dutch in all contexts and *niks nie* 'nothing not' sounds odd as a fragment answer.

(44) a. Ik em er gieneniene (*nie) gezien.[10]
I have there no.masc.one.masc not seen
'I haven't seen a single one.'
b. A: Oeveul hebde der gezien? – B: Gieneniene (*nie).
how.many have.you there seen no.masc.one.masc not
'How many of them did you see?' – 'Not a single one.'

(45) a. Ik em niks (?nie) gekocht.
I have nothing not bought
'I didn't buy anything.'
b. A: Wat hebde gekocht? – B: Niks (??nie).
what have.you bought nothing not
'What did you buy?' – 'Nothing.' [Asse Dutch]

[10] The combination of *gieneniene* and *nie* is possible in these sentences under a double negation reading, however.

As the data on these cases are not very clear yet, I defer this issue to further research.

Another question that comes to mind is why the two structures presented in section 6 cannot co-occur. That is, why for instance (46) is ungrammatical.

(46) *Ij eit noet nie niemand nie gezien.
he has never not no-one not seen

We expect that *noet* and *nie* can form one constituent and that both *noet nie, niemand* and *nie* can be in the specifier of the sentential NegP. The illformedness of this sentence might be due to a restriction that only allows XPs without internal NegP to be in the specifier of sentential Neg, in order to check a Neg-feature. It's not clear whether this solves all problems, however: all sentences with n-words and *nie* in the middle field can in principle be ambiguous between the two structures. This is an issue I still need to look into.

8. Conclusions

Summing up, the main claim of this paper is that negative concord fragment answers such as *niemand nie* 'no-one not' are derived by movement of the fragment to a left-peripheral position. A second step elides the TP containing the rest of the clause, leaving only *niemand nie*, parallel to Merchant (2004). This analysis implies that the fragment must be one constituent: the DP contains a NegP headed by *nie* 'not' and *niemand* moves to its specifier to check a Neg-feature. This 'one constituent'-analysis is confirmed by data concerning verb second, coordination, complements of extraposed PPs and the co-occurrence with definite and indefinite DP arguments.

Negative spread, on the other hand, is analyzed differently: the n-words and an optional *nie* occupy (multiple) specifier positions of a NegP dominating the VP. The analysis of *niemand nie* and negative spread as two different structures predicts that sentences such as *ik em niemand nie gezien* 'I have no-one not seen', with one n-word, are structurally ambiguous. *Niemand nie* can be one constituent, like in the fragment answers, or it can be analyzed as negative spread.

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ON CATEGORY RESTRICTIONS IN ACROSS-THE-BOARD AND PARASITIC DOMAINS: EVIDENCE FROM RUSSIAN*

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Abstract

This paper is concerned with the nature of category restrictions in across-the-board and parasitic gaps. Postal (1993) observes that parasitic gaps in English exhibit category restrictions but across-the-board gaps do not show such restrictions. Munn (2001) argues that independent differences in the across-the-board and parasitic gap structures can account for category restrictions in parasitic gap constructions. Based on a new set of data from Russian contrastive coordination, the paper provides strong evidence in support of the argument that category restrictions should be attributed to the inherent properties of the extraction site, which in this case is the extraction site of the contrastive coordination.

1. Introduction

This paper is concerned with the nature of category restrictions in across-the-board and parasitic gap constructions. Across-the-board gaps originate in coordinate structures from movement of the same constituent out of each conjunct, as illustrated schematically in (1).

(1) Wh_i [$_{XP}$ ... gap_i ...] and [$_{XP}$ ... gap_i ...]

A parasitic gap is formed when the same constituent becomes an antecedent of more than one gap and the subsequent gap depends on the first gap, as shown in (2).

(2) Wh_i [$_{XP}$ ... gap_i ... [$_{XP}$ ... *parasitic* gap_i ...]]

In English, parasitic gaps show restrictions to certain kinds of syntactic categories (Cinque, 1990; Postal, 1993). On the other hand, across-the-board gaps do not

* I thank Alan Munn for helpful discussions of this work. I also thank Cristina Schmitt, Barbara Abbott, Yen-Hwei Lin, the audience of BIDE 2006, LSA Summer Meeting 2006 and the SLS conference 2006 for their insightful comments. For native-speaker judgements, many thanks go to Artem Prokhorov, Elena Selezneva, Olga Eremina and Dmitriy Bryndin.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 17-32.

show such restrictions (Postal 1993). Consider, as an example, the contrast between the across-the-board and parasitic gap structures in (3).

(3) a. [How sick]$_i$ did John look *gap*$_i$ and (Betty) say he actually felt *gap*$_i$?
b. *[How sick]$_i$ did John look *gap*$_i$ without actually feeling *parasitic gap*$_i$?
(Postal, 1993, 736)

In (3a), it is possible to move the *how*-phrase out of each conjunct and the sentence can render an interpretation that 'John looked very sick and Betty said he actually felt very sick'. However, in (3b), it is not possible to extract the *how*-phrase out of the parasitic gap site. The sentence cannot convey that 'John looked very sick without actually feeling very sick'. The contrast in (3) suggests that the parasitic gap structures in English are more restricted than the across-the-board gap constructions.

Based on the contrast between the across-the-board and parasitic gap structures, such as (3), Postal (1993) has argued that parasitic gaps and across-the-board gaps represent distinct phenomena and require different analyses.

Munn (2001) argues that independent differences in the across-the-board and parasitic gap structures can account for category restrictions in parasitic gap constructions. He shows that parasitic gap structures involve an operator that can block some extractions and induce weak island effects. No such intervening operator is present in the across-the-board gap structures. Under this analysis, a unified treatment of both constructions can be preserved.

In the paper I argue for the dependency of category restrictions on properties of the extraction site. Evidence comes from coordinate structures in Russian. I consider two coordinate structures with two different conjunctions. The contrastive coordination which occurs with the *a* conjunction and the non-contrastive coordination which uses the *i* conjunction. Consider, as an example, the sentences in (4a) and (4b).

(4) a. Scenario: What did Dima and Olja buy?
Dima kupil knigu, **a** Olja kupila ğurnal.
Dima bought book A Olja bought magazine
'Dima bought a book and/but Olja bought a magazine.'
b. Scenario: What are the two events that happened at the book store?
Dima kupil knigu **i** Olja kupila ğurnal.
Dima bought book and Olja bought magazine
'Dima bought a book and Olja bought a magazine.'

Interestingly, across-the-board gaps of the contrastive coordination (5a) but not of the non-contrastive coordination (5b) in Russian show the same kind of category restrictions that parasitic gaps do. Consider the contrast between the across-the-board and parasitic gap structures in (5).

(5) a. *[Naskol'ko bol'nym]$_i$ Dima vygljadel *gap*$_i$, **a** Lena utverğdala, čto on
how sick Dima looked A Lena claimed that he
čuvstvoval sebja *gap*$_i$ na samom dele ?
felt self actually
'*/??How sick did Dima look and/but Lena claim he actually felt?'

b. [Naskol'ko bol'nym]$_i$ Dima vygljadel *gap*$_i$ **i** Lena utverğdala, čto on
how sick Dima looked and Lena claimed that he
čuvstvoval sebja *gap*$_i$ na samom dele ?
felt self actually
'How sick did Dima look and Lena claim he actually felt?'

c. *[Naskol'ko bol'nym]$_i$ Dima vygljadel *gap*$_i$ ne čuvstvuja sebja *parasitic gap*$_i$
how sick Dima looked NEG feeling self
na samom dele?
actually
'*How sick did Dima look without actually feeling?'

In both constructions in (5a) and (5c), movement of the *how*-phrase is blocked. The fact does not hold for (5b), however.

The blocking of the movement of the *how*-phrase, such as (5a), is due to properties inherent to the contrastive coordination. The semantics of the contrastive coordination requires each conjunct to represent a topic-focus structure (Büring 1997) which, in its turn, creates weak island environments, as defined in Szabolcsi and Zwarts (1997). Consider first the sentences in (6).

(6) Scenario: What did Dima and Olja do with the books?

a. Dima$_{T\ opic}$ knigi kupil$_{F\ ocus}$, **a** Olja$_{T\ opic}$ (knigi/ih) prodala$_{F\ ocus}$
Dima books bought A Olja books/them sold
'Dima bought the books and/but Olja sold them.'

b. *Dima$_{T\ opic}$ knigi kupil$_{F\ ocus}$, **a** Olja prodala knigi
Dima books bought A Olja sold books
'*Dima bought the books and/but Olja sold books.'

c. *Dima kupil knigi, **a** Olja$_{T\ opic}$ knigi prodala$_{F\ ocus}$
Dima bought books A Olja books sold
'*Dima bought books and/but Olja sold the books.'

In (6a), each conjunct represents a topic-focus structure, as indicated by the subscripts XP$_{T\ opic}$ and XP$_{F\ ocus}$, and forms a felicitous sentence in the given context. In (6b) and (6c), only one of the conjuncts constitutes the topic-focus structure and the sentences are ungrammatical. The set of sentences in (6) suggests that in the contrastive coordination each conjunct has to represent the topic-focus structure.

The topic-focus structure induces weak island effects:

(7) a. Scenario: Olja broke the car and/but Dima fixed it.
Čto Dima$_{T\ opic}$ počinil$_{F\ ocus}$?
what Dima-nom fixed
'What did Dima fix?'

b. Scenario: Dima fixed the car.
Čto Dima počinil?
what Dima-nom fixed
'What did Dima fix?'

c. Scenario: Olja broke the car and/but Dima fixed it quickly.
*Kak Dima$_{Topic}$ mašinu počinil$_{Focus}$?
how Dima-nom car fixed
'How did Dima fix the car?'
d. Scenario: Dima fixed the car quickly.
Kak Dima počinil mašinu?
how Dima-nom fix car
'How did Dima fix the car?'

The sentences in (7a) and (7b), on the one hand, and in (7c) and (7d), on the other hand, form minimal pairs differing only in the topic-focus marking. Both structures in (7a) and (7b) allow extraction of the *what*-phrase. In (7c), however, movement of the *how*-phrase is blocked and the interpretation that 'Dima fixed the car quickly' is barred. The contrast between (7a) and (7c) indicates that the topic-focus structure permits some but not all *wh*-phrases to extract. This fact suggests that the topic-focus structure creates weak island environments.

The Russian data show that the contrastive coordination is more restricted than the non-contrastive coordination. Restrictions emerge because of the properties inherent to the contrastive coordination. Each conjunct of the contrastive coordination has to constitute the topic-focus structure which induces weak island effects. The non-contrastive coordination does not possess such properties and does not show category restrictions.

The contrastive coordination data in Russian provide strong evidence in support of the claim that category restrictions depend on properties of the extraction site. They further support a unified analysis of the across-the-board and parasitic gap structures.

The paper is organized as follows. Section 2 discusses properties of across-the-board and parasitic gap structures with respect to islandhood and crossover. Section 3 discusses category restrictions in across-the-board and parasitic gaps. Section 4 provides an account for restrictions in the across-the-board gaps of the contrastive coordination. Section 5 concludes the paper.

2. On Properties of Across-the-Board and Parasitic Gap Structures

Two approaches have been undertaken to analyze across-the-board and parasitic gap constructions. According to the first approach (Williams 1990), parasitic gap structures are treated as coordinate structures. It has been argued, however, that this approach does not make correct predictions about properties of the gaps. Parasitic gaps show restrictions that do not appear in across-the-board gaps (Postal 1993). The across-the-board formalism, in its turn, does not provide a mechanism that would account for the restrictions.

According to the second approach, across-the-board movement is viewed as parasitic gap extraction (Pesetsky 1982; Franks 1993; Munn 1993). Within this approach, across-the-board gaps are reduced to parasitic gaps and the across-the-board movement is abandoned entirely. This latter approach assumes a null operator analysis of parasitic gap structures (Chomsky 1986; Cinque 1990; Lasnik and Stowell 1991) and extends it to across-the-board gap constructions (Munn 1993). The

null operator analysis involves movement of a null operator to the edge of the corresponding extraction site, as shown in (8) (irrelevant details omitted).

(8) a. [$_{CP}$ Kogo$_i$ [$_{IP}$ Dima vnes v spisok *gap*$_i$] [$_{BP}$ Op$_i$ [$_{B'}$ i [$_{IP}$ Lena priglasila
who Dima put on list and Lena invited
gap$_i$]]]]
'Who did Dima put on the list and Lena invite?'

b. [$_{CP}$ Kogo$_i$ [$_{IP}$ Dima vnesv spisok *gap*$_i$] [$_{BP}$ Op$_i$ [$_{B'}$ a [$_{IP}$ Lena priglasila
who Dima put on list and/A Lena invited
gap$_i$]]]]
'Who did Dima put on the list and/but Lena invite?'

c. [$_{CP}$ Kakuju stat'ju$_i$ [$_{IP}$ Dima raspečatal *gap*$_i$] [$_{PP}$ Op$_i$ [$_{P'}$ do togo kak [$_{IP}$
which article Dima printed before
pročital *parasitic gap*$_i$]]]]
read
'Which article did Dima print before reading?'

In the paper, I am adopting the null operator analysis of across-the-board and parasitic gap constructions.

In this section, I discuss properties of across-the-board and parasitic gap structures and show that across-the-board and parasitic gaps in Russian behave differently with respect to weak crossover and resumptive pronouns, but not with respect to strong islands and strong crossover. The former fact can be accounted for within the null operator analysis of across-the-board and parasitic gap constructions.

2.1. Strong Island Effects

Across-the-board and parasitic gaps exhibit movement-like behavior and can be treated in the same way (Kayne 1983; Chomsky 1986). The Russian data drawing on some original facts from English show the same effects.

Both across-the-board gaps and parasitic gaps exhibit movement-like behavior yielding subjacency effects (Kayne 1983; Chomsky 1986; Cinque 1990). Movement out of the parasitic gap site and across-the-board movement are blocked if the second conjunct or parasitic gap site is an island (enclosed in brackets): wh-island (9a) and (10a) or adjunct-island (9b) and (10b).

(9) Across-the-board gaps

a. *Which man$_i$ did John interview *gap*$_i$ and wonder who to ask [which job to give to *gap*$_i$]?
b. *Which man$_i$ did John interview *gap*$_i$ and meet the man in the office [near *gap*$_i$]?

(10) Parasitic gaps

a. *Which man$_i$ did John interview *gap*$_i$ without expecting us to ask [which job to give to *parasitic gap*$_i$]?
b. *Which man$_i$ did John interview *gap*$_i$ without meeting the man in the office [near *parasitic gap*$_i$]?

Strong island effects in the sentences above are comparable with the single gap violations, as shown in (11). They cannot be attributed to the properties of the multiple gap constructions alone.

(11) a. *Which man$_i$ did John wonder who to ask [which job to give to *gap$_i$*]?
b. *Which man$_i$ did John meet the man in the office [near *gap$_i$*]?

The Russian across-the-board and parasitic gap structures show strong island effects too. The sentences in (12) involve wh-island violations in across-the-board (12a) and (12b), and parasitic gap structures (12c), respectively.

(12) a. *Kakomu sotrudniku$_i$ Dima pozvonil *gap$_i$* i zadumalsja, [kakuju rabotu
which worker Dima called and thought which job
predloğit *gap$_i$*]?
gives
'*Which worker did Dima call and wonder which job to give to?'
b. *Kakomu sotrudniku$_i$ Dima pozvonil *gap$_i$*, a potom zadumalsja, [kakuju
which worker Dima called A then thought which
rabotu predloğit *gap$_i$*]?
job gives
'*Which worker did Dima call and/but then wonder which job to give to?'
c. *Kakomu sotrudniku$_i$ Dima pozvonil *gap$_i$* posle togo, kak podumal, [kakuju
which worker Dima called after thought which
rabotu predloğit *parasitic gap$_i$*]?
job gives
'*Which worker did Dima call after wondering which job to give to?'

As in English, single gap constructions in Russian demonstrate strong island effects. The latter, therefore, cannot be attributed to the properties of the multiple gap constructions.

(13) a. *Kakomu sotrudniku$_i$ Dima zadumalsja, [kakuju rabotu predloğit *gap$_i$*]?
which worker Dima thought which job gives
'*Which worker did Dima wonder which job to give to?'

2.2. Crossover Effects

2.2.1. Strong Crossover

Across-the-board and parasitic gaps behave like a *wh*-trace (Munn 2001). They show strong crossover effects both in English (14) and Russian (15).

(14) a. *Which man$_i$ did we talk to *gap$_i$* and he$_i$ never visit *gap$_i$*?
b. *Which man$_i$ did we talk to *gap$_i$* after he$_i$ saw *parasitic gap$_i$*?

(15) a. *Kakogo soseda$_i$ my priglasili v gosti *gap$_i$* i on$_i$ ne navestil *gap$_i$*?
which neighbor we invited to visit and he NEG visited
'*Which neighbor did we invite over and he never visit?'

b. *Kakogo soseda$_i$ my priglasili v gosti *gap$_i$*, a on$_i$ ne navestil *gap$_i$*?
which neighbor we invited to visit A he NEG visited
'*Which neighbor did we invite over and/but he never visit?'
c. *Kakogo soseda$_i$ my priglasili v gosti *gap$_i$* posle togo, kak on$_i$ navestil *parasitic gap$_i$*?
which neighbor we invited to visit after he visited
'*Which neighbor did we invite over after he visited?'

2.2.2. Weak crossover

Across-the-board and parasitic gaps behave differently with respect to weak crossover. It has been noted that the non-initial across-the-board and parasitic gaps do not induce weak crossover (Lasnik and Stowell 1991; Munn 2001).

(16) a. Which man$_i$ did you hire *gap$_i$* and his$_i$ boss fire *gap$_i$*?
b. *Which man$_i$ did his$_i$ boss fire *gap$_i$* and you hire *gap$_i$*?

(17) a. Which man$_i$ did you visit *gap$_i$* just before his$_i$ boss fired *parasitic gap$_i$*?
b. *Who*i* did his$_i$ mother gossip about *gap$_i$* despite you(r) having vouched for *parasitic gap$_i$*?

The facts hold for Russian as well.

(18) a. Kakomu mal'čiku$_i$ ty podaril CD *gap$_i$* i ego$_i$ roditeli podarili knigu
which boy you presented CD and his parents presented book
gap$_i$?
'Which boy did you present a CD and his parents present a book?'
b. *Kakomu mal'čiku$_i$ ego$_i$ roditeli podarili knigu *gap$_i$* i ty podaril CD
which boy his parents presented book and you presented CD
gap$_i$?
'*Which boy did his parents present a book and you present a CD?'
c. Kakomu mal'čiku$_i$ ty podaril CD *gap$_i$*, a ego$_i$ roditeli podarili knigu
which boy you presented CD A his parents presented book
gap$_i$?
'Which boy did you present a CD and/but his parents present a book?'
d. *Kakomu mal'čiku$_i$ ego$_i$ roditeli podarili knigu *gap$_i$*, a ty podaril CD
which boy his parents presented book A you presented CD
gap$_i$?
'*Which boy did his parents present a book and/but you present a CD?'

(19) a. Kogo$_i$ ty pohvalil *gap$_i$* preğde, čem ego$_i$ načal'nik uvolil *parasitic gap$_i$*?
who you praised before his boss fired
'Who did you praise before his boss fired?'
b. *Kogo$_i$ ego$_i$ načal'nik uvolil *gap$_i$* preğde, čem ty pohvalil *parasitic gap$_i$*?
who his boss fired before you praised
'*Who did his boss fire before you praised?'

2.3. Resumptive Pronouns

Across-the-board and parasitic gaps behave differently with respect to resumptive pronouns, as the Hebrew data in (20) show (Munn 2001).

(20) a. ha hiš še Rina roca ve hohevet hoto yoter mikulam
the man that Rina wants and loves him more-than anyone
'the man that Rina wants and loves more than anyone'
b. *ha hiš še Rina roca hoto ve hohevet yoter mikulam
the man that Rina wants him and loves more-than anyone
'the man that Rina wants and loves more than anyone'

In coordinate structures, only the second conjunct can contain a resumptive pronoun if the first conjunct has a gap. The generalization holds in parasitic gap constructions:

(21) a. ha mhamar še karati lifnei še tiyakti hoto
the article that read-I before that filed-I it
'the article that I read before I filed it'
b. *ha mhamar še karati hoto lifnei še tiyakti
the article that read-I it before that filed-I
'the article that I read it before I filed'

Across-the-board and parasitic gap constructions in Russian appear to confirm the asymmetry found in the Hebrew data, as shown in (22) and (23). The first conjunct in (22a) contains a gap and the resumptive pronoun is allowed in the second conjunct. The resumptive pronoun in the second conjunct can be omitted in (22a). In (22b), on the other hand, the second conjunct contains a gap and it is not allowed to have a resumptive pronoun in the first conjunct. As a result, (22b) is ungrammatical. The same is true for the contrastive coordination in (22c) and (22d).

(22) a. Vot eta stat'ja, kotoruju ja pročital i zatem vybrosil (ee) za
here this article which I read and then through-away it as
nenadobnost'ju.
not-wanted
'Here is the article that I read and then threw it away as not wanted.'
b. *Vot eta stat'ja, kotoruju ja pročital ee i zatem vybrosil za
here this article which I read it and then threw-away as
nenadobnost'ju.
not-wanted
'*Here is the article that I read it and then through away as not wanted.'
c. Vot eta stat'ja, kotoruju ja pročital, a zatem vybrosil (ee) za
here this article which I read A then threw-away it as
nenadobnost'ju.
not-wanted
'Here is the article that I read and/but then threw it away as not wanted.'
d. *Vot eta stat'ja, kotoruju ja pročital ee, a zatem vybrosil za
here this article which I read it A then threw-away as
nenadobnost'ju.
not-wanted
'*Here is the article that I read it and/but then through away as not wanted.'

Parasitic gap constructions in Russian show the same kind of asymmetry.

(23) a. Vot eta stat'ja, kotoruju ja pročital preğde čem ja vybrosil (ee) za
here this article which I read before I threw-away it as
nenadobnost'ju.
not-wanted
'Here is the article that I read before I threw it away as not wanted.'
b. *Vot eta stat'ja, kotoruju ja pročital ee preğde čem ja vybrosil za
here this article which I read it before I threw-away as
nenadobnost'ju.
not-wanted
'*Here is the article that I read it before I threw away as not wanted.'

Asymmetric behavior of across-the-board and parasitic gap structures with respect to weak crossover and resumptive pronouns shows that gaps need to be distinguished in some way. The null operator analysis can account for differences between the gaps.

3. Restrictions in Across-the-Board and Parasitic Gap Constructions

3.1. Semantic Type Restrictions

Parasitic gaps in English are only allowed where definite pronouns are allowed (Cinque 1990; Postal 1993, 1998; Munn 2001). Restrictions on parasitic gaps can, furthermore, be stated in terms of semantic type (Munn 2001):

(24) a. A null resumptive pronoun denotes an element of type <e>.
b. The semantic element represented by a parasitic gap must be a variable of type <e>.

Across-the-board gaps in English do not show such restrictions Postal (1993); Munn (2001). Interestingly, across-the-board gaps of the contrastive coordination in Russian do not allow the freedom of the English across-the-board gaps. As the data from the amount and functional readings below suggest, across-the-board gaps of the contrastive coordination in Russian are subject to the restrictions in (24).

3.1.1. Amount Readings

Amount relatives (Carlson 1977; Heim 1987; Grosu and Landman 1998) do not form parasitic gaps (Munn 2001). Consider a pair of sentences below:

(25) a. It was amazing the wine Bill drank *gap* after Fred spilled *parasitic gap* on the floor.
b. It was amazing the wine we drank *gap* that night.

The parasitic gap structure in (25a) does not have the amount interpretation. It has only the reading in which 'the wine Bill drank is that which was spilled'. The non-parasitic gap structure in (25b), on the other hand, allows the amount reading.

The standard analysis of amount relatives involves quantification over degrees, which are not individual denoting. If it is correct that parasitic gaps denote an individual, the fact that parasitic gap structures, such as (25a), do not allow amount readings is borne out.

Across-the-board gaps in English do not show the amount reading restriction:

(26) It would take us weeks to drink the wine that John drank and Bill spilled.

The sentence in (26) allows the interpretation in which 'for the amount of wine that John drank and Bill spilled it will take us weeks to drink that amount of wine'. The contrast between parasitic gaps and across-the-board gaps with respect to the amount reading suggests that across-the-board gaps may range over any semantic type.

Parasitic gaps in Russian show the amount restriction, as illustrated in (27).

(27) a. Bylo izumitel'nym vino, kotoroe Dima vypil *gap* posle togo, kak Artem prolil
was amazing wine which Dima drank after Artem spilled
parasitic gap na pol.
on floor
'It was amazing the wine Dima drank after Artem spilled on the floor.'

b. Bylo izumitel'nym vino, kotoroe my pili *gap* tem večerom.
was amazing wine which we drank that night
'It was amazing the wine we drank that night.'

The parasitic gap structure in (27a) does not render the amount interpretation as opposed to the non-parasitic gap structure in (27b).

Interestingly, across-the-board gaps in Russian show a split regarding the amount interpretation. Whereas across-the-board gaps of the non-contrastive coordination allow the amount reading, across-the-board gaps of the contrastive coordination do not:

(28) a. *U nas zanjalo by nedeli, čtoby vypit' vino, kotoroe Artem prolil *gap*, **a**
by us took would weeks that drink vine which Artem spilled A
Dima vypil *gap*.
Dima drank
'It would take us weeks to drink the wine that Artem spilled and/but Dima drank.'

b. U nas zanjalo by nedeli, čtoby vypit' vino, kotoroe Artem prolil *gap* **i**
by us took would weeks that drink vine which Artem spilled and
Dima vypil *gap*.
Dima drank
'It would take us weeks to drink the wine that Artem spilled and Dima drank.'

Across-the-board gaps of the non-contrastive coordination in (28b) have the amount interpretation in which 'for the amount of wine that Artem spilled and Dima drank, it would take us weeks to drink that amount of wine'. No such reading is possible in (28a).

The Russian data above show that only across-the-board gaps of the non-contrastive coordination may range over any semantic type. Across-the-board gaps of the contrastive coordination are restricted to variables of type <e>, just like parasitic gaps are restricted to individual denoting elements.

3.1.2. Functional Readings

Parasitic gaps do not allow functional readings (Munn 2001):

(29) Which poem did every poet throw out *gap* before her agent read *parasitic gap*?
  a. Every poet threw out her first poem before her agent could read it.
  b. *Every poet threw out her first poem before her agent read his first poem.

The parasitic gap structure in (29) has the interpretation in (29a). It cannot, however, be interpreted as in (29b) which is the sloppy identity reading of the parasitic gap. Under Chierchia's analysis of functional readings (Chierchia 1993), the sloppy identity reading obtains form the functional interpretation of a gap. A gap is a function which represents a higher order variable that is bound by a c-commanding element. According to this analysis, the impossible sloppy identity interpretation of the parasitic gap in (29b) would arise from the LF below.

(30) LF: [$_{C\ P}$ which poem$_i$ did [$_{I\ P}$ every poet$_j$ [$_{I\ P}$ throw out *gap*$^j{}_i$ [before her agent$_k$ read *parasitic gap*$^k{}_i$]]]]

If parasitic gaps denote individuals, they cannot be functions and, therefore, they cannot license the sloppy identity reading.

Across-the-board gaps in English allow functional readings (Munn 2001):

(31) Scenario: Bill and Fred are both restaurant critics, and each has a respective list of restaurants to review.
  a. Which restaurant did Bill review on Tuesday and Fred review on Wednesday?
  b. [$_{C\ P}$ which restaurant]$_i$ did Bill$_x$ review t$^x{}_i$ on Tuesday and Fred$_y$ review t$^y{}_i$ on Wednesday?

In the given context, the question in (31a) can be answered with 'Bill$_x$ reviewed his*x* first restaurant and Fred$_y$ reviewed his*y* second restaurant', which is the sloppy identity reading of the question. This reading arises from the LF in (31b).

The fact that across-the-board gaps allow functional readings with sloppy identity shows that across-the-board gaps are not restricted to variables of type <e>.

Parasitic gaps in Russian do not allow functional readings:

(32) Kakoj restoran Artem proveril vo vtornik *gap*, posle togo, kak Dima proveril
which restaurant Artem inspected on Tuesday after Dima inspected
parasitic gap v ponedelnik?
on Monday
'Which restaurant did Artem inspect on Tuesday after Dima inspected on Monday?'
  a. Artem*i* inspected his$_i$ most successful restaurant on Tuesday after Dima inspected it on Monday.
  b. *Artem*i* inspected his$_i$ most successful restaurant on Tuesday after Dima*y* inspected his*y* most successful restaurant on Monday.

Parasitic gaps in Russian do not license the sloppy identity reading, as the starred interpretation of (32) in (32b) indicates. They are, thus, subject to the semantic type constraint in (24), which says that the semantic element represented by a parasitic gap must be a variable of type <e>.

Across-the-board gaps of the non-contrastive coordination in Russian license functional readings with sloppy identity, whereas across-the-board gaps of the contrastive coordination do not:

(33) a. Kakoj restoran Artem proinspektiroval vo vtornik i Dima
which restaurant Artem inspected on Tuesday and Dima
proinspectiroval v sredu?
inspected on Wednesday
'Which restaurant did Artem inspect on Tuesday and Dima inspect on Wednesday?'

i. Artem$_x$ reviewed his$_x$ first restaurant and Dima$_y$ reviewed his*y* second restaurant.

b. Kakoj restoran Artem proinspektiroval vo vtornik, a Dima proinspectiroval
which restaurant Artem inspected on Tuesday A Dima inspected
v sredu?
on Wednesday
'Which restaurant did Artem inspect on Tuesday and Dima inspect on Wednesday?'

i. *Artem$_x$ reviewed his$_x$ first restaurant and Dima$_y$ reviewed his*y* second restaurant.

The question in (33a) allows the sloppy identity interpretation, such as (33a-i). No such interpretation is available in (33b).

The functional reading data above show that across-the-board gaps of the contrastive coordination are restricted to individual denoting elements, whereas across-the-board gaps of the non-contrastive coordination are not.

The category restrictions in parasitic gaps show that the extraction in parasitic gaps in English is subject to the constraint stated in (24). Parasitic gaps and across-the-board gaps of the contrastive coordination in Russian also show category restrictions. The question that arises is why across-the-board gaps of the contrastive coordination are subject to the constraint in (24). I address this question in the next section.

4. Explaining Restrictions in Contrastive Coordination

In this section, I first address the question why parasitic gaps are subject to the restriction in (24). I then argue that the same reasoning accounts for across-the-board gaps of the contrastive coordination in Russian.

4.1. Relativized Minimality and Parasitic Gaps

Adverbial adjunct parasitic gap structures in English, such as (34), constitute selective islands (Munn 2001).

(34) a. Which paper did you read before filing?
b. Which paper did you read after filing?

Temporal adjuncts, such as *before* and *after*, involve movement of a null temporal operator (Larson 1990) creating a context for selective islands:

(35) $[_{P\ P}\ \mathrm{Op}_{pg}$ before $[_{C\ P}\ \mathrm{Op}_{temp}\ [_{I\ P} \ldots\ \mathrm{t}_{pg} \ldots\ \mathrm{t}_{temp}]]]$

Within the Relativized Minimality approach, only referential arguments can escape weak islands. When adjuncts and non-referential arguments are extracted over other A-bar elements they result in relativized minimality effects (Rizzi 1996). Consider the following pairs of sentences:

(36) a. What do you know how to fix?
b. *How do you know what to fix?
c. What didn't you fix?
d. *How didn't you fix the car?
e. What did John frequently say that Bill bought?
f. *Why did John frequently say that Bill bought books?

(36a) and (36b) show that referential arguments can extract over *wh*-islands, whereas adjuncts cannot. (36c), (36d) and (36e), (36f) show that negation and intervening adverbials can block extraction of adjuncts but not of referential arguments.

The referentiality can be restated in terms of semantic type (Szabolcsi and Zwarts 1997). The non-referential elements, such as measure phrases, adverbials, predicates, are of semantically higher type than individuals. Under this view, selective islands are a scope phenomenon:

(37) "Each scopal element is associated with certain operations. For a *wh*-phrase to take wide scope over some scopal element means that the operations associated with scopal element need to be performed in *wh* 's denotation domain. If the *wh*-phrase denotes in a domain for which the requisite operation is not defined, it cannot scope over scopal element". (Szabolcsi and Zwarts 1997: 232)

Individuals denote boolean algebras, which are closed under intersection, union and complementation. In this sense, only individuals can escape selective islands because they are closed under all boolean operations.

If parasitic gaps were a variable denoting a non-individual, there would be a relativized minimality violation induced by the temporal operator. If parasitic gaps denote individuals, the relativized minimality violation does not arise.

4.2. Across-the-Board Gaps in Contrastive Coordination

4.2.1. Core Data: Contrastive vs. *Non-Contrastive Coordination*

Contrastive coordination, such as (38a), differs from non-contrastive coordination in (38b). The former type of coordination has a particular distribution of intonational patterns, i.e. each conjunct in the contrastive coordination is marked with the Low*High (marked by a rising pitch accent) - High*Low (marked as a falling

tone) intonational pattern (as in Büring 1997, following the A and B accents in Jackendoff 1972, adopted from Bolinger 1965).

(38) Scenario: What are the two events that happened?

a. Dima kupil knigu **i** Olja kupila ğurnal.
Dima bought book and Olja bought magazine
'Dima bought a book and Olja bought a magazine.'
Scenario: What did Dima and Lena buy?

b. Díma kupil knìgu, **a** Ólja kupila ğurnàl.
Dima bought book A Olja bought magazine
'Díma bought a bòok and/but Ólja bought a màgazine.'

Constituents marked with the rising accent are topics, whereas constituents marked with the falling accent are foci. The topic-focus accent marking is encoded at logical form (LF) and is marked as $XP_{T\ opic}$ and $XP_{F\ ocus}$, respectively. Consider, as an example, the sentence in (39).

(39) Scenario: Well, what about Fred? What did he eat?
FRED$_{T\ opic}$ ate BEANS$_{F\ ocus}$
LF: [$_{XP}$ FRED$_{T\ opic}$ ate BEANS$_{F\ ocus}$]

The data in Russian indicate that contrastive coordination licenses the topic-focus accent marking, whereas non-contrastive coordination does not. Compare the contrast between (40a) and (40b):

(40) a. *KNIGU$_{T\ opic}$ kupil DIMA$_{F\ ocus}$ **i** ĞURNAL$_{T\ opic}$ kupila OLJA$_{F\ ocus}$
book-acc bought Dima-nom and magazine-acc bought Olja-nom
'Dima bought the book and Olja bought the magazine.'

b. KNIGU$_{T\ opic}$ kupil DIMA$_{F\ ocus}$, **a** ĞURNAL$_{T\ opic}$ kupila OLJA$_{F\ ocus}$
book-acc bought Dima-nom A magazine-acc bought Olja-nom
'Dima bought the book and/but Olja bought the magazine.

In (40), non-canonical word order unambiguously signals the topic-focus accent marking. Only contrastive coordination is licit in this context.

Further restrictions in the contrastive coordination reveal that each of the conjuncts has to be the topic-focus accent marked, as the ungrammatically of (41a) and (41b) suggests.

(41) a. *KNIGU$_{T\ opic}$ kupil DIMA$_{F\ ocus}$, a Olya kupila ğurnal.
book-acc bought Dima-nom A Olja-nom bought magazine-acc
'Dima bought the book and Olja bought a magazine.

b. *Dima kupil knigu, a ĞURNAL$_{T\ opic}$ kupila OLJA$_{F\ ocus}$
Dima-nom bought book-acc A magazine-acc bought Olja-nom
'Dima bought a book and Olja bought the magazine.

In (41), non-canonical word order licenses the topic-focus accent marking only in one of the conjuncts. If only the first conjunct, as in (41a), or the second conjunct, as in (41b), is topic-focus accent marked, the sentence becomes ungrammatical.

4.2.2. Topic-Focus Structure and Weak Islands

The topic-focus structure induces weak island effects:

(42) a. Scenario: Olja broke the car and/but Dima fixed it.
Čto Dima$_{T\ opic}$ počinil$_{F\ ocus}$?
what Dima-nom fixed
'What did Dima fix?'

b. Scenario: Dima fixed the car.
Čto Dima počinil?
what Dima-nom fixed
'What did Dima fix?'

c. Scenario: Olja broke the car and/but Dima fixed it quickly.
*Kak Dima$_{T\ opic}$ mašinu počinil$_{F\ ocus}$?
how Dima-nom car fixed
'How did Dima fix the car?'

d. Scenario: Dima fixed the car quickly.
Kak Dima počinil mašinu?
how Dima-nom fix car
'How did Dima fix the car?'

The sentences in (42a) and (42b), on the one hand, and in (42c) and (42d), on the other hand, form minimal pairs differing only in the topic-focus marking. Both structures in (42a) and (42b) allow extraction of the *what*-phrase. In (42c), however, movement of the *how*-phrase is blocked and the interpretation that 'Dima fixed the car quickly' is barred. The contrast between (42a) and (42c) indicates that the topic-focus structure permits some but not all *wh*-phrases to extract. This fact suggests that the topic-focus structure creates weak island environments.

5. Conclusions

In this paper, the nature of category restrictions in across-the-board and parasitic gaps has been discussed.

In English, parasitic gaps show restrictions to certain kinds of syntactic categories. On the other hand, across-the-board gaps do not show such restrictions. Postal (1993) has argued that different analyses for each construction are required. Munn (2001) has shown that independent differences in the across-the-board and parasitic gap domains can account for category restrictions in parasitic gaps. Under this analysis, a unified treatment of both constructions can be preserved.

Across-the-board gaps of the contrastive coordination in Russian show the same kind of category restrictions that parasitic gaps do. In the paper, I have argued that these category restrictions are due to properties present in the across-the-board domain of the contrastive coordination. I have shown that the semantics of the contrastive coordination requires each conjunct of the contrastive coordination to represent a topic-focus structure. The topic-focus structure blocks across-the-board extractions if across-the-board gaps denote non-individuals. There are no such restrictions in the non-contrastive coordination.

The Russian coordination data discussed in this paper provide support for the claim that category restrictions should be attributed to inherent properties of the extraction site.

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THE GRADIENT OCP: EVIDENCE FROM KOREAN REDUPLICATION

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1. Introduction

Korean is said to be one of the languages that make use of reduplication in order to enrich the lexicon. Ideophones (including onomatopoeia), for example, are one of the inventories which benefit from this strategy, which can be grouped into two encompassing classes, i.e., total and partial reduplications.

In this paper, I will focus on the pattern of total reduplication, under which reduplicant and base are identical. When the base begins with a consonant, reduplication is perfect.[1,2]

(1) a. *pʰotoŋ*-pʰotoŋ 'chubby'
b. *mik'il*-mik'il 'slippery'
c. *pʰalit*-pʰalit 'verdant'
d. *pokil*-pokil 'simmering'
e. *tekul*-tekul 'rolling'
f. *t'ok*-t'ok 'dripping; knocking; smart'

When the base begins with a vowel, the reduplicant has a consonant inserted.[3]

(2) a. als'oŋ-*tals'oŋ* 'confusing'
b. oson-*toson* 'on good terms'
c. oŋki-***tʃ****oŋki* 'densely'
d. alok-***t'****alok* 'pied'
e. ultʰuŋ-***p****ultʰuŋ* 'bumpy'
f. λls'iku-***tʃ****λls'iku* 'whoopee'
g. olmaŋ-***tʃ****olmaŋ* 'all sorts of little things (in a cluster)'
h. ali-***k'****ali* 'confused'

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[1] From here on, I will italicize the portion of the reduplicant. In this case of perfect total reduplication, I decided on the reduplicant partly by resorting to such a device as reduction test (e.g. tekul-tekul → *tek*-tekul).

[2] I am using the phonemic transcription throughout the paper, not the phonetic one. In Korean, voiced obstruents are allophones of voiceless phonemes when they are between sonorants, but it is not relevant to the focus of this paper.

[3] Here, I determined the base and reduplicant through such facts that the first morpheme in *als'oŋ-tals'oŋ* is from an independent form, *alisoŋ*, that *Als'iku* can be used on its own without the other morpheme, *tʃAls'iku*, and that *olmaŋ-olmaŋ* can be used for *olmaŋ-tʃolmaŋ*, while conveying the same meaning. In addition, I had recourse to the universal markedness constraint, i.e., Onset which requires a syllable onset in the unmarked forms like reduplicants.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 33-53.

Looking through the data given here, we see that the reduplicated consonant can vary in both place and manner of articulation. We see a bilabial consonant in (2e), a dorsal segment in (2h), and a coronal consonant in the rest of the data, and an affricate in (2c, f, g) but stops in (2a, b, d, e, h).

Then the question is whether the choice of inserted consonant is predictable. I will make an attempt to provide an analysis in the remainder of the paper. My major argument is that the inserted segment is not identical to the neighboring consonants. First of all, the relevant data are instantiated in the next section. Section 3 provides a corpus-based evidence for my argument. I also furnish experimental evidence in section 4. This evidence supports the idea of the gradient OCP, and an attempt to show this gradiency is made in section 5. The final section will wrap up the paper with the theoretical implications and future directions of the study.

2. Data

The database established based on *Essence Korean Dictionary*[4] provides 343 entries of total reduplication with an inserted or substituting[5] consonant in the onset of reduplicant. Some of the examples for each consonant by place and manner of articulation are as follows:

(3) palatal affricates (28%)

a.	oŋki-***ʧ****oŋki*	'densely'
b.	λls'iku-***ʧ****λls'iku*	'whoopee'
c.	olmaŋ-***ʧ****olmaŋ*	'all sorts of little things (in a cluster)'
d.	ile-***ʧ****λle*	'one thing or another'
e.	umul-***ʧ****'umul*	'hesitantly'
f.	umulʧ'λk-***ʧ****umul****ʧ****'λk*	'hesitantly'
g.	λls'a-***ʧ****λls'a*	'delightfully'
h.	kalisan-***ʧ****ilisan*	'bewildered'

(4) bilabial stops (27%)

a.	ult^{h}uŋ-***p****ult^{h}uŋ*	'bumpy'
b.	λtʃλŋ-***p****λ****t****/λŋ*	'rambling'
c.	λli-***p****λli*	'silly'
d.	otoŋ-***p****otoŋ*	'chubby'
e.	utʃil-***p****ut****ʧ****il*	'brusque'
f.	okɨl-***p****okɨl*	'bubbling'
g.	tʃ^{h}ail-***p^{h}****iil*	'procrastinate'

(5) alveolar stops (20%)

a.	als'oŋ-***t****als'oŋ*	'confusing'
b.	oson-***t****oson*	'on good terms'
c.	alok-***t****alok*	'pied'

[4] *Essence Korean Dictionary*. 2006. Paju, Korea: Minjungseorim Co.

[5] From here on, I will use "inserted" as an umbrella term for both "inserted" and "substituting" unless otherwise indicated.

d.	λtʃuŋi-***t'λtʃuŋi***	'rabble'
e.	aoŋ-***taoŋ***	'squabbling'
f.	otol-***tʰotol***	'knotty'
g.	kλmpul-***tλmpul***	'pell-mell'

(6) bilabial nasals (9%)

a.	oŋsoŋ-***maŋsoŋ***	'hazy'
b.	λli-***mali***	'drowsily'
c.	kinka-***minka***	'obscure'
d.	seŋke-***maŋke***	'groundless'

(7) velar stops (7%)

a.	upul-***k'upul***	'windingly'
b.	ona-***kana***	'all the time'
c.	sinan-***konan***	'gradually getting worse'

(8) alveolar fricatives (5%)

a.	alt'ɨl-***salt'ɨl***	'extremely frugal'
b.	λlki-***sλlki***	'entangled'
c.	tʃina-***sena***	'always'

(9) alveolar nasals (2%)

a.	tɨls'uk-***nals'uk***	'uneven'
b.	tɨlak-***nalak***	'going in and out incessantly'

Examining the above data makes it possible to present some observations as in the following:

(10) Observations of the data:

(i) If the base contains /k/ and /ŋ/, the inserted consonant can be /tʃ/ or /m/, but not /k/ or /ŋ/.
(ii) If the base contains /k/ and /l/, the inserted consonant can be /tʃ/, /p/, /t/, /s/, or /n/ but not /k/ or /l/.
(iii) If the base contains /ŋ/ and /l/, the inserted consonant can be /tʃ/, /p/, or /t/, but not /ŋ/ or /l/.
(iv) If the base contains /l/ and /l/, the inserted consonant can be /tʃ/, /pʰ/, /p/, /m/, or /s/, but not /l/.
(v) If the base contains /l/ and /m/, the inserted consonant can be /tʃ'/ or /t/, but not /l/ or /m/.
(vi) If the base contains /k/ and /m̩/, the inserted consonant can be /tʃ/, but not /k/ or /m/.
(vii) If the base contains /s'/ and /l/, the inserted consonant can be /tʃ/, but not /s'/ or /l/.
(viii) If the base contains /n/ and /l/, the inserted consonant can be /tʃ/, but not /n/ or /l/
(ix) If the base contains /ŋ/ and /tʃ/, the inserted consonant can be /p/, or /t'/, but not /ŋ/ or /tʃ/.

(x) If the If the base contains /ŋ/ and /t/, the inserted consonant can be /p/, but not /ŋ/ or /t/.
(xi) If the base contains /l/ and /tʃ/, the inserted consonant can be /p/, but not /l/ or /tʃ/.
(xii) If the base contains /n/ and /s/, the inserted consonant can be /t/, but not /n/ or /s/.
(xiii) If the base contains /ŋ/ and /ŋ/, the inserted consonant can be /t/ or /m/, but not /ŋ/.
(xiv) If the base contains /l/ and /t/, the inserted consonant can be /t^h/, but not /l/ or /t/.
(xv) If the base contains /k/ and /n/, the inserted consonant can be /m/, but not /k/ or /n/.
(xvi) If the base contains /l/ and /p/, the inserted consonant can be /k'/, but not /l/ or /p/.
(xviii) If the base contains /n/ and /n/, the inserted consonant can be /k/ or /s/, but not /n/.

On the whole, a generalization that can be made about the observations is that the inserted segment is not identical to the neighboring consonants.

3. Proposal

3.1. Place Identity Avoidance

In order to formulate the generalization given in the preceding section, I, first of all, present a hypothesis, called Hypothesis 1 that the place of the inserted consonant is not identical to those of its adjacent consonants. As it turns out, the following tables show that the inserted segments tend to be non-identical to the adjacent sounds in place.

(11) Tabulation: Place

Table 1

Place factor: The epenthetic/substituting segment is labial (2/121)

inserted C (LAB)			
following / **preceding**	**LAB**	**COR**	**DORS**
LAB		1	
COR		40	34
DORS	1	39	6

Table 2

Place factor: The epenthetic/substituting segment is dorsal (5/25)

inserted C (DORS)			
following / **preceding**	**LAB**	**COR**	**DORS**
LAB			
COR	5	15	2
DORS	1	2	

Table 3

Place factor: The epenthetic/substituting segment is coronal (162/197)

inserted C (COR)			
following / **preceding**	**LAB**	**COR**	**DORS**
LAB	2		5
COR	9	50	14
DORS	6	89	22

As seen in Table 1, only 2 cases out of 121 where a labial is inserted in the reduplicant have another labial in the adjacent positions, either right or left. In Table 2 where the inserted consonant is a dorsal, 5 cases out of 25 have another dorsal as a preceding or following consonant. On the other hand, Table 3 shows 162 cases out of 197 where the inserted coronal is flanked by one coronal or two. Now a question arises here. Why can a coronal be inserted next to coronals? In the next section, we look further into the data from a different perspective.

3.2. Manner Identity Avoidance

After establishing that the place feature of the inserted consonant tends not to be identical to those of the neighboring segments, I propose another hypothesis, called Hypothesis 2 which presents that if the place of the inserted consonant is identical to those of adjacent consonants, they will be distinct in manner. The following tables display that the problematic cases in Table 3 are not problematic any more. That is to say, the "coronal-coronal-coronal" cases hardly share the manner of articulation.

(12) Tabulation: Manner for "Coronal-Coronal-Coronal" in Table 3

Table 4

Manner factor: The epenthetic/substituting segment is a fricative (0/197)

inserted C (FRICATIVE)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP					1
NASAL		1			
FRICATIVE					
AFFRICATE					
APPROX.					5

Table 5

Manner factor: The epenthetic/substituting segment is a nasal (0/197)

inserted C (NASAL)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP					
NASAL					
FRICATIVE					
AFFRICATE					
APPROX.					1

Table 6

Manner factor: The epenthetic/substituting segment is an approximant (1/197)

inserted C (APPROXIMANT)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP					1
NASAL					
FRICATIVE					
AFFRICATE					
APPROX.					

Table 7

Manner factor: The epenthetic/substituting segment is an affricate (3/197)

inserted C (AFFRICATE)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP	2				3
NASAL		1		1	8
FRICATIVE					2
AFFRICATE				2	
APPROX.					12

Table 8

Manner factor: The epenthetic/substituting segment is a stop (4/197)

inserted C (STOP)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP					
NASAL			2		3
FRICATIVE					
AFFRICATE					
APPROX.	4				1

In Table 4 and 5, neither of the inserted consonants, fricative or nasal, share the manner with the neighboring consonants. When the inserted segment is an approximant, affricate, or stop, only a few cases are attested where the inserted consonant shares the same manner with the adjacent segments, as shown in Table 6, 7, and 8, respectively. We also find sequences of "dorsal-coronal-coronal" or "coronal-coronal-dorsal" rather abundant in Table 3.

(13) Tabulation: Manner for "(Dorsal)-Coronal-Coronal" in Table 3

Table 9

(6/197)

inserted \ following	STOP	NASAL	FRICATIVE	AFFRICATE	APPROX.
STOP	1			1	39
NASAL					6
FRICATIVE					4
AFFRICATE	3	3		2	27
APPROX.					3

(14) Tabulation: Manner for "Coronal-Coronal-(Dorsal)" in Table 3

Table 10

(0/197)

preceding \ inserted	STOP	NASAL	FRICATIVE	AFFRICATE	APPROX.
STOP					
NASAL	1				
FRICATIVE					
AFFRICATE	4				2
APPROX.	7				

As seen in Table 9 and 10, few or no cases are attested where the inserted coronal share the same manner with the preceding or following consonant. Therefore, we can conclude that the inserted consonant tends to be dissimilar from the adjacent consonants in place and manner. Although no serious problem is detected with regard to the argument and its evidence, it may be intriguing to investigate the manner factor on its own.

(15) Tabulation: Manner

Table 11

Manner factor: The epenthetic/substituting segment is a fricative (0/17)

inserted C (FRICATIVE)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP		1			4
NASAL	1	4			1
FRICATIVE					
AFFRICATE					
APPROX.		1			5

Table 12

Manner factor: The epenthetic/substituting segment is an affricate (5/97)

inserted C (AFFRICATE)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP	11	8		2	12
NASAL	7	10		1	26
FRICATIVE					2
AFFRICATE				2	
APPROX.	2	2			12

Table 13

Manner factor: The epenthetic/substituting segment is an approximant (4/4)

inserted C (APPROXIMANT)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP					3
NASAL					1
FRICATIVE					
AFFRICATE					
APPROX.					

(16) Tabulation: Place factor for Table 14

Table 14

Manner factor: The epenthetic/substituting segment is a stop (99/187)

inserted C (STOP)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP	10	19	1		35
NASAL	11	16	2	3	32
FRICATIVE			2		1
AFFRICATE				6	
APPROX.	23	13	2		11

(17) Tabulation: Place for "Nasal-Nasal-Nasal" in Table 15

Table 15

Manner factor: The epenthetic/substituting segment is a nasal (23/38)

inserted C (NASAL)					
following / **preceding**	**STOP**	**NASAL**	**FRICATIVE**	**AFFRICATE**	**APPROX.**
STOP		4			6
NASAL		12			3
FRICATIVE					
AFFRICATE		1			
APPROX.		3	1	1	7

Since approximants are rarely inserted into the reduplicant, the data about the approximant insertion are not critical to my argument. However, looking through the tables above, we come to pose some questions: (i) Why can a stop be inserted in a position adjacent to stops? (ii) Why can a nasal be inserted in a position next to nasals?

The ANOVA test provided in Table 16 exhibits that the distributions of the adjacent stops as apposed to the inserted stop are significantly different ($p < .05$). On the other hand, two stops before or after an approximant seldom share the same place of articulation, according to Table 17 and 18. Thus we can observe the interaction effect of place and manner. The same argument is true with the "nasal-nasal-nasal" cases. Table 19 shows that none of the nasals are identical in the place of articulation.

Table 16

One-way ANOVA: Independent variable is the place of inserted or substituting stops, and dependent variables are the place of preceding stops (Stop A) and the place of following stops (Stop C)

	Source	Sum of Squares	df	Mean Square	F	Sig.
Stop A	Between Groups	1.35	2	0.675	6.3	0.027
	Within Groups	0.75	7	0.107		
	Total	2.10	9			
Stop C	Between Groups	1.75	2	0.875	8.167	0.015
	Within Groups	0.75	7	0.107		
	Total	2.5	9			

Table 17

Places for the first two stops in a Stop-Stop-(Approximant) combination. The shaded cells are the area where we expect no or few frequencies (1/187)

inserted \ **preceding**	**LAB**	**COR**	**DORS**
LAB			
COR	2		
DORS	13	19	1

Table 18

Places for the last two stops in an (Approximant)-Stop-Stop combination. The shaded cells are the area where we expect no or few frequencies (4/187)

following \ **inserted**	**LAB**	**COR**	**DORS**
LAB		5	2
COR		4	7
DORS	4	1	

Throughout this section, the given data confirm both of my hypotheses, namely that there is a tendency for the inserted consonant to be distinct from the adjacent consonants in place and manner of articulation. With this in mind, I proceed to look at how native speakers of Korean produce the reduplicated forms with an inserted consonant.

Table 19

Places for the Nasal-Nasal-Nasal combination.
The shaded cell is the area where we expect few or no frequencies.
All the inserted nasals happen to be labial (0/38)

inserted C (LAB)			
following \ **preceding**	**LAB**	**COR**	**DORS**
LAB			
COR		5	
DORS		4	3

4. Experimental Results

For a pilot study of an online reduplication task, I hypothesize that the inserted or substituted segments will tend to be non-identical to the adjacent sounds in place and manner. The participants were 13 native speakers of Korean, who are graduate students at the State University of New York at Stony Brook. They were presented with nonsense or unheard-of morphemes. The participants were requested to write down what they regard as the most natural reduplicated forms, utilizing the given portion of the word. The test sheet is provided in the Appendix and the summary of results is shown in table 20:

(18) Table 20.[6] Consonant insertion vs. consonant substitution

item	**adjacent sounds**	**inserted consonants**																**dissimilarity (pl. & man.)**[7]
		t	tʰ	t’	s	s’	ʧ	ʧʰ	ʧ’	p	pʰ	p’	k	kʰ	k’	m	n	h	
a	ŋ, ŋ	5			3		1		1				1			1	1		√ √
b	t, k						7						1				4		√ √
c	s, s	3			4		1						3			1			* * (sss)
d	t̪, t	1			4				1								1		√ √
e	k, ŋ	1			1		2						3			5	1		√ √
f	m, l				7					2			1				1		√ √
g	n, k	2			2		4						2			3			√ √
h	ŋ, l	2			4		1			1		1				2	2		√ √

[6] When a participant provided two or more possible consonant insertion cases, I considered them all in this table. However, I did not count in the cases where the participants deleted the given consonant, and where they changed the vowels instead of consonants.

[7] The check marks mean the concerned segments are distinct from the flanking consonants whereas the asterisks show the identicalness of the inserted consonant with either the preceding or the following consonant.

item	adjacent sounds	inserted consonants																	dissimilarity (pl. & man.)[7]
		t	tʰ	t’	s	s’	ʧ	ʧʰ	ʧ’	p	pʰ	p’	k	kʰ	k’	m	n	h	
i	ŋ, m	9					2	1									1		√ √
j	ŋ, ŋ	3			3		1			1						2			√ √
k	ŋ, l	4			2		2			2			1			1			√ √
l	l, k	2			4		3			1			2						√ √
m	ŋ, l	4		1	3		1						1			1		1	√ √
n	l, ŋ	1			1		8						1				1		√ √
o	k, ʧ	2					2		1	1			3		1	2	1		* √ (kk)
p	l, ŋ				7		3						1			1			√ √
q	n, k	2				1	5			1						1	1		√ √
r	n, k	2				2	5						1				2		√ √
s	l, l				2		1			1	7		1	1					√ √
t	l, ŋ	2					2									7	1		√ √
u	l, k	2					1			5			2		1				√ √
v	l, s				2		2				1								√ * (ss)
w	k, t	5			1		1			1		2	2						√ * (tt)
x	ŋ, t							1		3		1					1	2	√ √
y	k, l	4			2		2		2	2	1								√ √
z	k, t	3			2		1			2			1	1				1	√ * (tt)
aa	k, l	1		1	5		1			3			2						√ √
bb	l, s	2								5		1	3						√ √
cc	k, t				1		2					6	1						√ √
dd	k, l	1			1	1	3	1				2							√ √
ee	l, s	3			3		3			3			1						√ * (ss)
ff	k, ʧ				3							4							√ √
gg	l, ŋ	1			1				2								1		√ √
hh	l, ŋ	2	1				2												√ √
ii	k, ʧ						2		2		1								√ * (ʧʧ)
jj	l, ŋ	1			7		1												√ √
kk	ŋ, l	1			3		3			1	1		1			4			√ √
ll	ŋ, ŋ	1					1			1			9		1				√ √
mm	l, ʧ								1	1		1	4					1	√ √
nn	l, ŋ	1			4		1			2									√ √
oo	l, k				2		2					2	1			4			√ √
pp	l, ŋ	1			2			1	3						1				√ √
qq	l, n				8					2									√ √

Even if this is a rough and not-fully-fledged test which might need a more sophisticated and systematic design, we can get a general picture of how Korean speakers choose a consonant to be inserted under total reduplication.

In the first place, we will consider the consonant insertion cases in which the test examples begin without the first onset segment, and the subjects had to insert some consonant. In Table 20, these cases are indicated with bold in the *item* column. In (b) where /t, k/ were supplied, most of the subjects opted for the segment /tʃ/, avoiding any identity to the neighboring segments in place and manner. In (c) where /s, s/ was provided, many subjects chose /s/. It seems to run counter to my prediction, but we see that /t/ and /k/ are also chosen for insertion, with similar frequency. Therefore, we cannot decide which consonant would be mostly frequently used as an inserted segment. In (e) where /k, ŋ/ were given, the majority put /m/ in the reduplicant onset. This supports the idea of identity avoidance in place and manner. This result is presumed to be due to the fact that Korean has this morpheme with an inserted /m/, viz. [**m**uŋke], already in the lexicon, and it might have influenced the subjects' decision. In (f) where /m, l/ were provided, the majority chose /s/ as an inserted consonant. In (g) where /n, k/ were provided, many subjects inserted /tʃ/. In (h) where /ŋ, l/ were presented, the majority picked out /s/. We can see a near consensus in (i) where /ŋ, m/ were provided, and /t/ was the preferred consonant in the reduplicant. In (j) where /ŋ, ŋ/ were in the base, the same number of the subjects (3 people) wrote down /t/ and /s/, respectively. In (k) where /ŋ, l/ were existing consonants, /t/ was the most favored segment. In (l) where we had [l, k] in the base, /s/ was chosen by the major number of the participants. In (m) where /ŋ, l/ were provided, /t/ was the most preferred consonant. In (n) where we had /l, ŋ/ in the base, almost all the participants chose /tʃ/. In (o) where /k, tʃ/ were provided, we obtain almost the same number of /t/, /tʃ/, /k/, and /m/. Hence, we cannot decide which one is preferred. In (p) where /l, ŋ/ were provided in the base, the majority of the subjects put /s/ in the reduplicant. What is interesting is that /l, ŋ/ in (p) and /ŋ, l/ in (h) are the same in combination but different in order. However, they show the same inserted consonant. It may indicate that Korean speakers think more of combination rather than order of the base consonants in epenthesizing a consonant in the reduplicant.

What about (u) where /l, k/ were provided? The majority chose /p/ for insertion. In (w) where /k, t/ supplied, /t/ was selected by many subjects. In (z) where /k, t/ were provided, just like in the case of (w), we see the same result as in (w). That is, we have more subjects who chose /t/ than those who chose the other sounds. However, /t/ is not an absolutely preferred inserted segment because 3 subjects chose /t/, whereas 2 subjects chose /s/ and /p/, respectively. But still, we can see some consistency among the native speakers in selecting a favored consonant when given the same set of consonants in the base. In (bb) where /l, s/ were furnished in the base, the major number of the subjects put down /p/ in the reduplicant. In (ee) where we had /l, s/, the same number of /t/, /s/, /tʃ/, and /p/ resulted. In this case, then, we cannot determine which consonant is the preferred. However, via analogy with (bb) which has an identical set of base consonants, we can assume that /p/ might be the consonant that can be used most frequently, in (ee), as well. In (ii) where we had /k, tʃ/ in the base, we got only five answers. Among them, two gave /tʃ/ and the

other two gave /tʃ'/. We cannot decide on a preferred inserted consonant with these meager results. Lastly, in (ll) where there were /ŋ, ŋ/ given in the base, the vast majority epenthesized /k/. The extant /ŋ/ and the inserted /k/ are pronounced in the same place, but they are distinct from each other since the former is a sonorant (nasal) and the latter is an obstruent (stop).

Now, let us look at the substitution cases. The outcome is very similar to those given above for the insertion cases. To take an example, let us have a look at (s) where /l, l/ were given in the base. In this case, the majority chose /p^h/ for replacing the existing onset consonant. In the instances of (jj) and (nn) where there were/l, ŋ/, we gained the same result, i.e. replacement of /m/ with /s/, by most of the subjects. The abutting /l/ and /s/ are both coronal, but they are different from each other, with the former being a sonorant (approximant) and the latter an obstruent (fricative).

In sum, the results from the online experiment with native speakers supports the corpus-based analysis, showing a tendency to choose an inserted or substituting consonant that is dissimilar from the neighboring consonants in place and manner.

5. Formal Analysis

With the hypothesis being confirmed, we explore the question whether these patterns can be analyzed within a theory of grammar that assumes ranked constraints. Now that we have established via the corpus data and the experimental results that the inserted consonant in the reduplicant is differentiated from the neighboring consonants, I argue that the patterns should be explained with stochastic constraint rankings, rather than absolute ones.

First of all, we saw from the corpus data that most of the inserted consonants are all chosen from the natural class of true obstruents. This kind of outcome can be anticipated if we think of the Sonority Principle (SP), which requires that lower sonority segments be preferred in nonmoraic (onset) positions. Due to this principle, we would prefer obstruents to sonorants, and stops and affricates to fricatives in the onset position.

(19) μ/a >> μ/e,o >> μ/i,u >> μ/r,l >> μ/m,n >> μ/v,z >> μ/f,s >> μ/b,d >> μ/p,t[8]

According to this sub-hierarchy of SP, adopted from Gnanadesikan (2004) and given in (19), μ/Y means "each Y must be parsed as a mora." Therefore, the lowest ranked segments on the hierarchy would make the best onsets.

Next, we observed from the corpus and online experiment that the inserted consonant tends to be distinct from the adjacent segments in place and manner. Hence, we need some constraint that requires identity avoidance, such as the Obligatory Contour Principle (OCP), given in (20).

(20) Obligatory Contour Principle (OCP): No identical elements next to each other.

[8] Gnanadesikan (2004) did not put /k/ and /g/ in this hierarchy, but I assume that /k/ must be categorized with /p, t/ and /g/ with /b, d/.

We can also recall the following universal hierarchy from Alderete et al. (1999) shown in (21), which was, in turn, adopted from Prince and Smolensky (1993):

(21) Place-Markedness Hierarchy: *Pl/Lab, *Pl/Dors >> *Pl/Cor

According to what we have discussed about the occurrence of consonants in the onset position of the reduplicant, we can come up with the constraint hierarchy in (22), which would be regarded as a hierarchy for obtaining an epenthesized consonant. This result is illustrated in the following tableau where we obtain an optimal output, i.e. the actual form, [oson-*toson*], with an inserted coronal stop.

(22) SP(Onset), OCP(Place/Manner) >> Place-Markedness Hierarchy

(23) Tableau for [oson-***t****oson*] 'on good terms'[9]

/oson-Red/	Max-IO	SP(Onset)	OCP(Pl/Man)	*Pl/Lab, *Pl/Dors	*Pl/Cor	*Pl/Phar	Dep-BR
☞ a. oson-***t****oson*			(nt, ts)[10]		*****		*
b. oson-***p****oson*				*!	****		*
c. oson-***k****oson*				*!	****		*
d. oson-***n****oson*		n!	nn, (ns)		*****		*
e. oson-***s****oson*		s!	(ns), ss		*****		*

Now, let us consider cases where bilabial and velar stops are inserted in the reduplicant.

(24) Tableau [ult^{h}uŋ-***b****ult^{h}uŋ*] 'bumpy'

/ult^{h}uŋ-Red/	Max-IO	SP (Onset)	OCP (Pl/Man)	*Pl/Lab, *Pl/Dors	*Pl/Cor	*Pl/Phar	Dep-BR
☞ a. ult^{h}uŋ-***p****ult^{h}uŋ*				*	****		*
☹ b. ult^{h}uŋ-***t****ult^{h}uŋ*			(tl)		*****		*
c. ult^{h}uŋ-***k****ult^{h}uŋ*			(ŋk)	*	****		*

The candidates (24b) and (24c) can go on to the next lower constraint even with the partial violations of OCP(Pl/Man). Then we would expect that (24b) should be

[9] According to the hierarchy in (22), we predict that [oson-*dʒoson*] should be the same as the actual output, [oson-*doson*], in the status of optimality. On the one hand, we might be able to exclude [oson-*dʒoson*], saying that /tʃ/ is more sonorous than /t/. On the other hand, we might have to resort to a more finely devised OCP based on the similarity between /t/ and /s, n/, and between /tʃ/ and /s, n/. At this point, I would say that they should be both optimal according to the given hierarchy of the constraints.

[10] When neighboring consonants violate the OCP partially, i.e., identical either in place or manner, I put them in parentheses and let them go on to the next constraint.

the winning candidate, contrary to fact. This means that there must be some operating force of OCP(PL/MAN) that keeps (24b) out of the running. Here, this constraint will gradiently apply to the data. Even if we have a lexical item (24a) well established in the lexicon, we can still accept (24b) because it is not completely bad and it is better than (24c). Hence, inserting /p/ is judged to be relatively better in the given environment than the sounds in the other candidates from the viewpoint of the OCP suggested here. That is, it does not mean that (24a) is absolutely the best single output among other candidates.

When it comes to the case in which we have an inserted velar stop, we can develop a tableau like in the following:

(25) Tableau for [ali-***k'ali***] 'confused'

/ali-RED/	MAX-IO	SP(ONSET)	OCP(PL/MAN)	*PL/LAB, *PL/DORS	*PL/COR	*PL/PHAR	DEP-BR
☞ a. ali-***k'ali***				*	**		*
b. ali-***p****ali*		*!		*	**		*
c. ali-***t****ali*		*!	(lt, tl)		***		*
d. ali-***k****ali*		*!		*	**		*

In (25), due to SP(ONSET), we can obtain the correct output. However, we could not exclude candidates like [ali-***p'ali***], which would have to be chosen as another optimal form according to the above constraint hierarchy. In fact, [ali-***p'ali***] is another actual word that has the same meaning as [ali-***k'ali***], but it is just used less frequently. This may suggest that /k'/ is just one of the probable sounds that can be epenthesized for the given input. To put it another way, it reveals a probabilistic or stochastic hierarchy of constraints imposed upon various potential output candidates.

6. Theoretical Implications and Future Directions

The analysis proposed in this paper is not without a supporting theoretical foundation. In this section, I give a brief overview of the refined viewpoint with respect to the OCP constraint. Frisch et al. (2004) argue that "the degree of co-occurrence restriction between consonants in the Arabic verbal roots depends on place of articulation, manner, and voicing features, as well as the distance between consonant pairs." (p. 218) In line with this, they point out that the traditional OCP constraint, which they call total OCP, is defective because there are some data it cannot explain in any way. They, instead, suggest a gradient OCP.

Providing evidence from many different languages with respect to the tendency to avoid repetition —local and non-local— Frisch et al. (2004) propose the formulation of phonotactic knowledge based on the idea that phonotactic acceptability is a gradient notion which is to be reflected in the patterning of lexical items of a language. In the same vein, Albright (2006) claims that "grammar itself is probabilistic and gradient." (p. 1)

Among the cross-linguistic phenomena that utilize an OCP-like identity avoidance strategy, there are Turkish emphatic reduplication, English shm-reduplication, Javanese echo-words, Cantonese language game, and adjective reduplication in the Tengxian dialect of Chinese (Wedel 1999, Yip 1993, 1996). As Wedel (1999) points out, all of these cases, including the Korean reduplication case discussed in this paper, exhibit some level of perceptual distinctiveness between base and reduplicant.[11]

However, the "feature similarity metric" employed in Frisch et al. (2004) to explain the gradiency of OCP, given in (26), does not seem to dispense with a problem.

(26) $$\text{Similarity} = \frac{\text{Shared natural classes}}{\text{Shared natural classes} + \text{Non-shared natural classes}}$$

The formula given in (26) computes the similarity among consonants due to their natural class features. Then, examples like [omok-***ʧ****omok*] and [omok-***ʧ****^{h}omok*] are expected to have the same frequency of occurrence because the inserted consonants (in boldtype) are equally distinct from the adjacent consonants in place and manner, which makes them as dissimilar as possible from either of the flanking consonants. However, in fact, we encounter the former much more frequently, and we hardly find the latter. Therefore, we cannot entirely resort to this computation in accounting for the gradiency of OCP in Korean reduplication.

On the other hand, native Korean speakers were inclined to choose the same kind of consonant for insertion into reduplicant, if they were given the same set of consonants in the base. This tendency implies that there must be some relevance between the native speakers' lexical knowledge and the phonotactics of the language. This kind of correlation between the lexicon and its phonotactic constraints is persuasively stated in the quotation from Frisch et al. (2004): "…Over time, functional pressures on the language have shaped the lexicon that is to be acquired by successive generations of speakers. These functional pressures influence borrowing, the creation of nonce forms, and the loss of lexical items…" (p. 218).

Recapping the paper with a remark that Korean reduplication presents another instance displaying the effects of a gradient OCP constraint, in addition to other cases like the Semitic languages, Turkish, Javanese, etc., I would like to lay an emphasis on the argument that speakers are implicitly aware of statistical patterns in the lexicon. As seen throughout the analysis, the OCP constraint was playing a pivotal role in determining the consonants inserted under reduplication. Besides, these inserted consonants can be said to be chosen in accordance with the speakers' innate knowledge of the lexicon.

Meanwhile, the claim that the OCP constraint is not totally but gradiently respected is considered to be meaningful and useful in pursuing other kinds of phonological research. At least, it seems to fit in with our intuition and observation that

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[11] Yip (1993) makes use of the constraint named *Repeat which corresponds to the OCP. She uses that constraint because she thinks it should be more general in explaining the reduplication or echo-word data which exist at the interface of phonology and morphology. This constraint is later adopted by Wedel (1999). I employ the existing OCP constraint but our tenets are the same in that base and reduplicant avoid repetition.

all the extant data do not necessarily abide by all the constraints or rules on a completely absolute scale.

With the pilot study as a starting point, my research is heading now toward reinforcing this argument with actual data by conducting a more sophisticated and carefully designed experiment with native speakers of Korean. Furthermore, I would like to discuss some similarly behaving data from other languages, which were already mentioned in this section, in comparison with the Korean data. This discussion will establish the gradient OCP and probabilistic grammar in a more robust manner.

Appendix

Direction

Each of the following morphemes is part of some reduplicative form. You, as a native speaker of Korean, are requested to fill in each of the blanks with a copied form of the given item. When you create a reduplicant, please make sure that a segment should be different from the correspondent in the given morpheme. You can prefix or suffix the reduplicative form to the given base. Feel free to write them in Korean, should you be more comfortable with using Korean.

Instantiation

a. oŋki-***tʃ****oŋki*
b. als'oŋ-***t****als'oŋ*
c. oson-***t****oson*

Questionnaires[12]

a.	-왱강-	[weŋkaŋ]
b.	-아그대-	[akte]
c.	-우세-	[use]
d.	-잣대-	[tʃatte]
e.	-웅게-	[uŋke]
f.	-얼금-	[ʌlkim]
g.	-오근-	[okɨn]
h.	-알강-	[alkaŋ]
i.	-엄벙-	[ʌmpʌŋ]
j.	-엉정-	[ʌŋtʃʌŋ]
k.	-얼멍-	[ʌlmʌn]
l.	-어글-	[ʌkɨl]

[12] This was given in Korean lest the words should get the subjects confused when provided in English. However, I am giving phonemic transcription here in the paper in order for them to be legible for the speakers of other languages. Some of the words are from a certain dialect of Korean, which is spoken by none of the subjects, and most of them are newly made up for the sake of this survey.

m. -얼루룽- [ʌluluŋ]
n. -옹알- [oŋal]
o. -우적- [utʃVk]
p. -옹골- [oŋkol]
q. -소곤- [sokon]
r. -새근- [sekɨn]
s. -칠레- [tʃʰile]
t. -송골- [soŋkol]
u. -우글- [ukɨl]
v. -부슬- [pusɨl]
w. -오독- [otok]
x. -포동- [potoŋ]
y. -후룩- [huluk]
z. -우둑- [utuk]
aa. -드륵- [dɨlɨk]
bb. -으슬- [ɨsɨl]
cc. -부득- [putɨk]
dd. -찌륵- [tʃ'ilɨk]
ee. -우술- [usul]
ff. -바직- [patʃik]
gg. -중얼- [tʃuŋʌl]
hh. -칭얼- [tʃʰiŋʌl]
ii. -오작- [otʃak]
jj. -몽골- [moŋkol]
kk. -대롱- [deloŋ]
ll. -웅시렁- [uŋsilʌŋ]
mm. -꾸질- [k'utʃil]
nn. -밍글- [miŋkɨl]
oo. -버글- [pʌkɨl]
pp. -종알- [tʃoŋal]
qq. -난들- [nantɨl]

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A NON-UNIDIRECTIONAL MOVEMENT IN THE VERBAL SYSTEM?

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1. Introduction

1.1. Path model

The theory of paths —as posited by Bybee, Perkins & Pagliuca (1994) and Dahl (2000b)— provides scholars with a model of the grammatical growth of verbal formations. It shows how grams belonging to a similar type emerge from lexical, semantically transparent and possibly iconic locutions, how they develop into prototypical categories of taxis, aspect, tense or mood, and finally how they decay, disappear or are reused for new grammatical purposes. In other words, clines aim at codifying an *exemplary* grammatical life of components of the verbal system. For instance, the trajectory that depicts the lifecycle of entities "born as" resultative proper grams predicts that such formations typically evolve into more central taxis (e.g. perfect), aspectual (e.g. perfective) and temporal (e.g. past tense) expressions. At the end of their grammatical existence, this group of formations is usually limited to a literary narrative remote past tense.[1]

1.2. Unidirectionality and universality

It is important to note that paths are frequently understood both as universal (Bybee, Perkins & Pagliuca 1994: 104) and unidirectional (Dahl 2000a: 11-12). This, in turn, gives an impression that the entire approach is teleological (goal-oriented), hodological (end-oriented) or "deterministic in […] philosophy" (Drinka 1997: 118). The universality and unidirectionality —and thus the determinism— of the clines need however to be clarified.

The universality of trajectories (i.e. the fact that they are intended to operate in all languages and to be valid in all geographical and temporal locations) as well as their unidirectionality (i.e. the claim whereby the paths are not reversible and thus that the order of stages located on a cline is invariable) refer to the abstract model and not to empirical cases (Dahl 2000a: 12 and Traugott 2001: 1, 5).

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[1] For a more detailed discussion of the grammatical life of original resultative constructions, see sections 2.2 and 3.1, below.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 55-71.

Paths have been extrapolated from extensive empirical research and verified by an immense sample of languages. This experimental foundation and the existence of a few irregular or problematic cases (cf. Drinka 1997) have led some scholars to understand clines as "almost universal" tendencies: although empirically confirmed, trajectories may be violated.[2] In that manner, the universality and unidirectionality are nearly or statistically true, accounting for a huge majority of cases but not for all of them (cf. Newmeyer 1998: 275 and Traugott 2001: 3).

Since paths correspond to inductive generalizations derived from available evidence, they are indubitably hypotheses about robust *tendencies* (Bybee, Perking & Pagliuca 1994: 104-105, Traugott 2001: 1). As any theory constructed upon empirical data by means of the inductive reasoning, the path model is in fact a belief that the evidence observed thus far and laws derived from it will hold for all languages and for all historical periods (Popper 1968 and 1972 and Wagensberg 2007). But this is nothing more than *a belief!* The induction by repeating or enumerating examples can never lead to an absolute universal truth. A hypothesis may have an overwhelming number of examples in its favor but we still do not know whether it is a universal law – verification is always open-ended (Popkin 1999: 647). Generally speaking, any inductive overgeneralization fails to be "logically" sustained because, when proposing a law, an immense portion of reality must always be ignored. In our case, how many languages (that exist now, are already extinct and will appear in the future) need to be verified yet in order to posit an absolutely universal rule? *Per vim*, the inductive approach will never allow us to grasp all possible linguistic cases. Even if we collected all the data currently available, the infinite amount of evidence (i.e. evidence available in the past but lost for today, as well as evidence that will be available in the future) would be left aside. This past or future evidence —currently inaccessible— could easily refute our law. Consequently, we take our generalization for laws, being aware that they are "hypothetical universals". In doing so, the path model does not differ from any empirical theory and thus its statements are as universal as biological, chemical or physical laws are. Like biology, chemistry and physics, the path theory interprets a limited amount of cases as representative enough for the universe or a delimited part of it and predicts that *all* entities of a given type should behave in such and such manner.

It must also be noted that clines are abstract idealizations, a type of higher level rules. They operate at a higher level of abstraction (Traugott 2001: 5), in a so-called ideal world where various "noises" have been ignored. It is at this level where they are both universal and unidirectional (Dahl 2000: 12). A given evolutionary pattern —derived inductively from empirical evidence— is *assumed* to be universal (cf. inductive generalization, above). But this universality refers to an abstracted model in which the process in question has been simplified enough so that it could be theoretically and scientifically manageable, and represented as isolated from the remaining parts of the system. Idealizing or even falsifying the real state of affairs, we treat a given law as an independent formula. Contrary to

[2] This infringement, however, is highly infrequent (cf. Nemeyer 1998).

the realistic situation, no interactions with the adjacent world are usually envisaged. But this is the only way any empirical science can go. Propositions of a scientific model not only overgeneralize but also profoundly idealize the universe – they never portray the world as it is (Auyung 1998). They state how a given phenomenon would be if it was perceived independently, in isolation or in ideal conditions – any friction, disturbing forces or accidents are simply treated as if they did not exist.

Consequently, the concepts of universality and unidirectionality do not imply that all concrete grammatical construction will always develop in the same manner. They mean that language evolution is driven by a number of theoretical principles. These abstract —both overgeneralized and idealized— truths are universally valid and, as any scientific theories (Luisi 2010: 26), deterministic.

1.3. Problem

Once identified as universal, all such scientific propositions are being constantly verified and, in particular, tested for a possible falsification. Although we take them for laws, we immediately wish to demonstrate that in certain aspects they may be modified, improved or even entirely remodeled. We know that our theory and thus our paths are provisional in their conclusions because they are —and must be— falsifiable (Luisi 2010: 28). As a result, we constantly test universal clines (which simply amount to the best available hypothesis we have) with concrete empirical evolutionary cases. We are particularly interested in supposedly irregular cases that have been reported to violate the rule.

If we encounter a supposed counterexample to a posited cline, quite commonly we can demonstrate that such a superficially reversal movement corresponds, in fact, to a combination of interacting and competing prototypical path-laws. Thus, the irreversibility or abnormality is only an impression – all underlying processes are fully regular and consistent with posited clines. In other words, there is no necessity to postulate opposite developments. What looks like heading towards a contrary direction is an aggregate of more basic and standard individual forces, viz. paths (Dahl 2000a: 12 and Andrason 2010a). In certain instances, however, reported irregular examples indeed seem to contradict a given cline. This is the case of the development of the Proto-Indi-European (PIE) Aorist in the Indo-Aryan (IA) branch (in Vedic, Brāhmaṇas and Classical/Late Sanskrit). According to Drinka (1997), the evolution of this gram constitutes a counterexample to the theory of universal paths, because it contravenes a unidirectional model of grammatical life of resultative formation, viz. the anterior cline.

In the present paper, we will demonstrate that the universality and unidirectionality of paths may be preserved —and thus Drinka's case dismissed— if we re-interpret the model of clines as a representation of the *acquisition of new senses* and not as a theorized replica of the *evolution of grammatical categories*.

We will start our study by explaining the "running" of the anterior cline (the path that is supposedly violated by the growth of the IA Aorist) in the standard model of universal trajectories (2.1) showing its shortcomings and inaccuracies (2.2). Next, we will propose a new understanding of the anterior trajectory where

stages represent senses and not grammatical categories (3.1). This view of the anterior track will enable us to employ the cline in order to represent a gram's polysemy – its semantic potential, a *state* (3.2). After that, a more realistic model of the development of grams (i.e. as an evolution of states) will be posited (3.2). Equipped with these new conceptual tools, we will demonstrate that the Aorist suffered an entirely regular modification during its history from Proto-Indo-European to Classical Late Sanskrit: it acquired senses respecting the order established by the anterior cline, thus confirming the ideas of universality and unidirectionality of *re-interpreted* paths.

2. Standard model

2.1. Standard model of the anterior path

Derived from extensive typological studies, the anterior path is an evolutionary scenario that provides a model of grammatical life of original resultative proper grams (e.g. Nedjalkov & Jaxontov 1988: 3-63; Bybee, Perkins & Pagliuca 1994: 51-105, Dahl 2000: 14-17 and Nedjalkov 2001: 928-940).[3] More specifically, this cline determines that resultative proper grams regularly become present perfects (anteriors)[4] which subsequently develop into perfective and simple past tenses. Bybee, Perkins & Pagliuca (1994) additionally split the present perfect stage into 'young' and 'old' anteriors. The former category is a prototypical present perfect while the latter offers certain uses that match more advanced phases of the path, being admissible in past functions. The anterior cline in its most classical and general version may be schematized as follows:

Resultative proper → present perfect → Perfective past / Simple past

Figure 1

Anterior path (adopted from Bybee, Perkins & Pagliuca 1994 and Dahl 2000a)

It should be noted that the standard model most commonly refers to grammatical categories and their development: a resultative proper gram develops into a perfect which, in turn, mutates into a perfective and simple past. Thus, the consecutive evolutionary stages correspond to gram types with their different semantic-functional

[3] Resultative proper grams are formations whose meaning consists of two equally relevant components: one indicates the currently attested state of an object or person and the other makes reference to an action, formerly accomplished, from which this on going state has resulted. In such expressions, neither the prior dynamic event nor the posterior static result is emphasized – both are indissoluble and interconnected.

[4] The perfect usually emphasizes the dynamic event or activity while the relevance of the component related to the resulting state —although certainly available— is reduced.

properties. As a result, the cline presents the evolution as if grams developed, "jumping" from one phase to another.[5]

2.2. Shortcomings of the standard model

While the standard model usually comprehends the subsequent evolutionary stages on the anterior cline as representing different grammatical categories, the situation in the real world is quite different. Grammatical formations do not jump from one stage to another – they rather amass senses that correspond to consecutive phases on a given trajectory, in our case, on the anterior path (Andrason 2011). The advancement on the trajectory (i.e. the possibility to convey senses located at the end of the path) does not imply that values acquired previously (i.e. properties that match more original stages of the cline) must be abandoned. On the contrary, they may survive for a long time even though the gram has developed meanings prototypical for highly developed phases of the pathway. Thus, grams do not necessarily mutate from a resultative proper into anterior and then into a past tense. Original resultatives rather acquire additional present perfect senses. Subsequently, they may gain an explicit past value, first perfective and subsequently non-perfective or durative. As a result, it is possible to find verbal formations whose total meaning reflects various stages on the anterior cline. For instance, the *passé composé* in French may be encountered in the function of a resultative proper, present perfect and perfective or simple past (Grevisse 1975), thus spanning the entire anterior path (Andrason 2010b). Similarly, the Akkadian *iprus* formation offers the value of a resultative proper (stative), present perfect, perfective past and simple past (Andrason 2010b). Probably, one of the most evident cases is the Biblical Hebrew *qatal*. This formation not only provides meanings that cover the entire anterior cline (resultative proper, present perfect, perfective past and simple past) but also conveys optative-conditional (counterfactual and factual, real and unreal), evidential (evidential proper and inferential) and future values. There is no path in the standard model that could predict such a heterogeneous category.

It must be emphasized that the correspondence of the overall meaning of a gram to a large portion of the path is highly frequent and stems from the fact that verbal grams (as any components of the language) are profoundly, regularly and inherently polysemous, displaying a broad range of uses and values (Evans & Green 2006: 169-170).

3. New model

3.1. New model of the anterior path

Since it is the development of semantic properties (i.e. incorporation of senses) —but not the evolution of realistic grams (i.e. grams do not jump from one stage to

[5] However, in the category of old anteriors, Bybee, Perkins & Pagliuca (1994) use the path model in order to account for the semantic potential of a gram – it is used a present perfect (the intermediate stage) and —to some extent— as a past tense (a more advanced stage).

another but, on the contrary, may span various portions of the cline)— that follows the order established by the anterior cline, the "traditional" path model should be reinterpreted. Although it fails to represent possible evolutions of realistic grammatical objects (categories such as the French *passé compose*, the Akkadian *iprus* or the Biblical Hebrew *qatal* are not posited by the standard model), the theory may be successfully maintained if we understand it as a codification of a unidirectional incorporation of new values and uses, prototypical to formations that originate in determined types of inputs. This means that paths predict the series of integrated meanings, and thus that stages located on a path make reference to consecutively acquired new senses.

Having said that, let us reinterpret the anterior trajectory as a portrayal of a gradual acquisition of new senses by original resultative constructions. Taking into account data provided by Harris (1982), Bybee, Perkins & Pagliuca (1994: 55-57, 98, 104-105), Squartini & Bertinetto (2000: 406-407, 414-417 and 422), Lindstedt (2000: 379), Heine & Kuteva 2007: 151, and Mitkovska & Bužarovska (2008: 136), it is possible to obtain a more detailed picture of the anterior cline. Resultative inputs first develop present perfect senses, acquiring successively and in the strictly determined order the following anterior[6] values: inclusive,[7] resultative,[8] frequentative,[9] experiential[10] and indefinite.[11] Afterwards they become acceptable in explicit past contexts, giving rise to definite past uses. Once admissible in an overt past environment, the gram usually increases its temporal distance from the enunciator's here-and-now. More exactly, it develops past functions in a following sequence: immediate, hodiernal, hesternal, recent, general and remote. It shall also be noted that all past tense uses are first generated in discourse from where they spread to narrative. Finally, in certain languages, during the acquisition of the past temporal value, it is possible to establish a stage where an upcoming past tense offers a clear aspectual perfective sense. At a posterior stage, such perfective pasts become admissible in durative or non-perfective contexts.[12] The entire trajectory may be schematized as follows:

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[6] In this article, the terms 'perfect' and 'anterior' are used as synonyms.

[7] The inclusive (also labeled universal) anterior indicates that an action or state holds without interruption from a determined point in the past to the present moment, e.g. *I have known Max since 1960* (Jónsson 1992: 129-145).

[8] The resultative anterior introduces dynamic events, portraying them as highly relevant for the present state of affairs, e.g. *I cannot come to your party – I have caught the flu* (McCawley 1971).

[9] See, for instance, the Portuguese perfect *Ultimamente o João tem lido muitos romances* 'Recently John has read many novels' (Squartini & Bertinetto 2000: 409).

[10] The experiential anterior indicates that the subject has an experience of having performed (or not) a given action. This means that the activity is portrayed as an experience which occurred at least once, and which might have been repeatable, e.g. *I have never read that book* or *I have read 'Principia Mathematica' five times* (Jónsson 1992: 129-145).

[11] The indefinite perfect (also labeled indefinite past) indicates clearly past events without, however, specifying its temporal location. As for the former property, the gram approximates a past tense. However, given the latter characteristic, the formation behaves as a typical present perfect. Therefore in figure 2 below, it is located between the semantic domains of a present perfect and past tense.

[12] The grouping of such perfective and non-perfective values delivers the category of a simple past tense (cf. Bertinetto & Lenci 2010: 36-38).

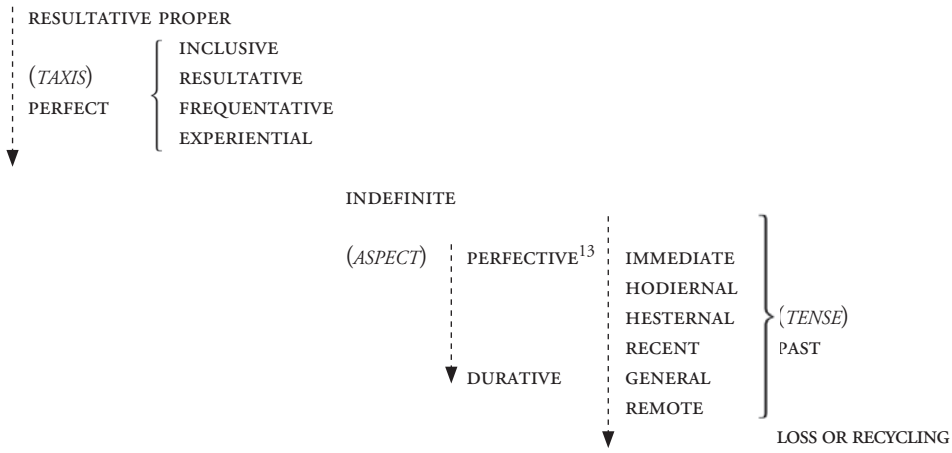

Figure 2

Anterior path as a sequence of incorporation of new senses[14]

3.2. Anterior cline as a model for a gram's polysemy

Since the model determines the order of senses incorporated into the total meaning of an originally resultative construction, the unidirectional chain posited by it may be

[13] As a definite past, the gram may undergo two, to some extent, independent types of evolution. One consists in increasing the temporal distance from the speaker's here-and-now: immediate > hodiernal (the same day or one day's past) hesternal (yesterday's past) > recent > general (a person life's past) and remote (historical and ancient) past. The other includes the acquisition of certain aspectual nuances, first perfective ones (perfective past) and next durative or non-perfective ones (the gram functions as a simple past – an aspectually neutral gram). This change is facultative and occurs in determined types of verbal systems. It shall be noted that there is no precise stage-to-stage equivalence between the stages which link the indefinite perfect and various subcategories of the definite past on the one hand, and the development of the perfective past into its aspectually neutral variant, on the other.

[14] The vertical arrows in this figure symbolize the diachronic progression of resultative inputs. Take note that our labels —conceptual boxes that make reference to senses acquired by resultative inputs— are not arbitrary. They meet three conditions. First, our categories respect the terminology commonly used in grammatical descriptions of languages belonging to distinct families (cf. Nurse 2008, Waltke & O'Connor 1990 and Hewson & Bubenik 1994) and in studies dedicated to general linguistics (cf. Bybee, Perkins & Pagliuca 1994 and Haspelmath et al. 2001). Second, in certain languages, the labels, employed in figure 2, correspond to realist and independent categories – they typologically exist. And third, these specific categories sometimes have a practical application. Namely, they enable linguists to establish an exact range of correspondence between constructions whose semantic potential, although similar, is not identical. For example, the category of an inclusive and hodiernal (and, in certain case, hesternal) definite past gives us a possibility to determine the precise difference in meaning between the English and Spanish present perfects (Bybee, Perkins & Pagliuca 1994: 98). In English, the present perfect gram (*I have done*) fails to appear with the sense of a definite hodiernal-hesternal past, while in Spanish a typologically equivalent formation (*he hecho*) does not provide the value of an inclusive perfect. The remaining perfect uses (resultative, experiential, iterative and indefinite) are conveyed both by the English and Spanish form.

employed in order to define the synchronic semantic potential of a concrete and realistic gram that has been developing in accordance with the path. Put differently, given that resultative proper formations incorporate and store taxis, aspectual, temporal values in the sequence established by the anterior cline, the overall meaning of a formation —its entire polysemy— may be equaled with a portion of the trajectory. Each specific sense simply corresponds to a stage on the path – each one of them has been acquired at a given historical moment. This interpretation of the anterior track harmonizes with a principle of cognitive linguistics whereby a synchronic semantic variation is a static vestige of a diachronic change (Lewandowska-Tomaszczyk 2007: 140).

Consequently, resultative grams may be understood at any moment of their development as collections or amalgamations of senses that match evolutionary segments of the anterior path. Thus, the total meaning of a gram —its *state* at a time *t*— is portrayed as a portion of the cline (cf. Van der Auwera & Gast 2001: 186-188). In this view, the path model represents an "equation" or an abstract law governing the acquisition of new values.

3.3. New model of evolution of grams

As explained above, the anterior path (as any cline) specifies the order of incorporation of new senses but not the extent of their accumulation. Virtually, post-resultative grams at a given moment in their historical development allow any amalgamation of values (portrayed as stages of the trajectory) with the exception that no islands are allowed – the semantic potential corresponds to an uninterrupted section of the cline.[15] More specifically, the type of combination of senses acquired in accordance with the anterior cline is undetermined: it may cover one phase, two phases, a large segment of the cline or, in an extreme case, the entire trajectory.

Furthermore, since the meaning of a realistic gram is typically polysemous and cannot be reduced to one diachronic stage of the path, the evolution of a resultative construction cannot be equaled with the anterior cline because this trajectory, as mentioned above, does not indicate possible states of post-resultative constructions. More specifically, it says nothing about the extent of amalgamation of senses. Consequently, it does not depict realistic evolutionary movements. Strictly speaking, no verbal formation evolves in the manner indicated by the anterior path due to the fact that no gram mutates, jumping from one sense-stage to another.

However, given that the anterior cline may be employed to represent a complex state of a gram, viz. its entire polysemy (a formation is portrayed as a portion of the anterior trajectory, where each sense matches a given diachronic stage during which it has been acquired), it is possible to posit a more accurate model of the evolution of resultative formations built on the anterior cline scheme. This new representation will determine how the state of a construction, i.e. its path-representation, has been evolving during various historical periods. More precisely, we will determine what the form's polysemy *p*-portrayed and ordered by means of the anterior track into a

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[15] This assumption has its roots in another principle of cognitive linguistics whereby senses must be connected, deriving —both conceptually and diachronically— one from another (cf. relatedness principle in Evans & Green 2006: 331-332, 352-253 and Lewandowska-Tomaszczyk 2007: 140)

sequence ($x_1 ... x_n$) where each x symbolizes a given sense that, in turn, corresponds to a diachronic stage on the path – has been at distinct temporal points t. Consequently, the semantic development of a formation will correspond to a sequence of states (for a practical illustration, see section 4 below).[16]

Having discussed theoretical aspects of the path model, let us illustrate how this alternative understanding of the anterior path and other clines operates in practice. In the following part of the article, we will show that the new viewpoint of the anterior trajectory can successfully eliminate a supposed example of a contrary development provided by Drinka (1997). In other words, we will demonstrate that the novel perspective enables us to "regularize" the evolution of the IA Aorist and, hence, preserve the universality and unidirectionality of the anterior path.

4. Re-directing a "non-unidirectional" development

4.1. Drinka's argument

According to Drinka (1997: 125), the development of the Aorist in Sanskrit is a clear counterexample to the principle of unidirectionality. Employing the model posited by Bybee, Perkins & Pagliuca (1994: 105), she understands the representation of the evolution of resultatives as a change from one category into another category. More specifically, Drinka claims that resultatives develop into anteriors (perfects), which, in turn, become perfectives or pasts.[17]

With this comprehension of the anterior path, Drinka proceeds to discuss the Indo-Iranian case. She claims that the change of the Sanskrit Aorist from a perfective past into a present perfect (as well as into a recent and experienced past) contravenes the anterior path hypothesis and thus constitutes a counterexample to the unidirectionality principle (ibid.: 122-123). Her argumentation may be summarized as follows. Classical Proto-Indo-European included in its verbal repertory the Aorist defined as a perfective past and the Perfect used as a stative or resultative proper formation. In Vedic (the oldest strata of Sanskrit), the PIE Perfect conserved its original value of expressing present states. In Sanskrit, however, it moved down the cline

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[16] At a higher level of analysis, if we compare an extensive amount of such concrete evolutionary cases, and the development of states in concrete languages, it will be possible to posit a true *evolutionary* anterior path. This cline will not describe incorporation of senses (as our anterior cline does) but will provide some rules or generalizations concerning the evolution of real-world grams. Namely, it will show how the amalgamation —the extent of polysemy stored in accordance with the anterior path— develops and thus how the semantic potential of resultatives evolves. This signifies that while the paths (anterior track included) determine the direction and order of consecutively acquired senses during the evolution of a category, this *state* trajectory represents consecutive *sets of accumulated and developed meanings*. We still lack such a global evolutionary view built on a comprehensive empirical study.

[17] Following Bybee, Perkins & Pagliuca (1994), Drinka (1997: 119-120) distinguishes between 'young' and 'old' anteriors (perfects) and assumes that the former diachronically precede the latter. As explained, young anteriors are gram with an exclusive present perfect sense (prototypical present perfects). Old anteriors, on the contrary, show signs of taking on perfective and past senses – they "moved down the path" (ibid.: 119). Thus in Drinka's model (exactly as was the case in the standard model), the stages of a resultative, young anterior, perfective and past make reference to verbal categories. However, when describing the category of an old perfect, stages of the cline are employed in order to refer to values, components of the semantic potential of the formation.

and developed the sense of a resultative present perfect. Furthermore, it also was employed to express past —even remote— events and facts. Thus, the inherited PIE Perfect (a stative resultative proper gram) developed into a past tense, confirming the principle of the anterior cline. On the other hand, Drinka (ibid.) claims that the Aorist (a descendent from the PIE perfective past) is employed in Vedic in order to denote recent past activities, facts that refer to personal experience or events that have a strong connection to the present state of affairs. Also in Brāhmaṇas (a subsequent stage of this ancient Indo-Aryan language – an intermediate phase between Vedic and Classical/Later Sanskrit; cf. Whitney 2003: xv-xvi), the Aorist played the role of a present perfect in direct discourse. Since "[i]t is the aorist, not the perfect, which is used to refer to personal experience […and since t]he perfect is used to refer to the ancient, mythical event [and] the aorist […] to the recent replication of this event on a personal level", Drinka (1997: 122) concludes that the perfective past became a present perfect. This change of course violates the anterior path principle: past tenses (either perfective or simple) are not supposed to develop into present perfects. In the next section, we will proceed to analyze this "irregular" evolution in more detail, showing the inaccuracy of Drinka's argument.

4.2. The evolution of the Aorist and "related" grams

In order to give a more comprehensive picture of the entire development, we will analyze not only the semantic potential of the Aorist, but also the polysemy of two other formations, viz. Perfect and Imperfect. As we will see, the growth of these constructions greatly influenced the evolution of the Aorist itself. We will start the analysis by describing the situation in Proto-Indo-European. Next, the modifications of the state: the Perfect, Imperfect and finally, Aorist in three different periods of Sanskrit (in Vedic, Brāhmaṇas and Classical/Late Sanskrit) will be discussed.

The PIE Perfect was a prototypical resultative proper formation. It conveyed stative and resultative-stative senses (Hirt 1928: 278-284, Szemerényi 1990: 317 and Tichy 1998: 81-82) and displayed an exemplary de-transitive nature, still seen in Greek (cf. Chantraine 1986: 197-198 and especially Perel'muter 1998: 277, 280, 287). On the other hand, as again documented by Homeric Greek, it did not function as a dynamic resultative perfect – it rather expressed pure states or states viewed as results of previous actions (cf. Chantraine 1986: 197-199 and Tichy 1998: 81-82). The meaning of the PIE Imperfect is reconstructed as an exemplary imperfective past (progressive, habitual or durative; cf. Tichy 1998: 74). However, the Aorist was not only a perfective past as claimed by Drinka. Since there was no specialized present perfect in the verbal system, the Aorist —a perfective past gram (Tichy 1998: 74, 114-116)— must likewise have expressed the sense corresponding to the semantic domain of present perfects. It probably conveyed values of a resultative, experiential, iterative and indefinite perfect. All of these sense are still available in Latin where the Perfectum (a morphology that in several aspects has its roots in the PIE Aorist; cf. Hewson & Bubenik 1997: 191, 195) may function not only as a narrative perfective or simple past tense, but also as a present perfect (resultative, experiential, iterative or indefinite; see, Hewson & Bubenik 1997: 196 and Zawadzki

2003: 93-94).[18] Consequently, the PIE Aorist covered not one, but several stages on the anterior cline – it spanned from the present resultative perfect to the perfective past.

In Indo-Iranian, as correctly observed by Drinka (1997: 121), the PIE Perfect advanced on the path. In Vedic, the Perfect expresses the condition acquired by the subject. This present state is usually portrayed as resulting from a previous activity (Macdonell 1993: 341). In this usage, conveying resultative-stative and stative (with no resultative nuances available) senses, the gram approximates the category of a resultative proper. However, the formation may also function as a dynamic present perfect. It provides the value of an inclusive or resultative perfect, as well as the sense of an experiential present perfect (Macdonell 1993: 341 and Hewson & Bubenik 1997: 58). Generally speaking, in all of these cases, the Perfect expresses events that, although have occurred previously, remain relevant for a present situation. In certain instances, however, where the idea of current relevance is absent, the gram is employed with the force of an indefinite present perfect. In addition, the Vedic Perfect commonly appears in the recent past function, introducing activities that were completed in an immediate or recent past. On the contrary, only very sporadically, the formation may denote a single action in remote past or in narration (Whitney 2003: 296). In such cases, the gram typically interrupts the narrative story line, introducing a reflection that may commonly be understood as expressing the effect of the action previously related (ibid.: 343). On the whole, the functions of a resultative proper and present perfect clearly predominate. In Brāhmaṇas, the Perfect provided three main values, functioning as a resultative proper, present perfect (in various subtypes) and simple (perfective and non-perfective) narrative past (ibid.: 344-345). This means that the category further advanced on the path. In particular, the distinction of the tense value between the Perfect and the Imperfect (cf. the next paragraph) is almost entirely lost. The difference between the two categories employed in the narrative past function consists in frequency – the Imperfect predominates while the Perfect is only exceptionally used (cf. Whitney 2003: 296). Thus, as was the case in Vedic, the most common use of the Perfect corresponds to the true present perfect sense – the gram indicates a completed event and events located in a proximate past. Finally, in the Classical Sanskrit, the gram functions as a "preterite" or a broad simple past tense (ibid.).[19]

Another important category that conditioned the development of the Aorist was the Imperfect. The Imperfect —a reflex of the PIE imperfective past— already in Vedic ceased behaving as an exemplary imperfective past and evolved into a general simple narrative tense, often conveying the idea of continuity. It could introduce both past progressive or habitual activities (i.e. durative or non-perfective) as

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[18] A similar present perfect sense of the PIE Aorist is demonstrated by the Germanic Preterite. In Gothic, the Preterite (a gram that is partially derived from the PIE Aorist, cf. Hewson & Bubenik 1997: 212-219) clearly provides two major groups of senses: present anterior (or even past anterior) and simple (both perfective and non-perfective) past (cf. Braune & Ebbinghaus 1971: 106). Similarly, in Old Icelandic, the Preterite besides its most common function of a simple past tense (perfective or durative) may also be employed as a present perfect (inclusive, resultative, experiential, iterative and indefinite) or as a pluperfect (Iversen 1994: 140).

[19] According to Hindu grammarians —although not confirmed by Whitney (2003)—, the Perfect describes facts not witnessed by the narrator.

well as isolated momentary (i.e. perfective) events (Hewson & Bubenik 1997: 61). The Imperfect also may convey the sense of past anteriority, functioning as a pluperfect (ibid.). As noted by Macdonell (1993: 345), the Imperfect is a past tense of narration with no relation to the present. The meaning of the Imperfect has remained unchanged through the entire history of Old Indo-Aryan. Both in Brāhmaṇas and Classical/Late Sanskrit, the gram denotes all types of past events (either perfective or non-perfective) – it is a simple past tense, a preterite (Whitney 2003: 278).

Having explained the development of the Indo-Aryan Perfect and Imperfect, let us describe the factual evolution of the Aorist. In Vedic, the PIE Aorist is used with a clear dynamic present perfect sense, expressing actions that occurred in the past but that at the same time remain relevant for the present situation (Hewson & Bubenik 1997: 59). Acting as a present perfect, the Aorist virtually provides senses corresponding to all its subtypes – it functions as an inclusive, resultative, experiential and iterative present perfect (Macdonell 1993: 345). It should be noted that the gram does not express the resultative proper value (both resultative-stative and stative), which is regularly conveyed by the Perfect (cf. Macdonell 1993: 343 and Hewson & Bubenik 1997: 59). Additionally, the Aorist introduces indefinite (indefinite perfect) and immediate past events. Finally, Whitney (2003: 928-929) affirms that in Vedic hymns, the Aorist may sometimes be used narratively, supposedly with a general or remote past temporal value. In general, the prototypical usage of the Vedic Aorist corresponds to the present perfect, indefinite perfect and immediate (discursive) past tense. In Brāhmaṇas, the Aorist again expresses events that belong to the speaker's experience or that have been witnessed by him or her. As an exemplary perfect of current relevance, it is commonly used in the sense of an inclusive, resultative, experiential and iterative perfect (cf. Macdonell 1993: 345-346). In may also indicate past events, either indefinite or, when appearing with the adverbs *purā* 'formerly', definite and recent. On the contrary, the gram never narrates – it does not introduce central events of a narrative storyline. When the Aorist appears in narration, it expresses results of a ritual (Hewson & Bubenik 1997: 59-60). This lack of the narrative remote past value distinguishes the Aorist from the Perfect and Imperfect (Whitney 2003: 329). As observed by Whitney (2003: 329), in the two older strata of the language —i.e. in Vedic and Brāhmaṇas— the Aorist most commonly has the value of a proper present perfect or discursive recent past. It expresses a previously accomplished action that is relevant for the present. It indicates that something has just occurred, that something has never, once or often occurred, that something has been occurring, and that something has formerly or recently occurred. On the contrary, in the later Sanskrit language, the Aorist is employed as a simple past tense, a preterite. In this function, it is equivalent to the Imperfect and Perfect and introduces any past events and activities: indefinite, recent and discursive, remote and narrative, as well as perfective and non-perfective (ibid.: 328-329).

4.3. Model of the evolution of the Aorist

Already the sole analysis of the semantic potential of the Aorist shows that Drinka's treatment is far too simplistic. Neither may the PIE Aorist be equaled with an invariant perfective past nor is its successor in Vedic and Brāhmaṇas a present per-

fect only. In all the historical periods, the gram displays a broad range of senses – it is polysemous.

In accordance with the new understanding of the path model, let us use the anterior cline as a template of this polysemy i.e. as a conceptual matrix of the semantic potential offered by the Aorist. Since the model posited in figure 2 is far too complex to be employed in order to portray the change of the state of the Aorist from Proto-Indo-European to Classical/Late Sanskrit, we will simplify it. Put differently, in order to render the visual portrayal of the semantic space of the gram neater and the comparison of the states of the formation more straightforward, the following changes will be introduced. First, we shall represent the stage of the resultative proper sense as "1", all the perfect senses as "2" and the indefinite perfect as "3".[20] Consequently, we will not distinguish between various perfect anterior uses. Furthermore, we will group the values of an immediate-recent past and discursive past as "4" and the sense of a general-remote past and narrative past as "5". Finally, the stage of perfective meaning will be symbolized as "6" while the phase of the durative or non-perfective past value will be represented as "7". Thus, the entire anterior cline will receive the following simplified shape:

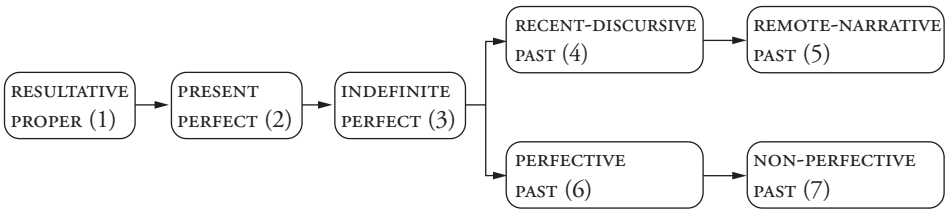

Figure 3

Anterior cline as a simplified matrix of a possible semantic potential

Using this template —based on the anterior cline model— let us represent the development of the semantic potential of the Aorist from Proto-Indo-European to Classical Sanskrit, passing through the stages of Vedic and Brāhmaṇas Sanskrit in accordance with the information provided in section 4.2. In Proto-Indo-European, the Aorist functions as a present perfect (2) indefinite perfect (3), recent (4), remote (5) and perfective (6) past. The only change in older strata of Sanskrit affects the sense of a remote past (5) – in Vedic it becomes infrequent and in Brāhmaṇasis entirely missing. In Classical/Latte Sanskrit, the Aorist "regains" the remote-narrative past value (5) and acquires the meaning of a non-perfective past (7). At the same time, the formation loses the present perfect values (2).

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[20] The distinction between the indefinite perfect and the remaining present perfect senses is maintained. The values grouped in box "2" (inclusive, resultative, frequentative and experiential) regularly convey the idea of current relevance. This shade of meaning is however missing in the indefinite perfect, which expresses a past event without specifying its exact temporal location.

[21] In Proto-Indo-European, the narrative past value makes reference to personal or oral narration. Of course, there was no *literary* narrative genre at this time.

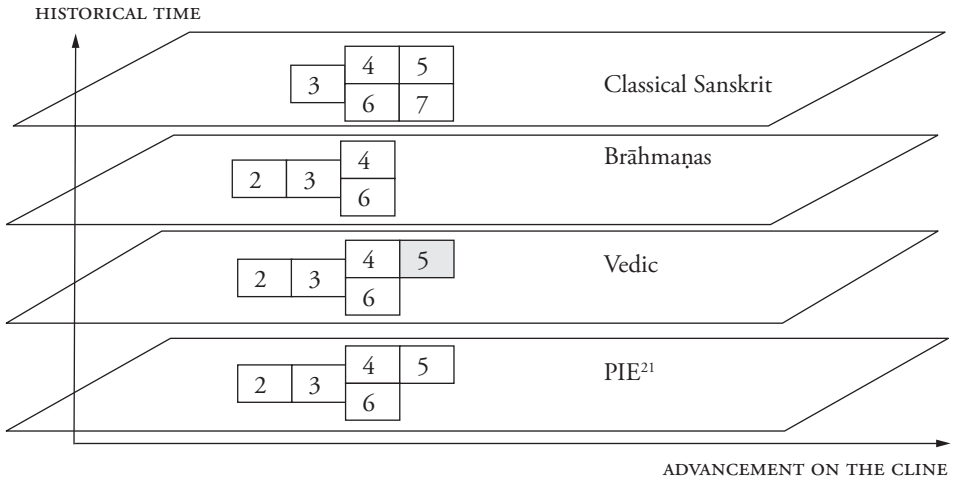

Figure 4

Evolution of the state of the Aorist[22]

Figure 4 demonstrates that no irregular movement occurred in the history of the Aorist. The gram never transmuted from a perfective past into a present perfect. What happened is the following: in Indo-Aryan, the sense of a remote-narrative past gradually decreased in frequency,[23] becoming rare in Vedic and entirely lacking in Brāhmaṇas. In Classical/Late Sanskrit, the Aorist became a prototypical simple past tense: it reincorporated the (temporarily lost) remote-narrative past value, acquired the non-perfective past meaning, simultaneously abandoning the sense of a present prefect of current relevance.

This decrease in frequency of the remote-narrative past value —fully tolerable by the anterior cline model in the new version because peripheral senses may be abandoned without any theoretical problem[24]— stemmed from the growth of the Perfect (it could be used as in narration) and in particular from the development of the Imperfect (already in Vedic it expressed both imperfective and perfective past events and activities). In Classical/Late Sanskrit, the Aorist, Perfect and Imperfect merged into a broad past tense, a preterite (Hewson & Bubenik 1997: 52, 55).[25]

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[22] The grey color in box "5" indicates that this sense is highly infrequent and in some cases dubious.

[23] This decrease is of course reconstructed because we do not have any direct data concerning the frequency of senses provided by the Aorist in Proto-Indo-European, itself a reconstructed language. Here, in light of the evidence offered by ancient languages such as Greek, Latin, Gothic or Old Icelandic we assume that in the PIE period, the gram was a regular perfective past – both recent-discursive and remote-narrative.

[24] As explained, the only constraint is the formation of so-called 'semantic islands'.

[25] Although the majority of forms derived from the Imperfect, certain Perfect (*uvāca* 'he said', Hewson & Bubenik 1997: 58) and a lot of originally Aorist forms were likewise preserved (ibid.: 55).

5. Conclusion

The present paper has demonstrated that the universality and unidirectionality of verbal paths can be maintained if we understand the model of clines as a representation of the acquisition of new senses and, hence, as a matrix of the sematic potential displayed by a gram at a determined historical moment – i.e. as its synchronic state. The evolution of grammatical categories, in turn, should be interpreted as a succession of states which are portrayed as portions of a given trajectory (or a cluster of them).

This alternative interpretation of the path model —where the polysemy is in focus— enabled us to refute an alleged counterexample to the anterior cline movement. By analyzing the state of the Aorist in Proto-Indo-European and in three historical varieties of the Sanskrit languages (Vedic, Brāhmaṇas and Classical/Late Sanskrit), we showed that the gram had undergone an entirely regular development. More specifically, the sequence of acquired senses during the history of the Aorist and thus the total direction of the trajectory it followed stand in perfect harmony with the order and direction established by the anterior path.

Since the traditional paths are now regarded as abstract, generalized and fictionalized imperatives —"equations" that, on the one hand, control the arrangement of subsequently incorporated senses but, on the other, fail to portrait real developments (they say nothing about the state space of a gram)—, and given that concrete grammatical evolutions are represented as changes in the state displayed by a given formation in distinct diachronic strata, a new universal model of the realistic evolution of verbal constructions seems necessary. This novel theory would deliver universal and unidirectional properly *evolutionary* clines, i.e. trajectories that would encapsulate generalizations concerning the evolution of states of grams belonging to a similar type. The formulation of such a model, built on an extensive empirical study, where changes in states displayed by various formations need to be compared, will constitute a future research activity of the author.

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VOWEL QUALITY EFFECTS ON HIATUS RESOLUTION IN SPANISH

Irene Barberia

1. Introduction

Hiatus Resolution refers to the various strategies that languages use in order to avoid two adjacent heterosyllabic vowels at the phonetic output. These strategies include vowel reduction, diphthongization, coalescence and deletion as the most common reported in the literature. From the point of view of production, Hiatus Resolution (henceforth HR) can be explained by the crosslinguistic preference for CV syllables. It has also been claimed that speakers apply HR strategies in a gradient manner, basing their choice of the strategy on patterns of prosodic lengthening (Simonet 2005). From a perception point of view, the avoidance of adjacent vowels is motivated by a perceptual reduction of vowel distinctions in weak contexts, which triggers changes in the vowels, in order to neutralize (or, at least, reduce) those distinctions (Fourakis 1991, Aguilar 2003, Sands 2004). Hiatus Resolution in Spanish is a phonetic phenomenon favored in contexts of reduced perceptibility, such as unstressed syllables in connected speech. The factors that affect HR are numerous and of a diverse nature: phonetic, phonological and usage-based.[1] This paper explores the effects on HR in Spanish of one of these factors: vowel quality.

Phonologically, Spanish sequences of non-high vowels within word boundaries are heterosyllabified, as in *teatro* 'theater' ([te. a.tro]). But when a high vowel is involved, then (i) either the high vowel bears stress and hiatus takes place, as in *teoría 'theory'* ([te.o. ri.a]) or (ii) the high vowel is unstressed and diphthongization occurs, as in *peinar* 'to comb' ([pej. nar]). Across word boundaries, vowel sequences are always heterosyllabified, regardless of vowel height or stress. However, the actual phonetic realizations of non-identical vowel sequences differ from the phonological expectations. For instance, the vowel sequence /ea/ in the word pair *este asunto* ('this subject') can be pronounced in hiatus ([es.te#a. sun.to]), with vowel reduction ([es. t̩#a. sun.to]), diphthongization ([es.tja. sun.to]) or with deletion of one vowel ([es. ta. sun.to]). These are all strategies that Spanish uses in order to resolve hiatus sequences at the phonetic level.

[1] For a literature review on the effects of the different factors favoring HR in Spanish refer to the following: Aguilar (1999, 2003), Aguilar & Machuca (1995), Alba (2005), Casali (1997), Dauer (1983), Hualde & Chitoran (2003), Jenkins (1999) and Quilis (1981).

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 73-82.

Assuming Ladefoged's (1993) account for vowel sonority, less sonorous vowels undergo HR more easily than more sonorous vowels, all other factors being equal. Then, it seems logical to question which of the two vowels in the sequence (V1 or V2) is a better target to undergo changes when HR strategies apply. A study by Esgueva (1999) on deletion of vowel sequences suggests a preference for corner vowels (/a, i, u/) to prevail in hiatus sequences over mid vowels (which become the target for HR), and also back vowels to prevail over front vowels. Unfortunately, Esgueva does not provide specific explanations for his results. However, Aguilar (1999) proposed a correlation between duration and vowel quality in a study on hiatus/diphthong alternation. Added to that, in her later study Aguilar (2003) analyzing the production of sequences /a/ + /a, e, i/ in unstressed positions (in order to neutralize the effect of stress) by Spanish speakers, she shows a gradation of preference for different strategies of hiatus resolution based on the quality of the vowels in the sequence: *non-high* > *identical* > *high* for monosyllabification strategies (these include reduction of non-high vowels and diphthongization); *identical* > *high* > *non-high* for coalescence and deletion.

Taking Aguilar's (2003) as a departure, a larger experimental study was conducted to analyze the use of HR strategies in Spanish, including all possible non-high vowel combinations. The results of part of that experiment, those involving a production task, are presented here. This paper focuses on the effects of vowel quality on the resolution of non-high vowel sequences in Spanish.

2. Hiatus Resolution strategies

The results of the acoustic experiment presented in this paper are based on the duration and frequency (F1 and F2 values) measurements of the vowel sequences produced by native speakers. Measurements of these two acoustic correlates are used to define the various strategies that speakers use in Spanish to resolve hiatus.

2.1. Hiatus

Along the lines of Martínez-Celdrán (1984: 221), vowels in hiatus are defined in the literature as two "autonomous vowels", nuclei of adjacent syllables: acoustically, each vowel maintains its own well defined formant values and the transition from one vowel to the other is shown by an abrupt change in the spectrogram, especially in the F2 value. Throughout the data analysis, instances of hiatus exhibit the durational values of two full vowels and stable formant frequency values.

In the experiment, hiatus is rarely produced as defined above, since vowel assimilation in F1 and/or F2 is usually found. In these cases, however, vowel sequences are considered in hiatus, because it shows a durational value that corresponds to two vowels.

2.2. Acoustic diphthongization and gliding

During the speech act, durational reduction may imply a syllabic reorganization of the speech sounds. If there is not enough time to produce both vowels in the se-

quence completely, at least one of the vowels is durationally reduced. When the reduction in the duration of a vowel is significant, the vowel may lose its syllabicity and it will merge into the syllable of the other vowel in the sequence. Acoustically, according to Martínez-Celdrán (1984), the glide in a diphthong has lost its autonomy and its formants look like an appendix of the syllabic nucleus (1984: 222). This occurs to non-high vowels, as defined below:

> Acoustic diphthongization: $[V_1.V_2] \rightarrow [.\underset{\smile}{V}_1V_2.]$ or $[.V_1\underset{\smile}{V}_2.]$
>
> Significant durational reduction of a nucleic vowel in a vowel sequence. It may also lead to a certain degree of qualitative assimilation to the other vowel in the sequence.

Shifting the formant values of a reduced non-high vowel in the sequence to those of [j] or [w] results in a qualitative change of the vowels into glides. By enlarging the articulatory distance between the two vowels in the sequence, a better perception of the two vocalic sounds under durational reduction is assured. When the vowel suffering qualitative and durational changes rises to a glide, gliding occurs.

2.3. Coalescence and deletion

A further reduction in the duration of the vowel sequence leads to the production of a single vowel instead of two. In such contexts, the speaker may (i) either delete completely one of the vowels in the sequence or (ii) produce a different vowel instead of the sequence. Usually in the latter case, this vowel maintains features of the original vowels in terms of F1 and F2 values. When both vowels merge into a new one, partially assimilating each other, coalescence occurs.

> Coalescence: $[V1.V_2] \rightarrow V_3$
>
> Resyllabification of a hiatus into a single syllable, the resulting vowel is a combination of the F1/F2 values of the original vowels.

Deletion, on the contrary, is used in order to produce a single vowel from the original two vowels in the sequence. This eliminates traces of formant values of the target vowel.

> Deletion: $[V_1.V_2] \rightarrow [V_1]$ or $[V_2]$
>
> Resyllabification of a hiatus into a single syllable, resulting in the deletion of one of the original vowels.

Table 1 summarizes the acoustic characterization of the different ways vowel sequences were produced in the production task, including all possible HR strategies.

		Phonetic representation	Duration	Frequency	V_1-to-V_2 transition
Hiatus	Hiatus	$[V_1.V_2]$	Two vowels	Stable, clearly defined formant values for both vowels.	Abrupt and short
	Vowel assim.	$[V_1.V_2]$	Two vowels	Stable formant values for two vowels. The assimilated vowel shows F1 and/or F2 values closer to the values of the adjacent vowel.	Abrupt and short
	Vowel rising	$[V_{+high}.V_2.]$ or $[V_1.V_{+high}]$	Two vowels	Stable formant values for two vowels. One of the vowels shows formant values of a high vowel.	Abrupt and short
HR strategies	Acoustic diphthong.	$[.\underline{V_1V_2}.]$ or $[.\underline{V_1V_2}.]$	More than one vowel but less than two	Stable formant values for one vowel. Reduced vowel shows formant values close to the original vowel.	Smooth
	Vowel gliding	$[.GV_2.]$ or $[.V_1G.]$	More than one vowel but less than two	Stable formant values for one vowel. The reduced vowel shows formant values close to those of a high vowel.	Smooth
	Deletion	$[V_1]$ / $[V_2]$	One vowel	Stable formant values for either the first of second vowel only.	No transition
	Coalescence	$[V_3]$	One vowel	Stable formant values for one vowel, showing an F1 value of the V1 and F2 value of V2, or vice versa.	No transition

Table 1

Acoustic description of the strategies of hiatus resolution

3. Experimental procedures

The experiment consists of a production task performed by 8 native speakers of Spanish. They were 4 male and 4 female native speakers of northern varieties of Peninsular Spanish, from the communities of the Basque Country, Galicia, Castile-Leon and Catalonia. Their ages at the time of the experiment were between 25 and 30 years old, except for one of the female speakers, who was 42. At the time of the experiment, all of them were first or second year graduate students at the University of Illinois at Urbana-Champaign. Prior to that, they had lived in their place of origin in the Spanish communities mentioned above.

Subjects were asked to perform a reading task and their production was recorded for later analysis. The corpus for the production task consisted on a list of sentences that had words and word pairs (henceforth *tokens*) containing all possible combinations of non-high vowel sequences in Spanish: /ae/, /ao/, /ea/, /eo/, /oa/ and /oe/. A total of 43 tokens containing the vowel sequences were created with controlled syllabic structure. All the tokens varied in syllable length, from two to four syllables. The syllables containing the vowel sequences were unstressed and were adjacent to a stressed syllable. Each token was embedded into a sentence in order to provide a natural context for the production, given the fact that it was a reading task and not spontaneous speech. The tokens were placed regularly towards the middle of the sentence, avoiding placing them right before a pause or at the end of an intonational boundary.

Subjects were asked to read the list of sentences containing the tokens three consecutive times. The sentences were preceded by three filler sentences at the beginning and followed by three filler sentences at the end. The filler sentences allowed the subjects to familiarize themselves with the reading list and to adapt their rhythm for the recording session, in order to keep a similar structure to that of the sentences for the analysis; filler sentences were not included in the analysis, in order to avoid interacting effects. The complete reading set of 43 sentences (plus 6 filler sentences), read three consecutive times by each subject, made a total of 129 tokens containing vowel sequences for each subject analysis.

Subjects were trained to produce a more or less constant speech rate throughout their reading task, with a production speed that would be fast enough to allow hiatus resolution strategies to take place. The reading speed was close to *connected speech*, following Llisterri (1992). Subjects were asked to maintain that rhythm throughout the reading task. The purpose of the training was to get the reading to sound as natural as possible and closer to a spontaneous style rather than a reading style.

The recording was carried out in a sound-treated room at the phonetics laboratory of the University of Illinois at Urbana-Champaign. This acoustic experiment was conceived to record the subjects' production of those vowel sequences, which were, a posteriori, categorized into the different strategies of hiatus resolution and analyzed for the effect of vowel quality. The reading task lasted an average of ten minutes for each subject. The production data (subjects' recordings) was recorded with a professional-quality equipment (micro: head-mounted Shure SM10A; recording, CSL 4300B Kay Elemetrics; sampling rate 44.100Hz).

4. Results

Since vowels are acoustically defined according to their duration and formant frequencies (Martínez-Celdrán 1984, Quilis 1993), hiatus resolution strategies are based on the characterization of those acoustic features. Thus, the objects of analysis in this experiment are *duration* and *frequency*. Duration refers to the possible durational reduction in the production of the vowel sequences, due to the application of hiatus resolution strategies. In the analysis of the production of each token, the duration of the vowel sequence was measured. Each subject repeated the production task three times; therefore, three productions were measured for each to-

ken. An average of those values was used in the statistical analyses. Measurements of F1 and F2 of the vowel sequences were also obtained. Although the actual formant values are not reported in a specific section within this paper, they were used as a criterion to classify the vowel sequences within the different categories of hiatus resolution strategies.

All measurements in the production experiment were manually obtained from waveform, spectrogram and spectra exploration using the *Praat* software for speech analysis (by Paul Boersma and David Weenink, *www.fon.hum.uva.nl/praat*, version 4.6.20). There were cases were formant measurements were difficult to obtain; in such cases, the formant tracking algorithm from Praat was used. For contexts where measurements were unclear, a second opinion from a phonetician was used to obtain a more accurate description. The statistical analyses run on the recorded data result from one-way ANOVA tests, conducted using SPSS 15.0 for Windows.

4.1. Vowel height

Tables 2 and 3 below display the results for the occurrence of the various strategies of hiatus resolution based on the height of the vowels in V1 or V2 positions. The results in table 2 show a significant preference for hiatus when the first vowel in the sequence is a low vowel. This result is consistent with those in table 3: hiatus and acoustic diphthongization show a higher percentage of production when V2 is a non-low vowel. In addition to that, there is a significant preference for coalescence when V2 is a low vowel. Unlike for coalescence, the results for deletion are not significant, but they suggest a similar preference (table 3). The results in tables 2 and 3 suggest a trend that divides into similar preferences of use hiatus and acoustic diphthongization on the one hand, and coalescence and deletion on the other. This division is further supported by the results recorded for vowel frontness and backness.

Table 2

V1 height: percentage of strategies produced

Strategy	V1=low	N	V1=non-low	N	*p*-value	F-value
Hiatus	15%	312	10%	643	.014*	F(1,953) = 6.011
Ac. diph.	18%	312	20%	643	.472	F(1,953) = .517
Gliding[2]	2%	312	1%	643	.241	F(1,953) = 1.379
Coal.	38%	312	44%	643	.084	F(1,953) = 2.990
Del.	27%	312	26%	643	.602	F(1,953) = .272

[2] Regarding gliding, the results do not show significant data and the choice of that strategy was limited to tokens that had a palatal consonant right after the vowel sequence. They are not relevant in the rest of the analysis either.

Table 3

V2 height: percentage of strategies produced

Strategy	V2=low	N	V2=non-low	N	*p*-value	F-value
Hiatus	7%	358	15%	597	<.001*	F(1,953) = 12.591
Ac. diph.	14%	358	22%	597	.002*	F(1,953) = 9.354
Gliding	1%	358	1%	597	.412	F(1,953) = .674
Coal.	49%	358	38%	597	.001*	F(1,953) = 11.065
Del.	29%	358	25%	597	.158	F(1,953) = 1.992

4.2. Vowel frontness

The results of the effects of vowel frontness are shown in tables 4 and 5 below. Most of them were not significant. However, the significant results reflect the effect of frontness in the choice of strategy of HR. Concerning the vowel in V1 position (table 4), deletion shows a greater percentage of production when V1 is a non-front vowel. Table 5 also shows only a significant difference: acoustic diphthongization is produced less often when V2 is a front vowel. However, again, a trend for a division is suggested based on the overall results: hiatus and acoustic diphthongization occur more often if V2 is non-front, whereas coalescence and deletion have a greater percentage of occurrence if V2 is a front vowel.

Table 4

V1 frontness: percentage of strategies produced

Strategy	V1=front	N	V1=non-front	N	*p*-value	F-value
Hiatus	12%	354	11%	601	.605	F(1,953) = .267
Ac. diph.	21%	354	18%	601	.416	F(1,953) = .663
Gliding	1%	354	1%	601	.395	F(1,953) = .724
Coal.	44%	354	40%	601	.272	F(1,953) = 1.209
Del.	21%	354	29%	601	.011*	F(1,953) = 6.485

Table 5

V2 frontness: percentage of strategies produced

Strategy	V2=front	N	V2=non-front	N	*p*-value	F-value
Hiatus	11%	245	12%	710	.690	F(1,953) = .159
Ac. diph.	13%	245	21%	710	.004*	F(1,953) = 8.212
Gliding	2%	245	1%	710	.077	F(1,953) = 3.144
Coal.	44%	245	41%	710	.397	F(1,953) = .717
Del.	30%	245	25%	710	.135	F(1,953) = 2.233

4.3. Vowel backness

The effects of backness on the strategies of HR are displayed in tables 6 and 7 below. Table 6 shows significant results for hiatus, gliding and deletion strategies. Hiatus and gliding show a greater percentage of occurrence when V1 is a non-back vowel, this difference being highly significant (p= .002); on the contrary, deletion is preferred when the first vowel in the sequence is a back vowel. The results in table 7 suggest a correspondence with those in table 6, since hiatus and acoustic diphthongization are more common when V2 is a back vowel whereas gliding, coalescence and deletion occur more often if V2 is non-back.

Table 6

V1 backness: percentage of strategies produced

Strategy	V1=back	N	V1=non-back	N	p-value	F-value
Hiatus	7%	289	14%	666	.002*	F(1,953) = 9.322
Ac. diph.	19%	289	19%	666	.903	F(1,953) = .015
Gliding	0%	289	2%	666	.036*	F(1,953) = 4.396
Coal.	43%	289	41%	666	.544	F(1,953) = .369
Del.	31%	289	24%	666	.033*	F(1,953) = 4.585

Table 7

V2 backness: percentage of strategies produced

Strategy	V2=back	N	V2=non-back	N	p-value	F-value
Hiatus	17%	352	9%	603	<.001*	F(1,953) = 15.442
Ac. diph.	29%	352	14%	603	<.001*	F(1,953) = 32.874
Gliding	0%	352	2%	603	.015*	F(1,953) = 5.923
Coal.	33%	352	47%	603	<.001*	F(1,953) = 16.983
Del.	21%	352	29%	603	.006*	F(1,953) = 7.713

5. Discussion on the results

Although the data discussed in the previous section does not reveal many significant results, they do suggest a trend that divides the different strategies of HR into two categories. Regarding vowel height, more instances of hiatus occur when the low vowel is in the first position in the vowel sequence, as displayed in table 2; this is supported in table 3, since hiatus as well as acoustic diphthongization occur with a greater percentage if V2 is not a low vowel (therefore, the low vowel has to be in V1 position). Regarding vowel frontness, the results in tables 4 and 5 suggest that deletion occurs more often if V1 is not a front vowel (table 4); and if V2 is a front vowel, then coalescence and deletion are the preferred strategies (table 5). The only significant results in table 5 show a lower preference for acoustic

diphthongization when V2 is a front vowel, which supports the idea of a categorical division between hiatus and acoustic diphthongization on the one hand, and coalescence and deletion on the other. Each of these groups is used under similar conditions, according to the results in section 4. The results on backness displayed in tables 6 and 7 also support this categorical division: hiatus is chosen more often to resolve hiatus, when V1 is non-back (table 6); that is, hiatus (and acoustic diphthongization) is preferred when V2 is a back vowel (table 7). On the contrary, if V1 is a back vowel, deletion is preferred (table 6); that also corresponds to the fact that when V2 is non-back, then coalescence and deletion are chosen as preferred strategies (table 7).

Given that six vowel combinations (/ae/, /ao/, /ea/, /eo/, /oa/ and /oe/) were considered in this experiment about Spanish, the results suggest a hierarchy of preference for targeting a specific vowel (V1 or V2) within the vowel sequence, when HR applies. On the one hand, more instances of hiatus are maintained if V1 is the low vowel /a/, less if it is the front vowel /e/ and even less if it is the back vowel /o/. On the other hand, when V2 is a back vowel, hiatus and acoustic diphthongization show the greatest percentage of occurrence, whereas coalescence and deletion show the lowest. These results are indeed relevant since they suggest a partition among the various strategies of hiatus resolution into two main groups; i.e. hiatus and acoustic diphthongization, containing two vowels in the sequence, and coalescence and deletion, which have monophthongized the sequence. Finally, coalescence shows the highest percentage of occurrence when V2 is the vowel /a/. This is an interesting result suggesting that centralization of the vowel sequence (since /a/ is a low central vowel) is preferred in raising sonority sequences (/ea/ and /oa/) than in falling sonority sequences (/ao/ and /ae/).

The overall results show the existence of vowel quality effects on the different strategies of HR. They do not show that more sonorous or more marked vowels resist better hiatus resolution. But they do suggest that a categorical division may exist in the continuum of HR strategies.

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LENGTHENING AND PROSODY IN TUSCAN ITALIAN

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1. Introduction

Prosodic structure is frequently cued by changes in duration, including longer sounds in stressed syllables and lengthening at the edges of prosodic phrases. In several Italian dialects, these cross-linguistic tendencies interact with the lengthening phenomenon known as *Raddoppiamento fono-sintattico* (RF), which affects word-initial consonants under certain phonological and lexical conditions. This study focuses on those cases where RF lengthening is triggered by a preceding word-final stressed vowel. The examples in (1) illustrate the phenomenon.

(1) città [s:]anta "holy city" *RF*
frutta [s]ekka "dried fruit" *no RF*

This type of Raddoppiamento is a productive process, as opposed to lexically-constrained types of RF, which have a limited set of lexical triggers and, thus, are not productive. This morpho-lexically restricted Radoppiamento is discussed elsewhere in the literature (for example, recently in Absalom et al. 2002) and will not be further considered here. RF is not found in all Italian dialects. This process is not present in the varieties spoken in northern Italy. Traditionally, it is said to occur in the dialects spoken south of the imaginary line that goes from La Spezia to Rimini as well as in Sicily, Sardinia and Corsica (Absalom at al. 2002). However, even those dialects that supposedly present RF display much variation, making it hard to reach any generalizations about RF that would apply cross-dialectally (among others see Loporcaro 1997). For this reason, the present study focuses on Tuscan Italian and aims at analyzing RF as manifested in this dialect.

RF was first reported by the XVII century scholar, Claudio Tolomei (Fiorelli 1958) and has since then received much attention in the Italian dialectological and phonological literature. Traditionally, these studies were based on impressionistic data but recently, production and perception studies have been conducted in order to understand the phonetic underpinnings of the process and what factors, if any, condition its application. One of the main conclusions that stem from these instrumental studies is that RF is variable, i.e., far less categorical than previously thought. This finding raises the question of what conditions this variability, something that will be explored here. Furthermore, these studies have shown that the actual duration of the sounds involved in RF, i.e., the final stressed vowel and the lengthened consonant, is different and more gradient than traditionally considered, putting into

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 83-108.

question theoretical explanations of RF. Let us review some of the literature that informs our study and helps to develop our hypotheses.

1.1. Previous theoretical and empirical studies on RF

Previous studies on RF can be divided into two groups: theoretical studies based on impressionistic data and instrumental studies based on acoustic data. The former group presents claims regarding the nature of RF that will be tested in this paper. The latter provides us with some of the phonetic details of the process, which will be further explored in the current study. For our purposes, first I discuss different phonological explanations present in the literature, together with empirical findings supporting or refuting those explanations, and then I focus on what has been said about the possible blockers or restrictions on RF, both from a theoretical and empirical perspective. I am ultimately interested in understanding what conditions the degree of lengthening and its possible blocking.

1.1.2. Phonological explanations

Different phonological explanations have been proposed to explain why RF takes place. Vogel (1978) presents RF as a resyllabification rule, by which the well-formedness conditions of Italian are met. Within the framework of autosegmental phonology, she proposes that the first consonant of word2 associates with the final stressed vowel of the preceding word in order to form a closed syllable. The consonant also remains as the onset of the initial syllable in word2, giving rise in this way to lengthening. In line with Vogel (1978), Chierchia (1982, 1986) explains RF as an effect of more general syllabification rules operative in the language. This view holds that there is no specific RF rule and that the lengthening results from the Italian syllabification requirements. Crucial to Chierchia's argument is the claim that words beginning with /s/ (e.g. *sporca* 'dirty') followed by a consonant do not undergo RF. McCrary (2004) presents acoustic data lending support to Chierchia's observation. McCrary shows that RF affects words that begin with a consonant followed by a vowel or a liquid but not words that begin with sequences of /s/ and a consonant.

Another phonological approach to RF claims that this lengthening process is a technique to avoid a stress clash, i.e., two adjacent stresses. Nespor and Vogel (1979) argue that RF obtains in order to separate two primary stresses. The problem with their proposal is that they assume that RF only occurs when word1 has final stress and word2 has initial stress, but subsequent work has shown that RF may occur when word2 has non-initial stress (Loporcaro 1997, Agostiniani 1992). Marotta (1986) takes a similar approach and argues that RF takes place to increase the distance between two primary stresses. More precisely, she predicts that the duration of the resulting lengthened consonant is inversely proportional to the size of the interstress interval. Payne (2005) does not find any support for Marotta's hypothesis since the lexical stress of the second word does not influence the duration of RF long consonants, more precisely, she does not find that lengthened consonant duration decreases as the interstress interval increases.

The most prevalent phonological approach to RF is the bimoraic analysis. According to this view, Italian has a bimoraic rule, by which stressed syllables have to be heavy, i.e., they must contain two moras. This bimoraic requirement is satisfied for word final stressed syllables by lengthening a following consonant. Crucially, these analyses rely on a ban on word-final long vowels to explain why bimoraicity is achieved by lengthening the consonant rather than the stressed final vowel (see among others Bullock 2000, 2001, Chierchia 1982, 1986, D'Imperio and Rosenthall 1999, Morén 1999, Repetti 1991, Wiltshire and Maranzana 1998). Absalom et al. (2002) argue that bimoraic analyses face several problems and present evidence against the bimoraic rule that comes from different phenomena in the language. Of importance here, Absalom et al. (2002) argue that a further problem for bimoraic analyses is that final stressed vowels do seem to be able to lengthen. Other studies have also focused on the ban on final long vowels and refuted it by analyzing acoustic data that show that such vowels can be long when compared with their unstressed counterparts (McCrary 2004).

It should be noted that the ban on final long vowels for Italian is common to all phonological analysis of RF (see also Borrelli 2000, Lepschy and Lepschy 1977). They all assume that final stressed vowels are short, and that long vowels are found only in stressed open non-final syllables. This restriction is not immediately obvious because it contradicts the phonetic tendency found cross-linguistically to lengthen stressed final vowels (Farnetani and Kori 1986). In order to understand the motivation behind such a claim, it might be relevant to consider some phonetic work on Italian vowel duration in different stressed positions within the word. For instance, D'Imperio and Rosenthall (1999) carry out an experiment to compare the differences in duration between stressed vowels depending on their position in the word, i.e., initial, medial or final. From their results, D'Imperio & Rosenthall conclude that final stressed vowels in open syllables are shorter than stressed vowels in open syllables in any other position. The authors argue that "a stressed vowel in a final open syllable does not lengthen" (1999: 2), based on the comparison between stressed vowels in different positions within the word. However, for cases of RF, we need to consider if the final stressed vowel does not lengthen with respect to its unstressed final counterpart. Consequently, it might be possible that the origin of the phonological ban on long stressed final vowels comes from a misinterpretation of the facts. In fact, Farnetani and Kori's (1986) experimental results show that there is a significant duration difference between stressed and unstressed vowels in all positions, although they do not consider cases of RF.

1.1.3. Restrictions on RF

As mentioned earlier, recent studies have instrumentally shown that RF is variable and less categorical than previously considered. In relation to this, some early work on RF focused on what restricts or blocks the application of the process. Initial claims argued that RF is prosodically and/or syntactically restricted, more precisely, that the process is subject to syntactic or phonological constraints. In fact, this differentiation has been the object of debate among scholars. Some regard the process as purely phonologically limited by prosodic constraints, while others have claimed that

syntactic structure plays a role as a constraint. Among the latter, work by Napoli & Nespor (1979) has been especially influential because they propose a condition called the Left Branch Condition that is operative not only in Italian but in other languages with external sandhi rules and left-branching structures.[1] They examine instances in which RF is blocked and conclude that the syntactic tree of the particular utterance is crucial in determining the application or non-application of the lengthening rule.

Among the studies dealing with the prosodic conditions on RF, Nespor and Vogel (1986) claim that the process is restricted to the phonological phrase. This claim is couched within their Prosodic Phonology theory according to which speech is structured into hierarchical prosodic constituents in a non-recursive way. The different constituents of the prosodic hierarchy are the application domains of certain phonological rules. Thus, in the case of RF, its application domain would be the phonological phrase. Later work by the same authors argues that in fact, RF is not limited to the phonological phrase but rather to the phonological utterance (Vogel 1997) based on data from Agostiniani (1992), who cites cases where RF applies across intonational phrase boundaries. Other studies have also noted that RF can apply across intonational boundaries (Absalom 1995, Roca 1994).

The presence of a pause between word1 and word2 has been reported to block RF (Absalom et al. 2002, Agostiniani 1992, Canepari 1991, Loporcaro 1997, Stevens et al. 2002). Stevens and Hajek (2006) argue that pauses, together with pitch breaks, vowel lengthening and glottal stop insertion, signal the presence of a phonetic phrase boundary and act as blockers of RF, which is restricted by this type of boundary. The authors perform an auditory analysis of contexts where RF could potentially apply (i.e., contexts where there is a word that ends with a stressed vowel followed by a consonant-initial word) and identified those cases where one of these blockers occurred. They found that pauses occurred more frequently than any of the other three blockers. They do not report any measurements of the word initial consonant in order to assess whether RF takes place or not. Rather, since they do not expect to find any cases where RF applies in the presence of a blocker, they argue that "the length or duration of word-initial consonants is irrelevant because [RF] can only apply where no break is perceived between word1 and word 2". However, this claim is based on their expectations and not on an analysis of their data.

Long vowels have also been reported as blockers of RF. Absalom et al. (2002) say that final vowel lengthening is possible and that when it occurs, it has the potential to prevent RF from taking place. The explanation for this is that vowel lengthening indicates the presence of a pause or a prosodic boundary and thus, this type of lengthening is associated with a lack of RF (Loporcaro 1997, D'Imperio & Gili Fivela 2003). Note that this claim does not necessarily apply to lengthened vowels that may occur as the result of stress rather than as the result of the presence of a prosodic boundary, i.e., there is an interaction between long vowels and prosodic structure in terms of blocking RF. Finally, RF is also reportedly blocked by the insertion of different glottal phenomena (Absalom, Stevens and Hajek 2002, Stevens &

[1] See Napoli and Nespor (1979, section 8) for details about other languages that seem to have phonological processes conditioned by this Left Branching Condition.

Hajek 2006). Stevens & Hajek (2005) analyze these glottal phenomena and conclude that they are better described as pre-aspiration of the lengthened voiceless stop. Stevens & Hajek found that this pre-aspiration occurs for consonants lengthened by RF and also for word-medial geminate consonants. Based on their acoustic results, the authors argue that pre-aspiration is used to enhance the length of the voiceless consonant.

1.2. Goals of the study

The current study explores the role of different factors in blocking RF, in order to better understand the nature of this lengthening process and its acoustic characteristics in relation to the duration of the segments involved. More precisely, I analyze the role of prosodic structure and the quality of the segments involved in favoring or disfavoring the occurrence of RF. In terms of prosodic structure, the presence of an intonational boundary does not reportedly block RF. However, recent studies on the effect of prosodic boundaries have shown that these are elastic phenomena and that the effects are gradient rather than categorical (Byrd & Saltzman 1998, 2003, Byrd 2006). Extending these results, we would expect that the presence of an intonational phrase boundary would have some gradient effect on RF, i.e., such a boundary might not categorically block RF but it might attenuate the lengthening. Note that there is no instrumental data showing what exactly happens with intonational phrase boundaries. Similarly, I explore the role of pauses on RF and their potentially gradient effects on the lengthening process: I test whether pauses actually block RF or just decrease the extent of the lengthening.

In terms of the role of the segments involved, I include an environment that is usually not discussed in the RF literature, namely contexts in which the initial segment of word2 is a vowel. All analyses and explanations of this lengthening process have focused on the cases where a sequence of a vowel and a consonant is found. But, in order to have a comprehensive characterization and understanding of RF, we need to know what actually happens when the second segment is a vowel. The prediction is that an initial vowel is not lengthened, based on impressionistic descriptions of the process. Here, I present acoustic data to prove this observation. Relatedly, the present study analyzes the duration of final stressed vowels in order to corroborate recent claims that these vowels do in fact lengthen, despite the traditional ban on final stressed long vowels adopted by bimoraic approaches to RF.

With these goals in mind, I elaborate the hypotheses in (2) related to the presence and degree of lengthening of the segments involved in the process, i.e., the last segment of word1 and the first segment of word2, with respect to several variables, namely stress, boundary and identity of the segments under study. The first two hypotheses (i, ii) test the traditional environment for Raddoppiamento, i.e., the environment where word2 begins with a consonant, in relation to the presence or absence of an intonational phrase boundary. The next two hypotheses (iii, iv) test the occurrence of RF in a new environment that has not been analyzed before, namely, when word2 begins with a vowel. The boundary effect is also considered for this context. The last hypothesis (v) tests the lengthening of final stressed vowels in RF contexts. Thus, the current experiment is designed to obtain from native Italian speakers

acoustic data containing the relevant environments under controlled conditions. The results will confirm or refute the influence of the factors mentioned above in the duration of the segments and the interaction between some of them, such as stress and boundary. Section 2 describes the experimental methodology developed to test the five hypotheses. Section 3 reports the results regarding the duration of the different segments involved and the influence of the different factors. Section 4 offers some discussion of these results and relates them to previous findings. Section 5 concludes with the implications of the findings and venues for future research.

(2) Hypotheses:
   i. Initial consonant in word2 lengthens after a stressed vowel.
   ii. Initial consonant in word2 lengthens after an intonational phrase boundary but to a lesser extent.
   iii. Initial vowel in word2 does not lengthen after a final stressed vowel.
   iv. Initial vowel in word2 does not lengthen after boundary due a final stressed vowel
   v. Final vowel is word1 lengthens when stressed relative to its unstressed counterpart.

2. Experimental Methodology

2.1. Stimuli

In order to test the three factors mentioned above, each stimulus contains a particular environment according to stress, phrasal boundary and the quality of the segments involved. Let us discuss each of these factors in turn. The first word in the sequence word1 word2 is variably stressed in the last syllable, i.e., it contains either final or non-final stress. Since lengthening is conditioned by the position of the stress within the first word and not within the second word, the latter word is invariably stressed in the first syllable. Consequently, we have pairs of sentences like those in (3) and (4), where the environment is exactly the same except for the stress in word1. Although the target segments appeared italicized in the following examples, the speakers did not see them in italics. Notice also that all the phrases were formed by a noun and an adjective, where word1 was always a noun and word2 an adjective. This prevents any difference depending on semantics or syntax.

(3) La nostra è una facolt*à i*brida. "Ours is a hybrid faculty"

(4) È una piant*a i*brida. "It's a hybrid plant"

In order to test the boundary effect, the target words, i.e., word1 and word2, were placed within the same phrase or separated by an intonational phrase boundary, so that both words belong to different phrases. Consequently, sentences such as (5) and (6) were included, where the only difference is whether the relevant environment is phrase internal (5) or at the phrase juncture (6).

(5) Roma è una citt*à s*anta. "Rome is a saint city"

(6) Se conosci la citt*à*, *s*anta non è. "If you know the city, it's not holy"

Since the lengthening process is triggered by a stressed word final vowel, word1 always ended in a vowel, either /i/ or /a/. On the other hand, the second word could begin with a consonant (/s/[2]) or with a vowel (/i/ or /a/). This presents a widening of the contexts considered by previous work that only took into account the effect on an initial consonant. Examples (7) and (8) illustrate two sentences that differ only in the quality of the first segment in word2. Table I summarizes the structure of the stimuli according to the three factors tested for, i.e., location of stress within word1, the presence or absence of an intonational phrase boundary between word1 and word2 and the quality of the segments involved, and it includes the target words. The sixteen complete sentences included in the experiment can be found in the Appendix 1.

(7) Fu un giovedì *a*cido. "It was a harsh Thursday"

(8) Fu un giovedì *s*obrio. "It was a sober Thursday"

Table I

Summary of stimuli according to stress, phrase boundary and segment quality
(# indicates a word boundary; ## indicates an intonational phrase boundary)

	Final stress in word1		**Non-final stress in word1**	
	V1 V2	**V1 C**	**V1 V2**	**V1 C**
Phrase internally	facoltá # **i**brida giovedí # **a**cido	cittá # **s**anta giovedí # **s**obrio	pianta # **i**brida studenti # **a**bili	frutta # **s**ecca studenti # **s**obri
Phrase juncture	facoltá ## **i**brida giovedí ## **a**cido	cittá ## **s**anta giovedí ## **s**obrio	pianta ## **i**brida studenti ## **a**bili	frutta ## **s**ecca studenti ## **s**obri

2.2. Participants and data collection

Acoustic data from four native speakers of Italian was collected. All of them came from the same geographical area in Italy, namely Tuscany. They were all young college-educated adults. Three of the speakers were from Florence and one from Pisa. Special attention was paid to the origin of speakers, since dialectal differences with respect to the phenomenon of RF have been reported (Borrelli 2000, Loporcaro 1997 and references in section 1).

The sixteen sentences containing the different environments were divided in two blocks according to the presence or absence of an intonational phrase boundary between word1 and word2 and arranged so that the two blocks alternate. Each of these blocks (eight sentences) was pseudorandomized for each speaker avoiding the subse-

[2] /s/ was chosen as the relevant consonant rather than a stop in order to avoid spirantization, i.e., the Gorgia Toscana, which targets voiced and voiceless stops in intervocalic position in Tuscan Italian (Marotta 2001, Sorianello 2001 and Villafaña Dalcher 2006). Furthermore, stops have been reported to show glottal phenomena in their production in RF environments (Stevens & Hajek 2005). These effects were minimized by using a target word-initial /s/.

quent occurrence of the same environment and rerandomized for each repetition. A total of ten repetitions for each environment were produced by each speaker. A Marantz PMD 201 portable cassette recorder and a Sennheiser e845 microphone were used for the recordings. Subjects were given written instructions in Italian. They were asked to read the sentences in an informal style, as if they were talking to a friend.

2.3 Data analysis

The data was digitized at a 22,000 Hz sampling rate using the Macquierer program of data analysis. The same program was employed to obtain the synchronized waveforms and spectrograms used to measure the duration of the relevant segments, i.e., the vowel and consonant duration in the VC sequences, and the two vowels in the VV sequences.

In the sequences formed by a vowel and a fricative consonant (VC), the vowel was measured from the beginning of the first glottal pulse, right after the opening of

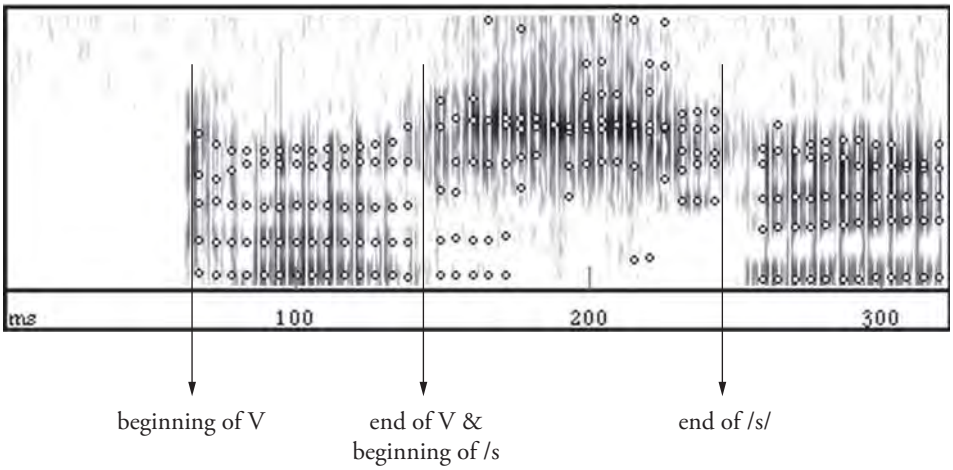

Fig. 1

Spectrogram for a V/s/ sequence

the closure for the preceding stop, to the last vocal pulse corresponding to the vowel as identified in the acoustic representations. The fricative consonant /s/ was measured in the spectrogram from the beginning of the period of frication with high energy above the vowel formant range to the end of this period. Figure 1 illustrates the measurements for a VC sequence.

In the VV sequences formed by two vowels, the first vowel was measured following the same criteria as for the vowel in a VC sequence, i.e., from the beginning of the first glottal pulse to the end of the last pulse. The second vowel was measured in the same manner. It should be noted that this system was useful only in those cases where there was a pause between both vowels. Figure 2 illustrates an instance of a /i a/ sequence with the presence of a period of silence, i.e. no voicing, between the two vowels.

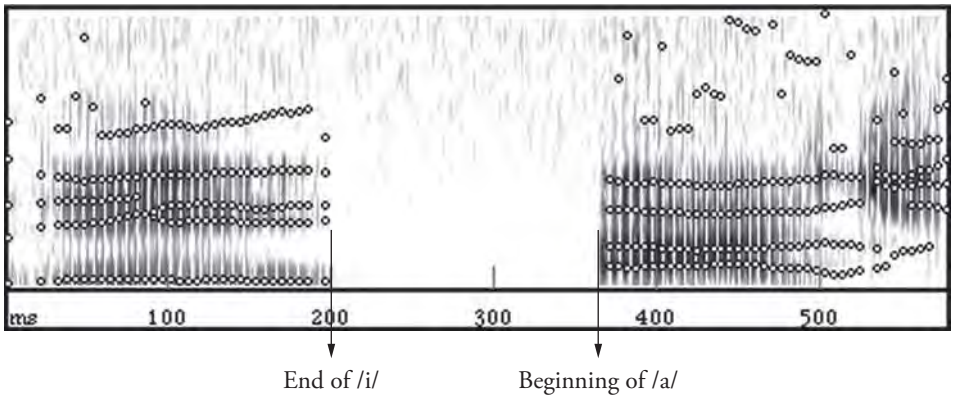

Fig. 2

Spectrogram for the sequence /i a/ with silence inbetween the two vowels

In the instances where no pause was present, different criteria had to be used to define the end of the first vowel and the beginning of the second. For this purpose, both the waveform and spectrogram for the relevant sequences were taken into account. Diagnostic for the end of one vowel and the beginning of the following was a change in the waveform shape corresponding to the transition from one vowel to the next, more precisely a change from low to high amplitude for /a i/ sequences or from high to low amplitude for /i a/ sequences. Synchronously, in the spectrogram the relevant diagnostic was the amount of change in the F1 formant transition. LPC formant tracking of the sequence allowed us to establish the end of the first vowel to be where the biggest fall, for /i a/, or rise, for /a i/, in the value of F1 took place. That same point was considered the beginning of the second vowel. In the rare cases where the waveform shape change and the F1 drop/fall did not coincide, the spectrogram diagnostic was used. The spectrograms in figures 3 and 4 illustrate how the measurement of these sequences was carried out.

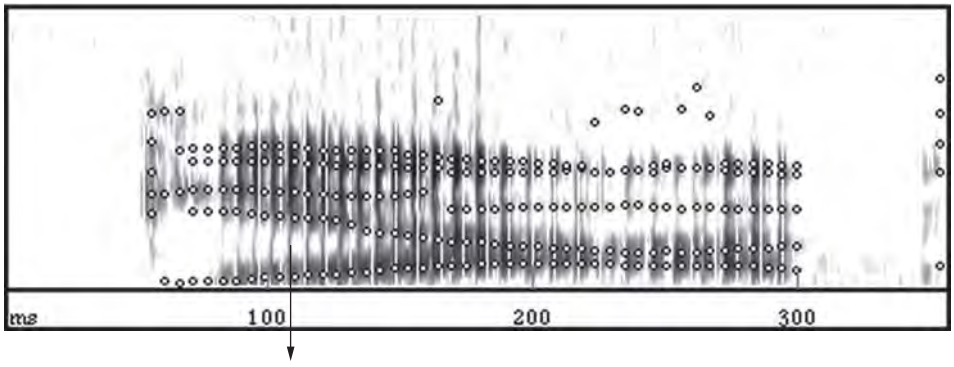

Fig. 3

Spectrogram for the sequence /i a/ without an intervening pause

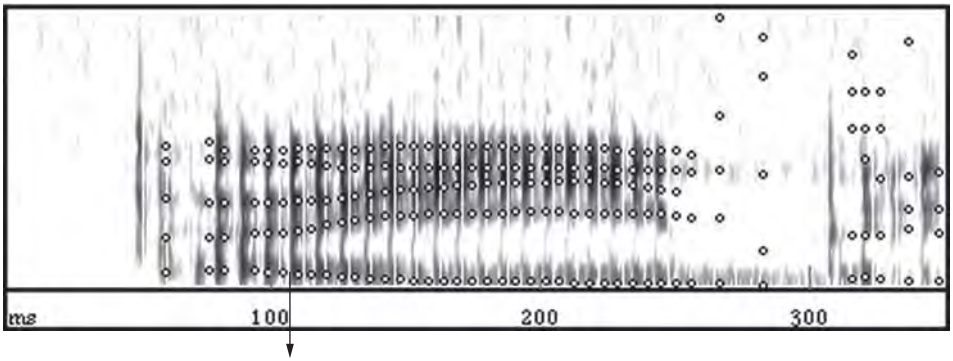

Fig. 4

Spectrogram for the sequence /a i/ without an intervening pause

In order to evaluate whether the hypothesized factors, i.e., stress, boundary, and segment identity (/a/, /i/, /s/), have an effect on the duration of a segment, three-factor full interaction ANOVAs were carried out for the duration of the three relevant segments (V_{w1}, C_{w2}, V_{w2}) for each subject. Further, it is necessary to test the difference between the initial consonant duration after a stressed vowel and a boundary vs. after an unstressed vowel and a boundary to determine whether RF lengthening occurs or fails to occur after a phrasal boundary. For this purpose, we carried out a planned means comparison test.

3. Results

The results are organized according to the segments whose duration is considered, i.e., initial consonant in word2 (section 3.1), initial vowel in word2 (section 3.2) and final vowel in word1 (section 3.3). Section 3.4 reports the results with respect to the presence of a pause, followed by a summary of the main results.

3.1. Duration of initial consonant in word2

The results of the ANOVA for speaker A indicate that stress has a statistically significant effect on the duration of the consonant ($F(1, 72) = 47.89$, $p < .0001$). The initial consonant is longer when it is preceded by a stressed vowel (142 ms) that when this vowel is unstressed (128 ms). The presence or absence of a boundary is also a significant factor for consonant duration ($F(1, 72) = 72.6$, $p < .0001$). The consonant is longer after a boundary (143 ms) than when there is no boundary (126 ms). The statistical results show that there is no significant effect of the preceding vowel identity on fricative consonant duration. Finally, there is a significant interaction between boundary and stress ($F(1, 72) = 37.81$, $p < .0001$) such that the stress effect is greater when no boundary is present. Figure 5 illustrates this point. The results of the planned means comparison indicate that there is no significant

difference in the postboundary consonant duration after a stressed or an unstressed vowel, i.e., there is not difference between the two leftmost bars in Figure 5.

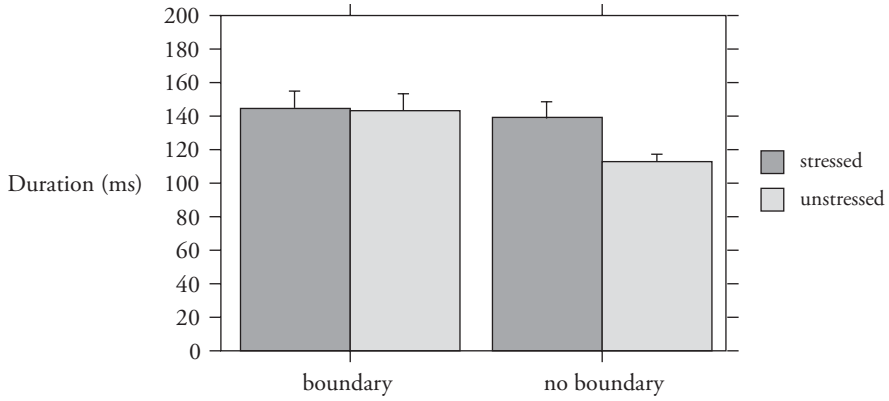

Fig. 5

Interaction between stress and boundary for C duration (speaker A)

The ANOVA test for speaker B reveals that stress is a significant factor for consonant duration ($F(1, 72) = 152.18$, $p < .0001$). The initial consonant is longer after a stressed vowel (153 ms) than after an unstressed vowel (115 ms). The presence or absence of a boundary also has a significant effect on consonant duration ($F(1, 72) = 29.57$, $p < .0001$). The consonant is longer when there is no boundary (142 ms vs. 125 ms). For speaker B, the identity of the preceding vowel is a significant factor for consonant duration ($F(1, 72) = 21.77$, $p < .0001$). We find a longer consonant after /i/ than after /a/. There is a significant interaction between boundary and stress ($F(1, 72) = 86.76$, $p < .0001$) such that the stress effect is greater in the absence of a boundary. Figure 6 shows this interaction. The planned means compar-

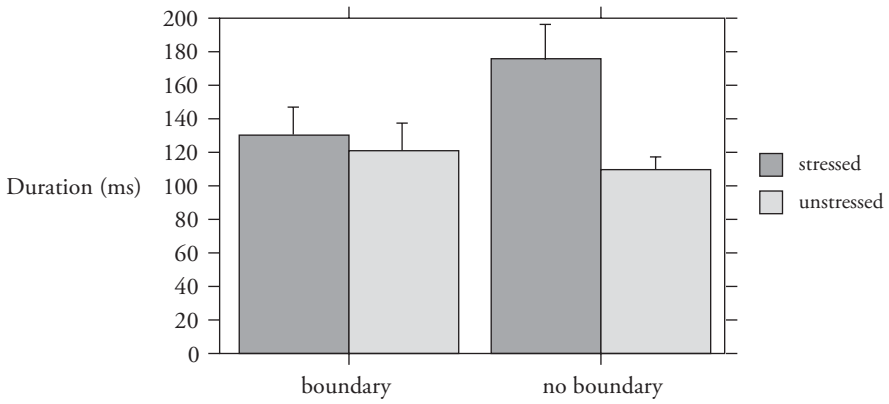

Fig. 6

Interaction between boundary and stress for C duration (speaker B)

ison results for this speaker indicate that there is a significant difference in the postboundary consonant duration depending on whether the preceding vowel is stressed or unstressed ($F(1, 72) = 4.56$, $p = .036$), i.e., the two leftmost bars in Figure 6 are significantly different. The postboundary consonant is longer after a stressed vowel (130 ms vs. 120 ms).

The ANOVA results for speaker C show that stress is a significant factor for consonant duration ($F(1, 72) = 206.23$, $p < .0001$), with the initial consonant being longer after a stressed vowel (141 ms) than after an unstressed vowel (108 ms). Boundary is also a significant factor ($F(1, 72) = 30.01$, $p < .0001$). The duration of the consonant is greater when there is no boundary (131 ms vs. 118 ms). The identity of the preceding vowel has a significant effect on the consonant duration ($F(1, 72) = 36.81$, $p < .0001$). The consonant is longer after /i/ than after /a/. There is a significant interaction between stress and boundary ($F(1, 72) = 104.9$, $p < .0001$) such that the stress effect is greater in the absence of a boundary, as Figure 7 illustrates. For speaker C, the planned comparison test indicates that the status of the preceding vowel as unstressed or stressed makes a significant difference in postboundary consonant duration ($F(1, 72) = 8.48$, $p = .0048$), i.e., the two leftmost bars in Figure 7 are different. The postboundary consonant is longer after a stressed vowel (123 ms vs. 113 ms).

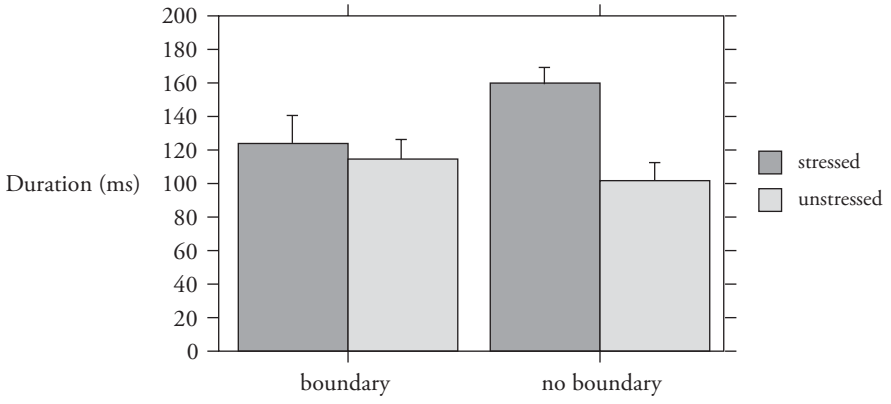

Fig. 7

Interaction between stress and boundary for C duration (speaker C)

The ANOVA results for speaker D indicate that stress is a significant factor for consonant duration ($F(1, 72) = 139.89$, $p < .0001$). The initial consonant is longer after a stressed vowel (148 ms) than after an unstressed vowel (114 ms). According to the results, the presence or absence of a boundary has a significant effect on consonant duration ($F(1, 72) = 85.66$, $p < .0001$), the consonant being longer when there is not any boundary (145 ms vs. 118 ms). The identity of the preceding vowel is not a significant factor for this speaker. There is a significant interaction between stress and boundary ($F(1, 72) = 89.21$, $p < .0001$) such that the stress effect is greater when no boundary is present (see Figure 8). The planned comparison shows that

there is no significant difference in postboundary consonant duration depending on the stressed or unstressed status of the preceding vowel (F(1, 72) = 2.84, p = .0964), although the p-value could indicate a trend.

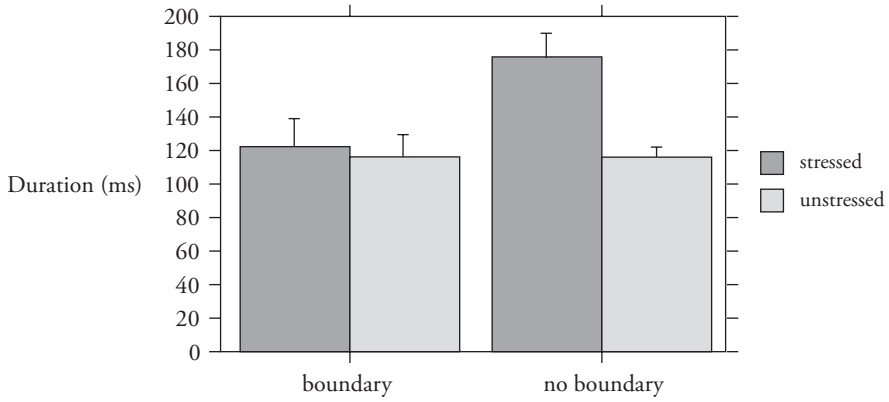

Fig. 8

Interaction between stress and boundary for C duration (speaker D)

3.2. Duration of initial vowel in word2

Next, I consider the results for the environment where the initial segment in word2 was a vowel. The ANOVA results for speaker A show that stress is not a significant factor for vowel duration. On the other hand, the presence or absence of a boundary proves to be a significant factor (F(1, 72) = 10.14, p = .0021). The vowel is longer when there is no boundary (140 ms vs. 129 ms). Not surprisingly, the identity of the vowel has a significant effect on the vowel duration (F(1, 72) = 245.49, p < .0001). The vowel is longer when it is /a/. Finally, there is not a significant interaction between stress and boundary for speaker A.

For speaker B, stress is a significant factor for vowel duration (F(1, 72) = 4.93, p < .0295). The vowel is longer when the preceding vowel is unstressed (142 ms vs. 130 ms). The results show that the presence or absence of a boundary has a significant effect (F(1, 72) = 100.02, p < .0001). The vowel is longer when there is not any boundary (164 ms vs. 109 ms). The identity of the vowel is a significant factor (F(1, 72) = 16.613, p = .0001). When it is /a/, the initial vowel in word2 is longer. There is not a significant interaction between boundary and stress for speaker B.

The ANOVA results for speaker C reveal that stress is not a significant factor for vowel duration. The presence or absence of a boundary has a significant effect (F(1, 72) = 21.00, p < .0001). The vowel is longer when there is no boundary (149 ms vs. 127 ms). The identity of the vowel is a significant factor (F(1, 72) = 56.33, p < .0001). The vowel is longer when it is /a/. There is no significant interaction between stress and boundary for speaker C.

The effect of stress on vowel duration proves to be non-significant for speaker D. The results show that the presence or absence of a boundary is significant

(F(1,72) = 28.08, p < .0001). The absence of a boundary correlates with a longer vowel (159 ms vs. 126 ms). Also for this speaker, the identity of the vowel turns out to be a significant factor (F(1, 72) = 55.08, p < .0001). The vowel is longer when it is /a/. There is no significant interaction between stress and boundary for speaker D.

3.3. Duration of final vowel in word1

In this section, I consider the effect of stress, boundary and segment identity on the final vowel of word1. The statistical results for speaker A reveal that stress is a significant factor for vowel duration (F(1, 148) = 384.24, p < .0001). The final vowel is longer when it is stressed (108 ms vs. 66 ms). Also, the presence or absence of a boundary proves to be significant (F(1, 148) = 447.63, p < .0001). The vowel is longer before a boundary, i.e., phrase finally (109 ms vs. 65 ms). The identity of the following segment, i.e., /a/, /i/ or /s/, proves to have a significant effect on the vowel duration (F(2, 148) = 3.73, p = .026). The final vowel is longest when preceding /i/. The results show that there is a significant interaction between boundary and stress (F(1, 148) = 59.12, p < .0001) such that the lengthening of V1 when phrase final is heightened when the vowel is stressed as compared to unstressed, as the two leftmost bars in Figure 9 show.

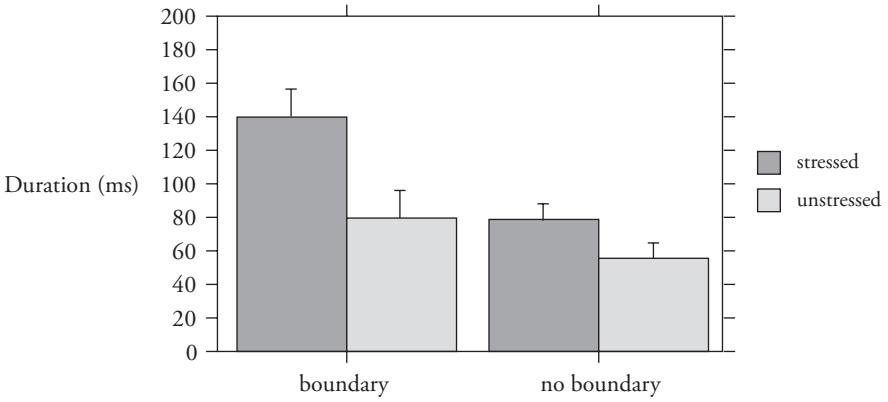

Fig. 9

Interaction between stress and boundary for V1 duration (speaker A)

According to the ANOVA results, stress is a significant factor for vowel duration (F(1, 148) = 186.38, p < .0001) for speaker B. The final vowel is longer when it is stressed (129 ms vs. 75 ms). The presence or absence of a boundary also has a significant effect on the final vowel (F(1, 148) = 87.56, p < .0001). This vowel is longer when it precedes a boundary (122 ms vs. 83 ms). For this speaker, the identity of the following segment does not have a significant effect on the vowel duration. As the ANOVA test results show, there is a significant interaction between stress and boundary (F(1, 148) = 9.62, p.002) such that the lengthening of V1 in phrase final

position is greater when the vowel is stressed as compared to unstressed, as can be seen in Figure 10.

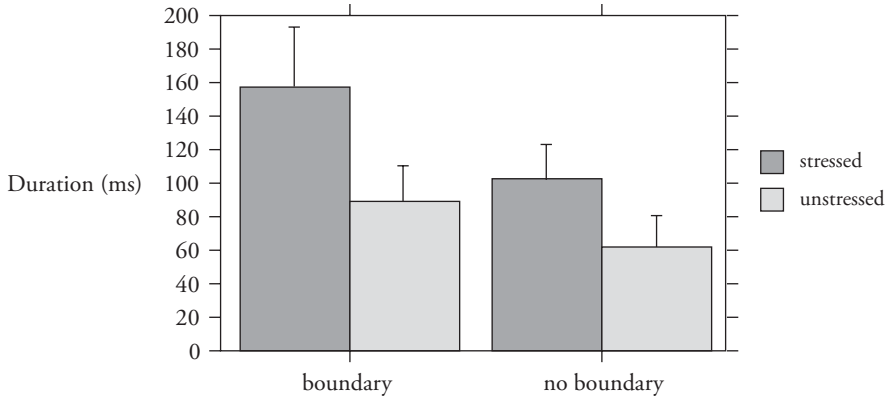

Fig. 10

Interaction between stress and boundary for V1 duration (speaker B)

Stress proves to be a significant factor ($F(1, 148) = 295.36$, $p < .0001$) for speaker C. The final vowel is longer when it is stressed (124 ms vs. 66 ms). From the ANOVA results, we see that the presence or absence of a boundary has a significant effect on the vowel duration ($F(1, 148) = 209.91$, $p < .0001$). The final vowel is longer when it precedes a boundary (121 ms vs. 70 ms). The identity of the following segment proves to be significant for the vowel duration ($F(2, 148) = 27.29$, $p < .0001$). The final vowel is longest with /i/ and next longest with /s/. The results show that there is a significant interaction between stress and boundary ($F(1, 148) = 19.8$, $p < .0001$) such that the lengthening of V1 in phrase final position is greater when the vowel is stressed, compared to its unstressed counterpart, as Figure 11 illustrates.

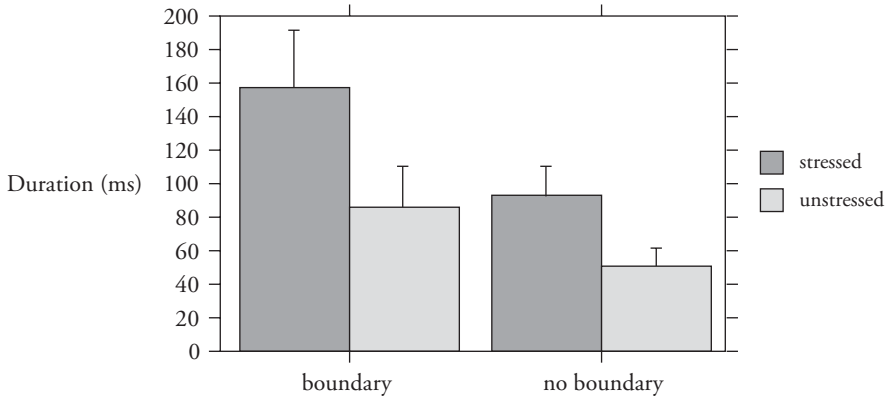

Fig. 11

Interaction between stress and boundary for V1 duration (speaker C)

For speaker D, the results show that stress is a significant factor ($F(1, 148) = 222.5$, $p < .0001$). The final vowel is longer when it is stressed (132 ms vs. 73 ms). The presence or absence of a boundary is also significant ($F(1, 148) = 431.81$, $p < .0001$). The final vowel is longer before a boundary (142 ms vs. 63 ms). On the other hand, the identity of the following segment proves to be a non-significant factor for vowel duration. Finally, the ANOVA results show that there is a significant interaction between stress and boundary ($F(1, 148) = 15.74$, $p = .0001$) such that the lengthening of V1 in phrase final position is greater when the vowel is stressed as compared to unstressed, as we can see in Figure 12.

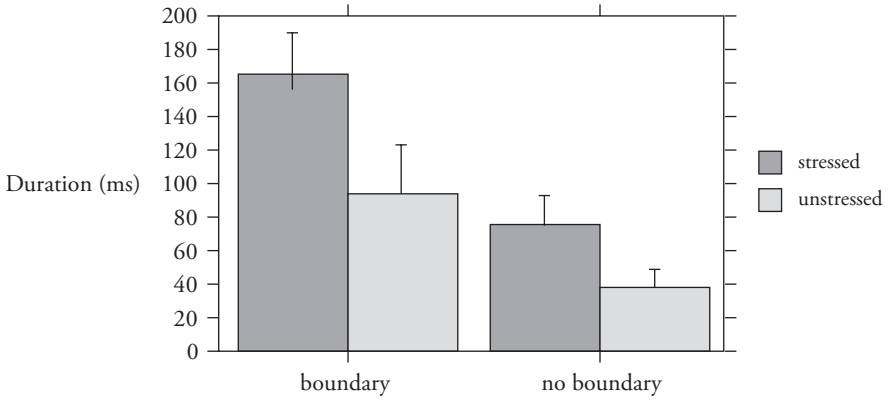

Fig. 12

Interaction between stress and boundary for V1 (speaker D)

3.4. Pause effects

The environments where a phrase boundary is present are the potential contexts for the appearance of a pause. Figure 13 shows the distribution of periods of silence according to their length (ms) for each speaker.

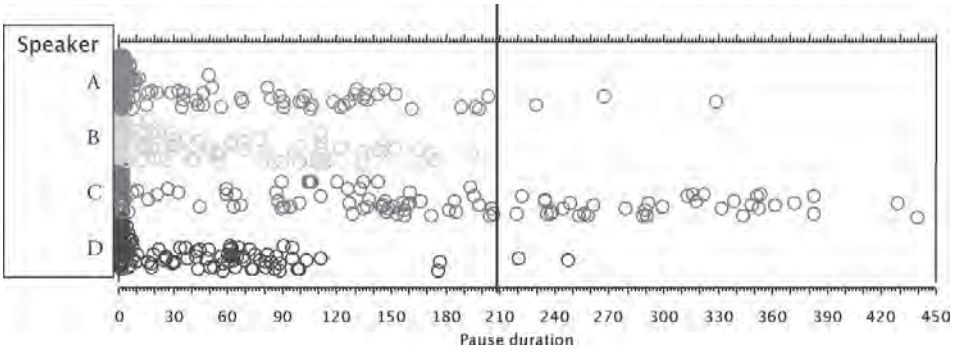

Fig. 13

Distribution of pause duration by speaker

It is evident from this distribution that there are different degrees of length for the periods of silence. It should be noted that not every period of silence constitutes a pause. Duez (1981) establishes that any period of 200ms and over showing no periodic or aperiodic noise constitutes a pause. However, in our data, shown in Figure 13, there is a discontinuity in the distribution at 210ms. For this reason, I establish the pause level at 210ms instead of 200ms. After establishing this criterion, we see that only speaker B has a substantial number of tokens with pauses. Consequently, the stress and pause effects were tested only for this speaker.

A two-factor ANOVA was carried out with the duration of the initial fricative of word2 as the dependent variable, and stress and pause as the independent variables. The results show that the presence or absence of a pause has no significant effect on the segment duration ($F(1, 76) = 3.57$, $p = .0627$) (123 ms with pause vs. 135 ms without pause).

3.5. Summary of results

With regards to the duration of the initial consonant in word2, stress has an effect for all the speakers, namely the consonant is longer when it follows a stressed vowel. Similarly, the presence or absence of a boundary is significant for all speakers. The consonant that does not follow a boundary is longer than a postboundary consonant. This is true for all speakers except for speaker A, for whom a postboundary consonant is longer. The identity of the vowel preceding the consonant is a significant factor only for speakers B and C. For these speakers, the consonant following /i/ is longer than that following /a/. The interaction between stress and boundary proves to be significant for all speakers such that the stress effect is greater when no boundary is present. However, the difference in duration of a postboundary consonant depending on whether the preceding vowel is stressed or unstressed is significant only for speakers B and C. Table II is a summary of the relevant effects on the initial consonant duration.

Table II

Summary of effects on the duration of the initial consonant in word2

	Stress effect	**Boundary effect**	**V1 identity effect**	**Stress & Boundary interaction**	**boundary&stress vs. boundary&no-stress difference**
speaker A	✓ s > u	✓ b > nb	no	✓ snb > sb	no
speaker B	✓ s > u	✓ nb > b	✓ i > a	✓ snb > sb	✓
speaker C	✓ s > u	✓ nb > b	✓ i > a	✓ snb > sb	✓
speaker D	✓ s > u	✓ nb > b	no	✓ snb > sb	no

As far as the duration of the initial vowel in word2, stress does not have a significant effect on the vowel duration for speakers A, C or D. However, stress proves to be significant for speaker B, for whom the initial vowel is longer when it follows an unstressed vowel. On the other hand, boundary is a significant factor for all the speakers. The initial vowel is longer when there is no boundary. The identity of the vowel proves to be a significant factor for all speakers. When the initial vowel is /a/, its duration is longer. Finally, stress and boundary do not have a significant interaction for any speaker. Table III summarizes the main effects on the initial vowel duration.

Table III

Summary of effects on the duration of the initial vowel in word2

	Stress effect	**Boundary effect**	**V2 identity effect**	**Stress & Boundary interaction**
speaker A	no	✓ nb > b	✓ a > i	no
speaker B	✓ u > s	✓ nb > b	✓ a > i	no
speaker C	no	✓ nb > b	✓ a > i	no
speaker D	no	✓ nb > b	✓ a > i	no

Finally, the duration of the final vowel in word1 is significantly affected by the stress. This vowel is longer when it is stressed. This is the case for all the speakers. The presence or absence of a boundary is also a significant factor. The final vowel is

Table IV

Summary of effects on the duration of the final vowel in word1

	Stress effect	**Boundary effect**	**Following segment effect**	**Stress & Boundary interaction**
speaker A	✓ s > u	✓ b > nb	✓ i > a > f	✓ sb > snb
speaker B	✓ s > u	✓ b > nb	no	✓ sb > snb
speaker C	✓ s > u	✓ b > nb	✓ i > f > a	✓ sb > snb
speaker D	✓ s > u	✓ b > nb	no	✓ sb > snb

longer when it occupies a preboundary position. This is true for all speakers. With regard to the identity of the following segment, it is not a significant factor for speakers B or D. However, speaker A and C present a significant influence of the identity of this segment. The interaction between stress and boundary is significant for all the speakers such that the lengthening of V1 in phrase final position is greater when the vowel is stressed as compared to unstressed. Table IV shows the results for the duration of the final vowel in word1.

4. Discussion

This section evaluates the results presented above in relation to our hypotheses (see (2) in section 1.2). The first hypothesis tests whether RF lengthening takes place in the traditional environment, i.e., where word1 ends with a stressed vowel and word 2 begins with a consonant. The results support this hypothesis and evidence RF – an initial consonant is longer when it follows a stressed vowel than an unstressed one. However, it is important to consider the amount of lengthening of the consonant in order to evaluate previous claims which suggest that RF is the same as gemination (Borrelli 2000, Chierchia 1982, 1986, Stevens & Hajek 2005). Table V shows the duration for the consonant in question, in the presence or absence of a preceding stress. Only the environments with no boundary are taken into account, since the traditional formulation of RF refers to the absence of boundaries between word1 and word2.

Table V

Duration (ms) of the initial consonant after a stressed and unstressed vowel and percentage of lengthening for each speaker

	Duration after a stressed vowel	**Duration after an unstressed vowel**	**Percentage of lengthening**
Speaker A	139	113	23%
Speaker B	175	109	60%
Speaker C	159	103	54%
Speaker D	175	115	52%

In order to compare the results from RF environments with the duration of parallel single and geminate consonants, relevant data from two of the experiment's speakers was collected in a follow-up study, where the duration of word internal single and geminate [s] was measured. Remember that Italian has a contrast between singleton and geminate consonants only word-medially. The stimuli in this follow-up consisted of sentences with similar structure to those in our first experiment. The difference being that in this case the target segment was in word internal position. The word carrying the relevant consonant was a noun of the shape CVCV (e.g. basi 'bases') or CVCCV (e.g. passi 'steps'), with initial stress. This noun was followed by an adjective to mirror the structure of the RF experiment sentences. See Appendix 2 for a complete list of the relevant utterances. The speakers were recorded in exactly the same

conditions as in the first experiment. Table VI shows the duration of geminate and single consonants from this follow-up sentence set. By comparing Table V and VI, we can see that the percentage of lengthening in the RF environment is not as great as the lengthening for geminates. This suggests that the RF process as exemplified in the present study does not involve the formation of geminates, but only the lengthening of the segment to a lesser degree than that found for geminate consonants.

Table VI

Geminate and singleton duration (ms) from follow-up experiment

	Geminate	**Singleton**	**Percentage**
Speaker A	123	41	200%
Speaker D	143	38	276%

The results for percentage of RF lengthening in Table V can also be compared with those found in an independent study by Farnetani and Kori (1986) for singleton and geminate [s], shown in Table VII. As reported above, consonants subject to RF (see Table V) lengthen to a lesser degree than the geminate consonants in Farnetani and Kori's data. Relatedly, Payne (2005) analyzes RF long consonants and geminate consonants and finds that these two types of long consonants are different not only in terms of their duration (lexical geminates being longer) but also in terms of their non-durational cues, i.e., their formants values. These results lead the author to conclude that RF consonants and lexical geminates are different and that consonants lengthened by RF do not result in geminates, confirming what the current study reports.

Table VII

Duration (ms) of fricative single and geminate consonant from Farnetani and Kori (1986)

	Geminate C	**Single C**	**Percentage of Lengthening**
Speaker 1	221	127	74%
Speaker 2	255	87	193%
Speaker 3	271	117	131%

Our second hypothesis predicted that the initial consonant in word2 would lengthen after a boundary but to a lesser extent. The results show that the presence or absence of a boundary is a significant factor on the realization of RF, in that the initial consonant is longer when no boundary is present. Focusing on those contexts where there is an intonational phrase boundary, the difference in duration for the initial consonant depending on whether the preceding vowel was stressed or unstressed was significant for two of the speakers. This means that the presence of a boundary did not block the lengthening from taking place for these two subjects. On the other hand,

this difference was not significant for the two other speakers, although they show the same qualitative pattern. Thus, our results lend support to claims that the presence of a boundary is a not a categorical blocker for RF. However, I find that an intonational boundary does have some effect on RF but that this effect is gradient, i.e., there is some lengthening but less than when no boundary is present. At this point, it is worth looking at the mean duration for the postboundary consonant after a stressed and an unstressed vowel for those speakers where the difference is significant. See Table VIII.

Table VIII

Duration (ms) of postboundary consonants

	After stressed vowel	**After unstressed vowel**	**Percentage of lengthening**
Speaker B	130	121	8%
Speaker C	123	114	8%

Notice that the percentage of lengthening is not as great as in the environment where there is no boundary (see Table V). It seems that the RF lengthening is a gradient phenomenon since it is greater or smaller depending on the context. Although the boundary does not block lengthening for these speakers, the lengthening obtained is smaller compared to the cases where no boundary is present. These results lend support to the view of boundaries as elastic phenomena with gradient effects on neighboring sounds (Byrd & Saltzman 2003).

Next, let us consider the results regarding the presence of a pause in the RF environments and the initial /s/ duration. For the speaker that presented a significant number of tokens with pauses (speaker B), there was no effect of the pause on the lengthening. This is contrary to what had been previously reported, namely that when a pause occurs between word1 and word2 RF does not apply (Absalom et al. 2002, Agostiniani 1992, Canepari 1991, Loporcaro 1997, Stevens and Hajek 2006). The current results show that the occurrence of a pause is not a blocker of the phenomenon, although it does have an effect on the amount of lengthening. Table IX includes the initial consonant duration in contexts with and without a pause, and it shows that the lengthening is greater when there is no pause. This indicates that the presence of a pause has a gradient effect on RF in that the amount of lengthening is smaller. Thus, we can conclude that RF lengthening is gradient and it depends on

Table IX

Duration (ms) of initial consonant with and without pause and after stressed/unstressed vowel

	pause		**no pause**	
	after stressed V	**after unstressed V**	**after stressed V**	**after unstressed V**
Speaker B	130	113	157	115

factors such as phrase boundary and pause, but, crucially, the presence of these prosodic elements does not rule out the process. I argue that this is directly related to the elastic nature of prosodic phenomena, which is manifested in gradiently varying degree of disjuncture at phrase boundaries (Byrd & Saltzman 1998, 2003, Byrd 2006).

The third hypothesis was that an initial vowel in word2 does not lengthen in the RF environment. The results clearly support this hypothesis. For three of the speakers, stress does not have a significant influence on the duration of this vowel, i.e., there is no difference in its duration after a stressed or an unstressed vowel. For one of the speakers, there was a significant difference depending on the presence of a preceding stressed element. However, in this case, the initial vowel was shorter after a stressed element. This shows that consonants are the only segments subject to RF lengthening.

The fourth hypothesis makes reference to the fact that the initial vowel in word2 will not lengthen after a boundary. As we just saw, this vowel does not lengthen in the RF environments, i.e., without a boundary and after a stressed vowel. So, this hypothesis is already refuted by the results discussed with respect to hypothesis three. However, it is useful to consider the boundary effects independently of the preceding stressed or unstressed element. The results show that the boundary is a significant factor for initial vowel duration, namely this vowel is longer in the absence of a boundary. This indicates that initial vowels undergo postboundary or phrase initial shortening.

The last hypothesis states that a final vowel lengthens when stressed. The results lend support to this hypothesis. The final vowel is significantly longer when it is stressed than when it is unstressed. Table X illustrates the percentage of lengthening of the final vowel depending on whether it is stressed or unstressed, in the absence of a following boundary.

Table X

Duration (ms) of final vowel without a following boundary

	Stressed	**Unstressed**	**Percentage of lengthening**
Speaker A	78	53	44%
Speaker B	102	63	62%
Speaker C	91	49	85%
Speaker D	83	42	96%

If we compare the percentage of lengthening for final vowels (Table X) and initial consonants (Table V) in the RF environment, we see that the percentage of vowel lengthening is greater than that of consonant lengthening for all the speakers. These findings clearly refute the claim of bimoraic analyses that final stressed vowel cannot be long in Italian (see Borrelli 2000 for a review of these analyses). Furthermore, these results show that vowel lengthening and consonant lengthening can occur at the same time, i.e., they do not exclude each other. Finally, it should be

noted that the final vowel is longer in preboundary position, indicating that there is preboundary lengthening (see for example Wightman, Shattuck-Hufnagel & Ostendorf 1992 for American English). This stands in contrast with the results obtained for the initial vowel, which was shorter in postboundary position.

5. Conclusion

This study provides a quantitative, empirical analysis of RF and of the effect of different factors on the lengthening, focusing on the role of prosodic boundaries, pauses and the quality of the segments. Regarding the characteristics of RF in terms of the segment involved, I found that this process only targets initial consonants; initial vowels are not affected by RF. On the other hand, the final stressed vowel lengthens considerably when it carries a stress. That is, RF environments present not only initial consonant but also final vowel lengthening, contradicting previous accounts of the process.

The results presented above shed light on the nature of RF and more precisely, characterizes its interaction with prosodic structure. I argue that this interaction is gradient and elements that had been previously reported as blockers of RF do not categorically define the result of RF. More precisely, this study shows that the presence of a boundary or a pause has gradient effects on RF: RF can lengthen a postboundary or a postpause consonant, but the degree of lengthening will be smaller than when no boundary or pause is present. This behavior agrees with approaches to prosodic structure that view boundaries as elastic phenomena that affect segmental structure in a gradient manner (Byrd & Saltzman 2003). The current study has some limitations and some of the factors interacting with RF need to be analyzed in more detail. For instance, the effect of pause may need further study since our data does not provide many tokens for this context. The challenge when analyzing pause effect is how to incorporate different ways to manipulate pause production into the experimental methodology.

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Appendix 1

Stimuli used in the main experiment analyzing RF (target sounds are in bold).

1. La nostra è una facolt**à i**brida.
   «Ours is a hybrid faculty»
2. Fu un giovedì **a**cido.
   «It was a sour Thursday»
3. Roma è una citt**à s**anta.
   «Rome is a holy city»
4. Fu un giovedì **s**obrio.
   «It was a sober Thursday»
5. È una piant**a i**brida.
   «It is a hybrid plant»

6. Sono studen**t**i **a**bili.
   «They are handy students»
7. Ha comprato frut**t**a **s**ecca.
   «He's bought dry fruit»
8. Sono studen**t**i **s**obri.
   «They are sober students»
9. Se conosci la facol**t**à, **i**brida non è.
   «If you know the faculty, it is not hybrid»
10. Quando lo mangiammo giove**d**ì, **a**cido non era.
    «When we ate it on Thursday, it was not sour»
11. Se conosci la citt**à**, **s**anta non è.
    «If you know the city, it is not holy»
12. Quando lo vedemmo giove**d**ì, **s**obrio non sembrava.
    «When we saw him on Thursday, he did not look sober»
13. Quando studiamo quella piant**a**, **i**brida non era.
    «When we studied that plant, it was not hybrid»
14. Quando abbiamo conosciuto gli studen**t**i, **a**bili non erano davvero.
    «When we met the students, they were not handy at all»
15. Quando mangiammo la frut**t**a, **s**ecca non era.
    «When we ate the fruit, it was not dry»
16. Quando abbiamo conosciuto gli studen**t**i, **s**obri non sembravano.
    «When we met the students, they did not look sober»

Appendix 2

Stimuli used in follow-up experiment analyzing single/geminate consonants duration (target single and geminate consonants are in bold).

1. Le nostre sono ba**s**i deboli.
   «Ours are weak bases»
2. Cammina a pa**ss**i lunghi.
   «He walks with long steps»
3. Abbiamo ricevuto la carta Vi**s**a nuova.
   «We have received the new Visa card»
4. Siamo finiti in una ri**ss**a furiosa.
   «We ended in a furious fight»

DETERMINER SHARING IN SPANISH: DET & DET$_{Foc}$

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1. Introduction

Determiner sharing is present in coordinate sentences where, in languages like English or Spanish, the verb is gapped in non-initial conjuncts and a determiner is also missing from such conjuncts. A determiner sharing sentence in Spanish is (1).

(1) Ni demasiados chicos fueron al cine ni (–) chicas (–) al parque
neither too.many boys went to.the movies nor (–) girls (–) to.the park
'Neither too many boys went to the movies nor too many girls went to the park.'

The second conjunct in (1) is missing both the verb 'went' and the determiner 'too many'. This type of sentence is the focus of this article. There are two possible major analyses to this kind of sentence: the large conjunct approach and the small conjunct approach. In the large conjunct approach analysis, conjuncts are sentential and missing words are accounted for by processes such as PF deletion. Consider (2).

(2) [$_{TP}$ neither too.many boys went to.the movies] nor [$_{TP}$ (–) girls (–) to.the park]

The two conjuncts in (2) are sentential, whole TPs, and missing words are deleted. On the contrary, in the small conjunct analysis, conjuncts can be smaller than sentences and there is a part of the structure that is located above conjunction and is shared by the conjuncts. This is represented in (3).

(3) [$_{TP}$ neither too.many boys [$_{vP}$ went to.the movies] nor [$_{vP}$ girls to.the park]

This structure (3) is different from (2) in that conjuncts are smaller (they are vPs) and the part of the structure where the string 'neither too many boys' is present is shared by the vP conjuncts. In this article, I defend a specific analysis inside the small conjunct approach and I rethink its structure so that (i) the theory becomes simpler and (ii) I widen the set of data that I can account for.

I assume Arregi and Centeno's (2005) and Centeno's (2007) analyses which follow Lin (2002). This is a small conjunct analysis to determiner sharing sentences that postulates a number of determiner related positions in the structure, DETs, to which DPs move obeying restrictions that I explain in section 2.1. A preliminary representation of this kind of analysis is (4). This is the structure of the Spanish determiner sharing sentence (1) as in Arregi and Centeno (2005).

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 109-123.

(4) [$_{TP}$ neither too.many boys$_i$ went [$_{DET1}$ t$_i$ [$_{vP}$ [$_{vP}$ t$_i$ t$_v$ to.the movies] nor [$_{vP}$ girls t$_V$ to.the park]]]]

Because conjuncts are not sentential in (4), they are small conjuncts. Some of the missing elements are accounted for via different types of movements to the shared part of the structure that are explained in section 2. Finally, there is a DET position right above the coordination of vPs. DETs are positions that are separate from common D positions. In this article, I give further evidence for DETs and I specify the positions they occupy in more detail than in previous analyses.

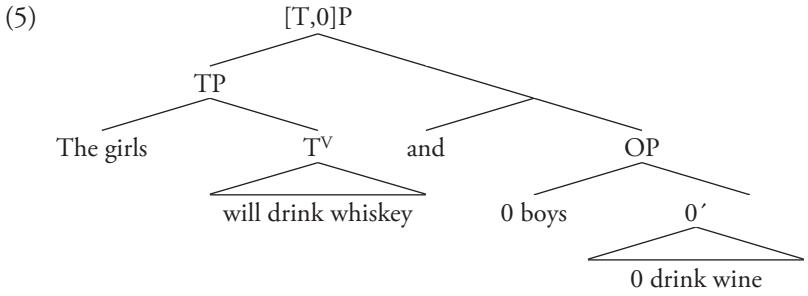
In order to do this, I analyze information structure assuming Rizzi (1997), where the complementizer system is split. With more projections now present in the structure, the locations of high DETs can be better specified. Furthermore, by assuming a proposal like Jayaseelan's (2001), where TopPs and FocPs are also present below IP, lower DETs' locations can also be better specified. I show in this article that DET positions can only be of two types: DET and DET$_{Foc}$. With the analysis of information structure both at the CP level and the IP level in determiner sharing sentences, I account for more empirical data.

This article is organized as follows. In section 2, I explain the background to the analysis. First, I provide the major features of the small conjunct analysis that I assume here (Lin 2002). I also discuss its extension onto Spanish and I provide evidence in favor of DETs as in Centeno (2007). In section 3, I rethink the structure by including small desirable changes to this determiner sharing analysis and by analyzing information structure at the CP and IP levels. In section 4, I conclude the article explaining how the picture is set for subsequent research.

2. Background: The Determiner Sharing Analysis

There are two major approaches to determiner sharing: the large conjunct approach and the small conjunct approach. I briefly discuss them and I focus on the small conjunct approach that I develop here. The large conjunct approach in determiner sharing is represented by Ackema and Szendroi (2002).[1] This analysis postulates that conjuncts are sentential. Here, the missing words are elided: ellipsis per se affects the missing verb, and 'dependent ellipsis' affects the missing determiner (5).

(5)



[1] Both labels, large and small conjunct approach, come from the literature on gapping (sentences were only the verb is missing in part of the conjuncts). Main representatives of the large conjunct approach in gapping are: Neijt (1979), Wilder (1994, 1997), Hartmann (2000), among others.

These authors follow Williams (1997) in assuming double headed phrases in coordination contexts. These phrases are labeled as represented at the top of the structure in (5): [T,0]P. When heads are not pronounced and are affected by ellipsis, they are represented by 0. Although there is a large number of interesting details in Ackema and Szendroi's (2002) analysis, I continue with small conjunct analyses, the focus of this paper.

Representative works that analyze determiner sharing by means of small conjuncts are McCawley (1993), Johnson (2000), Lin (2002), Citko (2006), Arregi and Centeno (2005), and Centeno (2007).[2] The analysis in Lin (2002) can be represented as in (7), which is the structure of the English determiner sharing sentence (6). Conjuncts are smaller than sentences and there is a part of the structure that is above coordination, and hence, is shared by the conjuncts. The words that are missing from conjuncts mainly result from movements.

(6) The girls will drink whiskey, and boys drink wine.

(7) [$_{TP}$ The girls$_i$ will [$_{DET}$ t$_i$ [$_{vP}$ [$_{vP}$ drink whiskey] & [$_{vP}$ boys drink wine]]]]

In (7), the conjuncts are vPs and there is a DET position above coordination which the DP in the first conjunct moves to. This type of movement is normally considered to be asymmetric, ruled out by the CSC, Coordinate Structure Constraint (Ross 1987). However, Lin (2002) assumes a different version of the CSC and provides evidence that this type of movement is only apparently asymmetric, and hence, grammatical.

In this article, I follow this kind of approach because evidence in favor of these analyses is conclusive across the existing literature. Among the arguments that are used in these small conjunct analyses, one is related to cross-conjunct binding sentences. These sentences are exemplified in (8).

(8) Not every student$_i$ [bought a hat] and [her$_i$ brother a sweatshirt]

The interest of this sentence (8) is that the quantifier 'not every student' can bind the pronoun 'her'. Because binding is only possible when there is a c-commanding relationship between two elements, the only way the quantifier can bind the pronoun is if the former c-commands the latter. For this to happen, the quantifier needs to be outside the first conjunct because, if not, it could not c-command any element in the second conjunct. This means that there needs to be a shared c-commanding part of the structure, as represented in (8), from which some elements can c-command the material in the conjuncts. This is strong evidence that small conjuncts are needed in coordinate structures.

In order to be more specific now, I explain the major features of the small conjunct analysis that I assume in two subsections. In the first one, I provide some main features of Lin's (2002) analysis which is focused on English. In the second subsection, I explain how this approach can be expanded to capture Spanish facts.

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[2] Other small conjunct approaches in the gapping literature are Siegel (1987), Johnson (1996, 2003), Lin (2000).

2.1. Determiner Sharing in English

The small conjunct analysis of Lin (2002) which postulates the determiner related positions, DETs, is illustrated in (7), repeated here as (9).

(9) [$_{TP}$ The girls$_i$ will [$_{DET}$ t$_i$ [$_{vP}$ [$_{vP}$ drink whiskey] & [$_{vP}$ boys drink wine]]]]

I now explain the nature of DETs and the restrictions that affect their position in the structure.

Lin assumes Sportiche's (1996) DP-Partitioning Hypothesis by which determiners are divided in two positions in the tree. In Lin (2002), these positions are D, which is the determiner position per se; and DET, which is a position to which D normally moves (10).

(10) [$_{TP}$ . . . DET [$_{vP}$ . . . DET [$_{VP}$ . . .]]]

In Lin's analysis, these DETs exist in the structure under specific requirements which need to capture a generalization that applies to determiner sharing phenomena. This generalization is expressed in McCawley (1993) and more accurately in Lin (2002) and Siegel (1984, 1987). McCawley (1993) provides empirical evidence that it is not possible to have determiner sharing if the verb is not gapped. This is illustrated in (11-12). The verbal form 'are named' in (11) needs to be gapped in non-initial conjuncts for the sentence to become grammatical. If it is not gapped, like in (12), the result is ungrammatical. Lin (2002) explains that in order to have determiner sharing, it is Tense that needs to be gapped. Examples (13-14) illustrate this.

(11) Too many Irish setters are named Kelly, German shepherds Fritz, and huskies Nanook.

(12) *Too many Irish setters are named Kelly, German shepherds are named Fritz, and huskies are named Nanook.

(13) The boys will wash the dishes and (–) girls (–) mop the floor.

(14) *The boys will wash the dishes and (–) girls **will** mop the floor.

Determiner sharing is possible in (13) because T, the auxiliary 'will', is gapped in the second conjunct. On the contrary when 'will' is not gapped the sentence becomes ungrammatical (14). Lin's analysis captures this contrast by means of the positions that DETs occupy and the requirements that specify their location.

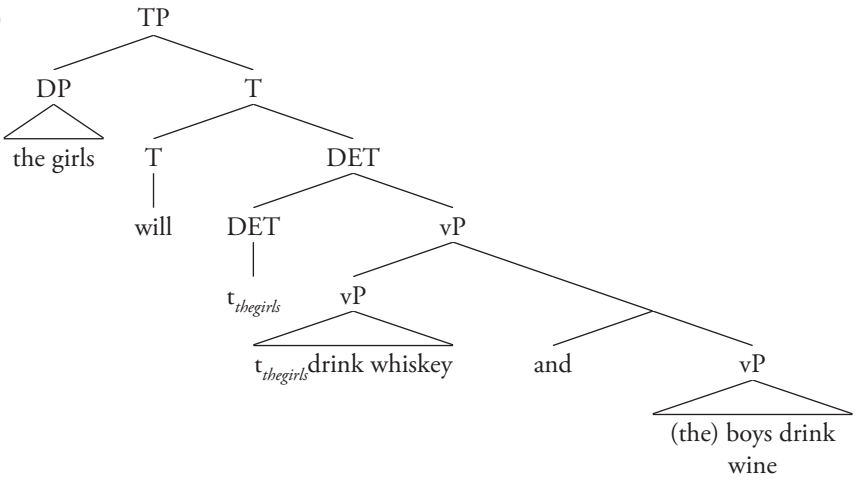
The conditions that regulate the relation between the D positions and the DET positions are the following (15).

(15) a. D must be within the c-command domain of DET at LF.
b. DET must be adjoined to a DP headed by D by Spell-Out.
c. D needs to be adjoined to DET to be spelled-out.

Lin states in these conditions (15) that the DET position needs to c-command D and the latter normally adjoins to DET by Spell-Out. The result of this is that D is spelled-out when adjoined to DET. Hence, if D is not in DET it does not get to be

pronounced. In order to illustrate the DET-D relationship, the determiner sharing structure in (9) is represented here in more detail in (16).

(16)



In the first place, the DPs that share DET are inside the conjuncts. Since D gets spelled-out when D moves to DET, the DP in the first conjunct moves there so that its D is pronounced. However, the DP in the second conjunct does not have any available DET position to move to. This is why, the determiner in the second conjunct does not get to be pronounced.

Because the DET position is right above coordination, and hence, it delimits the coordinated material, everything above DET should be shared. Tense is generated above DET and this means that it needs to be shared, and because of that, gapped in the conjuncts. Hence, the Tense that is in the form of an auxiliary or as part of a tensed verb is located in the shared part of the structure. This is the reason why determiner sharing forces Tense to be also shared, because it is above DET. I briefly schematize this in (17).

(17) $[_{TP}$ **T** $[_{DET}$ **DET** $[_{vP}$ $[_{DET}$ **DET** $[_{VP}$]]]]]

The incorporation of DETs to the structure makes possible to capture the generalization that Tense needs to be always shared for determiner sharing to be present in the structure. This is another reason why I assume this analysis. Also, because of two aspects that I develop in what follows: (i) there is more evidence for DETs, empirical and theoretical, (ii) the relation between T and DET allows to capture more data than what is covered in Lin (2002).

Although Lin (2002) provides other important aspects to the theory, I only reproduce here the ones that are crucial for the goal of this article. In the next subsection, I explain a way in which this analysis can be extended onto Spanish. I discuss further on the nature of the relation between T and DET, and on further evidence in favor of DETs.

2.2. Determiner Sharing in Spanish

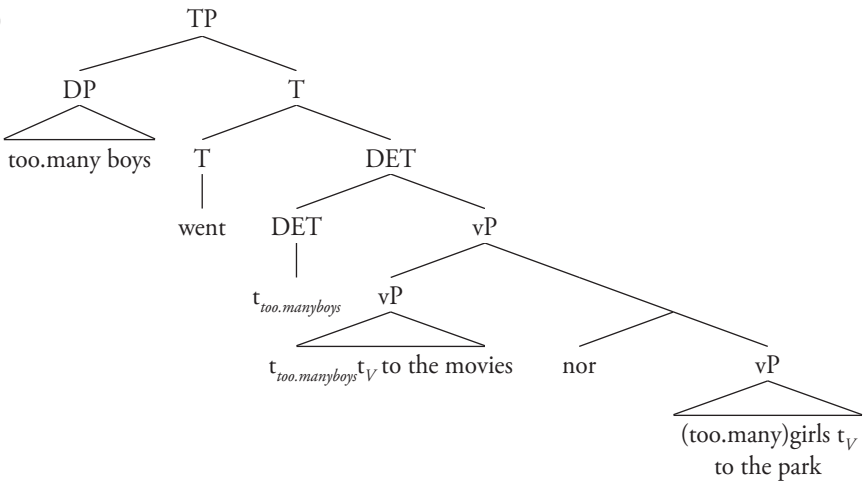
The first aspect to notice is that both subject determiner sharing (example (1) repeated here as (18)) and object determiner sharing (example (19)) are possible in Spanish.[3]

(18) Ni demasiados chicos fueron al cine ni (–) chicas (–) al parque
neither too.many boys went to.the movies nor (–) girls (–) to.the park
'Neither too many boys went to the movies nor too many girls went to the park.'

(19) 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.'

In both sentences (18, 19), DPs in different conjuncts are sharing a determiner 'too many'. In the case of (18), the DPs sharing DET, 'too many boys' and 'too many girls' are in subject position. In the case of (19), the DPs that share DET, 'too many books' and 'too many magazines' are in object position. Determiner sharing in (18, 19) is possible because T is gapped in non-initial conjuncts in both cases. The syntax of DETs in these Spanish cases is the same as in Lin (2002). This is illustrated in (20), the structure of sentence (18).

(20)



The determiners are within their conjuncts and DETs are shared. Same as above, the requirements between DETs and Ds apply, and because of that the determiners

[3] For a better understanding of object determiner sharing in Spanish, I refer the reader to my dissertation (Centeno 2011). Also see footnote 1.

in the non-initial conjuncts are not pronounced. The verb is gapped from the conjuncts and is present in the shared part because it has moved Across The Board to T, in the shared part.

Wh-determiner sharing sentences are also possible. These are cases where the DPs sharing DET are wh-phrases. In (21) the wh-phrases that share DET are 'how many books' and 'how many magazines'.

(21) ¿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?'

Because T is shared, the conjuncts need to be smaller than TPs. Still, the wh-phrase that share DET in the second conjunct 'how many magazines' has moved upwards above vP (22). This is considered to be an intermediate copy of wh-movement in Arregi and Centeno (2005) and evidence in favor of cyclicity in wh-movements as in Chomsky (1986, 2000), Fox (2000) and Nissembaum (2000). This evidence suggests that another projection between TP and vP is needed in this type of Spanish determiner sharing cases. The overt intermediate copy of the phrase that both undergoes wh-movement and is involved in DET sharing appears in this intermediate projection that is labeled Agr$_O$P (22).

(22) . . . [$_{\text{Agr}_O\text{P}}$ (how many) magazines$_i$ reviewed [$_{\text{vP}}$ Pedro t$_V$ [$_{\text{VP}}$ t$_V$ t$_i$]]]

Because of that, Arregi and Centeno (2005) postulate another DET position at that height (23).

(23) [$_{\text{TP}}$ . . . DET [$_{\text{Ar}_O\text{P}}$ . . . DET [$_{\text{vP}}$ . . . DET [$_{\text{VP}}$ . . .]]]

Apart from this intermediate position, other examples suggest the need of another DET position, a higher one. Consider the following examples (21) repeated here as (24) and (25).

(24) ¿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?'

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

Examples (24, 25) are wh-determiner sharing sentences whose only difference is that 'has' is present in both conjuncts in the second sentence (25). Since both sentences are grammatical, it can be seen that the gapping of T in non-initial conjuncts is optional in this type of question.[4] Notice that this goes against the generalization that T gapping is mandatory in order to have determiner shar-

[4] The existence of this type of examples in English is already noticed in Ackema and Szendroi (2002).

ing. However, this is not a problem for the theory assumed and developed in this work.

In the theory that is assumed here, DET is the delimiting element between the conjoined material and the shared part. Hence, as seen before, when DET is low in the structure, everything above it is shared, and that is why T is gapped from non-initial conjuncts. So according to this, if T is not shared (present in both conjuncts) in this wh-determiner sharing example, (25), DET should be above the Tense projection. The structure that is needed is (26), where conjuncts are CPs and the DET position is above them. This DET position is labeled DET_{Wh}.

(26) $[_{DET_{Wh}}$ how.many books$_i$ $[_{CP}$ $[_{CP}$ t_i has read Juan] and $[_{CP}$ magazines has reviewed Pedro]]]

After CPs are completely formed with their corresponding movements in (26), another movement is done by the wh-phrase to DET_{Wh} from the first conjunct. The determiner in this phrase gets spelled-out this way. Although conjuncts are CPs, there is still a part of the structure, the DET_{Wh} position, that is shared by the conjuncts. Because of this, conjuncts are smaller than whole sentences.

This structure is not only suggested by the grammaticality of sharing a determiner with out sharing T. It is also supported by the following evidence. Before I provide this evidence, observe a natural consequence to this analysis. Normally, in the determiner sharing cases that are analyzed, the grammatical functions of the DPs involved in DET sharing are the same. Notice the grammatical functions of the DPs in (19) repeated here as (27).

(27) 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.'

The DPs 'too many books' and 'too many magazines' are both objects and the sentence is grammatical. However, when DPs with different grammatical functions share DET, the sentence becomes ungrammatical (28).

(28) *Ni María ha dado demasiados caramelos a Pedro ni niños comido la tarta
neither Maria has given too.many candies to Pedro nor boys eaten the cake
'Neither Maria has given too much pizza to Pedro nor too many boys have eaten the cake.'

The first DP in the determiner sharing relationship 'too many candies' is an object and the second DP 'too many boys' is a subject. These different grammatical functions make the conjunction be of different categories. This is so because each grammatical function corresponds to different positions at different heights. Coordination of different categories is not possible. In coordination contexts, conjuncts of same category need to be conjoined. The structure of the ungrammatical example (28) is (29).

(29) $[_{TP}$ M. has $[_{vP}$ given $[_{DET}$ too many candies$_i$ $[_{VP}$ t_i to P. $]_{VP}$ nor $[_{vP}$ boys eaten the cake $]_{vP}$]]

The categories of the conjuncts in (29) are different. The first conjunct is a VP because the DP sharing DET is an object, and the second conjunct is a vP because the subject is present in the conjunct. This yields to ungrammaticality in (28).[5]

Evidence for a structure where DET_{Wh} is present comes from looking further into grammatical functions of DPs and their positions. I consider sentences where DPs with different grammatical functions are involved in wh-movements and in DET sharing. These sentences are therefore evidence not only in favor of DET_{Wh} but also in favor of DETs in general.

Consider the following contrasts (30-31, 32-33).

(30) ¿Cuántos ejemplos has creado y profesores te han dicho que eran incorrectos?
how.many examples have.2SG created and teachers you.ACC have said that were incorrect
'How many examples have you created and how many teachers have told you that they were incorrect?'

(31) *¿Cuántos ejemplos has creado y profesores dicho que eran incorrectos?
how.many examples have.2SG created and teachers said that were incorrect
'How many examples have you created and how many teachers have told you that they were incorrect?'

(32) ¿Cuántas flores han florecido y plantas has metido en el invernadero?
how.many flowers have blossomed and plants have-2-SG put in the greenhouse
'How many flowers have blossomed and how many plants have you put in the greenhouse?'

(33) *¿Cuántas flores han florecido y plantas metido en el invernadero?
how.many flowers have blossomed and plants put in the greenhouse
'How many flowers have blossomed and how many plants have you put in the greenhouse?'

The difference between grammatical sentences (30, 32) and their counterparts (31, 33) is the gapping vs. no gapping of T. Hence, the only source for the grammatical contrast is the presence/absence of T in non-initial conjuncts. In example (30), the auxiliary 'have' is present in the second conjunct and this makes the sentence grammatical. Notice that the grammatical functions of the DPs sharing DET are different: the first DP is an object and the second DP is a subject. This can only happen because T is present in both conjuncts. The same applies to example (32).

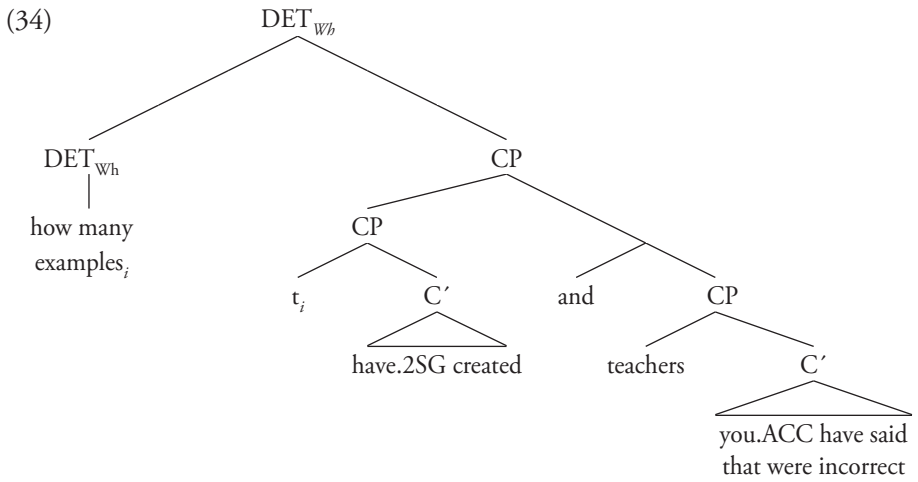
[5] This kind of reasoning is well established in the coordination literature and it can be considered legitimate. However, I am well acquainted with the literature of unbalanced or asymmetric coordination, according to which conjuncts of different categories can be conjoined. For a more suitable potential explanation of the ungrammaticality of this example (28), which is not based on the categories of the conjuncts, I refer the reader to my dissertation, Centeno (2011).

However, in examples (31, 33), the auxiliary 'have' is not present in the second conjunct and determiner sharing by two DPs that have different grammatical functions is not possible because they are in different positions.

The different behavior between the grammatical sentences and the ungrammatical ones can only be understood if the DPs sharing DET are in Spec, CP in the grammatical sentences. This is so because Spec, CP is one position where elements with different grammatical functions can occupy the same position from conjunct to conjunct. This way, coordination of same categories (coordination starting at same height in each conjunct) is achieved: coordination of CPs. Notice that this is forced by the presence of T in both conjuncts. If T is present in both conjuncts, the DET position should be above it and the wh-phrases sharing DET should be in Spec, CP.

Since this is the only explanation for the grammaticality of these sentences (30, 32), this is evidence that a DET position above CP, DET_{Wh}, is needed in the structure. This is illustrated in (34) which corresponds to example (30).

(34)



The DPs 'how many examples' and 'how many teachers' need to be in Spec, CP and they are sharing a DET, DET_{Wh}. Finally, because Tense is not present in the conjuncts in the ungrammatical sentences (31, 33), coordination of CPs is not forced, and hence, there is conjunction of elements of different categories because the DPs involved in sharing are in different positions. The analysis of this kind of sentences is already given in (29), which is a structure that illustrates coordination of different categories.

So far, the structure assumed for Spanish determiner sharing is (35), which comprises the four DET positions that have been justified above.

(35) DET_{Wh} $[_{CP} \ldots [_{TP} \ldots DET [_{Ar_OP} \ldots DET [_{vP} \ldots DET [_{VP} \ldots]]]$

In the next section, I maintain these DET positions but I rethink the structure so that I locate the positions of DETs more accurately. In doing so, the empirical basis of this study becomes wider and the theoretical basis simpler.

3. A Preferable Change: DET and DET$_{Foc}$

So far, I have assumed a structure for determiner sharing in Spanish where DET positions are situated above VP, vP, Agr$_O$P, and CP. My goals here are (i) to be more specific in positioning DETs, (ii) to simplify the determiner sharing theory, and (iii) to capture more data. In order to do so, I propose to assume Rizzi's (1997) CP-split in the analysis of determiner sharing structures. The complementizer system splits into the following projections in that work (36).

(36) [$_{\text{ForceP}}$ [$_{\text{Top•P}}$ [$_{\text{FocP}}$ [$_{\text{Top•P}}$ [$_{\text{FinP}}$]]]]]

This higher split system is partly devoted to the final landing sites of A'-movements. By atomizing the complementizer system, I am able to be more specific about the positioning of the higher DETs.

Lower landing sites of A'-movements are postulated to be also present internally to the IP projection in Jayaseelan (2001). I propose to also assume these IP-internal TopP and FocP that are postulated in analyses like Jayaseelan's (2001).[6] By adopting this proposal, I can make the theory simpler. And, finally, by considering determiner sharing sentences with A'-movements, I can consider a set of data that, to my knowledge, has not been considered before.

In order to illustrate this proposal, consider (37).

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

This is a regular wh-determiner sharing sentence that has already been analyzed with a DET$_{Wh}$ at the top of the structure. However, with the new positions that are now in the structure, the analysis should be (38), where wh-phrases sharing DET naturally stop at Spec, FocP. As a consequence, DET$_{Wh}$ is now labeled DET$_{Foc}$.

(38) [DET$_{Foc}$ how many booksi + DET$_{Foc}$ [$_{FocP}$ [$_{FocP}$ t$_i$ has read Juan] and [$_{FocP}$ magazines has reviewed Pedro]]]

Both wh-phrases 'how many books' and 'how many magazines' are on Spec, FocP, sharing DET$_{Foc}$. This DET position is needed because T, the auxiliary 'have' is present in both conjuncts.

The same kind of logic can be used in the analysis of a different type of sentence where Tense is shared (gapped from the second conjunct) and wh-determiner sharing is present (39).

(39) ¿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?'

---

[6] See the work by Jonny Butler (2004) also.

Because Tense is gapped, the conjuncts need to be smaller than T. In the theory so far, these examples are Agr_OP coordinations, where the elements in the second conjunct stop moving at that height and the ones in the first conjunct can keep on moving up to the shared structure. My proposal adopts Jayaseelan's (2001) IP-internal FocP to account for this kind of example (39). In this case, the wh-phrases that move up to Spec, FocP in the complementizer system, start moving up to Spec, FocP beneath IP. Consider the structure of both conjuncts (40).

(40) . . . [$_{FocP}$ t_i read [$_{vP}$ Juan t_V t_i]]]
. . . [$_{FocP}$ magazines$_j$ reviewed [$_{vP}$ Pedro t_V t_j]]]

Because the wh-phrases share DET and DET is above FocP for both conjuncts, this is a DET_{Foc} projection. The wh-phrase in the first conjunct adjoins to DET_{Foc} so that its determiner is spelled out and it keeps on moving up to the higher FocP (41).

(41) [$_{FocP}$ how.many books$_i$ [$_{TP}$ has [$_{FocP}$ [$_{FocP}$ t_i read [$_{vP}$ Juan t_V t_i]]] & [$_{FocP}$ magazines$_j$ reviewed [vP Pedro t_V t_j]]]]]]

With the new analysis, I can be more specific about the positioning of both higher DETs because the structure also displays the information structure projections. Consider (42).

(42) **Now:** [$_{TopP}$ [$_{FocP}$ [$_{TP}$ [$_{TopP}$ [$_{FocP}$ [$_{vP}$ [$_{VP}$]]]]]]] – **Before:** [$_{CP}$ [$_{TP}$ [$_{vP}$ [$_{VP}$]]]]

I have shown that higher DETs, DET_{Foc}, need to be located above FocPs because so far phrases sharing DET are wh-phrases. Notice that because of the changes I propose, the DETs theory is simpler. Before, DETs were of three different types: the DETs that corresponded to thematic positions, the DET that was above Agr_OP, and the DET_{Wh} above CP. In the analysis I propose, DETs are of two kinds only: DET_{Foc} and DETs. Consider the new structure (43).

(43) [$_{TopP}$ **DET**$_{Foc}$ [$_{FocP}$ [$_{TP}$ [$_{TopP}$ **DET**$_{Foc}$ [$_{FocP}$ DET [$_{vP}$ DET [$_{VP}$]]]]]]]

DETs are the ones that correspond to thematic positions. And $DETs_{Foc}$ are the ones that correspond to the landing sites of wh-movements, either final or intermediate landing sites. The DETs theory is simpler this way and it can account for the different sets of data in a more logical way. The structure for determiner sharing in declarative sentences has a DET position above thematic positions; and the structure for wh-determiner sharing sentences has a DET_{Foc} position above FocP.

In addition, with this kind of analysis, I can account for the following contrasts (44-45, 46-47). These are examples where DPs sharing DET are in Spec, FocP or Spec, TopP.

(44) *Demasiados chicos cuándo han comprado el pan y chicas dónde comido?
too.many boys when have eaten the bread and girls where eaten
'When have too many boys bought bread and where have too many girls eaten?'

(45) Demasiados chicos cuándo han comprado el pan y demasiadas chicas dónde han comido?
too.many boys when have eaten the bread and too.many girls where have eaten
'When have too many boys bought bread and where have too many girls eaten?'

(46) *Demasiados libros Pedro los ha leído y revistas María revisado
too.many books Pedro them has read and magazines María reviewed
'Pedro has read too many books and María has read too many magazines'.

(47) Demasiados libros Pedro ha leído y revistas María revisado
too.many books Pedro has read and magazines María reviewed
'Pedro has read too many books and María has read too many magazines'.

In sentences (44-45), the DPs 'too many boys' are in Spec, TopP position. There is a grammaticality contrast between the two sentences. The difference between them is that the ungrammatical sentence (44) is a determiner sharing sentence. The DPs that enter the DET-D relationship are in Spec, TopP position and this ungrammaticality suggests that DPs in that position cannot share DET.

This aspect is reinforced by the second pair of sentences (46-47). These two determiner sharing sentences are a minimal pair whose only difference is the presence of the clitic pronoun 'them' in (46). This pronoun makes sentence (46) be an example of Clitic Left Dislocation (CLLD). In these CLLD sentences, the element displaced to the left is normally considered a topic. When this clitic is not present, the dislocated element is normally considered a focused element (Rizzi 1997). It is the dislocated elements in these sentences (46-47) that are sharing DET. Now, if the grammaticality contrast is taken into account, it is only the focused element that can share DET because the sentence with the focused element is grammatical (47). In example (46), where the dislocated element sharing DET is a topic, the sentence is ungrammatical. This is evidence that higher in the structure, other than in thematic positions, the elements sharing DET should be in Spec, FocP, and therefore, that these DET positions should be DET$_{Foc}$. Consequently, there is evidence that the structure should be (43), repeated here as (48).

(48) [$_{TopP}$ **DET**$_{Foc}$ [$_{FocP}$ [$_{TP}$ [$_{TopP}$ **DET**$_{Foc}$ [$_{FocP}$ DET [$_{vP}$ DET [$_{VP}$]]]]]]]

A further step that can be taken with this proposal is to consider both topicalized and focused elements in the same determiner sharing sentence. This is possible (49).

(49) ¿Pedro cuántos libros ha leído y Juan revistas revisado?
Pedro how.many books has read and Juan magazines reviewed
'How many books has Pedro read and how many magazines has Juan reviewed?'

In example (49), there are elements both topicalized and focused in both conjuncts. 'Pedro' and 'Juan' are topics, and 'how many books' and 'how many magazines' are foci. The analysis of this sentence brings some complications to this analysis but I solve them in subsequent work. Still, it is clear from also considering this

example (49) that the analysis of information structure is necessary in the understanding of these structures.

4. Conclusion

In this article continue my research on determiner sharing in Spanish by slightly changing the structure that has been published so far. In doing this, two important goals are achieved. First, I make the determiner sharing theory simpler and more logical. Second, the set of Spanish determiner sharing sentences accounted for is wider than before. The approach adopted is a small conjunct analysis which postulates that some determiner related positions need to be present in the structure. This is postulated in Lin (2002) and extended onto Spanish by Arregi and Centeno (2005) and Centeno (2007). In the latter works, further evidence in favor of DETs is provided and I dedicate part of this article to expand such evidence.

I also account for A'-movements of different types in determiner sharing sentences and I include more projections in the structure assuming analyses like Rizzi (1997) and Jayaseelan (2001). This atomizes the structure and makes it possible to define the locations of DET positions in a more accurate way. In doing so, I show that there needs to be only two types of DET positions; $DETs_{Foc}$ and DETs. This makes the theory simpler and accounts for data not accounted for before. It also makes possible to consider a further set of data that I analyze in my subsequent research.

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THE DISTRIBUTION BETWEEN THE OLD DUTCH PRESENT PERFECT AND PRETERIT

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1. Introduction

The Old Dutch present perfect has received very little attention in the linguistic literature so far. This lack of interest is part of a more general neglect of Old Dutch, and it is mainly due to a lack of data sources; only two Old Dutch texts have been preserved. One is a word-for-word translation of the Psalms found in the Vulgate, the other is a free translation of and a comment on the Song of Salomon. Although there are only these two texts, the present paper shows that there is nevertheless enough material to draw conclusions on the properties of Old Dutch tenses.

In this paper I discuss a set of data that show that the Old Dutch preterit and the Old Dutch present perfect are distributed according to the Elsewhere Principle. Specifically, I will show that the present perfect is an aspectually and temporally more specific tense than the preterit, which acts as the default past tense in Old Dutch. The data and the analysis offer an insight into the aspectual and temporal properties of Germanic past tenses in the early medieval period.

The paper is organized as follows. In the next section I present the basic data and the research questions that arise from these data. I show that a Latin perfect can be translated both by an Old Dutch present perfect and by an Old Dutch preterit. In other words, both Old Dutch tenses can be used to translate a single Latin tense. The question is why this is the case and more importantly, what determines the distribution of these two tenses. In the third section I present the prerequisites for the analysis. These include analyses of the temporal and aspectual properties of the Latin perfect, the Old Dutch preterit and the Old Dutch present perfect. I show that the Latin perfect is a perfective past tense, the Old Dutch preterit an aspectually unmarked past tense and the Old Dutch present perfect a perfective tense that expresses a completed event with a present result. In section four I show that the distribution of the Old Dutch preterit and present perfect depends on a result in the present and more generally can be accounted for by means of the Elsewhere Principle. The last section sums up and concludes.

2. Basic data and research questions

Translating Latin tenses into Old Dutch. In this paper, I use data from the *Egmondse Williram* (henceforth EW). This eleventh century text contains two parts. The first is a translation of the Latin version of the Song of Salomon. It is important

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 125-136.

that this translation is such that the content of the Latin text is preserved in the Old Dutch version. Central to this article is the fact that the event structure of the Latin text is maintained in the Old Dutch text. The second part of the text is a comment on the Song of Salomon. As this paper focuses on the distribution of Old Dutch tenses as translations of the Latin perfect, I mainly use data from the first part of the EW.

In the Old Dutch translation of the Latin Song of Salomon, the Latin perfect is translated either by an Old Dutch present perfect or by an Old Dutch preterit.

(1) a. Lavi pedes meos
washed.*perf* feet mine
b. Ich havo mine fuoze gethuagan
I have my feet washed.*part*
'I have washed my feet' (EW 78,2-3)

(2) a. filii matris meae pugnaverunt contra me
sons mother.*gen* mine fought.*perf* against me
b. Miner muoder kind vuchtan wither mer.
my.*gen* mother children fought.*pret* against me
'My mother's children fought me.' (EW 11, 1-3)

In (1) the Latin perfect *lavi* 'I washed' is translated by the Old Dutch present perfect *havo gethuagan* 'I have washed'. Note that the Old Dutch present perfect is a periphrastic tense which contains an auxiliary (*have* or *be*) and a past participle. In (2) the Latin perfect *pugnaverunt* 'fought' is translated by the Old Dutch preterit *vuchtan* 'fought', which is a non-periphrastic tense form.

These data raise two questions. First, one wonders why two different Old Dutch tenses, i.e. the present perfect and the preterit, are used as translations of one single Latin tense (the perfect). Secondly, we will question the factor that determines the distribution between these two tenses.

3. Prerequisites for the analyses: tense and aspect in Old Dutch and Latin

3.1. Introduction

In order to be able to address the research questions raised above, I first present an analysis of the temporal and aspectual properties of the tenses involved, i.e. the Latin perfect, the Old Dutch present perfect and the Old Dutch preterit. For this analysis I combine a Reichenbachean tense notation (Reichenbach 1947) with the notation of aspect proposed by Smith (1991).

Reichenbach divides the concept of tense into three points: the event time, the moment of speaking and the reference time. The event time, E, refers to the moment at which the event takes place. The moment of speaking, S, refers to the moment at which the sentence is uttered. The reference point, R, refers to a more abstract point, which relates the event time to the moment of speaking. This can be illustrated by means of the following example.

(3) At 8 o'clock, John will have eaten.

In (3), *at 8 o'clock* does not refer to the event time. The event of John eating has taken place before 8 o'clock. The function of *at 8 o'clock* is to link the perfectivity of

the event *(At 8 o'clock John has eaten)* to the posteriority of the sentence to the moment of speaking (8 o'clock is still in front of us). Reichenbach named this point between the event time and the moment of speaking the reference point. A time adverbial usually refers to this reference point. The two possible relations between these three points are precedence, indicated by an underscore, and simultaneity, indicated by a comma.

To denote outer aspect, i.e. the aspectual properties of the tense proper, I will use the notation of Smith (1991). Smith divides the aspectual properties of an event into an implied initial point, a final point and an interval between these two points. Note that it is not a possible interpretation of an initial or final point which is at stake here, but the inherent implication of these points by the proper meaning of the tense. A perfective tense will thus be represented as follows.

(4) [I……F]

The square brackets indicate the interval of the event, an interval which takes place between an initial point I and an implied final point F. When the presence or absence of the final point is underspecified, I will put parentheses around F.

(5) [I……(F)]

Note that the underspecification of the final point, which yields the interpretation of an unmarked tense, is not the same as the absence of the final point, which indicates imperfectivity. An underspecified tense can syntactically behave both as an imperfective or as a perfective tense. This can be illustrated by means of the following modern Dutch example.

(6) Marie wandelde naar school en ze groette de directeur.
Mary walked to school and she greeted the principal
'Mary walked to school and she greeted the principal.'

The aspectually underspecified preterit (6) yields two possible interpretations, i.e. a perfective and an imperfective reading. The first possibility is that Mary walked to school, arrived at school and greeted the principal. This is the perfective reading in which the first event reached its final point before the second event took place. The second possibility is that Mary was walking to school and greeted the principal on her way to school. This is the imperfective reading in which the first event (the walking) did not reach its final point before the second event took place. As aspectually unmarked tenses give no grammatical information on the presence or the absence of the final point, we call these tenses underspecified for the final point. An imperfective tense or formulation on the other hand will only yield the interpretation in which the first event did not reach its final point before the second event took place, as in the following modern Dutch example.

(7) Marie was naar school aan het wandelen
Mary was to school on the walk.*inf*
en ze groette de directeur.
and she greeted the principal
'Mary was walking to school when she greeted the principal.'

In (7) only one interpretation is possible; Mary greeted the principal while she was walking to school. From (7) we can conclude that imperfective tenses give grammatical information on aspect. More specifically, they assert the absence of the fi-

nal point from which a specific interpretation of the event structure follows. Imperfective tenses are thus very different from aspectually underspecified. Imperfective tenses assert the absence of the final point, whereas underspecified tenses give no information on the presence or the absence of the final point.

We will also distinguish between some properties of inner aspect, these are the aspectual properties of verb types. More specifically, we need to make a distinction between an inherent, natural final point and an arbitrary final point.

Natural final points are restricted to verbs expressing achievements and accomplishments (Dowty 1979, Vendler 1967). Verb types with a natural final point, Fn, imply that the final point will occur at a given, non-arbitrary moment. Moreover, if the event is not interrupted before the final point, the event will end in a result.

(8) I baked a pie. We can eat it now if you want to.

(9) I was baking a pie, the telephone rang, I did not finish the pie.
#I baked a pie.

In (8) the event of baking a pie has ended and results in the presence of a pie. The given final point is the pie; baking a pie ends when the pie is finished. (9) shows that if this event is interrupted before the final point, one cannot use a perfective tense to state that the event took place. Other examples are *to fly to Prague*, *to read a book*, *to swim 100 meters*, etc.

Arbitrary final points are typical for verbs expressing activities (Dowty 1979, Vendler 1967). Verb types with arbitrary final points can be ended at any arbitrary moment and do not imply a result.

(10) I was working, the telephone rang and I did not work anymore that evening.
I worked. *(activity)*

In (10), one can use a perfective tense to state that the event took place, despite the fact that the activity was interrupted at an arbitrary moment. No result is inherently implied. Other examples are *to laugh*, *to sleep*, *to dance*, etc.

In the next section a Reichenbachean tense system will be combined with Smith's notions of initial points and final points of outer aspect and the notions of natural and arbitrary final points in inner aspect. I first discuss the Latin perfect.

3.2. The Latin perfect

The Latin perfect is a clear example of a perfective past tense (Comrie 1998: 12, 53). As the Latin perfect is a perfective tense, it implies that the event has ended, i.e. the event took place in an interval between an initial point I and an implied final point F. As the Latin perfect is a past tense, it implies that the event took place before the moment of speaking. This can be summarized as follows.

	Lat perf
aspectually	[I.....F]
temporally	E, R _S

1

(11) the Latin perfect

3.3. The Old Dutch preterit

I will show that the Old Dutch preterit is a past tense which is unmarked for aspect. This view on the Old Dutch preterit is supported by Comrie (1998: 83), who makes a similar claim for all Old Germanic preterits. In the following paragraphs, I present Old Dutch data to support this view. I first consider the temporal properties of the Old Dutch preterit and then its aspectual properties.

I claim that the Old Dutch preterit is a genuine past tense. This implies that both the event and the reference point are situated before the moment of speaking. This can be demonstrated on the basis of sentences in which a temporal adverbial is combined with a preterit. As we have seen in section 3.1, a temporal adverbial normally refers to R. If R is situated before S, i.e. in the past, we predict that the temporal adverbial refers to the past as well. This expectation is borne out. The Old Dutch preterit can only combine with past temporal adverbials, as can be seen in (12) and (13).

(12) Hiz ne-uerid nu so niet, so hiz eer deda.
He not-goes now so not so he earlier did.*pret*
'He no longer walks as he used to do.' (EW 39, 2-3)

(13) So thar nah, tho ich hiro gescriphta thurgh suoghta,
so there after then I their writings through sought.*pret*
tho vand ich minen wine.
then found.*pret* I my lover
'Thereafter, when I went through their writings, I found my lover.' (EW 48, 31)

In (12) the preterit *deda* 'did' is combined with the temporal adverbial *eer* 'earlier' that refers to the past, whereas in (13), the preterits *suoghta* 'sought' and *vand* 'found' are combined with a past temporal adverbial, namely *tho* 'then'. From the combination of past temporal adverbials with a preterit we can conclude that the preterit is a genuine past tense. This supports the traditional view on the Old Germanic preterit as in Comrie (1998: 83)

I will further show that the Old Germanic preterit is unmarked for aspect. I first demonstrate that it cannot be interpreted as a durative, imperfect tense. Then I illustrate that it cannot be a perfective either. As the preterit cannot be reduced to imperfectivity or perfectivity, I conclude that it is neither of both and thus unmarked for aspect.

The Old Dutch preterit is not inherently durative. Support for this view comes from individual-level predicates (Diesing 1992: 17). Individual-level predicates express an inherent property and typically combine with the tense that is least specified for aspect. A further and a possibly related fact is that they are incompatible with a durative interpretation (Klein 1994: 101).

(14) The brontosaur was an herbivore.

(15) *The brontosaur was being an herbivore.

(14) contains an example of an individual-level predicate, i.e. *to be a herbivore*. It expresses an unchangeable property of the subject, namely that the brontosaur is a

herbivore. As can be seen in (15), individual-level predicates are incompatible with a durative tense. Similar Old Dutch sentences always contain a preterit.

(16) her was Ismahelis sun
he was Ismahel.*gen* son
'He was Ishmael's son' (EW 9, 3-4)

In the individual-level predicate in 16 a preterit is used to express the unchangeable property of kinship. This implies that the preterit is the least marked past tense of Old Dutch, as individual-level predicates typically combine with the aspectually least marked tense. Furthermore, the occurrence of the preterit in individual-level predicates implies that the preterit is not a durative tense, as individual-level predicates are incompatible with durativity (cf. 15). The preterit is thus the least marked past tense of Old Dutch and it is non-durative.

The above reasoning, however, does not exclude the possibility that the Old Dutch preterit in fact denotes perfectivity. This is for example the case for the English simple past, as in 17. A good test to detect the presence or absence of perfectivity are the event structures between main clauses and their temporal adverbial clauses. When the events in the temporal adverbial clause and in the main clause are interpreted as taking place sequentially, the tense of the main clause is perfective (cf. Smith 1991). On the other hand, when the events in the temporal adverbial clauses and in the main clause are interpreted as overlapping, the tense of the main clause is not perfective. Smith (1991) gives the following examples to illustrate this.

(17) Mary sang when John entered the room.

(18) Mary was singing when John entered the room.

In 17 Mary starts to sing when John enters the room. The two events are sequential. This sequential interpretation indicates that the tense of the main clause, here the simple past, is a perfective past tense. In 18 Mary sang while John entered the room. The events are interpreted as overlapping, which indicates that the tense of the main clause, here the past continuous, is not a perfective past tense. From the use of a non perfective tense in the main clause, we can conclude that the events of the main clause and the temporal adverbial clause are overlapping. Similarly, we can conclude the absence of perfectivity from overlapping events.

According to the reasoning above, the use of the Latin imperfective tense *esset* 'was' in 19a, which is of course a non perfective tense, yields an overlapping interpretation of the events in the Latin sentence.

(19) a. Cum esset rex in accubitu suo
when was.*impf* king on throne his
nardus mea dedit odorem suum
oil mine gave.*perf* odour its
b. Tho ther kuning gezas upho sinemo stuole,
when the king sat.*pret* up his chair
tho begunda min salfwerz meer ande meer ze stinchene
then began.*pret* my ointmentmore and more to scent
'When the king was sitting on his throne, my balm began to smell more and more.' (EW 19, 1-3)

According to the overlapping interpretation of the Latin sentence, the balm began to smell while the king was sitting on his throne. The Latin version is translated such that the event structure is preserved, as I noted in the introduction under 2. Because of this, we can assume that the event of the main clause *begunda* 'began' and the event of the temporal adverbial *gezas* 'sat' in 19b should also be interpreted as overlapping. The fact that the events are overlapping leads to the conclusion that the Old Dutch preterit is not perfective.

We have seen that the Old Dutch preterit is neither imperfective nor perfective. Moreover, we have seen that the preterit must have been the aspectually least marked past tense of Old Dutch. From this we can conclude that the Old Dutch preterit is an aspectually unmarked past tense, in line with the traditional view. This can be summarized as follows.

(20) The Old Dutch preterit

	OD pret
aspectually	[I.....F]
temporally	E, R _S

3.3. The Old Dutch present perfect

I will show that the Old Dutch present perfect is a tense which indicates that an event that took place in the past has ended in a present result. I first consider the temporal properties of the Old Dutch present perfect and then its aspectual properties.

I claim that the Old Dutch present perfect has a reference point situated in the present. A testing ground for this hypothesis is once again provided by sentences in which a temporal adverbial is combined with a present temporal adverbial. As we have seen in 3.1, a temporal adverbial commonly refers to R. If R is simultaneous with S, i.e. in the present, we predict that a temporal adverbial will refer to the present as well. This expectation is borne out. The Old Dutch preterit can only combine with present temporal adverbials, as can be seen in (21) and (22).

(21) Ienoch nehavon ich sin niet fundan
until.now not.have I him not found.*part*
'Still, I have not found him.' (EW 48, 5)

(22) Nu ich hine vundan havon
now I him found.*part* have
'Now that I have found him,…' (EW 48, 34)

In 21 the present perfect *havon fundan* 'have found' is combined with the temporal adverbial *ienoch* 'until now', which refers to the moment of speaking. Similarly, in 22 the present perfect *havon fundan* 'have found' is combined with a present temporal adverbial, namely *nu* 'now'. We can thus conclude that the Old Dutch present perfect refers to the present.

Aspectually, the present perfect is a perfective tense that implies a present result. This means that it expresses the fact that a certain event took place prior to

the moment of speaking and that this event necessarily ended in a result that holds for the present. This analysis is supported by two sets of data. First of all, the use of the present perfect is restricted to verbs denoting achievements and accomplishments (Dowty 1979, Vendler 1967). The Latin perfect is translated 16 times by means of a present perfect and in all these cases the verb type has a natural final point. A present perfect of a verb with an arbitrary final point does not occur. All these are translated by means of the Old Dutch preterit. This can be seen in the following table.

(23) The present perfect is restricted to Fn-verbs

	Fn	Fa
preterit	0	18
present perfect	16	0

Table 23 shows that the present perfect is never used to translate a verb type with an arbitrary end point and is restricted to verb types with a natural final point.

As we have seen above, these verb types have an inherent end point, which necessarily ends in a result. From this, we expect that the present perfect is resultative. Indeed, the presence of a result is often made explicit by the context, as in the following examples.

(24) a. Lavi pedes meos quomodo inquinabo illos?
washed.*perf* feet mine how soil them
b. Ich havo mine fuoze gethuagan
I have my feet washed.*part*
scal ich sie auor bewollan?
shall I them over soil.*inf*?
'I have washed my feet, how shall I soil them again?' (EW 78,2-3)

(25) a. Quo declinauit dilectus tuus? et querimus eum tecum
where fled.*perf* lover yours? and seek him you.with
b. Saga uns, wara is thin wino untwichan
say us where is your lover fled
ande wir suochon hin mit thir!
and we seek him with you
'Tell us where your lover fled and we will seek him together with you!' (EW 98,1)

In 24 the past event is the washing of the feet, which ends in clean feet. The context indicates that the result of clean feet still holds for the present, as they can be soiled again. In 25 the past event is the fact that the lover fled, which ends in the absence of the lover. Here again, the context indicates that the result holds at least until the moment of speaking, given that the speaker proposes to look for the fled lover.

Summing up, the present perfect is restricted to Fn-verbs, it expresses an accomplished event and it necessarily implies a result. That present result is linked to R, which is situated in the present. We can thus conclude that the present perfect

expresses a past event with a result in the present. This can be summarized as follows.

(26) The Old Dutch present perfect

	OD pres perf
aspectually	[I.....Fn]
temporally	E _S,R

3.4. Summary

The above discussion can be summarized as follows.

(27) Overview

	Lat perf	OD pret	OD pres perf
aspectually	[I.....F]	[I.....(F)]	[I.....Fn]
temporally	E,R _S	E,R _S	E _S,R

The Latin perfect expresses a perfective past event. It implies that the event took place in the past and that the final point was reached in the past. Also the Old Dutch preterit is a past tense. It is not completely similar to the Latin perfect however, as it is aspectually unmarked. The presence of the final point is grammatically unmarked. The Old Dutch present perfect on the other expresses the final point as the Latin perfect does. However, it differs from the Latin perfect as it has a reference point in the present and is restricted to verb types with a natural final point.

4. The analysis: the Old Dutch preterit vs. the Old Dutch present perfect

We have seen that the preterit expresses a past event and that the present perfect is restricted to verbs with an inherent end point that express a past event with a present result. From this, we can predict the distribution of the Old Dutch preterit and the Old Dutch present perfect as translations of the Latin perfect.

First of all, as the present perfect is restricted to verb types with an inherent end point, we predict that every Latin perfect of a verb type with an arbitrary end point will be translated by the Old Dutch preterit. This expectation is borne out, as can be seen in the following table.

(28) The present perfect is not used to translate Fa-verbs

	Fa
preterit	18
pres perfect	0

In 28 it is again illustrated that every Latin perfect of a verb with an arbitrary end point is translated by means of a preterit and that the present perfect is never used to

translate such Latin perfects. The following sentence exemplifies the Old Dutch translation of verb types with arbitrary final points by means of an Old Dutch preterit.

(29) a. filii matris meae pugnaverunt contra me
sons mother.*gen* mine fought.*perf* against me
b. Miner muoder kind vuchtan wither mer.
my.*gen* mother children fought.*pret* against me
'My mother's children fought me.' (EW 11, 1-3)

In 29, the Latin perfective *pugnaverunt* 'fought' is translated by means of the Old Dutch preterit *vuchtan* 'fought'. The verb *to fight* has an arbitrary end point and thus cannot end in a result. As expected by our analysis, in Old Dutch the preterit is used.

We further predict that each Latin perfect of a verb type with an inherent end point and the possible interpretation of a result in the present will be translated by means of the Old Dutch present perfect. This expectation is also borne out, as is shown in the following example.

(30) a. Lavi pedes meos quomodo inquinabo illos?
washed.*perf* feet mine how soil them
b. Ich havo mine fuoze gethuagan
I have my feet washed.*part*
scal ich sie auor bewollan?
shall I them over soil.*inf*?
'I have washed my feet, how shall I soil them again?' (EW 78,2-3)

In 30, the Latin perfect *lavi* 'I washed' is translated by means of the Old Dutch present perfect *havo gethuagan* 'have washed'. As we have seen above, the verb *to wash* has an inherent end point and the context of this example allows for the interpretation of a present result. Not surprisingly, then, we find a present perfect in the Old Dutch text.

Thirdly, we also predict that verb types with inherent end points used in a context disallowing the interpretation of a present result, cannot be translated by an Old Dutch present perfect. Recall that for this tense to be licit, there has to be a result in the present. When a past event ends in a past result, then, the Old Dutch preterit is once again used. Consider in this respect the following example.

(31) a. Ferculum fecit sibi rex salomon
table made.*perf* himself king Solomon
columnas eius fecit argenteas.
columns its made.*perf* silver
b. Ther cuning Salemon machoda himo selvemo eynan disk
The king Solomon made.*pret* him self one table
Thie suule, thie waran silverin.
The columns those were.*pret* silver
'King Solomon made himself a table. The columns were made of silver.' (EW 52, 1-4)

In 31, the Latin perfective *fecit* 'made, produced' is translated by the Old Dutch preterit *machoda* 'made'. The event of making a table has an inherent end point, i.e.

the moment at which the table is finished. We have seen that when the end point of a verb with an inherent end point is reached, the event necessarily ends in a result. As such, the event of making a table will necessarily end in a result, namely a table. In the case of such an accomplished event, we expect the present perfect. In spite of this, the Old Dutch preterit is used. We thus need to account for this unexpected occurrence of the preterit. This explanation can be found in the further description of the table. The use of the past tense in this description implies that the table no longer exists. The table, which is the result of the event, thus cannot be situated at the present. The fact that the result is not longer present makes the use of the present perfect illicit, as the present perfect has a present reference point to express a present result. Since the context makes the use of the present perfect unsuitable, the preterit is used as a default form.

I have shown that the aspectual unmarkedness of the Old Dutch preterit and the implication of a result in the present of the Old Dutch present perfect account for the following three facts. Firstly, Latin perfects of verb types with an arbitrary end point are translated by means of an Old Dutch preterit. Secondly, Latin perfects of verb types with an inherent end point and a present result are translated by an Old Dutch present perfect. Thirdly, Latin perfects of verb types with an inherent end point but without a present result are translated by an Old Dutch preterit. Put differently, the Old Dutch present perfect is used if there is an implied result in the present, while the preterit is used in all other cases. In table 32 the number of occurrences are given.

(32) Overview

	Fn + present result	Fn without present result	Fa
preterit	0	18	18
pres perf	16	0	0

16 times we have a Latin perfect of a verb type with a natural final point in a context that does not make the interpretation of a present result illicit. All these are translated by means of the Old Dutch present perfect. 18 times occurs a Latin perfect of a verb type with a natural final point in a context that prohibits the interpretation of a present result, as in 31. In these cases, the Old Dutch preterit is used. Another 18 times, the preterit is used to translate Latin perfects of verbs with arbitrary final points.

The distribution between the present perfect and the preterit seems to be an example of Kiparsky's Elsewhere Principle (Kiparsky 1973: 94). This principle states that if both a general rule and a specific rule are applicable in a certain situation, the specific one blocks the application of the general one. This holds for the Old Dutch present perfect and the Old Dutch preterit. The present perfect and the preterit both refer to a past event. The present perfect, however, is more specific in that it also implies that there is a result in the present. The preterit on the other hand is aspectually unmarked and can be used regardless of whether there is a result in the present or not. This means that when both tenses could in principle be used (i.e. when the Latin source refers to a past event with a present result), it is the more specific

present perfect that takes precedence over the underspecified (and thus general) preterit, a classic case of the Elsewhere Principle.

5. Conclusion

Old Dutch has two tenses that express a past event. The first is the preterit, which is an aspectually underspecified past tense. The second is the present perfect. This is a perfective past tense that implies a result in the present. Both tenses can be used as translations for the Latin perfect. As the present perfect is more specific than the preterit, their distribution is determined by Kiparsky's Elsewhere Principle. The present perfect is only used if there is a result in the present. The Old Dutch preterit is used in all other cases.

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POSTVERBAL SUBJECT AGREEMENT IN SVO LANGUAGES

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1. Introduction

There is an interesting asymmetry in agreement relations in a number of languages and to a small extent in Spanish too. The asymmetry in point has been the following: whereas preverbal subjects fully agree with the verb, postverbal subjects exhibit a default subject-verb agreement relation. This is exemplified in (1) below. Furthermore, from a typological point of view there is a another seemingly agreement distinction, that is, whereas agreement relations are sensitive to the Subject-verb order in some languages, languages like Mainstream Italian and Spanish seem to be immune to this configuration, as shown by the contrast between the examples in (1) from Fiorentino and those in (2) from Spanish:

(1) a. *La Maria la è venuta*
The Mary CL3.SG.F Aux-3SG arrived-F
b. *Gl'è venuto la Maria*
CL3.Aux.3Sg arrived the Mary
c. **L' è venuta la Maria*
CL3.SG.F-Aux.3SG arrived-F the Mary
'Mary has arrived' (from Brandi & Cordin 1989)

(2) a. *Los chicos han vuelto*
The boys have.3PL come back
'The boys have come back'
b. *Han/*ha vuelto los chicos*
Have.3PL/3SG come back the boys

This paper deals with the complex distributional facts of agreement relations in Spanish and other Romance languages. Specifically, we investigate why default agreement is forced upon the verb in some cases and is not obligatory in some others. We entertain a number of hypotheses put forward in the agreement literature, such as Mensching & Remberger (2003), Rigau (2001) and Sigurdsson (2004), and discuss their analyses with respect to the data they are able to account for or the data they fail to explain. Also, the alleged typological division between languages that trigger default agreement with postverbal subjects and those that do not becomes an overgeneralization since there are always cases in which the paradigm breaks down

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 137-150.

and exceptions to the type do occur. From here we conclude that default agreement with postverbal subjects is a syntactic multifactored phenomenon. Moreover, along the lines of Chomsky (2001a, b), we show how full agreement with certain postverbal subjects fares better with the more general operations of Merge, Agree, and Value advocated in this framework than with the traditional standard Spec-Head agreement relation or even with the covert feature movement operation for weak features put forward in Chomsky (1993). This paper contains two main bodies of content. The first part consists of a discussion of the hypotheses already available in the literature. The second part provides an analysis of standard Spanish and offers a solution for some puzzling data in Spanish.

2. Evidence in favour of the Spec-Head relation as an instantiation of agreement

Agreement has been characterized in the generative literature as a Spec-Head relation (cf. Chomsky 1991 and much related work). This has been explained under the standard analysis as follows: the preverbal subject occupies the Specifier position of a functional head to which the verb moves at some point of the derivation and agreement is established. Raising to a Spec position correlates with richer inflectional markers on the head than most of alternative relations that involve a H(...)Spec relation. This is crosslinguistically supported by data from Arabic, Bantu languages and a good number of Romance dialects among many others, in which postverbal subjects require a weak agreement relation, as (1) above from Fiorentino illustrates. In (1a) the subject *María* agrees in person, number and gender features with the verb. This type of full agreement relation is impossible when the subject is postverbal as in (1c), and only a 3rd person default agreement is allowed, as shown in (1b).

It is often the case that default agreement triggers the occurrence of an overt expletive in preverbal position in languages like French, as illustrated in (3):

(3) *Il est arrivé des garçons*
EXPL Aux arrived some boys
'Some boys have arrived'

In fact, the occurrence of the expletive *il* supports the Spec-head hypothesis since the verb would be forced to agree with the 3rd person singular expletive occupying the specifier position, and default agreement morphology would automatically follow from this relation.

The same analysis could be applied to the Fiorentino example in (1b) if it were not for the fact that Brandin and Cordin (1989) states that Fiorentino, as opposed to French, is a null subject language and the clitic *gli* is actually licensing an expletive ***pro***. The facts from Trentino also constitute evidence for the positing of an expletive *pro* (cf. Chomsky 1982) which triggers default agreement on the verb, as in (4):

(4) a. PRO *E' venú qualche putela*
Aux.3SG come some girls
'Some girls have come'

b. PRO *L'è vegnuda qualche putela*
Aux.3PL come.3Fem. some girls
'Some girls have come'

The 3rd person plural verbal agreement morphology for the auxiliary *l'è* is disallowed with plural postverbal subjects in Trentino, which under the framework discussed in this section is explained as a mismatch between the 3rd person singular expletive pro in Spec position and plural agreement features on the auxiliary head.

Conceptual developments put forward in Chomsky (2000, 2001a, b), such as the irrelevance of the Spec-head relation or the non-existence of covert feature movement, give way to a revision of the phenomenon of Spec-head agreement as internal Merge and Agree plus pied-piping. The Spec-head hypothesis also suggests that there should be no agreement without movement to a Spec position. In the next section, the power of the Spec-head hypothesis will be tested by confronting cases of full agreement with postverbal subjects.

3. A plausible Spec-Head account of agreement with postverbal subjects

One phenomenon that, to the best of our knowledge, was never given a final satisfactory account was that of full agreement in Head-Spec orders, that is, when the agreeing XP follows the agreeing X. In contrast to the paradigm in (1), a good number of languages such as Mainstream Italian, most dialects of Spanish, and Basque to mention some, obligatorily exhibit full-fledged subject-verb agreement independently of the order of these two elements. This is illustrated in (5):

(5) *Lo* **ha/han*$_i$ *visto los chicos*$_i$
CL3.ACC HAVE3SG/3PL seen the guys.3Pl
'The guys have seen it'

Several attempts have been made in the literature to analyze predicate-subject orders (see Goodall 2001, Contreras 1991, Olarrea 1995). One possible syntactic derivation is that both the subject and the verb have raised to a functional category to meet the Spec-head relation, and subsequently the verb amalgam is fronted to yield the word order in (5). The motivation for the final movement of the verb is usually related to informational requirements, that is, depending on the topic and focus status of the constituents. The verb complex in (5), for instance, is the topic of the sentence, whereas the subject indirectly becomes the focus by being the most embedded element (cf. Cinque 1993).

This reverse predicate-subject word order with full agreement is also found in Spanish small clauses, as exemplified in (6):

(6) *He visto cansados a los chicos*
Have seen tired to the children
'I have seen the children tired'

The word order in (6) is accounted for in Franco (2000) as the result of inner topicalization of the secondary predicate. Again, the head of the secondary predicate concords in phi features with the subject of the small clause, which is in final position. Thus, movement to an intermediate functional position (AGRadj Phrase) to obtain a Spec/head relation for feature checking was assumed in his work.

More complex operations such as remnant movement are required for longer sentences with transitive predicates, as in (7):

(7) *Ayer visitaron a los heridos los médicos*
Yesterday visit.PL to the injured the doctors
'Yesterday the doctors visited the injured'

One could assume that in (7), after the verb *visitaron* 'to visit' and the subject *los médicos* 'the doctors' have met the spec-head relation for feature checking in a functional projection outside the VP (most likely TP), the subject moves up to the specifier of a higher XP for interpretational purposes, for instance, to get focused. Subsequently, all the material below the subject is fronted, as an instance of remnant movement, to a position in the left periphery of the sentence (cf. Rizzi 1997). The position targeted by remnant movement in the left periphery is usually the Spec of a Topic phrase. In this way, the spec-head analysis in combination with a subsequent application of different modes of predicate fronting became the classic straightforward hypothesis, at least to account for the occurrences of full agreement with postverbal subjects illustrated in (6) and (7) above.

However, even though the Spec-head relation does play a role in agreement, it is not sufficient to account for certain cases of full agreement with existential postverbal subjects which will be discussed in the next section.

4. A problem for a Spec-Head configuration account of post-verbal subjects

The distributional facts of postverbal subjects in Spanish provide evidence that show that the subject of a transitive construction is generated in a position outside the VP. It is a well-known fact that Spanish bare nouns must be postverbal (cf. Contreras 1986). This can be reinterpreted as a constraint by which Spanish bare nouns must occur VP internal due to its existential nature (cf. Diesing 1992). On the contrary, definite nouns (DPs) have to be occupy positions outside the VP for them to obtain the presuppositional reading. Interestingly enough, postverbal subjects of transitive constructions cannot be bare nouns, as shown in the paradigm below:

(8) a. **Ya compraron los juguetes padres*
already bought the toys parents
b. *Ya compraron los juguetes los padres*
already bought the toys the parents
'The parents already bought the toys'
c. **Ya compraron padres los juguetes*
already bought parents the toys
d. *Ya compraron los padres los juguetes.*
already bought the parents the toys
'The parents already bought the toys'

One can assume that in (8a) and (8c) the subject *padres* being a bare noun with an existential interpretation must be within the existential closure of the VP. However, if subjects of transitive verbs are generated in spec of the vp the existencial reading enforced by the bare noun is missed in the mapping onto the syntactic structure.

The subject facts in (8a) and (8c) greatly contrast with subjects of unaccusative verbs in (9a) and objects of transitive verbs in (9b):

(9) a. *Vinieron soldados*
Came-3rd.PL soldiers
'Soldiers came'
b. *Compraron juguetes*
Bought-3rd.PL toys
'They bought toys'

In view of the asymmetry between (8a) and (8c) on the one hand and (9a) on the other, it is reasonable to claim that the subject of an unaccusative verb is generated in spec of VP.

Actually, the evidence in (9a) stands against the syntactic derivations via remnant movement put forward in section 2 above as a solution to the Verb-subject orders that exhibit full agreement. If we retake once again Diesing's (1992) analysis of existential interpretation by which existential elements do not move out of the VP since the VP node constitutes the existential closure node we would expect, contrary to the facts, that Spanish existential subjects in unaccusative constructions would not be able to enter in a Spec-head relation in a functional projection, and hence, trigger default agreement.

Additional prima facie counterexamples to this prediction are found in unaccusative constructions in Mainstream Spanish with postverbal indefinite subjects which still exhibit full agreement, as shown in (10) (cf. Mejías-Bikandi 1995):

(10) *Llega*/an$_i$ unos trenes$_i$ al anden*
Arrive-SG/PL several trains to the platform
'Several cars arrive to the platform'

The relevance of (10) is that the only reading available is that in which *unos trenes* only gets the existential interpretation. Along the lines of Mejias-Bikandi's (1995) analysis of postverbal subjects in Spanish, this semantic interpretation can be structurally derived if we assume again that material inside the VP is part of the Nuclear Scope. Thus, in the logical representation, the variable of the indefinite NP in (7) is bound by an abstract existential quantifier. For our purposes, this means that the NP never left the VP in the syntactic derivation and consequently, the hypothetical Spec-head relation requirement at some point of the derivation for full agreement between the verb and the subject was never fulfilled in (10). Still, full agreement is obtained.[1]

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[1] In the subject-verb alternative order Mejías-Bikandi (1995) claims that both the existential and generic (or even presuppositional) readings are available, as exemplified in (i):

(i) *Unos trenes llegan al anden (y otros se quedan)*
several cars arrive (and others stay)
'Several cars arrive (and other stay)'

For the generic reading in (i) the subject is scoped out of the VP to Spec of TP and the generic reading becomes available. Also the verb moves to T to check its features against the subject in a Spec-Head configuration. The existential reading in (i) is obtained under the same derivation plus the LF chain reconstruction of the NP to its trace inside the VP. In fact, Mejías-Bikandi shows that reconstruction is

To top it off, the positing of a silent expletive in the Spec position of a functional category does not account for (10) either since singular agreement is not obtained at all. To conclude this discussion, agreement between the subject and the verb takes place in (9) and (10) independently of the Spec-Head relation.[2]

In sum, the situation at this point is the following: Spec-head relations are not enough to account for the whole scenario of agreement facts, still, the Spec-head relation account fares best when it comes to explaining a large set of data represented in (1), (2), and (8). In the next sections we are going to discuss alternative proposals from the literature and attempt to provide an analysis that reconciles all these accounts and thus explain both, the well-behaved agreement with preverbal subjects as well as the seemingly problematic facts of verb agreement with certain postverbal subjects, with an emphasis on the Spanish data.

5. Quirky subjects, EPP checking, and default agreement

There is a whole wealth of data from a large number of diverse languages in which default agreement with postverbal Nominatives occurs when there is a Dative element (or a locative sometimes) in preverbal position or close to the verb. Ribargoçan Catalan, Aranese Occitan (cf. Rigau 2001) and Old Spanish (cf. Mensching & Remberger 2003) to mention some provide good illustrations of this phenomenon:

(11) *Mos caleva istes cadires*
to-us.Dat was necessary these chairs Ribargorçan Catalan
'We need these chairs' (from Rigau 2001)

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blocked and therefore, only the generic reading is obtained when there is a negative adverb intervening, as in (ii) below (example 4 in Mejías-Bikandi 1995):

(ii) *Un hombre apenas lava platos*
A man(generic/*existential) hardly (ever) washes dishes

[2] A fashionable solution to the word order and the licensing of agreement features in non Spec-Head configuration in the generative literature of the 90s was proposed along the lines of Chomsky's (1993, 1995) claim on the existence of covert feature movement. Under this view, the checking of agreement features can be done via covert movement of the features which adjoin to the checking head at the LF level (see also Ura 1996). The asymmetry between overt and covert movement was in principle geared on the strength of features. That is, overt movement was triggered by strong features of the attracting head since strong features had to be eliminated at Spell Out, that is, before the derivation went to PF, otherwise the derivation would crash. Weak features on the contrary could be eliminated at LF after Spell Out, therefore, no overt movement takes places and the principle of Procrastinate posited in Chomsky (1993), that is, do not move anything until it is necessary, is observed. The strong versus weak distinction has been reanalyzed later on as non-interpretable versus interpretable features in Chomsky (1995). Agreement features on the head, structural Case, and the EPP feature on Tense are standard non-interpretable features.

Going back to our empirical problem in (10), agreement would have be obtained, in the light of this approach, by covert feature movement of the phi features of the subject to the relevant functional head, that is, T or AGRs. The lexical material of the subject, on the other hand, stays in situ within the VP and the existential interpretation becomes available. Therefore, we must presume that verb-subject agreement features in (7) and (10) are weak or uninterpretable for that matter. This solution works beautifully for the paradigm from Fiorentino in (1). However, since agreement is rich in (10), it is hard to understand how the agreement features in (10) are any "weaker" than those in (2a). Given the data in (2a) and (10) it seems that the categorization strong versus weak features might just be a value assigned as an ad hoc diacritic to indicate movement. Most importantly, there is good evidence from natural languages that rich inflectional morphology and strong features as triggers of movement do not always walk hand in hand.

(12) *Mos cau aguestes cagires*
to-us is necessary these chairs
'We need these chairs'
Arenese Occitan
(from Rigau 2001)

(13) *Les uino muitos males*
to-them.Dat came many evils
'Many evils came upon them'
Old Spanish
(from Mensching & Remember 2003)

None of the examples from (11) to (13) contain a subject expletive or a subject clitic in contrast to the French example in (3) or the examples from Fiorentino and Trentino in (1) and (4). However, it seems that dative clitic has the same effect as the expletive/subject clitic on triggering default agreement on the verb. The interference of the dative for agreement is somehow reminiscent of Dative intervention Effects in Boeckx (2000), but the two phenomena are far apart since Dative intervention in Icelandic affects mostly to certain person combinations of Dative and Nominative pronouns. Hence, it has been analyzed in the literature as a Person Case Constraint related type of phenomena, as in Sigurdsson (2004)

In Franco and Huidobro (2003) we suggest that the dative clitic by being higher than the Nominative DP checks the EPP feature of T. At the same time, this checking operation sends all the agreement features to Spell Out before any further agreement checking with the Nominative DP could take place. However, Spanish and Italian stand out as a strong exception to this hypothesis since full agreement obtains in inversion predicates.

In other words, Agree probes into a VP internal argument in these two languages, as shown in (14):

(14) a. *A mí me gustan las lentejas*
To me cl.dat like the lentils
'I like lentils'
b. *Pro Me encantan las lentejas*
to me cl.dat love the lentils
'I love lentils'

Even if the dative argument in (14) checks the EPP feature, the VP internal nominative object is still able to fully agree with the verb. We will address this issue in subsequent sections in our analysis.

6. The Number Feature Hypothesis

Mensching and Remberger (2003), among others, have realized that actually it is the number feature what is lost when the default agreement surfaces: "the essence of the construction is the lack of agreement in Number" (Mensching and Remberger (2003: 12). This observation indeed has been the key to a number of proposals on default agreement based on the nature of the number feature. Thus, Mensching and Remberger (2003) advocate the existence of defective T without the feature number, which can be parametrized across languages. Sigurdsson (2004) claims two different functional phrases for Person feature and Number feature projected in this order,

which would allow him to explain the lack of agreement with nominative objects when there is a quirky dative subject occupying Spec of Number Phrase. Furthermore, Rigau (2001) states that in Ribagorçan Catalan default agreement is obtained because the number feature in T is locative marked in the lexicon and is able to agree with the oblique clitic.

However, most Romance languages that exhibit the preverbal versus postverbal asymmetry with respect to agreement have one property in common, that is, default agreement cannot occur with personal pronouns. This was early mentioned in Brandi and Cordin (1989) with respect to the distribution of default agreement in Fiorentino and Trentino, as in (15) below. This constrast between nominal and pronominal postverbal subjects is replicated by agreement relations in Ribargoçan Catalan (cf. Rigau 2001) or lower registers of colloquial Spanish among many languages.[3]

(15) a. *tu vieni te*
CL2nd come you-ACC
'You come'
b. *e vien loro*
CL3rd come.PL they
'They come'

The problem that the contrast in (15) poses for the Number Feature Hypothesis is that if T is specified somehow with respect to the feature number, thus, allowing default agreement, still, how is it possible that the presence of a pronominal argument overrides this feature number specification on T and turns this feature into a variable valued by this pronominal argument? Moreover, it is not always the case that default agreement only neutralizes number agreement. There are some languages for instance Fiorentino itself which also neutralizes the feature gender. We are not claiming here that the previous analyses presented so far are not able to handle these cases, however, their stipulation will be double when confronting these cases in which gender agreement is also lost. Finally, the optionality of full agreement with postverbal nominal subjects in Colloquial Portuguese and Colloquial Spanish would remain a mystery under the Number Feature Hypothesis.

7. The analysis

Chomsky (2001a, b) dispenses with Spec-Head relations, and alternatively attempts to capture all agreement relations under a more general relation, which he calls Agree. Agree is an agreement relation between two elements, the Probe and the Goal, under which the process of feature checking takes place. Agree can also be a

[3] The asymmetries in the richness of agreement between pronouns and lexical NPs have been attested at large in the Romance linguistics literature (cf. Franco 1993, Suñer 1999). The phenomenon has to do with the nature of pronouns as lexicalized phi-features and not with the fact that NPs are third person, otherwise (15b) would be ungrammatical. One can hypothesize that the subject pronouns in (i) have a whole uninterpretable set of phi features and work as a probe that have to match and agree with a goal T. Again, if we assume that all personal pronouns are non existential referential elements and hence, have to be scoped out of the VP, the full agreement relation is borne out from our previous analysis based on the internal Merge (Spec-Head) of referential postverbal subjects.

long distance agreement relation under c-command. The evidence from rich morphology (agreement) in favour of a Spec-head relation is reanalyzed by Chomsky (2001b) in a new light. That is, morphological richness is a reflex of the satisfaction of the EPP feature by internal Merge. Furthermore, Chomsky (2001b: 11) states that "if there is no SPEC-head relation, then the EPP-feature Occ cannot be satisfied by Merge alone. It follows that internal Merge requires Agree. Therefore, Move = Agree + Pied + piping + Merge" (p. 11)".

Assuming the mechanisms outlined above, our next goal is to reanalyze the subject-verb agreement paradigms exemplified so far. The strength of agreement with preverbal subjects can be understood as a closer relation since the uninterpretable EPP feature of T (C-T unit in Chomsky's terms) has to be checked by internal Merge and, relevantly, internal Merge and Agree are considered simultaneous operations (Chomsky 2001b: 13). The probe T will make available a position for Merge (i.e. SPEC) with the nominative subject goal. In other words, the Spec-head configuration is a by product of internal Merge.

As regards agreement with VP internal postverbal subjects neither the paradigms nor the contexts are uniform, as we have seen in the examples above. Let us see first how a postverbal existential subject can fully agree with the verb in Spanish, as in (16):

(16) *No *ha/han$_i$ venido chicos$_i$ este mes*
No **have3sg/3pl** come boys.3Pl this month
'There have not arrived boys this month'

In (16) under the operation Agree the phi features of the Probe T search for the Goal that can Match those features and value them for subsequent deletion. In this case, *chicos* constitutes a complete goal which is paired with the probe T by Agree under c-command minimizing Search. It is also understood that Case and agreement features are checked under the same operation and similar conditions. The obvious question that comes next is to see what happens to the EPP feature of T, or to put it differently, what are the reasons why the nominative subject remains in situ in (16). The answer is the same for both issues. Along the lines of Chomsky (2001b: 10), Internal Merge is motivated by scopal and discourse related properties and by the same token, a head H has OCC (EPP) "only if that yields new scopal or discourse related properties" (Chomsky 2001: 10). Usually, preverbal subjects are topics, thus, we can assume that there was not any Topic feature in the numeration in (16) to be satisfied. Alternatively, one could propose that the strength of the inflection on the verb is enough to check the EPP on a head to head relation.

The set of data in (1b) and (3) however exemplifies instances of obligatory default agreement with postverbal subjects in Fiorentino and French, which drastically contrasts with the Spanish sentences. The Fiorentino data does not pose much of a problem if we assume that there is a null expletive in subject position that bears default agreement. In fact, in French, a Romance related language, this hypothetical expletive surfaces overtly, as in (3) repeated here as (17) for convenience:

(17) *Il est arrivé des garçons*
EXPL Aux arrive some boys
'Some boys have arrived'

In (17), the verb does not agree with the plural NP in sentence final position, but with the third person singular expletive *il*. In this regard, Fiorentino is not very different from French. The rich agreement paradigm in this Italian dialect allows the expletive to be a null *pro* according to Brandi and Cordin or the expletive surfaces as a default clitic, i.e., *gli* according to Mensching and Remberger (2003). The derivation would be as follows: (i) the expletive in accordance to Chomsky (2001a: 12) has the uninterpretable feature [person]. Under local Match, the expletive agrees with T and deletes the EPP feature of T and its own [person] feature. Furthermore, it might well be the case that when T and the expletive paired, all the agreement features went directly to Spell Out rendering those features invisible for the next probe-goal relation between the T and the postverbal NP goal to satisfy the checking of Case features by a nominative element. Now considering that the same constructions as in the Fiorentino construction in (1b) and the French construction in (17) would exhibit plural agreement in Spanish, we conclude that the occurrence of an overt or covert expletive account is not a possibility in Spanish. Actually, this property of Spanish rather than being ad hoc stipulation is borne out from the pro-drop parameter.

The second context in which default agreement takes place is that of (11) to (13), in which a dative clitic precedes the verb and the subject follows the verb. Our account of default agreement for these facts ultimately goes along the lines of that of default agreement with expletives in Spec of TP. That is, the Dative Argument projects higher than the Nominative one and this Dative DP undergoes a hibrid clitic movement, first as an XP move to Spec of TP and then cliticization onto the verbal amalgam in T. Similarly, when the dative clitic merges with TP, the EPP feature of T is checked and sent along with the agreement features of T to Spell-Out.

How does the syntax of Spanish (see also Central Catalan, Standard Italian) manage to obtain full agreement with the postverbal nominative argument in (14)? We claim that the answer to this puzzle lies in the status of clitics across languages. If we adopt Franco (1993) proposal for Spanish object clitics in which clitics are functional heads that project an agreement phrase AGRoP below TP, the conclusion is that the Spanish dative clitic will never be part of an internal merging operation of movement to Spec of TP in which all agreement features of T are discharged. On the other hand, the Spanish verb picks up the agreement dative clitic head on its way to T forming a complex inflected verbal amalgam under T. Since the dative clitic is an agreement head probe there has to be a goal to match its features with. This goal can be instantiated by internal merging in the form of a dative DP or in the form of a pro in Spec of TP. In either case the clitic *me* checks both, its own agreement features as well as the EPP of T by being in a head to head relation with T. At this point, the agreement features of the Goal in Spec of TP are checked off. Thus, the agreement features of T remain initially unchecked until the operation Agree subsequently comes into play under c-command and probes for the Phi-features of the postverbal nominative argument.

8. Two apparent problems posed by Spanish.

In the previous section, we have claimed that there are no covert expletives available in constructions with postverbal subjects in Spanish and consequently there is

no default agreement. However, There are two structures in Spanish and most languages in which the occurrence of an expletive is standardly assumed, that is, existential and weather verb constructions:

(18) *Hay cinco hombres*
there are five men
'There are five men'

(19) *Llueve*
rain
'It rains'

We would like to show that both constructions are quite different and at the same time they are similar under the hypothesis that none of them involve an expletive subject. In the existential construction in (18) there is no expletive *pro,* but an etymologically locative clitic *y* (cf. Old Spanish *hi/hy*, the 'h' is not pronounced), which merges with T and later on is cliticized onto the third person of the verb *haber*, i.e., *ha*. In the derivation, the clitic, before it attached to the verbal head entering in a head to head relation, would have merged with T in which the EPP would be satisfied and the phi features neutralized. It would be hard to show that there is any locative clitic in present day Spanish, however, locative clitics and locative pronouns are responsible for lack of agreement in other Romance languages and the locative account outlined above explains reasonably well what might have happened in the history of Spanish, even though nowadays *hay* could be considered a relic-form.

In any event, our prediction is that some cases of full agreement should surface in the prototypical expletive constructions. Thus, if there is no element that internally merges with T the operation Agree will apply and the agreement features of T will be matched with a c-commanded Goal, which is indeed the case that spoken Spanish exhibits with other tenses in the existential construction:

(20) *Han habido varios fallos*
have.pl had some mistakes
'There have been some mistakes'

(21) *Habrían unas trescientas personas*
would have about three hundred people
'There could be about three hundred people'

(22) **Hayan hombres de todos sitios*
there were men from every where

For the construction with weather verbs such as that in (19) with llueve, the verbal inflection is strong enough either to check the EPP or to license a *pro* with the features 3rd person singular for the same purpose. Again, full agreement occurs in the spoken language, as shown in (23):

(23) *Llovieron chuzos de punta*
rain.pl pieces of ice pointing down
'It rained cats and dogs'

Finally, there is another construction in Spanish that occasionally exhibits default agreement. The construction in question is a mixture of those we have seen above, that is, it is an inversion predicate and the verbs are of an existential nature, also called deontic existentials in Rigau (2001). This is illustrated in (24):

(24) *Me falta(n) las cartas de recomendación.*
CL.1st-DAT. lack-**sg.** the letters of recommendation
'I'm missing the recommendation letters'
'I still have to do the letters of recommendation'

In this paper we contend that the sentence in (24) is not a counterexample to full agreement in inversion predicates in Spanish (cf. example 14). One property that sets example (24) apart from those sentences with default agreement from other Romance languages discussed above is that agreement is optional.[4] Furthermore, the sentence has an ambiguous interpretation as captured by the English glosses. The first intepretation is uniquely existential whereas the second interpretation is deontic existential. Under the second interpretation, (24) can be paraphrased as:

(25) *Me falta hacer las cartas de recomendación*
To me.cl.dat lack do the letters of recommendation
'I still have to do the letters of recommendation"

Under the second reading (deontic), example (24) is derived from (25) after deletion of an infinitival verb has applied. Now the picture is more clear. Full agreement occurs when the verb agrees with the DP Nominative. On the contrary, 3rd person singular agreement occurs when the verb agrees with a non finite clause.

Therefore, there is no lack of agreement or optionality of agreement for that matter in Spanish inversion predicates. Default agreement is only an illusion as far as the construction in (24) is concerned. Each different occurrence of agreement correlates with one specific structure and one particular meaning. As a piece of evidence only those inversion predicates that can take nonfinite clauses can show lack of agreement with the Nominative DP:

(26) a. * *Me sobra (hacer) los papeles*
me.cl.dat have enough (do) the papers
b. *Me toca (hacer) los peores papeles*
me.cl.dat touch (do) the worst roles
'It is (always) my turn to play the worst roles'

Moreover, if we align full agreement with the first existential deontic interpretation and 3rd person agreement with the second deontic only interpretation we could safely state that agreement works as a disambiguator in this type of inversion predicates shown in (24). Further evidence that full agreement is related to core existential interpretations can be seen in (27):

(27) *Me falta*/an llaves*
To me.cl.dat miss.sg/pl keys
'I'm missing the keys'

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[4] Notice that the pronominal vs nominal contrast in terms of agreement also holds in Spanish inversion predicates, as shown by the contrast between (24) above and (i) below:

(i) a. *Me faltan/*a_i $ellos_i$*
CL.1st-DAT lack-3 pl/sg they
'I'm missing them'

b. Me faltas/a_i tu_i*
CL.1st-DAT lack-2sg/3sg you
'I'm missing you'

The sentence in (27), given that bare nouns can only have existential readings in Spanish due to its position within the VP (cf. section 3), can only mean that 'some keys are missing or lost', and crucially, full agreement is required, thus, confirming our hypothesis, under which the existential interpretation in Spanish inversion predicates correlates with full agreement.[5]

9. Conclusion

The strength of agreement reflects the history of the syntatic derivation as well as the specific position of elements. Two constructions of the type V NP may have an identical word order at first sight, however, the positions those elements occupy and the derivation in the syntax could have been completely different in each utterance. In most cases, agreement is geared on the operation of internal merging provided there is no interference by an intervening element. In the remaining cases, it is the operation Agree under c-command that grants the matching of uninterpretable features that were left unchecked. Incidentally, default agreement with postverbal subjects seems to be a phenomenon typical of SVO languages. In contrast, languages with a canonical VSO order mostly hold full agreement relations between the verb and the subject that follows.

Acknowledgements

This research has been partially supported by the Basque Government Research Project Grammar and Linguistic Variation - HM-2009-1-1 the UPV/EHU unit, UFI11/14, and by the Basque Government Research Grant for Consolidated Research Groups at Basque universities Ref. GIC07/144-IT-210-07. We are also grateful to Javier Ormazabal and Milan Rezac for their comments. An early version of this paper was presented at the 8th Hispanic Linguistics Symposium and the 7th Conference on the Acquisition of Spanish and Portuguese as First and Second Languages at the University of Minnesota in October 16, 2004. We are grateful to this audience for the feedback. All errors remain ours.

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[5] Still, the facts in (27) raise the question of why the deontic intepretation is not obtained. To put it differently, one wonders why (27) cannot be derived from (i) below under deletion of the non-finite verb:

(i) *?Me falta hacer llaves*
to me.clo.dat do keys

One possibility that comes to mind is that the bare noun *llaves* incorporates onto the verb *hacer*. Once the incorporation of *llaves* has taken place it would be impossible to delete of one part of the V + N unit.

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LARYNGEALS AND PROSODY IN PANOAN

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1. Introduction[1]

Panoan comprises 34 languages currently or formerly spoken in Peru, Bolivia and Brazil (Amarante Ribeiro 2006; cf. Loos 1999, Lewis 2009). Panoan languages have been of interest in recent literature because they are ergative (Loos 1973, Valenzuela 2003, Lanes 2005) and because of several segmental and syllabic alternations that appear to be foot-sensitive in the absence of or in conflict with stress (see for example González 2003 and Elías-Ulloa 2006). Many of these alternations involve laryngeal consonants. For example, [h] is epenthesized rhythmically in Huariapano (Parker 1994, 1998), and /ʔ/ undergoes foot-sensitive deletion or coalescence in Capanahua (Loos 1969, Safir 1979, González 2002, Elías-Ulloa 2006).

The fact that glottal consonants are deployed in foot-sensitive alternations in Capanahua and Huariapano begs the question of whether other Panoan languages have similar phenomena. This paper attempts to answer this question by surveying the prosodic functions of glottal consonants [h, ʔ] in 27 Panoan languages. It builds on Gonzalez (under review), a study of the phonemic and phonetic status of glottals in 20 of these languages. These detailed surveys are made possible through a recent increase in documentary work in Panoan, mostly by Brazilian researchers, as well as a surge in acoustic, comparative and historical studies of this language family.

The main findings of the present study are that while rhythmic, exclusively foot-sensitive phenomena involving laryngeals is only reported for Huariapano and Capanahua, stress-conditioned insertion of [ʔ] is attested in four other languages: Katukina, Kaxinawá, Sharanawa and Saynáwa. Additionally, it is shown that in a large number of Panoan languages surveyed, laryngeals —specially [ʔ]— act as boundary markers for various prosodic categories, including morphemes, words,

[1] This work was partially supported by a Small Grant from the Council on Research and Creativity (CRC) at Florida State University, which allowed the author to conduct library research in Brazil in Summer 2011. The author thanks José Elías Ulloa for kindly sharing his work on Shipibo and Capanahua and Rogério Vicente Ferreira for answering questions about Matis. Special thanks to Angel Corbera Mori, Eclenir da Silva, Filomena Sndalo and Maria Bernardete Abaurre at UNICAMP; Bruna Franchetto, Marília Facó Soares, and the librarian Cristina Araujo Coimbra at UFRJ; and Mara Santos at the Museu do Indio in Rio de Janeiro for their generous hospitality and their invaluable help in accessing, obtaining and discussing Panoan sources.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 151-168.

phrases, sentences and utterances. Because the glottal stop is rarely phonemic in Panoan, this paper argues that the range of prosodic functions that it can take is connected to its phonological status.

The structure of this paper is as follows. Section 2 provides a brief phonological sketch on the Panoan languages surveyed in this study. Section 3 discusses in detail the prosodic functions of glottals attested in the languages in the survey, and section 4 summarizes the generalizations that emerge. Section 5 provides a preliminary analysis for some of the patterns discussed under Optimality Theory. Finally, section 6 is the conclusion.

2. Panoan languages: A brief introduction

Panoan languages have been dubbed one of the least studied language families in South America (Erikson 1994). However, the last decades have seen an increase in their documentation efforts, especially for Panoan languages spoken in Brazil. These include acoustic investigation (Lanes 2000, 2005, Elías-Ulloa 2010), comparative approaches (Lanes 2000, 2005, Cruvinel 2009, Silva 2010), and phonological analyses in Optimality Theory (Costa 2000, Dorigo 2001).

Panoan languages tend to have between 11 and 16 consonant phonemes. These typically include voiceless stops /p, t, k/, affricates /ts, tʃ/, fricatives /s, h/ and /ʃ/ or /ʂ/, nasals /m, n/, approximants /w, j/, and rhotic /ɾ/ (Lanes 2005: 196-198). The four-vowel system /a, i, ɨ, u/ appears to be the most common vowel inventory (Lanes 2005: 94-95). The preferred syllable template is CV, although V, VC and CVC syllable structures are well-attested. Codas are usually restricted to sibilants, glottals and nasals; the latter are frequently realized as nasalization on the previous vowel. Some Panoan languages appear to have a minimal two-syllable restriction for words. Stress is typically assigned in a two-syllable window initially or finally depending on the language. Foot structure varies between iambic and trochaic, sometimes within the same language, as in Matses (Dorigo 2001), Marubo (Costa 2000) and Shipibo (Elías-Ulloa 2006).

Table 1 lists the 27 Panoan languages included in the present survey. This table provides information on whether glottal consonants occur phonemically / / or phonetically [ ] and a brief summary of their distribution. The Panoan branch and location for each language is given according to the information in Lewis (2009) and the main references consulted for this investigation.

Table 1

Distribution of glottals in the Panoan languages surveyed[2]

Language	Glottals	Distribution	Branch and location	References
Matís	[ʔ] (/k/)	Word-final	Northern Brazil	Ferreira 2001, 2008, pc
Matsés (Mayoruna)	[ʔ] (/k/) [ʔ]	Syllable-final Morpheme-final	Northern, Peru Northern, Brazil	Fleck 2003 Dorigo 2001
Shipibo- Conibo	/h/ /ʔ/	Syllable-initial (mostly) Phrase-initial, final; #_#	North-Central Peru	Elías-Ulloa 2006, 2010; Valenzuela et al. 2001
Capanahua	/h/ [h] /s/ /ʔ/ [ʔ] [ʔ] /tʃ/	Word-initial Word-medial coda Syllable initial, final + _ +; other contexts Word-medial coda	North-Central Peru	Loos 1969, 1986, Loos and Loos 1998, Elías-Ulloa 2006, 2009
Marubo	[ʔ]	Boundary marker	North-Central, Brazil	Costa 1992, 2000
Sharanawa (Marinahua)	/h/ [ʔ]	Syllable-initial (rare) #_#; syllable-final	South-Central Peru, Brazil	Pike and Scott 1962, Shell 2008
Yaminahua	[ʔ] (/k/)[3] [ʔ] /h/	Syllable-initial Word-initial, word-final Word-initial (one word)	South-Central Peru, Bolivia, Brazil	Eakin 1991, Faust and Loos 2002, Loos 2006, Lanes 2000, 2005
Yawanawa	/h/ [h] /x/ [ʔ]	Syllable-initial Word-medial coda Syllable-initial Syllable/word final	South-Central Brazil	Paula 2004[4]
Amahuaca	/h/ /ʔ/ [ʔ]	Morpheme/root initial Syllable-initial, final Word-final	South-Central Peru, Brazil	Osborn 1948, Russell 2008 Sparing-Chávez 1998
Poyanáwa	/h/ [ʔ]	Syllable initial and final Not reported	South-Central, Brazil	Paula 1992
Nukini	/h/	Syllable-initial, final	South-Central, Brazil	Aguiar 2004
Mastanawa	/ʔ/ /h/	Syllable-initial Word-final (rare) Syllable-initial (rare)	South-Central, Brazil	Silva 2010
Tuxinawa	/ʔ/	Syllable-initial	South-Central, Brazil (extinct)	Silva 2010

[2] The symbol # indicates word boundaries. + stands for morpheme boundaries.
[3] Cruvinel (2009: 14) considers that /ʔ/ is a phoneme in Yaminahua.
[4] But see Lanes (2005: 196), who lists /x/ instead of /h/ for Yawanawa.

Language	Glottals	Distribution	Branch and location	References
Xitonawa	/h/ /ʔ/	Syllable/word-initial Syllable-initial, final	South-Central;Brazil	Silva 2010
Yoranawa (Parquenahua, Nahua, Yora)	/h/	Word-initial	South-Central, Brazil	Cruvinel 2009
Chácobo	/h/ /ʔ/	Word-initial Syllable-initial; word-final	Southern, Bolivia	Prost 1965, 1967, Shell 2008
Katukína	/h/ [ʔ]	Mostly word-initial Word-final	South-Eastern, Brazil	Aguiar 1994[5]
Camannawa	/ʔ/	Not reported	South-Eastern, Brazil	Loos 1999
Kaxinawá	/h/ [ʔ]	Word-initial (mostly) Syllable-final	South-Eastern Peru, Brazil	Camargo 1992, Shell 2008
Kaxararí	/h/ [ʔ]	Syllable-initial Word final; V_V	Eastern, Brazil	Sousa 2004[6]
Cashibo-Cacataibo	/ʔ/	Word-initial	Western, Peru	Shell 1950, 1987, Wistrand Robison 1978
Shanenawa	/h/ [ʔ]	Syllable-initial Word-final; #_#	Unclassified Brazil	Cândido 1998, 2004
Huariapano	/h/ [h] [ʔ]	Word-initial Word medial coda Word-final	Unclassified, Peru; extinct	Parker 1994, 1998
Arara	/h/ [h] ~ [v]	Syllable initial Coda (one morpheme) Syllable-initially (rare)	Unclassified, Brazil	Cunha 1993
Saynáwa	/h/ [h] /s/ [ʔ]	Word-initial Syllable final [o_t] Word/utterance final	Unclassified, Brazil	Cavalcanti Couto 2010
Pacanawa	/h/ /ʔ/	Not reported Not reported	Unclassified, extinct	Loos 1999
Yoranawa (Parquenahua, Nahua, Yora)	/h/	Word-initial	South-Central, Brazil	Cruvinel 2009

The information available for Panoan, and in particular, for glottal consonants in each of its languages varies widely. However, the following generalizations apply

[5] Barros (1987: 41-43) reports that [ʔ] can occur word-initially in isolated words and as onset and coda.

[6] But see Lanes (2005: 196), who lists /x/ instead of /h/ for Kaxarari.

from the sources consulted. Most Panoan languages (21 out of 27 surveyed) have a phonemic /h/ in their inventory, but significantly fewer (10 out of 27 surveyed) have a phonemic glottal stop. In general, when glottals are phonemic in Panoan they rarely occur in coda position. Below are examples from Yawanawa (1), where /h/ can occur as an onset (1a) and as a coda word-medially (1b) (Paula 2004: 61), and Cashibo-Cacataibo (2), where /ʔ/ occurs contrastively word-initially (Shell 1950; Wistrand Robinson 1978).

(1) /h/ in Yawanawá (Paula 2004: 73, 79, 84)[7]
a. /*h*u/ 'hair' /mɨ.*h*i/ 'hand'
b. /tsɨ*h*.ʃɨ.pa/ 'black' /ka.ka*h*.ma/ 'doesn't want to go'

(2) /ʔ/ in Cashibo-Cacataibo (Shell 1950: 198-201)
a. [*ʔ*i.no] 'wildcat' vs. [i.tsi.bi] 'kind of tree'
b. [*ʔ*o.to.tum.bo] 'kind of fruit' vs. [o.mõ] 'kind of frog'

Several Panoan languages have laryngeals as allophones of other consonants. For example, glottal stops are allophones of /k/ in Peruvian Matses (Fleck 2003), Yaminahua (Eakin 1991, Faust and Loos 2002) and possibly Matis (Ferreira p.c.). [ʔ] is also an allophone of /tʃ/ in Capanahua (Loos 1969). Reports for Amahuaca suggest that the glottal stop alternates with [k] and [n] in specific morpho-phonological contexts (Russell 2008, Sparing-Chávez 1998). Glottal fricatives are allophones of sibilants in Capanahua (Loos 1969, Elías-Ulloa 2009) and Saynáwa (Cavalcanti Couto 2010) and of velar /x/ in Yawanawá (Lanes 2000, 2005). Although contrastive, /h/ is reported to alternate with /v/ in Arara (Cunha 1993). For a more extensive survey of allophonic variation involving glottals in Panoan, see González (under review).

Laryngeals are also involved in an extensive range of prosodic functions in Panoan. They enter in rhythmic (foot-based) alternations in Huariapano and Capanahua (section 3.1) and quantity-sensitivity to stress in Katukina, Shanenawa, Saynáwa and Kaxinawá (section 3.2). Additionally, they often demarcate morphological and syntactic boundaries from morphemes to sentences (section 3.3) and may also indicate emphasis (section 3.4). A detailed consideration of each of these functions follows.

3. Prosodic distribution of glottals in Panoan

3.1. Rhythmic alternations in Panoan

Huariapano (unclassified; extinct) and Capanahua (North-Central Panoan) have well-studied rhythmic, foot-sensitive phenomena involving glottals in coda position. Huariapano has a phonemic /h/, as evidenced by the minimal pair [hi.wi] 'branch, stick' and [i.wi] 'stingray' (Parker 1994: 96). [h] also epenthesizes word internally in coda preceding voiceless consonants (cf. 3a with 3b, c). Stress does not condition [h]

[7] The data in this paper is presented following the conventions of the IPA unless otherwise noted. Syllable boundaries, and often, stress marks are included for convenience, following syllabification and stress for each language.

epenthesis except in the first syllable of the word, where [h] epenthesis cannot co-occur with main stress (cf. 3b, c with 3d) (Parker 1994, 1998).

(3) Coda [h] epenthesis in Huariapano (Parker 1994: 102, 108; 1998: 26, 28)

a.	[ka. moʂ]	'species of venomous snake'	*[ka*h*. moʂ]
b.	[ˌpi*h*.ka. ti*h*.kaj̃]	'they ate'	
c.	[na*h*. kaʔ]	'manioc beer'	
d.	[na.kaʔ]	'flea'	*[na*h*.kaʔ]
e.	[ˌiʃ.to. ki. raŋ.ki]	'(it) came running'ˋ	*[ˌiʃ.to*h*.ki. raŋ.ki]

Descriptively, [h] is inserted in odd-numbered syllables (cf. 3b-d with 3e; Parker 1994). [h] epenthesis occurs left-to-right in the word in a trochaic pattern similar to the main pattern of secondary stress in Huariapano; this is why it does not occur in stressed word-initial syllables (Gonzalez 2003; cf. Parker 1994, 1998). From a metrical point of view, [h] epenthesis occurs in foot heads and serves a rhythmic purpose. This phenomenon appears to be a unique phenomenon in Panoan, especially since [h] is rarely involved in prosodic alternations in this language family. Intriguingly, [h] epenthesis in Huariapano shows many similarities to coda [h] insertion in Urarina (González 2011), an Amazonian isolate located close to the area where Huariapano was spoken (Olawsky 2006). For further examples and theoretical analysis, see Parker (1994, 1998), and González (2003, 2011).

Related rhythmic phenomena involving the glottal stop are attested in Capanahua, which has both /h, ʔ/ as phonemes and lacks secondary stress (Loos 1969). In this language, [ʔ] is deleted in coda of even-numbered syllables (cf. 4a, b with 4c; Loos 1969: 183-4). Elías-Ulloa (2009: 1-11) reports that /ʔ/ occurs exclusively in 'stressed' syllables, i.e., in head syllables in the metrical structure. In coda of unstressed initial syllables, /ʔ/ occurs variably as a glottal stop or creakiness on the preceding vowel (4d). In 'unstressed' syllables, i.e. in non-head syllables in the metrical structure, /ʔ/ is always realized as creakiness of the preceding vowel (4e).

(4) [ʔ] deletion in Capanahua (from Elías Ulloa 2009: 11, 14)

a.	/taʔ/	[taʔ]	*declarative modal*
b.	/ʔonan-iʔ-ki/	['ʔo.na.niʔ.ki]	'He knows'
c.	/βitʃ-iʔ/	['βi.tʃi]	'I grab'
d.	[baʔ.'kiʃ] ~	[bạ.'kiʃ]	'tomorrow, yesterday'
e.	[('tuʔ.ku.) (-ˌma. –tạ.) -ki]		'it's not a frog'

A related phenomenon in Capanahua is onset-to coda metathesis of [ʔ] (Loos 1986: 299). An onset glottal stop in a third syllable of a word metathesizes to the coda of the same syllable, glottalizing the vowel over which it passes (5a). If there is already a coda glottal stop in this syllable, the onset deletes (5b) (Loos and Loos 1998: 21, 22).

(5) [ʔ] metathesis in Capanahua (Loos 1986: 299)

a)	/kɯtsin-ʔino/	(colored-tiger)	[ke.tsĩ.ĩʔ.no)]	'tigrillo'
b)	/bana-ʔaʔ-ki/	(plant-past validational)	[ba.na.aʔ.ki]	'I planted'

The phenomena exemplified in (4, 5) is also conditioned by foot-structure. In particular, the non-heads of trochaic feet are made lighter or weaker by [ʔ] deletion, while [ʔ] metathesis makes the head of a trochaic foot stronger (González 2003). La-

ryngeal rhythmic phenomena in Capanahua signal foot structure in the absence of stress, and in conflict with it in Huariapano. This is rare typologically, since stress and foot tend to work together in languages (González 2003 and references therein).

Although the remaining Panoan languages surveyed do not have exclusively foot-conditioned rhythmic phenomena involving glottals, a connection between laryngeals and stress is found in a few languages. This will be discussed in the next section.

3.2. Stress alternations in Panoan

The glottal stop is epenthesized for stress purposes in Katukina, Kaxinawá, Shanenawa and Saynáwa. The first two languages belong to the Southeastern branch of Panoan. The third, according to Cândido (2004), is very close to Katukina, and Saynáwa is unclassified. All these languages have final stress.

Katukina has phonemic /h/ in onset position (Aguiar 1994: 45, Barros 1987: 10, 18) and a predictable occurrence of [ʔ] in coda of stressed, final syllables ending in oral vowels (6a). Other codas include /ɾ, s, ʂ, ʃ, j, n, w/ (6b), which unlike [ʔ] can be onsets as well (Aguiar 1994: 73).

(6) Glottal consonants in Katukina (Aguiar 1994: 58-67, 78)

a.	/ßaɾi/	[ßa.' ɾiʔ]	'sun, day'	/tsatsa/	[tsa.'tsaʔ]	'fish'
b.	/kaman/	[ka.'mɜ̃]	'puppy'	[ja.'wiʂ]	'armadillo'	

Similarly, Shanenawa has phonemic /h/ as onset word initially and medially (Cândido 2004: 38, 39). [ʔ] is epenthesized in word-final syllables that lack a coda, ensuring that the main-stressed final syllable is heavy (7b, c) (Cândido 2004: 41-7). Other codas in Shanenawa are /s, ʂ, n, j, w/ (7a) (Cândido 2004: 41). In compounds formed of two words, each ending in an open syllable, the glottal stop surfaces only in the final syllable of the second word (7d). Thus, [ʔ] seems to be a reflex of main stress rather than of stress generally (Cândido 2004: 43).

(7) Glottal consonants in Shanenawa (Cândido 2004: 38, 39, 42, 43, 45)

a.	[ka.'mã]	'dog'	['ʂaw]	'bone'	[ju.'maj]	'ounce'
b.	/fu/	['fuʔ]	'hair'	/nai/	[na.'iʔ]	'sky'
c.	/istuku/	[is.tu.'quʔ]	'monkey'	/paʂinipa/	[pa.ʃi.ni.'paʔ]	'yellow'
d.	[i.'viʔ]	'wood' +	[pa.'niʔ]	'net (bed)'	[i.ˌvi.pa.'niʔ]	'bed'

Kaxinawá also has main stress always on the last syllable of the word, with the exception of very specific morphological contexts (Camargo 1992: 174-176). /h/ is phonemic and generally occurs as onset word-initially (Camargo 1992: 96, 113). The glottal stop occurs as word-final coda if the word ends in an oral vowel (8a, b). It can also occur as word-medial coda in an otherwise open syllable, although this context is not well understood (Camargo 1992: 143, 144). Other codas in Kaxinawá include /n, s, ʂ/ (8c, d) (Camargo 1992: 148).

(8) Glottal consonants in Kaxinawá (Camargo 1992: 142, 143, 145, 175)

a.	/ɨ/	[ɨʔ]	'scratch'	/na/	[naʔ]	'nest; this one'
b.	/punu/	[pu.noʔ]	'vein'	/ʂapu/	[ʂa.poʔ]	'cotton'
c.	/pupus/	[pu.pus]	'mud'	/unpaʂ/	[õm.paʂ]	'water'
d.	/hunun/	[hu.nõ]	'tree with poisonous fruit'			

Last but not least, Saynáwa also has /h/ and stress on the final syllable (Cavalcanti Couto 2010). A process of [ʔ] epenthesis occurs word-finally if the stressed syllable lacks a coda consonant (cf. 9a, b). It is interesting that [ʔ] epenthesis occurs after nasal vowels (9b) and that it alternates with vowel lengthening in monosyllables (9c) (Cavalcanti Couto 2010: 118, 139).

(9) Glottal consonants in Saynáwa (Cavalcanti Couto 2010: 77, 84, 117, 139)

a.	/βitaʃ/	[βi.ˈtaʃ]	‘leg’	/ɾais/	[ɾa.ˈis]	‘son-in-law’
b.	/hənə/	[hə.ˈnəʔ]	‘river’	/ismin/	[ˌiʃ.ˈmɛ́ʔ]	‘vulture-king’
c.	/na/	[ˈnaʔ] ~ [ˈnaː]		‘this’ (demonstrative pronoun)		

These four languages lack phonemic /ʔ/ and have final stress and obligatory glottal stop epenthesis in coda in the main stressed syllable. As shown in the following section, other languages with word-final epenthesis of [ʔ] in Panoan have different properties: they may have phonemic /ʔ/, they do not necessarily have final stress, and glottal stop epenthesis is optional and variable. These differences strongly suggest that the main motivation for final glottal stop epenthesis in Katukina, Shanenawa, Kaxinawá and Saynáwa is stress-related. An analysis of this pattern in the framework of Optimality Theory will be proposed in section 5.

3.3. Domain demarcation in Panoan

The glottal stop is reported to have a demarcative function in several Panoan languages at the beginning or end of various domains, including morphemes, words, phrases, sentences and utterances. The most inclusive example of boundary demarcation for [ʔ] appears to be Marubo, where the glottal stop can indicate initial or final boundaries for all of these morphological and syntactic constituents (Costa 1992: 221-227). In other Panoan languages the demarcative nature of this consonant is reportedly more limited, being inserted as onset in word or utterance initial position before onsetless vowels, at morpheme or word boundaries between adjacent or identical vowels, and in coda position at the end of morphemes, words, phrases and sentences. Crosslinguistically, it is common for glottal stops to demarcate prosodic boundaries; one well-known example is German (Ladefoged and Maddieson 1996: 74, Alber 2002).

3.3.1. Morpheme boundaries

In some Panoan languages, including Capanahua, Marubo, Shipibo and Brazilian Matses, the glottal stop is epenthesized at morpheme-boundaries. Capanahua also deletes glottals across morpheme boundaries. Glottal restrictions to specific morphemic positions are attested in Capanahua, Shipibo and Amahuaca.

In Marubo, which lacks phonemic glottals, [ʔ] can indicate morpheme initial or final boundaries; very slow speech can also demarcate morphemes (Costa 1992: 221-227). Similarly, in Brazilian Matses, which also lacks phonemic laryngeals, [ʔ] optionally occurs as a morpheme-final marker between suffixes or between roots and suffixes (Dorigo 2001: 72, 139, 141). [ʔ] is reported to be a coda in these cases. It tends to occur after the ‘non-past’ {-ɛ́}, ‘past’ {-ɔ}, ‘remote past’ {-da}, and ‘com-

pleted action' {-a} suffixes. It also appears regularly between a root and the nominalizer {-kit} and sporadically before the intensifier {-kjɔ} (Dorigo 2001: 139-140, 201). The glottal stop is not the only boundary marker in Brazilian Matses; other possible markers are /ɾ/, realized as [ɾ] between vowels (Dorigo 2001: 143-147) and [n], which occurs between the root and the adjectivizer {-bo} or the diminutive {-pi} (Dorigo 2001: 150-152).

In Capanahua, where /ʔ/ is phonemic, [ʔ] is epenthesized intervocalically across certain morpheme boundaries (10) (Loos 1969; Elías Ulloa 2009: 23-4). On the other hand, both /h/ and /ʔ/ can be deleted across morpheme-boundaries in some cases. For example, /ʔ/ can be deleted before the recent past morpheme (11b), but not before the remote past (11a). Deletion of /h/ may accompany deletion of an adjacent consonant (11c, d).

(10) Capanahua glottal stop epenthesis between morpheme boundaries (Loos 1969: 176)

a.	/bana-i/	['ba.na.ʔi]	'planting'
b.	/bana-ipi-ki/	['ba.na.ʔi.pi.ki]	'planted it (yesterday)'

(11) Capanahua /ʔ/ and /h/ deletion between morpheme boundaries (Loos 1969: 176-177)

a.	/mapɯt–ʔoʂki/	[ma.pɯ.ʔoʂ.ki]	'he ascended (remote past)'
b.	/mapɯt–ʔa-ʂ-ki/	[ma.pɯ.taʂ.ki]	'he ascended (recent past)'
c.	/siɾip-ha-kin/	[si.ɾi.a.kin]	'did it well'
d.	/hamak-ha-kin/	[ha.ma.a.kin]	'stepped down'

Valenzuela et al. (2001: 282) state that [ʔ] occurs predictably in Shipibo when a stressed open monosyllable is followed by a vowel-initial item at morpheme boundaries, as in /to/ 'pop' + /ati/ (nominalizer) = [toʔati]. A connection between stress and boundary marking in Shipibo is also mentioned for utterance-final positions (section 3.3.4).

Glottal consonants are reportedly restricted to certain morphemes or morpheme positions in various Panoan languages. Thus, in Capanahua both [h, ʔ] are restricted to the first syllable of a morpheme, and in Shipibo, [ʔ] never occurs morpheme-internally or within a compound (Elías-Ulloa 2010). Similarly, in Amahuaca, /h/ reportedly occurs as onset morpheme-initially only (Osborn 1948: 189)–but cf. Russell (2008: 63), who states that /h/ can only be found initially (i.e., as onset) within a root.

3.3.2. Word boundaries

The glottal stop can occur as an optional word-initial boundary in Yaminahua (Lanes 2000, 2005, Loos 2006) and in Marubo. In the latter, [ʔ] is reportedly inserted word-initially both in isolated words or in words in context (Costa 1992: 221-227). The glottal stop is also common between adjacent vowels across word boundaries in Shanenawa (Cândido 1998), Shipibo (Elías-Ulloa 2010), and (optionally) in Sharanawa (Pike and Scott 1962).

As a word-final boundary, the glottal stop is attested in Marubo (Costa 1992), Yaminahua (Lanes 2000, 2005), Kaxarari (Lanes 2005), Huariapano (Parker 1994),

Chacobo (Shell 2008), Sharanawa (Pike and Scott 1962), Shanenawa (Cândido 1998, 2004), Amahuaca (Osborn 1948; Russell 2008) and Saynáwa (Cavalcanti Couto 2010). Examples from most of these languages are discussed in more detail below.

In Sharanawa, [ʔ] optionally appears at the end of words in isolation (Pike and Scott 1962: 3, 4). In Huariapano, where /ʔ/ is not a phoneme, [ʔ] occurs optionally as word-final coda after a vowel. Unlike other word-final codas /s, ʃ, ʂ, n/, the glottal stop fails to attract stress and therefore does not contribute to syllable weight (cf. 12a, b) (Parker 1994).

(12) Huariapano [ʔ] as a word-final boundary marker (Parker 1994: 97, 98)

a.	/pino/	['pi.no] ~	['pi.noʔ]	'hummingbird'
b.	[ja.'wiʃ]	'opossum'	[ʂa.'ßin]	'bee'

Similarly, in Chacobo, where /h, ʔ/ are attested in onset position, [ʔ] is reported to occur at the end of a word in isolation (Shell 2008: 40, Prost 1965, 1967). In Amahuaca, [ʔ] is also reportedly inserted word-finally after a codaless vowel (Osborn 1948: 189, Russell 2008: 66). /ʔ/ is attested in this language word-medially as coda, and as onset word-initially and medially (Shell 2008: 57-59, Russell 2008: 66; cf. Osborn 1948: 189).

In Shanenawa, the glottal stop optionally occurs word-finally in stressed syllables (section 3.2), and also, optionally, between words (13) (Cândido 1998, 2004).

(13) Glottal stop between compounds in Shanenawa (Cândido 1998: 97)

a.	[na.'waʔ]	'non-Indian'	[pi.'jaʔ]	'arrow'	[na.ˌwaʔ.pi.'jaʔ]	'rifle'
b.	[ta.'ɾiʔ]	'cape'	[ʂɨ.'ʧɨʔ]	'chest'	[ta.ˌɾiʔ.ʂɨ.'ʧɨʔ]	'blouse'

The occurrence of the glottal stop as a word-final boundary marker varies in the languages considered above. But unlike the cases examined in section 3.2, it can be optional, [ʔ] may or may not be a phoneme in the language, and main stress does not necessarily fall on the final syllable. For these reasons, these patterns are considered to be qualitatively different to the stress-conditioned epenthesis of [ʔ] discussed in section 3.2.

3.3.3. Phrase boundaries

Demarcation of phrase boundaries is not generally reported for Panoan languages. Two exceptions are Marubo and Shipibo. In Marubo, the glottal stop can indicate the end or beginning of a phrase, or can occur before or after pause (Costa 1992: 224, 227). In this language, lengthening of low-pitched, short and unstressed syllables can also indicate the end of beginning of a phrase (Costa 1992: 227, 228). Similarly, in Shipibo [ʔ] is reported to be usually epenthesized phrase-initially before onsetless vowels and phrase-finally after codaless vowels (14) (Elías-Ulloa 2010). The same applies at the beginning or end of words in isolation, which are equivalent to phrases according to Elías-Ulloa (2010).

(14) Shipibo [ʔ] insertion at phrase boundaries (Elías-Ulloa 2010: 54)

a.	/akʊ̄npana/	[ʔa.kʊ̄m.pa.naʔ]	'rattlesnake'

3.3.4. Sentence and utterance boundaries

The glottal stop occurs as a boundary marker at the beginning and/or end of sentences or utterances in several Panoan languages. In Sharanawa, [ʔ] optionally appears at the end of sentences (Pike and Scott 1962: 3, 4). In Marubo, the [ʔ] can indicate the end or beginning of a sentence (Costa 1992: 224). Valenzuela et al. (2001: 282) reports a similar distribution for Shipibo, with the exception that utterance-finally, the glottal stop is inserted after stressed vowels only (but see Elías-Ulloa 2010, who proposes the phrase as the relevant domain). In Saynáwa, [ʔ] can occur at the end of an utterance; according to Cavalcanti Couto (2010: 157), the glottal stop is a prosodic marker that delimits the phonological utterance.

Two unusual patterns are Capanahua, where [ʔ] is reported to epenthesize before word-initial /β, ɾ/ in sentence juncture (15) (Loos 1969), and Amahuaca, where [ʔ] deletes utterance-initially (Shell 2008: 57-59, Russell 2008: 66; cf. Osborn 1948: 189). These patterns are not reported in any other of the Panoan languages surveyed.

(15) Capanahua [ʔ] epenthesis in sentence juncture (Loos 1969: 176)

a.	/ßana-wɯ/	[ʔßa.na.wɯ]	‘plant’
b.	/ɾaʔmaβi +ɾɯɾa-wɯ/	[ʔraʔ.ma.βi.ɾɯ.ɾa.wɯ]	‘chop now’

3.4. Emphasis

Fleck (2003: 75, ft. 2, 443) notes that in Peruvian Matses, the glottal stop can optionally occur syllable-finally in morphemes such as {-ma ~ -maʔ} ‘but’, {-ada ~ -adaʔ} ‘uncertainty’, {-ta ~ -taʔ} ‘imperative’. He observes that when [ʔ] occurs, the allomorph is more emphatic or dramatic, tends to co-occur with emphatic intonation and loudness, and normally follows a pause. For Shipibo, Shell (2008: 41) reports that /h/ is inserted in coda to denote emphasis, as in /hatíßi/ ‘everything’ vs. /hatíhßi/ ‘everything-emphatic’. Recent work in Shipibo does not seem to confirm this fact (see for example Elías-Ulloa 2010).

Lanes (2005: 203) mentions that in Kaxarari the glottal stop can occur word-medially between vowels, probably as a hiatus resolution and for emphasis. Unfortunately, no examples or further information are provided for this distribution.

4. Discussion

The survey of the prosodic distribution of laryngeals in Panoan languages shows that the glottal stop is overwhelmingly employed as a boundary marker demarcating the beginning or end of morphological and syntactic categories. Also attested but rarer is the connection of the glottal stop (in one case only, the glottal fricative) to foot-structure, main stress, and emphasis. This is coherent with the cross-linguistic tendency for laryngeals (especially the glottal stop) to be involved in prosodic phenomena (Ladefoged and Maddieson 1996: 74; González 2003 and references therein). The wide range of prosodic functions of the glottal stop in Panoan is also probably connected to its relatively low occurrence as a phoneme in most of the languages surveyed.

If the specific phonological contexts for boundary marking are considered, it appears that in most cases the glottal stop is epenthesized before initial vowels or after

final ones. In the first case, the glottal stop may fulfill the role of a default onset due to its lack of supra-laryngeal features. Alternatively, the glottal stop may be inserted because many Panoan languages have a restriction or preference against vowel-initial morphemes, words, phrases and sentences.

In a few languages the glottal stop occurs to break out a sequence of two vowels in separate morphemes or words. A restriction against complex vowels may be a necessary but not exclusive motivation for this epenthesis, since adjacent vowels within morphemes or words do not trigger epenthesis. On the other hand, the glottal stop is also epenthesized as coda at the end of morphological and syntactic boundaries. Here the motivation is not syllable-based since codas are dispreferred typologically. A possible aerodynamic scenario for the occurrence of [ʔ] in this position is the lowering of pitch that may occur during the final part of words in isolation, phrases, sentences or utterances. Pitch lowering and the slower vibration of the glottal folds might contribute to the occurrence of glottal stops in this position. This seems supported for Marubo, where [ʔ] epenthesis is more common in syllables that are low-pitched and unstressed than in syllables that are high-pitched, stressed and long (Costa 1992: 224-225).

The occurrence of the glottal stop as a boundary or emphatic marker in the Panoan languages surveyed is frequently reported as a tendency or as optional. However, in four languages (Katukina, Kaxinawá, Shanenawa, Saynáwa) the glottal stop is epenthesized in a final, stressed syllable in a categorical manner. The fact that [ʔ] epenthesis is obligatory, unlike the occurrence of the glottal stop constituent-finally, suggests that it is connected primarily to stress. In these four languages, the glottal stop is the default segment which can be used to make a stressed syllable heavy (cf. Cândido 2004 and Cavalcanti Couto 2010). Since these languages have iambic footing, and the preferred iamb configuration cross-linguistically is the uneven light-heavy (Hayes 1995), these languages exemplify a connection between stress and foot structure that is mismatched in the glottal phenomena attested for Capanahua and Huariapano (section 3.1). An Optimality-Theoretic analysis of this pattern is provided in the next section.

5. Analysis

While the foot-conditioned laryngeal phenomena attested in Huariapano and Capanahua have been well-studied and analyzed in the literature (see section 3.1 for details and references), this is not the case for other prosodic phenomena involving laryngeals in Panoan. This section proposes and Optimality-Theoretic account for glottal stress-conditioned epenthesis in Katukina, Shanenawa, Saynáwa and Kaxinawá. A theoretical analysis of boundary and emphasis marking is not offered at this time since these are frequently reported to be optional or limited to specific morphemes and in general the information available for them is more sketchy.

The analysis proposed here makes use of undominated constraint FtBin (Prince 1980, Kager 1989, Prince & Smolensky 1993), which outranks Parse (McCarthy and Prince 1993: 14). The effect of this ranking is to ensure that all syllables in a word are parsed by binary feet. The constraint Rightmost (Prince & Smolensky

1993, Kager 1999: 131) conspires for main final stress, while RhType = Iamb advocates for final prominence within a foot (Kager 1999: 136). The effect of these two constraints is to capture iambic footing and main final stress in these languages.

(16) Metrical constraints for Katukina, Shanenawa, Kaxinawá and Saynáwa (I)

FtBin	Feet are binary under a moraic or syllabic analysis
Parse	Syllables are parsed into feet
Rightmost	Align (Hd-Ft, Right, PrWd, Right) 'The head foot is rightmost in the prosodic word'
RhType = Iamb	Feet have final prominence

Stressed syllables are heavy in these four languages. If the main stressed syllable lacks a coda or a nasal vowel (which counts as two moras), a glottal stop is inserted. The constraint Stress to Weight, which advocates for quantity-sensitivity (Riad 1992, Kager 1999) outranks Dep-μ, which prohibits epenthesis of a moraic element (Kager 1999) (17).

(17) Metrical constraints for Katukina, Shanenawa, Kaxinawá and Saynáwa (II)

Stress to Weight	Stressed syllables are heavy
Dep-μ	Output moras have input correspondents

The relevant ranking for Shanenawa, Kaxinawá, Katukina and Saynáwa is FtBin, RhType = Iamb, Rightmost, Stress to Weight >> Dep-μ >> Parse. This is exemplified for Shanenawa in Tableau 1. Candidates (a, b, e, f) lose from violations of undominated constraints. Candidates (c, d) tie on a violation of Dep-μ, since glottal epenthesis has applied in word-final coda. However, candidate (c) is optimal since it complies with Parse, unlike candidate (d).

Tableau 1

Glottal stop epenthesis in stressed syllable: Shanenawa

/ivi/ 'wood'	FtBin	RhT=Iamb	Rightmost	STW	Dep-μ	Parse
a. ('i.vi)		*(!)		*(!)		
b. (i.'vi)				*!		
☞c. (i. 'viʔ)					*	
d. i ('viʔ)					*	*!
e. i. ('vi)	*(!)			*(!)		*
f. ('iʔ.) vi			*!		*	*

Compare this situation with languages like Matis, with final stress but no glottal stop epenthesis. The relevant ranking for this language is similar to that exemplified in Tableau 1, with the difference that Dep-μ outranks Stress to Weight. This is shown in Tableau 2, where candidate (b) is selected as optimal since it does not violate any of the undominated constraints in the ranking.

Tableau 2

No glottal stop epenthesis in Matis

/waka/ 'water'	FtBin	RhT=Iamb	Rightmost	Dep-μ	STW	Parse
a. ('wa.ka)		*!			*	
☞b. (wa.'ka)					*	
c. (wa.'kaʔ)				*!		
d. wa ('kaʔ)				*!		*
e. wa ('ka)	*!				*	*
f. ('waʔ) ka			*(!)	*!	*	*

A question that arises is what ensures that epenthesis is realized as a glottal stop rather than any other consonant or vowel in these languages. One option is that there is a universal hierarchy of Dep-μ constraints such as that supralaryngeal consonants, which have more featural content, are more costly to epenthesize than laryngeal consonants. This could be formalized as Dep-μ [supralaryngeal] >> Dep-μ [laryngeal].

6. Conclusion

This paper presented a survey on the distribution of glottal consonants in 27 Panoan languages, focusing on their range of prosodic functions. Important findings that emerge are, first of all, that the glottal stop is the most common consonant used for prosodic purposes. Secondly, the most frequent prosodic function for laryngeals is the demarcation of the beginning or end of morphological and syntactic categories. Another important finding is that strictly foot-sensitive phenomena featuring laryngeals seems to be circumscribed to Huariapano and Capanahua, although stress-related phenomena is attested in Katukina, Shanenawa, Kaxinawá and Saynáwa.

It was suggested in this study that the fact that the glottal stop is overwhelmingly recruited for prosodic functions is connected to the fact that this consonant is often non-phonemic in Panoan, unlike its counterpart /h/, which usually is not subject to prosodic alternations. This is compatible with the fact that laryngeals have special features compared to supralaryngeals that make them more likely to undergo prosodic phenomena crosslinguistically.

A preliminary analysis in Optimality Theory was proposed for stress-conditioned laryngeal phenomena in Katukina, Shanenawa, Kaxinawá and Saynáwa. The theoretical account for the prosodic functions of emphasis and boundary-marking is left for further investigation, partly because of its optional nature and also for the need of a closer look at the contexts where they occur.

Issues for further investigation include more in-depth documentation for Panoan languages, especially those where not much information exists on laryngeals. The

study of phonetic correlates of laryngeal consonants should also be pursued further to show the exact manner in which these consonants are pronounced and their influence on surrounding segments. Large steps in this direction are Lanes (2005) and Elías Ulloa (2010).

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INTERFERENCE DURING SUBJECT RETRIEVAL IN SENTENCE COMPREHENSION. AN INTERFERENCE-BASED CHECKING ACCOUNT FOR OBJECT ATTRACTION

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1. Introduction

The process of computing syntactic representations during language comprehension includes the checking of dependencies like subject-verb agreement. The rule for subject-verb agreement is as simple as this: If the subject has a certain phi-feature specification, the verb has to have the identical values for these features. In German, subject and verb have to agree in person and number.[1]

For the processing of subject-verb agreement it is useful to distinguish two phases. First, a phrase structure representation for the subject has to be built and integrated into the *current partial phrase marker* (CPPM) for the entire sentence. On encountering the verb, not only the verb has to be integrated into the CPPM, but also subject-verb agreement has to be checked by comparing the number specifications of the subject and the verb. In verb-final languages like German, subject and verb can be separated by several items. As a consequence, the subject has to be retrieved from memory in order to carry out the comparison. Both the subject integration phase and the agreement checking phase might be vulnerable to disruptions resulting in an agreement error.

In this paper, I will discuss a specific kind of agreement error, namely attraction errors which occur when the subject and verb are separated by a further noun phrase (NP) not matching the subject in number. This intervening NP can be a modifier or an object. I will show that attraction errors elicited by an object cannot be attributed to an erroneous subject representation but rather to an interference-based disruption during subject retrieval in the checking phase.

The paper is organized as follows: In section 2 attraction errors are introduced. Section 3 shows that similar agreement errors can be elicited by an object. Sections 4-6 present a series of three experiments investigating object attraction. Finally, section 7 presents an interference-based account for object attraction claiming that agreement errors elicited by an object can be attributed to interference during the checking phase.

[1] Cf. Corbett (2006) for an overview of the typological diversity of agreement.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 169-182.

2. Attraction Errors

So-called attraction errors arise when a complex subject phrase contains a further noun phrase (which I call 'distractor') mismatching the head noun in number. A 'real life' example is given in (1) (from *The New Yorker*, quoted from Bock & Miller 1991: 46).

(1) *The readiness of our conventional forces are at an all-time low.

In (1) the verb erroneously agrees with the plural modifier instead of agreeing with the actual agreement controller, the head noun of the subject NP. Attraction errors have first been observed for language production (starting with Bock & Miller 1991; cf. the overview in Bock et al., 2001) but have been attested for language comprehension as well (e.g. Branigan et al. 1995, Pearlmutter et al. 1995, 1999, Nicol et al. 1997).

Attraction errors can be used to investigate questions of representation and computation. The present paper focuses on the computation of subject-verb agreement. As we will see in section 3 the checking process can be disrupted by an intervening object. I will discuss whether attraction errors elicited by an object are due to an impaired subject representation or rather due to interference during subject retrieval. Beforehand I will briefly discuss the main results from prior research concerning attraction within a complex subject NP.

Attraction errors in modifier constructions exhibit a strict asymmetry: A plural NP modifying a singular subject NP can cause an attraction error, while a singular NP modifying a plural subject NP cannot. With a sentence completion task using sentence fragments like (2), Bock and Miller (1991) found more agreement errors in (2b) than in (2a), but no difference in error rates between (2c) and (2d).

(2) a. the key to the cabinet ...
b. the key to the cabinets ...
c. the keys to the cabinet ...
d. the keys to the cabinets ...

This asymmetry between singular and plural is firmly established for English, and has also been found in other languages including German (for German see Hartsuiker et al. 2003, Hemforth & Konieczny 2003, Hölscher & Hemforth 2000). This finding is taken as evidence for an asymmetric representation of number (cf. Eberhard 1997) and a feature percolation account for attraction errors (cf. Nicol et al. 1997). According to this account, attraction errors result from erroneous feature percolation during the integration of the second NP into the current syntactic representation. As a result, a singular subject NP turns into a plural NP on processing a plural NP. The asymmetry naturally follows under the assumption of an underlying plural specification for plural nouns and the absence of such a number specification for singular nouns (cf. Eberhard 1997). In this case only plural NPs would be represented by a number feature —a plural flag— which can cause attraction while singular NPs lack a corresponding singular feature or flag. With singular not being represented by a feature, singular modifiers cannot cause number attraction.

Further evidence for the percolation account comes from the finding, that the hierarchical distance between the head noun and the second noun is a main determinant of attraction. Although the verb is closer to the plural modifier in (3b) than in (3a), Nicol and Vigliocco (discussed in Nicol et al. 1997) found more attraction errors for (3a) than for (3b). Comparable results for language comprehension have been provided by Nicol et al. (1997).

(3) a. The telegram [to the *friends* [of the soldier]] …
b. The telegram [to the friend [of the *soldiers*]] …

To sum up, the percolation account attributes attraction errors to erroneous feature percolation during the subject integration phase. The checking mechanism which is assumed to work basically flawlessly will later on retrieve a flawed subject representation and detect a seemingly agreement violation in actual ungrammatical sentences.

3. Object Attraction

Attraction errors are not restricted to complex subject NPs. For production, it has been shown that an object which does not match the subject in number can cause attraction as well (cf. Hartsuiker et al. 2001, Hemforth & Konieczny 2003). Sections 4-6 will present three experiments on German sentence comprehension showing that object attraction occurs in comprehension as well.

An obvious question that comes up at this point is whether attraction errors elicited by an object can be attributed to the same underlying mechanism as attraction errors elicited by a modifier. While percolation within a complex NP is conceivable, it is rather implausible from an object which is not part of the subject NP. When processing of the subject is completed, further material outside the subject NP should not affect its representation. As an alternative I will suggest that the checking process itself is disrupted by the presence of an object. The object interferes in the process of subject retrieval. Instead of retrieving the actual controller for agreement – the subject, the parser erroneously retrieves the object. If the object bears a number specification different from the subject's number specification a seeming agreement error will be detected.

The percolation account and the checking account make different predictions with respect to an asymmetry between singular and plural subjects and with regard to the role of case marking. Both dimensions have been tested experimentally using the method of speeded grammaticality judgments. Section 4 presents an experiment investigating whether the asymmetry observed for attraction in complex subject NPs shows up for object attraction as well. Sections 5 and 6 look at the role of morphological case marking.

4. Experiment 1

Experiment 1 compares attraction in simple subject-object sentences and attraction within a complex subject NP. Thirty-seven participants read forty sentences like (4) and judged their grammaticality. Each participant saw each sentence in one

of its eight versions. The versions result from a cross-factorial design including construction type, number specification of the subject and number specification of the second NP. All sentences contained an embedded clause with either a complex subject modified by genitive NP and an intransitive verb (cf. (4a-d)), or a simple subject followed by an object and transitive verb (cf. (4e-h)). The subject head noun of this embedded clause was always a feminine (and therefore case ambiguous) noun and either singular or plural. The modifier respective object was also a feminine noun and either matched or mismatched the subject in number.

(4) a. Ich habe gesehen, dass die Freundin der Schülerin gelacht hat.
I have seen that the friend the pupil.gen laughed has
b. Ich habe gesehen, dass die Freundin der Schülerinnen gelacht hat.
I have seen that the friend the pupils.gen laughed has
c. Ich habe gesehen, dass die Freundinnen der Schülerinnen gelacht haben.
I have seen that the friends the pupils.gen laughed have
d. Ich habe gesehen, dass die Freundinnen der Schülerin gelacht haben.
I have seen that the friends the pupil.gen laughed have
'I have seen that the friend(s) of the pupil(s) laughed'
e. Ich habe gesehen, dass die Freundin die Schülerin ausgelacht hat.
I have seen that the friend the pupil.acc laughed-at has
f. Ich habe gesehen, dass die Freundin die Schülerinnen ausgelacht hat.
I have seen that the friend the pupils.acc laughed-at has
g. Ich habe gesehen, dass die Freundinnen die Schülerinnen ausgelacht haben.
I have seen that the friends the pupils.acc laughed-at have
h. Ich habe gesehen, dass die Freundinnen die Schülerin ausgelacht haben.
I have seen that the friends the pupil.acc laughed-at have
'I have seen that the friend(s) laughed at the pupil(s).'

Sentences were presented visually on a computer screen in a word by word fashion with each word appearing at the same position (mid-screen). Each word was presented for 225 ms plus additional 25 ms for each character to compensate for length effects. Participants made their judgment immediately after the clause-final by pressing one of two response buttons. They had to respond within a time window of 2,000 ms, otherwise the trial was finished.

The results of experiment 1 are given in Table 1. The first row presents results (in terms of percentage of correct judgments) for the modifier construction. The second row gives the results for sentences in which the distractor is the object. Attraction rates (measured in difference in correctness between the match and the corresponding mismatch condition) are shown in Figure 1.

Three-way ANOVAS revealed a main effect of sentence type ($F1 = 25.9$, $p < .0001$; $F2 = 59.4$, $p < .0001$). Sentences in the modifier construction received less correct judgments than sentences in the object-construction. A potential reason for this difference will be discussed below. Furthermore, a main effect of matching was observed. Participants produced more judgment errors when subject and distractor (modifier respective object) differed in number ($F1 = 6.8$, $p = .013$; $F2 = 9.8$, $p = .003$). Crucially, experiment 1 exhibits different attraction patterns for the two types of construction. While the modifier construction replicated the asymmetric at-

Table 1

Percentages of correct judgments in experiment 1

	singular subject		**plural subject**	
	Match	**Mismatch**	**Match**	**Mismatch**
modifier	76	68	81	79
object	96	92	91	85

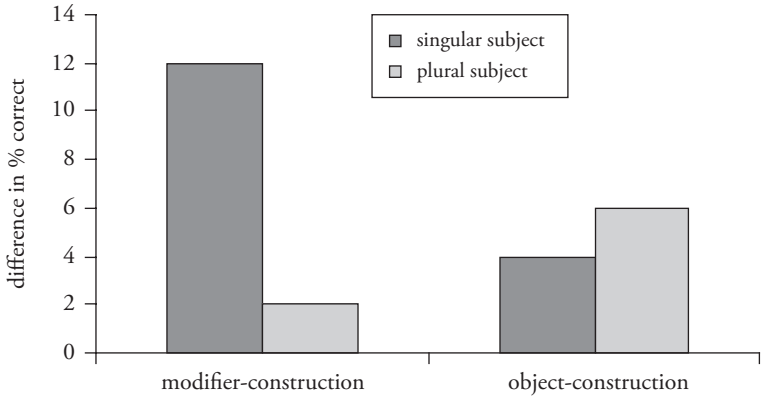

Figure 1

Attraction rates in experiment 1

traction pattern known from prior research, object attraction occurred for both singular and plural subjects, with no asymmetry. The three-way interaction reached significance in the item-analysis (*F2 = 1.0, p < .05*), but failed significance in the subject analysis (*F1 = 1.0, p = .32*).

This difference in error pattern suggests that there is also a difference with regard to the processes which underlie the agreement error. Before discussing these processes, I will briefly refute a potential objection with regard to the modifier construction.

Note that the modifier construction contains a local ambiguity. When the modifier is a singular NP it is case ambiguous between genitive and dative. Therefore, it can either be a genitive modifier as in (5a), a genitive object as in (5b) or a dative object as in (5c). This local ambiguity is resolved on the verb participle.

(5) a. …, dass die Freundin der Schülerin gelacht hat
that the friend the pupil.gen laughed has
'that the friend of the pupil laughed'
b. …, dass die Freundin der Schülerin gedacht hat
that the friend the pupil.gen commemorated has
'that the friend commemorated the pupil'

c. …, dass die Freundin der Schülerin geholfen hat
that the friends the pupil.dat helped has
'that the friend helped the pupil'

Since plural modifiers are only compatible with genitive, this ambiguity might produce a difference between match and mismatch conditions. However, while such an ambiguity-related mismatch effect can explain the overall low performance in the relevant conditions, it did not produce the observed asymmetry. Actually, it works against the asymmetry. With singular subjects the ambiguity occurs in the match condition (ambiguous singular modifier), but not in mismatch condition (unambiguous plural modifier). As a result the ambiguity might reduce the difference between the match and mismatch condition. With plural subjects, on the other hand, the ambiguity only occurs in the mismatch condition and therefore might increase the difference between the match and mismatch condition. Thus, although the observed asymmetry between singular and plural subjects might be modulated by the local ambiguity for singular modifiers, it is clearly produced by attraction.

In summary, experiment 1 has two main results. First, attraction errors can be elicited by modifiers and objects. Secondly, attraction errors elicited by a modifier are restricted to singular subjects, whereas attraction errors elicited by an object occur with both singular and plural subjects. As pointed out in section 2, an asymmetry between singular and plural is a crucial argument for percolation. Given that only plural is represented by an additional feature, only a plural modifier can elicit percolation. The absence of an asymmetry for object attraction argues against a percolation process in this configuration. The alternative is not to blame the subject representation but rather the checking process itself. For agreement checking, it is in principle conceivable that both singular and plural objects interfere with the retrieval of the subject. Retrieving the object instead of the actual agreement controller leads to a seeming agreement violation and a subsequent judgment error when subject and object differ in number.

It must be noted that although experiment 1 replicates findings from an prior experiment which only looked at object attraction (cf. Häussler et al. 2005), it stand in contrast to findings from sentence production. In a sentence-completion experiment, Hemforth and Konieczny (2003) found a reversed asymmetry. An attraction-like effect only occurred in sentences with a plural subject. For singular subjects Hemforth and Konieczny found no difference between sentences where the object was a singular NP and sentences in which the object was a plural NP. In addition to the attraction-like effect for plural subjects, a main effect of subject number was observed – participants produced more agreement errors for plural subjects than for singular subjects, even in the match condition. On the basis of this main effect, Hemforth and her colleagues (Hemforth & Konieczny 2003, Konieczny et al. 2004) offer an activation based account. The crucial assumption is that the observed difference for plural subjects is not due to an increased error rate in the mismatch condition, but rather due to a decreased error rate in the match condition. The authors claim that a plural object reactivates the plural representation of the subject which otherwise occasionally gets lost due to decay over time. The higher activation level of the plural specification in the match condition reduces the probability of an agreement error when the verb has to be pronounced. Under the assumption of an asymmetric rep-

resentation of number, no such effect is expected with singular subjects since there is nothing to reactivate.

The authors further claim that the described reactivation mechanism is restricted to co-arguments and does not occur for modifiers. They argue that an object unlike a modifier is integrated directly with the verb thereby giving the plural feature the opportunity to interfere with the plural feature of a co-argument. For modifiers, the only way to interfere with the head noun is via feature percolation. Note that this is not a necessary assumption since the modifier has to be integrated with the head noun and thereby might reactivate the plural specification.

However, this (re-)activation-based account can only partially explain the findings of the present comprehension experiment. Although sentences with a plural subject received less correct judgments than sentences with a singular subject, experiment 1 exhibits attraction effects for both sentence types. Crucially, experiment 1 exhibits no asymmetry between singular and plural subjects. Thus, decay and reactivation might play a role, but they are not the only source for agreement errors. Experiments 2 and 3 provide further evidence for the assumption that interference is the main source of attraction.

5. Experiment 2

Experiments 2 and 3 make use of the fact that German masculine and feminine determiners differ with regard to case marking. As can be seen in Table 2, the article has identical forms for nominative and accusative within the feminine and the neuter gender and the plural whereas these forms are different in the masculine gender.

Nouns show only little morphological case marking. If case is marked at all, it is mostly genitive or dative case. There is only one declinational class where nominative and accusative have distinct forms – masculine nouns like *Student* ('student'). How-

Table 2

Inflectional paradigm for the German definite article

Case	Gender		
	masculine	**feminine**	**neuter**
	singular		
nominative	der	die	das
genitive	des	der	des
dative	dem	der	dem
accusative	den	die	das
	plural		
nominative	die	die	die
genitive	der	der	der
dative	den	den	den
accusative	die	die	die

ever, these nouns have identical forms in all cells of the paradigm, except nominative singular (cf. Table 3).

Table 3

Inflectional paradigm for the noun *Student* ('student')

Case	Number	
	singular	**plural**
nominative	Student	Studenten
genitive	Studenten	Studenten
dative	Studenten	Studenten
accusative	Studenten	Studenten

Plural nouns are in general ambiguous with respect to case. A consequence of this syncretism is that a definite noun phrase can be case ambiguous depending on the number specification and gender. A singular masculine NP is unambiguous with respect to case,[2] feminine NPs, neuter NPs and plural NPs in general are indistinguishable in the nominative and accusative case.

Experiment 2 investigates forty embedded clauses like (6). The subject NP was in either case ambiguous or unambiguously marked for nominative. Unambiguous NPs had masculine gender, ambiguous NPs were the corresponding feminine counterparts. The object was always a feminine (i.e. case ambiguous) NP which either matched or mismatched the subject in number. Furthermore the embedded clause did or did not contain an adverbial between the object and the verb.

(6) a. …, dass die Studentin die Professorin (gestern öffentlich) kritisiert hat
that the student$_{(fem)}$ the professor yesterday in-public criticized has
b. …, dass die Studentin die Professorinnen (gestern öffentlich) kritisiert hat
that the student$_{(fem)}$ the professors yesterday in-public criticized has
c. …, dass der Student die Professorin (gestern öffentlich) kritisiert hat
that the student$_{(masc)}$ the professor yesterday in-public criticized has
d. …, dass der Student die Professorinnen (gestern öffentlich) kritisiert hat
that the student$_{(masc)}$ the professors yesterday in-public criticized has
'that the student criticized the professor(s) (yesterday in public)'

Forty participants took part in the experiment. The procedure of the experiment was the same as in experiment 1. The percentages of correct judgments are given in

[2] However, masculine NPs are not always unambiguously marked for case. When introduced by a possessive NP the case of the NP is obscured.

(i) {Peters Lehrer / der Lehrer} hat angerufen.

Peter's teacher the teacher has called

(ii) Ich kenne {Peters Lehrer / den Lehrer}.
I know Peter's teacher the teacher

Table 4. Since the presence or absence of an adverbial did not affect correctness, Figure 2 presents attraction rates collapsed over sentences with and without an adverbial.

Table 4

Percentages of correct judgments in experiment 2

	ambiguous subject		unambiguous subject	
	Match	**Mismatch**	**Match**	**Mismatch**
with adverbial	96	89	95	94
without adverbial	94	89	96	96

Figure 2

Attraction rates in experiment 2

Three-way ANOVAS revealed main effects of match (*F1 = 9.0, p < .005; F2 = 7.7, p < .01*), case ambiguity (*F1 = 13.4, p < .001; F2 = 7.0, p < .05*) and an interaction of the two factors (*F1 = 5.4, p < .05; F2 = 6.6, p < .05*). Pairwise comparisons show that the mismatch effect is restricted to case ambiguous subjects (*t1 = 3.6, p < .005; t2 = 4.0, p < .001*) and did not occur with unambiguous subjects (*t1 < 1 ; t2 < 1*). The presence or absence of an adverbial had no effect at all (*both Fs < 1*).

The crucial finding of experiment 2 is that attraction errors only occurred with case ambiguous subjects. Note, however, that the case ambiguous determiner *die* is also number ambiguous (*die Professorin*$_{SG}$, *die Professorinnen*$_{PL}$). In a language production experiment investigating number attraction in the modifier construction, Hartsuiker et al. (2003) have found attraction effects for German feminine head nouns but not for head nouns which either had masculine and neuter gender. For the latter they found no errors when head noun and modifier matched in number and only few errors in the mismatch conditions. Crucially, the difference between match and mismatch conditions was not significant. Although the neuter definite article is case ambiguous, it is not ambiguous with respect to number (cf. Table 2). Therefore, Hartsuiker et al. (2003) attribute the attraction errors found for feminine

head nouns to the number ambiguity of the definite article and not to the case ambiguity.

In the current experiment it is rather unlikely that the case ambiguity effect is actually a number ambiguity effect. If so, we would expect more judgment errors in the match conditions, but participants did pretty well in these conditions.[3] Furthermore it is neither the article nor the noun per se which marks the NP unambiguously for case and number. While most German nouns lack any morphological case marking for nominative or accusative, the inflectional paradigm for the definite article has different forms for nominative and accusative case in the masculine gender. However, the inflectional paradigm also contains several identical forms. The definite article *der* is not only singular nominative masculine, but also singular genitive and dative feminine and genitive plural for all three genders. The form *den* is ambiguous as well (accusative singular masculine, dative plural). Due to this syncretism articles are often ambiguous with respect to case and number. It is the combination of determiner and noun which makes the noun phrase *der Student* ('the student') in (6c) and (6d) unambiguously marked for nominative singular. The feminine counterpart *die Studentin* is case ambiguous, but unambiguous with respect to number.

If we rule out an effect of number ambiguity, the observed case ambiguity effect is hard to reconcile with a percolation account. Why should an NP which is unambiguously marked for case resist feature overwriting with respect to number? A checking account, on the other hand, can easily cope with the effect of morphological case marking. In order to check subject-verb agreement at the verb the parser needs to retrieve the subject. The parser looks for a nominative NP. For unambiguous subjects this is an easy task, for ambiguous subjects the parser sometimes is misguided by an object if the object is case ambiguous and therefore morphologically compatible with nominative case. In sum, experiment 2 provides a challenge for the percolation account and evidence for the checking account.

6. Experiment 3

Experiment 3 investigated the role of case marking of the object. In a sentence production experiment in Dutch, Hartsuiker et al. (2001) found an attraction effect when the object was a full NP, but no attraction effect when the object was a pronoun. They attribute the lack of object attraction for pronouns to the fact that Dutch pronouns are overtly marked for case whereas non-pronominal NPs are not. In the present experiment, the object was either a case ambiguous feminine NP or the unambiguous masculine counterpart. Furthermore, the object either matched or mismatched the subject in number. The subject was a case ambiguous feminine NP and either singular or plural. Again, an adverbial did or did not intervene between object and verb. The experiment included forty sentences like (7).

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[3] Keep in mind that particpants had to read and judge sentences under time pressure. They had no possibility to look back at the subject. A mean error rate of 4% in the mismatch conditions is a perfect result in the paradigm of speeded-grammaticality judgments.

(7) a. ..., dass die Studentin die Professorin (gestern öffentlich) kritisiert hat
that the student the professor$_{(fem)}$ (yesterday public criticized has
b. ..., dass die Studentinnen die Professorin (gestern öffentlich) kritisiert haben
that the students the professor$_{(fem)}$ yesterday public criticized have
c. ..., dass die Studentin den Professor (gestern öffentlich) kritisiert hat
that the student the professor$_{(masc)}$ yesterday public criticized has
d. ..., dass die Studentinnen den Professor (gestern öffentlich) kritisiert haben
that the students the professor$_{(masc)}$ yesterday public criticized have
'that the student(s) criticized the professor (yesterday in public)'

Forty-eight participants took part in experiment 2. The procedure of the experiment was the same as before. The percentages of correct judgments are shown in Table 5. Again the presence or absence of an adverbial did not affect correctness. Figure 3 presents attraction rates collapsed over sentences with and without an adverbial.

Table 5

Percentages of correct judgments in experiment 3

	ambiguous object		**unambiguous object**	
	Match	**Mismatch**	**Match**	**Mismatch**
with adverbial	97	85	97	93
without adverbial	96	86	97	94

ANOVAs revealed a main effect of match (*F1 = 21.0, p < .0001; F2 = 31.3, p < .0001*), ambiguity (*F1 = 11.5, p < .005; F2 = 13.3, p < .001*) and an interaction of the two factors (*F1 = 12.9, p .001; F2 = 16.6, p < .0005*). The adverbial had no effect (both Fs < 1). The remaining interactions failed significance (*all Fs < 1*).

Figure 3

Attraction rates in experiment 3

Experiment 3 provides further evidence for the role of morphological case marking. Although attraction occurred for both ambiguous and unambiguous objects, the

attraction rate is higher for ambiguous objects and only marginally for unambiguous objects. This is in line with findings from sentence production. The present results show that the lack of attraction for Dutch object pronouns found in Hartsuiker et al. (2001) is nothing specific for pronouns but rather has to do with case marking. We take this as evidence for an interference scenario, in which unambiguous case marking reduces the probability of mistaking an object as the subject.[4]

7. Conclusions

The present experiments provide evidence for attraction errors elicited by an object which does not match the subject in number. Before discussing further findings and an interference-based checking account for object attraction, I have to mention a potential objection. Since subject and object were always case ambiguous – compatible with both nominative and accusative case, it might be the case that participants occasionally analyze the first NP of the embedded clause as the object and the second NP as the subject. For object-before-subject (OS) readings agreement with the second NP would be correct. Thus, what looks like a judgment error due to a seeming agreement violation in the mismatch condition could rather be a sign of a (possible) OS reading with an actual agreement violation. However, given the strong evidence for a SO-preference (e.g. Bader & Meng 1999), this is a rather unlikely scenario. Further evidence for attraction as the cause of judgment errors comes from experiment 3 which shows that the same type of errors can be observed with unambiguous objects (for details see section 6). Finally, object attraction has been attested for Dutch as well (cf. Hartsuiker et al. 2001), a language which does not allow to scramble an object in front of the subject, except a focused object (cf. DeHoop & Kosmeijer 1995).

The experiments revealed two further effects. First, object attraction does not exhibit the same asymmetry observed in the modifier construction. Secondly, experiments 2 and 3 establish effects of morphophonological ambiguity. Object attraction is restricted to case ambiguous subjects and only marginally occurs with unambiguous objects. These findings are taken as evidence against a percolation scenario and for a scenario in which the checking process itself is disrupted due to interference by the object.

Percolation accounts assume that for attraction errors the representation of the subject NP is flawed while the checking process itself works correctly. Such accounts are challenged by the results presented above for three reasons: (i) when processing of the subject is completed, further material outside the subject NP should not affect its representation, (ii) percolation should result in an asymmetry between singular and plurals, (iii) percolation should not be sensitive to case ambiguity.

As an alternative, I would like to suggest that during the checking process which includes subject retrieval the object causes interference and occasionally is misretrieved as the controller for agreement. Such an interference-based checking account

[4] Hartsuiker et al. explicitly reject the idea that the effect of case ambiguity might be due to a misidentification of syntactic functions in the comprehension part of the sentence completion task.

offers a solution for all three challenges raised above. First, it is possible for an NP outside the subject to interfere in the process of subject retrieval, as long as it at least partially matches the retrieval cue. Secondly, interference is possible for both singular and plural objects. Thus, no asymmetry is expected. Third, unambiguous case marking should reduce interference.

Note that the interference-based checking account does not assume a linear, backward-search through the sentence conceived of as a string of words. As McElree (2000) and McElree et al. (2003) have shown, retrieval during sentence comprehension is mediated by a direct access mechanism, not by a search process. Direct access is achieved via retrieval cues. A further element can interfere when it (partially) matches the retrieval cues. Interference has a chance to apply whenever the parser needs to retrieve some earlier information from the CPPM, either to integrate the current word or to revise an initial analysis. For example, Gordon and his colleagues have shown that interference contributes to the increased complexity of object-extracted relative clauses in contrast to subject-extracted relative clauses (cf. Gordon, Hendrick & Johnson 2001, Gordon, Hendrick & Levine 2002). For interference during reanalysis van Dyke and Lewis (2003) have shown that recovery from a garden-path can become particularly difficult when the ambiguous region contains interfering items.

The present study provides evidence for interference during subject retrieval. Since the retrieval cues include nominative case, the object is always at a disadvantage and therefore only rarely considered to be the retrieval target. Ambiguity of case marking increases the probability of interference. Number does not seem to be among the retrieval cues, indicated by the fact that both singular and plural objects cause interference leading to attraction errors.

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THE HEBREW BINYAN *NIFʿAL:* TWO PATTERNS OF VERBAL PASSIVIZATION?

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1. Introduction

This paper sets out to examine a unique morphological pattern of Hebrew passivization. It is commonly assumed that different thematic realizations of the same concept (e.g. passive, causative, reflexive) are derived from the same basic entry via thematic arity (valence changing) operations. The cross-linguistic variation in deriving new predicates via arity operations is accounted for by the Lex(icon)-Syn(tax) Parameter (Reinhart & Siloni 2005)

(1) *The Lex-Syn Parameter*
UG allows arity operations to apply in the lexicon or in the syntax.

The syntactic component of the grammar is the engine that builds phrases from elements selected from the lexicon. It has been suggested that the syntactic machine operates with the selected elements and the lexical-semantic information they bear and cannot change their basic properties (Siloni 2002). Once a theta role is part of the theta grid of a predicate in the structure, it must either be merged as an argument or have a residue in the syntax or at the level of interpretation. This is formulated in the following guideline.

(2) *The Lexicon Interface Guideline* (TLIG)
The syntactic component cannot manipulate theta grids: elimination, modification or addition of a theta role are illicit in syntax

Following previous studies, I assume that Passivization is syntactic (Horvath & Siloni 2005), while other operations in Hebrew (Reinhart & Siloni 2005) are lexical. In this paper, I examine the morpho-phonology of Hebrew passivization. Hebrew passive verbs have a distinct morphology; they share the same vocalic pattern *u-a* regardless of the structure and segments of the active base form. There is one passive form , the *nifal* template, that demonstrates a different morphology. I argue that this passive form has become unproductive and that Hebrew aims at paradigm uniformity with regard to all passive verbs.

2. Passive Formation in Hebrew

The verbal system of Hebrew consists of prosodic shapes called binyanim. The binyan indicates the phonological shape of the verb, i.e. its vowels, its prosodic struc-

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 183-193.

ture and its affixes (if any). The phonological shape of a verb, unlike that of a noun, is essential for determining the shape of the other forms in the inflectional paradigm (Bat-El 1989, Aronoff 1994). A verb which does not conform to one of the existing binyanim cannot enter the verbal system. Therefore, every new verb that enters the language must conform to one of the existing vocalic patterns.

(3) Hebrew Binyanim[1]

Perfect	**Imperfect**
paʿal	yi-fʿa/ol
nifʿal	yi-paʿel
hifʿil	ya-fʿil
piʿel	ye-fa ʿel
hitpaʿel	yi-tpaʿel

I assume the word-based approach (Aronoff 1976), according to which the lexicon consists of words rather than morphemes or roots or coded concepts lacking a phonological matrix. Specifically, I adopt the theory of Stem Modification (Steriade 1988, McCarthy & Prince 1990, Bat-El 1994), which accounts for generalizations about morpho-phonological alternations by allowing for internal stem adjustments, rather than assuming extraction of a consonantal root (Bat-El 1986).

Semitic languages such as Hebrew and Modern Standard Arabic demonstrate a steady morphological pattern of passive verbs. A Hebrew transitive verb changes into passive by melodic overwriting, i.e. changing its vocalic pattern into *u-a.*

(4) *Hebrew passivization*

a. u a
↓ ↓
hiš lix ‘threw’ ⟶ hušlax ‘was thrown’

b. u a
↓ ↓
si per ‘told’ ⟶ supar ‘was told’

The morphological shape of passive verbs can be easily predicted. The passive forms of binyan *piʿel* are derived in the *puʿal* template and the passive forms of *hifʿil* share the *hufʿal* template. The relations between active predicates and their passive counterparts exhibit only melodic overwriting; the prosodic structure in both forms is identical and thus vacuously assigned. Melodic overwriting does not involve reference to the consonantal root (Bat-El 1994, 2002) as it operates directly on the stem.

In Laks (2006) I present differences between the morpho-phonology of lexical operations and the syntactic operation of passivization. Passivization demonstrate a

[1] The system of binyan names stems according to the traditional practice of associating the consonantal root *p/f, ʿ ,l* with a vocalic template.

rather predictable morpho-phonology, where there is a one-to-one relation between input and output forms. Moreover, the morpho-phonology of passivization applies to the segmental level only, as the only change that occurs is in the quality of the vowels. It is not intrusive to the base form as it does not change its prosodic structure. In contrast, the morpho-phonology of lexical opeartions is less predictable. The same binyan can serve as the output of more than one operation (5a). Such formations involve not only the segmental level but the prosodic one as well. This is manifested in addition or deletion of syllables or moras to the base forms. (5) demonstrates the different combinations of input-output binyanim of lexical operations.

(5) Hebrew possible input/output binyanim

Lexical Operation	**Input Binyan**	**Output Binyan**	**Examples**
a. Decausativization	hifʿil	paʿal nifʿal hitpaʿel	hixʿis → kaʾas ‘angered’ hivhil → nivhal ‘frightened’ hirgiz → hitragez ‘became upset’
	piʿel	paʿal hitpaʿel	simeax → samax ‘was happy’ rigeš → hitrageš ‘excited’
	paʿal	nifʿal	haras → neheras ‘ruined’
b. Causativization	paʿal	hifʿil piʿel	xatam → hextim ‘signed’ lamad → limed ‘studied - taught’
c. Reflexivization	paʿal	hitpaʿel nifʿal	raxac → hitraxec ‘washed’ šataf →ništaf ‘washed’
	piʿel	hitpaʿel	serek → histarek ‘combed’
	hifʿil	nifʿal	hišʾin → nišʾan ‘leant’
	hifʿil	hitpaʿel	higniv → hitganev ‘sneaked’

However, one intriguing passive form in Hebrew challenges the above observations. The Hebrew binyan *nifʿal* demonstrates a different thematic manifestation from other binyanim. This binyan, as well as other binyanim (e.g. *hitpaʿel*), can surface as the output of several lexical operations (6).

(6) Lexical operations in binyan *nifʿal*

Lexical Operation	**Examples**	
a. Decausativization	šavar → nišbar hixnis → nixnas hidhim → nidham	‘broke’ ‘came in’ ‘amazed’
b. Reflexivization	šataf → ništaf hišʾin → nišʾan	‘washed’ ‘leant’
c. Reciprocalization	pagaš → nifgaš	‘met’

As shown in (5) the input of such operations is not restricted to one template only. There are few cases where this binyan serves as a basic entry in the lexicon, e.g. *nitpal* 'picked on somebody'. However, many *nifʿal* verbs serve as the output of passivization, which is regarded as syntactic. This is not attested with regard to other binyanim. In this case the input of such operations is restricted to the *paʿal* template.

(7) *Nifʿal passive verbs*
katav → nixtav 'wrote'
bala → nivla 'swallowed'
ʾaxal → neʾexal 'ate'
baxar → nivxar 'chose'
šaʾal → nišʾal 'asked'

The morpho-phonology responsible for this derivation is different from the one of other passive verbs. It is performed by adding /*ni-*/ to the base. The first vowel of the stem is deleted to preserve the prosodic structure of a binary foot (two syllables). This challenges the distinction I propose between the morpho-phonology of the two types or thematic operations; why should this template serve both syntactic and lexical operations? Moreover, why is the passive formation of other templates (e.g. *piʿel*, *hifʿil*) manifested via melodic overwriting, while the one of *paʿal* is manifested by affixation?

In §3, I present an experiment I conducted in order to shed light on the two different morphological patterns of Hebrew passivization. I show that the *nifʿal* formation of passive forms has become unstable and less productive than melodic overwriting.

3. Passive Formation Experiment

3.1. Goal

The goal of this experiment is to examine the intuition of speakers with regard to the formation of passive predicates. It aims to test which prosodic templates subjects choose as a passive form of new transitive verbs they encounter.

3.2. Prediction

I predict that there would be no variation in the passive forms of *piʿel* and *hifʿil,* whose passive counterparts are expected to be *puʿal* and *hufʿal* respectively, while there would be a variation to some extent, with regard to the passive forms of *paʿal*. Speakers are expected to form the passive forms of *paʿal* as *puʿal*. Turning *paʿal* into *puʿal* involves only melodic overwriting without changing the prosodic structure of the verb, in contrast to a *paʿal-nifʿal /hufʿal* alternation, where the prosodic structure changes due to an addition of a prefix and a vowel deletion.

3.3. Method

Subjects were given nonce verbs in their active form and had to choose their appropriate passive counterparts out of five possibilities. Subjects were 50 native speakers of Hebrew between the ages of 12 and 47. The questionnaire consisted of 18 sentences, where each sentence contained two coordinated clauses. The first clause

consisted of an event described by an active verb and the second contained a paraphrase of this event. This paraphrase was in the passive voice. The subject had to fill in the missing verb. The second clause contained a by-phrase in order to make subjects use the passive form and to prevent an alternation with the decausative form. Eight sentences contained a nonce verb of binyan *paʿal* and eight sentences contained a nonce verb of the *piʿel* and *hifʿil* binyanim (four of each). I also added two monosyllabic verbs which I discuss in §3.6.

Subjects had to fill in the passive form as demonstrated in (8).

(8) rami **lasak** et ha-bayit, klomar ha- bait _____ al-yedey rami
'Rami **lasak (nonce verb)** the house, i.e. the house _____ by Rami'

In order to avoid revealing the purpose of this questionnaire, I inserted ten other sentences, where subjects had to choose the output form of operations other than passivization, such as reflexives and causatives, as well as the formation of nouns.

3.4. Results

The results are almost unanimous with regard to the passive forms of *piʿel* and *hifʿil*. 94% of the subjects used *hufʿal* as the passive of *hifʿil* and 92% chose *puʿal* as the passive of *piʿel*. This points to the high productivity of melodic overwriting in forming the passive forms of *piʿel* and *hifʿil*.

(9) Distribution of the passive forms of binyan *piʿel*

Nonce verb	puʿal		nifʿal		hufʿal		hitpaʿel		paʿul		Total
	num.	per.	num.	per.	num.	per.	num.	per.	num.	per.	
gines	47	94%	1	2%	0	0%	2	4%	0	0%	50
dimer	46	92%	2	4%	1	2%	0	0%	1	2%	50
gixel	46	92%	1	2%	1	2%	2	4%	0	0%	50
giles	45	90%	1	2%	2	4%	2	4%	0	0%	50
Average	46.00	**92%**	1.25	3%	1	2%	1.5	3%	0.25	1%	
Standard deviation	0.82	**2%**	0.50	1%	0.82	2%	1.0	2%	0.50	1%	

(10) Distribution of the passive forms of binyan *hifʿil*

Nonce verb	puʿal		nifʿal		hufʿal		hitpaʿel		paʿul		Total
	num.	per.	num.	per.	num.	per.	num.	per.	num.	per.	
hilrin	1	2%	0	0%	48	96%	0	0%	1	2%	50
hišnit	1	2%	1	2%	48	96%	0	0%	0	0%	50
himrig	2	4%	1	2%	45	90%	2	4%	0	0%	50
hexgil	3	6%	0	0%	46	92%	1	2%	0	0%	50
Average	1.75	4%	0.50	1%	46.8	**94%**	0.75	2%	0.25	1%	
Standard deviation	0.96	2%	0.58	1%	1.5	3%	0.96	2%	0.50	1%	

The results for the binyan *paʿal* are markedly different. Each verb had different results for the formation of its passive counterpart. For each verb, there was a different alternation between the forms of *puʿal* and *nifʿal* although the majority of subjects chose *puʿal* (11).[2] On average, 59% of the subjects chose *puʿal* as the passive form of *paʿal*, while 30% chose *nifʿal* as its passive form.

(11) Distribution of the passive forms of binyan *paʿal*

Nonce verb	puʿal		nifʿal		hufʿal		hitpaʿel		paʿul		paʿal		Total
	num.	per.	num.	per.	num.	per.	num.	per.	num.	per.	num.	per.	
palad	33	66%	12	24%	1	2%	3	6%	1	2%	0	0%	50
galas	38	76%	9	18%	0	0%	2	4%	1	2%	0	0%	50
kadaf	30	60%	14	28%	3	6%	3	6%	0	0%	0	0%	50
lasak	30	60%	12	24%	7	14%	1	2%	0	0%	0	0%	50
razal	33	66%	11	22%	4	8%	1	2%	0	0%	1	2%	50
kalam	20	40%	23	46%	5	10%	1	2%	0	0%	1	2%	50
gaxaš	24	48%	20	40%	5	10%	1	2%	0	0%	0	0%	50
gaxal	26	52%	17	34%	7	18%	0	0%	0	0%	0	0%	50
Average	29.25	**59%**	14.8	**30%**	4	9%	2	3%	0	0%	0	0%	
Standard deviation	5.73	11%	4.83	10%	2.56	6%	1.07	2%	0.5	1%	0.46	1%	

3.5. Discussion

The results in (9) and (10) point to the high productivity of melodic overwriting in forming passive predicates of *piʿel* andd *hifʿil*. There is hardly any variation in forming these passive verbs as the process responsible for their formation is predictable and not intrusive to the prosodic representation of the base form. However, the results for the binyan *paʿal* verbs are significantly different. For each verb there is a different variation between the forms of *puʿal* and *nifʿa* as shown in (11). On average, 59% of the subjects chose *puʿal* as the passive form of *paʿal*, while 30% chose *nifʿal* as its passive form. While the results reveal a tendency to use *puʿal* as the passive counterpart of *paʿal*, the gap in the results in comparison to the passive forms of *piʿel* and *hifʿil* should be accounted for. Note that the results are different for every verb. This indicates that the same speaker can choose different forms as the passive of *paʿal* and that the *paʿal-nifʿal* derivation of passive verbs has become unstable.

Note that there are two other factors that may have a considerable impact on the results; a phonological factor and psycho-linguistic factor. The former may determine that one form is preferred due the consonants that are involved and the way they are arranged, i.e. in a cluster or separated by a vowel. The latter states that similarity to an existing word or the context of the sentence can prime a choice of a template similar to a real word. Nonetheless, these two factors are expected to apply in all forms, not only within the *paʿal* nonce words. In light of the results for passive forms of *piʿel* and *hifʿil*, it seems that these considerations did not have a great effect. The results are rather similar within each binyan, regardless of the base consonants or the associations the sentence might raise.

[2] There were subjects who chose other forms for the passive verb, but their percentage is insignificant.

A significant number of subjects chose *puʿal* as the passive counterpart of *paʿal*. I argue that the motivation for this choice is the parametric value of the Lex-Syn parameter. Since passivization is considered syntactic, its formation is expected to be morphologically less intrusive and more predictable. Moreover, paradigm uniformity with other passive forms (Steriade 2000), i.e. *puʿal* and *hufʿal*, plays a role as well. Subjects who choose *puʿal* maintain the same vocalic pattern for all passive forms in the language.

The alternation between the *nifʿal* and *puʿal* forms can be explained by two factors. All passive forms of existing verbs in binyan *paʿal* are in binyan *nifʿal*. Speakers therefore have access to the *paʿal-nifʿal* paradigm of passivizations and, as a result, they analogously form new passive verbs in *nifʿal* as well. Speakers aim for paradigm uniformity with active-passive paradigms which they are already exposed to. Another possible explanation is paradigm contrast. Kenstowicz (2005) discusses several cases in which the phonology conspires to ensure that two phonologically distinct members of a paradigm remain phonologically distinct. He presents data where phonologically motivated processes fail to apply in order to maintain a paradigmatic contrast. In the Damascus dialect of Arabic, the third person object suffix demonstrates different behaviour with verbs in the first and third person feminine. Stress in Damascus Arabic falls on the rightmost heavy syllable, but never on the final syllable. When there is no heavy syllable, stress is antepenultimate. This dialect of Arabic has a constraint which prohibits a schwa in an unstressed open syllable. When adding the object suffixes to a verb, the stress might change. When the object suffix begins with a consonant, it closes the final syllable of the base to create a heavy syllable which attracts the stress (12a). When the suffix starts with a vowel, it should produce antepenultimate stress with syncope of the suffixal vowel (12b). However, such an input-output paradigm would merge this form of the paradigm with the first and second masculine (12c). Consequently, although the deletion of /e/ is phonologically motivated in both verbs, it occurs in only one.

(12) *Object suffixes in Damascus Arabic*
  a. ʿallamét-ni 'she taught me'
  b. ʿallamét-o 'she taught him'
  c. ʿallámt-o 'I/you taught him'

The same suffix behaves differently in essentially the same phonological context in order to achieve paradigmatic contrast. (12c) is the chosen output as there is no other member of the perfective paradigm competing for the same phonetic output.

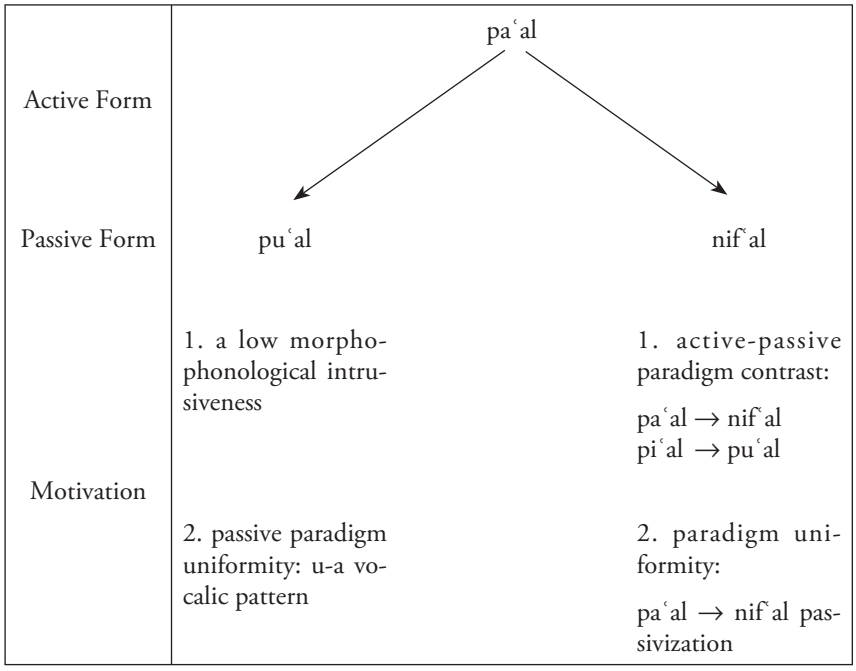
I argue that this paradigmatic contrast is also relevant for morphological processes. If passive counterparts of *paʿal* were in the *puʿal* form, they would be morphologically identical to the passive forms of *piʿel* verbs. Since speakers have access to the syntactic paradigms of passivization, there is a constraint prohibiting verbs of the *piʿel* and *paʿal* verbs to share the same passive counterparts. Thus, some speakers block the *puʿal* form as a passive form of *paʿal* in order to preserve a contrast. (13) demonstrates a case where transitive verbs with the same stem consonants are manifested in both *paʿal* and *piʿel*.[3] If melodic overwriting applied in (13a) there would be a merge of the passive forms of two semantically distinct verbs.

[3] Other examples of such pairs are *yacar* 'created' and *yicer* 'manufactured, *lamad* 'studied' and *limed* 'taught' and *patar* 'excused' and *piter* 'fired'.

(13) a. parak → nifrak / *purak ‘unloaded’
b. perek → purak ‘dismantled’

To conclude, paradim uniformity on the one hand, and paradigm contrast on the other hand could be responsible for the occurrence of passive forms in binyan *nifʿal*. Speakers who form *puʿal* as the passive counterparts of *paʿal* verbs aim for a low level of morphological intrusiveness for a syntactic operation and, in addition, paradigm uniformity with regard to the *u-a* vocalic pattern of other passive forms in the language (*puʿal* and *hufʿal*). The interacting factors that affect the choice of passive forms are presented in (14).

(14) The *puʿal - nifʿal* variation



3.6. Monosyllabic Verbs

There is a group of monosyllabic verbs in binyan *paʿal*. Many of them are intransitive verbs such as *rac* ‘ran’ and *šat* ‘sailed’, hence they have no passive counterparts. There is a small number of monosyllabic transitive verbs such as *cad* ‘hunted’. Binyan *nifʿal* has a marginal pattern *nipol/napol*. This pattern occurs with verbs of two consonants, for example *nasog* ‘retreat’ and it can also be found as a passive form of monosyllabic verbs in *paʿal* (15):

(15) *Napol/Nipol Passive forms*
cad → nicod ‘hunted’
laš → naloš ‘kneaded’
dan → nadon ‘discussed’

This template, however, is rather unproductive and the existing forms of its shape are few. I thus believe these passive forms are lexicalized and cannot be formed by a syntactic operation of passivization. The questionnaire also included two nonce monosyllabic verbs *lar* and *lat*. Subjects formed different passive counterparts for every verb as shown in (16) and (17).

(16) Passive forms of *lar*

percentage	number	Passive form
40%	20	hular
12%	6	lurar
2%	1	lurlar
2%	1	nilor
2%	1	nalor
8%	4	nilar
12%	6	nular
2%	1	larar
2%	1	nilran
2%	1	hulran
4%	2	luran
4%	2	hulrar
2%	1	nilra
6%	3	lar
100%	**50**	**Total**
76%	**38**	**Total u-a forms**

(17) Passive forms of *lat*

percentage	number	Passive form
50%	25	hulat
14%	7	lutat
2%	1	nalot
12%	6	nilat
4%	2	lulat
4%	2	nulat
2%	1	nolat
4%	2	niltat
2%	1	nimlat
6%	3	lat
100%	**50**	**Total**
72%	**36**	**Total u-a forms**

The *hupal* template is the most common passive form of both verbs. On average, 45% of the subjects used this form, while others formed the passive in many different

templates using various strategies.[4] Apart from *hupal*, all forms have a rather low percentage. This great variation in forming passive verbs from monosyllabic verbs shows that most speakers have not mastered the passive formation of monosyllabic verbs as they are rather rare and have an exceptional morphological shape. The *hupal* template clearly has a prominent advantage over each of the other forms used. The morpho-phonology responsible for its formation is relatively simpler in comparison to other forms. It involves adding the prefix /*hu-*/ to the base form that remains intact with regard to both the prosodic and the segmental level. Moreover, it resembles *huf'al* phonologically, as well as the vocalic pattern of both *huf'al* and *pu'al*. The formation of most of the other passive forms, in contrast, demonstrates a more intrusive morpho-phonology. Some are formed by reduplication of the last consonant, e.g. *lurar*. Although this form has the passive vocalic pattern *u-a*, its formation is morphologically complex as it is intrusive to the structure of the monosyllabic base.[5] Other forms are created both by affixation and by a vocalic change of the stem vowel, e.g. *nalor* and *nilat*. Additionally, paradigm leveling plays a role here in determining the passive form of monosyllabic verbs. The *hupal* form has the same vocalic pattern *u-a* of other passive forms and is therefore more accessible for speakers to form. Interestingly, there are two existing monosyllabic transitive verbs, which actually have a passive alternate with the *u-a* pattern:

(18) *u-a monosyllabic passive forms*
sam → husam 'put'
šar → hušar 'sang'

I argue that the verbs in (18) have a higher token frequency than the ones in (15). As a result, their passive form is more common as well and it bears the morphological shape of the *u-a* pattern. The frequent use of the passive predicate increases the tendency to form the unmarked pattern of passivization, i.e. the *u-a* pattern. Examining the vocalic patterns of all the passive forms which subjects used in this case, there is a notable preference for preserving the *u-a* pattern, regardless of the strategy that was implemented on the base. 76% of the subjects preserved the vocalic pattern of *u-a* for the passive form of *lar*, while 72% of them did so for *lat*. It should be noted that the formation of nonce verbs such as *nulat* demonstrate the same level of intrusiveness as the one of *hupal* as they only differ in the consonant of the suffix. Forms such as *nulat* were hardly used as there is no motivation for their formation. There are no existing analogous forms with the prefix /*nu-*/, while there are many such forms that consist of the prefix /*hu-*/.

The case of Hebrew monosyllabic verbs provides further evidence for the central role of paradigm uniformity in determining the morphological shape of a word. The choice of the *u-a* pattern serves the desire for uniformity within passive forms. The choice of the specific *hupal* pattern points to the constraint that syntactic operations should exhibit minimal intrusiveness to the base form.

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[4] I do not address the strategies used for all passive forms as many of them have a very low and insignificant percentage. Some subjects used rather peculiar forms that I do not account for and others simply did not change the nonce verbs. I assume that it results from a lack of acquaintace of such passive paradigms of monosyllabic verbs.

[5] I do not discuss this formation within the scope of this paper (See Bat El 2004).

4. Conclusions

In this paper, I accounted for the two patterns of Hebrew passivization. I began by presenting the morphology that manifests passivization in comparison to other thematic operations. I argued that the existence of the *nifʿal* passive forms contradicts the analysis of the unique morphology of passivization. The passive formation experiment reveals that binyan *nifʿal* has become less productive as the output of passivizations and that there is a strong tendency to apply the same vocalic pattern in the formation of passive verbs. The case of monosyllabic verbs lends further support for this claim as most subjects formed passive verbs with the *u-a* pattern. This analysis reveals the interaction of several factors which are responsible for the observed variation in forming passive counterparts of *paʿal* verbs. In addition to the difference in the morpho-phonology of lexical and syntactic operations, other factors such as paradigm uniformity and paradigm contrast play a role in determining the morphological shape of derived verbs.

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THE ACQUISITION OF ASPECT IN ITALIAN

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1. Introduction

Aspect conveys the internal compositional meaning of a sentence. We have to distinguish between two basic notions of aspect: *lexical aspect* and *grammatical aspect.*[1] *Lexical aspect* (or Aktionsart, situation aspect) deals with the temporal contour of a situation which is independent of the time; it describes whether an eventuality is stative or dynamic, punctual or durative. The lexical property that concerns us in this study is the property of telicity. This aspectual property encodes, for example, whether the event denoted by the verb has a natural terminus or not, that is if it is *telic* or *atelic*. The atemporality of a given lexical aspect is determined by the fact that "…the timeframe is irrelevant to the natural unfolding of the event" (Rosen 1999: 3). A predicate has telic interpretation when the event that it denotes reaches its point of culmination; in other words, when it entails the completion of an event as in *build the house, write a letter*. A telic predicate has a natural endpoint, while a predicate is atelic when the event that it denotes does not reach its culmination or does not encode any natural endpoint as in *laugh*, *work, love cheesecake*.

Grammatical aspect (or viewpoint aspect) operates on top of lexical aspect. The use of grammatical aspect implies that a speaker chooses a certain perspective to report on an event. This aspect "…focuses on the temporal perspective of the event" (Rosen 1999: 3) and it is usually determined by tense morphology. Grammatical aspect refers to the actual beginning and final boundaries of an event, whether they are implied or not. The grammatical/aspectual property that concerns us in this study is the property of *perfectivity*. A *perfective* reading presents the event as an unanalyzed whole, including its initial and final boundaries, whereas an *imperfective* reading zooms in on the event in progress without reference to the time when it started or ended.

Languages differ in how they mark the property of telicity. For example, Dutch and English encode telicity in the syntax-semantics of the direct objects. Transitive verbs with a semantically countable direct object may yield telicity (1), while Transitive verbs with an uncountable/mass object may yield atelicity (2). This can be shown using one of Dowty's (1979) tests for telicity: the contrast between durative

[1] The terms lexical and grammatical aspect have been identified in the literature as inner and outer aspect, Verkuyl (1987); situation time and point of view, Smith (1991/1997); and (a)telicity and (un)boundedness, Depraetere (1995) respectively.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 195-211.

versus time-frame adverbial phrases. Durative phrases (e.g. “for hours”) select for an atelic predicate, while time-frame adverbials (e.g. “in an hour”) select for telic ones. Compare the possible modifications in the Dutch examples in (1) and (2) reported by Van Hout (1998).

(1) Het paard heeft urenlang /* in een uur brood gegeten
(uncountable/mass) *telic reading*
The horse has hours-long/ in an hour bread eaten
‘The horse ate bread for hours/*in an hour.’

(2) Het paard heeft *urenlang / in een uur een appel gegeten
(countable) *atelic reading*
The horse has hours-long/ in an hour an apple eaten
‘The horse ate an apple *for hours/in an hour.’

Slavic languages mark the quantification directly on the specification +/– perfective of the verb. For instance, the examples in (3) and (4) illustrate it. Grammatical aspect is marked on the verb (Imperfective in 3a/4a and Perfective in 3b 14b) and depending on the verbal morphology the direct object is identified as definite or indefinite

(3) a. Ota pil vino (Van Hout 1998)
Ota drink (Imperfective) wine / ?the wine
‘Ota drank wine / ?the wine’
b. Ota vypil vino
Ota (Perfective suffix)drink *wine / the wine
‘Ota drank *wine / the wine’

(4) a. Jedi hrušky. (Van Hout 1998)
(He) eat (Imperfective) pears/ ? the pears
‘He ate pears/ ? the pears ‘
b. Snědi hrušky.
(He) eat (Perfective) *pears/ the pears
‘He ate *pears/ the pears

Van Hout (1998) claims that one may expect that learning the role of direct objects for telicity comes later than the role of perfective marking on the verb. She puts forward the hypothesis that when the lexical aspect of a verb is marked directly in its morphology it is easier to retrieve than when it is marked in the co-occurring elements. The experiments in Van Hout (1996, 1998) found out that Dutch and English children up to the age of 5 do not conform to the aspectual information related to object position in an adult-like way. On the other hand, Polish and Russian children as 2 and 3 year olds are able to compute their aspectual entailments right.

Italian seems to pattern with languages that encode telicity in the features of the direct object. Anyway, we need to add few considerations about the lexical properties of the intransitive verbs, which can be inherently +/–telic independently of the presence of a direct object. The syntactic characteristics of the argument projected in the verb phrases are crucial, but the semantic feature of the lexical items involved in the verb derivation can also be relevant. On the grammatical aspect side, the perfective morphology can be applied to all verb classes independently of their lexical aspect. In

this paper the acquisition of perfective morphology is investigated. The effect of the (a)telicity of verbs in the development of perfective morphology is examined in Child Italian. The hypothesis is that compositional telicity is acquired earlier than the lexical aspect as it results by the semantics of the lexical items that enter into the derivation, since the syntactic generalizations are easier to acquire than the semantic idiosyncratic properties. Perfective morphology should show particular properties in interaction with verbs whose lexical aspect is not given. The second section is devoted to the analysis of the characteristics of aspect in Italian, while the third section is dedicated to the background theories on the acquisition of aspect. In the fourth section the data are presented: an analysis of the appearance of perfective morphology in spontaneous speech, and two experimental tasks on the production and comprehension of the perfective morphology with different verb classes. In the last paragraph the data are discussed and a developmental analysis of the acquisition of aspect is given.

2. Background on Aspect in Italian

Telicity can be derived compositionally in languages like Italian. The direct object quantificational status (mass term versus count term or indefinite versus definite article) determines telicity. A dynamic verb with an indefinite object gives atelicity, e.g., *biada* 'fodder' in (5a), while a quantized/definite object yields telicity, as with la *biada* 'the fodder' in (5b). Thus, the aspectual semantics of the VP is compositionally determined (Verkuyl 1972, 1993; Krifka 1986, 1992).

(5) a. Il cavallo mangiò biada per ore /?in un'ora
(Indefinite) *atelic reading*
The horse eat (3 prs.s past) fodder for hours/?in an hour
'The horse ate fodder for hours/? in an hour'

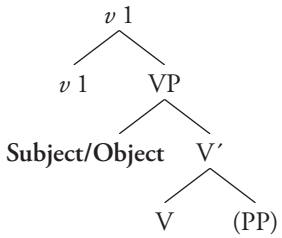
b. Il cavallo mangiò la biada *per ore/ in un'ora
(Definite) *telic reading*
The horse eat (3 prs.s past) the fodder for hours/?in an hour
'The horse ate the fodder *for hours/in an hour'

Intransitives, depending on the loci of generation of the subjects, entail telicity or not. Van Hout (2004) proposes that unaccusatives, since they project their argument in object position are inherently telic, while unergatives, since they project their argument in a *v*P external position, are inherently atelic. This generalization fits with Italian data. The unaccusative in (6) is telic and has a *v*P[2] structure as the one in (7), while the unergative in (8) is atelic and has a *v*P with the argument directly projected in the specifier position of the *v*P (9).

(6) Il cavallo arriva *per ore /in un'ora
(Unaccusative) *telic reading*
The horse arrive (3 prs.s pres) *for hours/in an hour
'The horse arrives *for hours/in an hour'

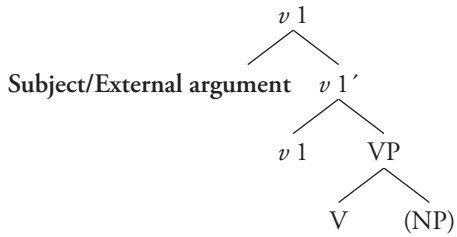
[2] We use an argument structure *à la* Larson (1988) where the VP is divided into two VP shells. The assumption is that higher VP is a *vP-like* projection (light verb) that allows the projection of an external argument as in Hale & Keyser (2002).

(7) Unaccusative[3]



(8) Il cavallo piange per ore /*in un'ora
(Unergative) a*telic reading*
The horse cries (3 prs.s pres) for hours/*in an hour
'The horse cries *for hours/in an hour'

(9) Unergative[4]



Given this structural generalization for the determination of telicity with intransitives, we can also find verbs that do not pattern with it. The unergative *finire* 'to end up' in (10) is telic. It behaves as an unergatives since it selects the auxiliary *avere* 'to have', that is a mark of unergativity/transitivity in Italian.[5] The auxiliary *essere* 'to be' is used only in cases where there is a movement from an object of the VP to the higher functional projections responsible for agreement morphology as in Burzio (1986):[6] that is, in unaccusatives and in passive constructions. In sum *finire* in (10) is an unergative but it does not behave for the determination of telicity as other unergatives like the one in (8).

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[3] The low PP in complement position depends from the fact that possibly, all unaccusatives do select a prepositional argument, which can remain silent. See also the discussion in Moro (1997).

[4] The low NP in complement position is the position where cognate objects are found as in *John danced a happy little dance*. The cognate object does not influence the determination of telicity as we can see in sentences like *John danced a happy little dance *in one hour/for hours.* For a discussion see Hale & Keyser (2002) and Mateu (2002).

[5] Levin & Rappaport Hovav (1995) defines the selection of auxiliary in Italian as an unaccusative diagnostic, that is, when we find the auxiliary *avere* 'to have' with intransitives it means that we are dealing with an unergative, while when we have the auxiliary *essere* 'to be' we are dealing with an unaccusative.

[6] For a more recent account on the auxiliary selection see Sorace (2000), who proposes a scale of verb classes identified for the different lexical values. This scale can be split in two parts for the selection of auxiliary.

(10) Gianni ha finito *per ore /in un'ora
telic reading
Gianni have (auxiliary 3 prs.s pres) finished *for hours/in one hour.
'Gianni has finished *for hours/ in one hour.'

In order to account for data like the one in (10), a different mechanism of determining telicity for intransitives is needed. The contrast is given by the fact that *finire* in (10) is telic because of the presence in its lexical root of the world *fine* that means *end* in Italian so Italian allows the determination of telicity also by lexical insertion directly in the root of the verbs.[7]

So in Italian two mechanisms are at work in order to determine the property of telicity along verb classes: on the one hand we have the characteristics of the object (both the direct objects of transitives and subjects of unaccusatives), and on the other the idiosyncratic characteristics of the lexical roots that enter into the VPs configurations.

The grammatical aspectual feature of *perfectivity* is encoded in Italian in the morphology of the *passato prossimo.* It is a compound tense form created by the present inflected form of the auxiliary and the past participle derived from the lexical root of the verb. The imperfective value is expressed through the morphology of the *imperfetto*. It is a past tense that gives a continuous, imperfective aspect with no termination entailments and it is derived by the adjunction of the morpheme *-v+ person and number* agreement morphology to the root of the verb.

The attribution of grammatical aspect through tense morphology works on predicates with marked lexical-aspectual values (such as telicity/atelicity). The lexical aspect of a given verbal item interacts with the grammatical aspect encoded in the tense morphology. Lexical and grammatical aspects interact as follows in the use of past tense morphology in Italian. The *passato prossimo* on the one hand gives an entailment of completion for telic predicates such that the event has progressed to its natural culmination moment and, on the other, it establishes termination for atelic predicates (there is no natural culmination moment for atelic predicates; the final moment is an arbitrary moment). The *imperfetto*, for its imperfective feature, suggests ongoingness with the force of a conversational implicature and it applies in the same way to both telic and atelic verbs. All these interactions are summarized throughout table 1.

[7] For a proposal on the syntax of VP that accounts for lexical differences in verbs that share the same syntactic structures see Mateu (2002). He argues that we have to recognize two elements at work in the configuration of verb classes in order to account for the relations between syntax and semantics: the *configurational semantics* that can be read off the mere argument structures, which coincides with l-syntax postulated by Hale & Keyser (2002); the *non-configurational* semantics associated to the relational heads of these structures. The *non-configurational semantics* is developed through binary features that reside in the relational node of the configurational structure. The non configurational semantics does not refer to lexical root but to the features of the element that enter into the VP configuration.

Table 1

Interaction between (a)telicity and the aspectual tenses

	Imperfetto	**Passato Prossimo**
TELIC	Ongoing	Completed
ATELIC	Ongoing	Terminated

Van Hout & Hollebrandse 2001.

For our purpose it is important to notice that *passato prossimo* gives perfective entailment to all verbs it applies on. So if children at some stage have problems just with one verb class in the interpretation of perfective morphology, it could mean that they have aspectual problems linked to such a verb class. So we employ the use/acquisition of perfective morphology along verb classes as a shortcut of the aspectual knowledge at work in Child Italian. In the next section we provide an overview of the studies on the acquisition of aspect.

3. Background studies on the Acquisition of Aspect in Italian

Several studies have focused on the first productions of perfective past tenses. Antinucci & Miller (1976), in a longitudinal study of 7 Italian children (aged between 1;6 and 2;5), found that children do not produce forms of *passato prossimo* with unergatives but that they only use such tenses with change of states verbs such as *diventare* 'become'. This led them to claim that children in the early stages are cognitively not ready to entertain abstract, temporal relations. At this point of their development they lack an abstract conception of time that would allow them to construct the relation "event x precedes event y" for any two events. Instead, they claim that children can use the form of *passato prossimo* in order to refer to the resulting characteristic of some predication, for example the end state of a change of state verb. Children are able to observe states in the present that have the characteristic of being linked to a preceding event of which they are the result (only telic representations). This led Antinucci & Miller to formulate the so-called *Aspect First Hypothesis* (AFH), whereby children present a cognitive deficit which is the underlying cause of why tense inflection cannot mark temporal relations. Children use the past form in order to refer to aspectual characteristics of the verb and not to the temporal ones: that is, children use the perfective morphology of *passato prossimo* in order to refer to *telicity*.

Data from other languages do not confirm some of the assumptions of the AFH. For example Beherens (1993) found in early German productions that were clear instances of the child's ability to refer to past events before the onset of linguistic tense marking, suggesting that children have a basic temporal orientation of past long before and dissociated from its morphological tense marking. Smith & Weist (1987) in their studies on Polish acquisition found that children are able to refer to the past properly and in earlier stages. Children aged between 1 year and 2 years were able to refer to events happening two weeks before the second experimental session by us-

ing past tense forms without referring to particular aspectual notions of the class of verbs. In next section other data coming from Italian spontaneous speech will confirm the fact that children are able to understand past tenses and furthermore the will help us in addressing the discussion about ASH.

Van Hout & Hollebrandse (2001) tested children's comprehension of telic sentences (all presenting an overt quantified object) with *imperfetto* and *passato prossimo* tenses using a picture selection task. Subjects were presented with short stories and accompanying pictures. The final picture of each story was missing. The children's task was to choose one of two pictures they were shown at the end of the story. They were asked about the picture using a question presented in the *passato prossimo* or in the *imperfetto*. The choice was between a picture of a completed situation and one of an ongoing situation. Half of the questions had an *imperfetto* and the other half had a *passato prossimo*. The story that at the end presented the question with an *imperfetto* implied the choice of the ongoing situation, while the situation with a *passato prossimo* triggered the choice of the completed situation. The 64 children tested in this experiment (aged between 3 and 5 years old) showed a particular pattern of comprehension: in table 2 the correct answers are computed; the choice of the correct picture for the *imperfetto* is the ongoing situation and for the *passato prossimo* the completed situation.

Table 2

Results of the comprehension task experiment: percentage of correctness

Age	Imperfetto	Passato Prossimo
3	35%	47%
4	71%	57%
5	58%	92%

Van Hout & Hollebrandse 2001.

3-year-old children present the lowest percentage of correct answers. 4 and 5 year olds show a higher percentage of correct answers. In any case, children make a lot of mistakes in performing this task. Children do not seem to recognize the grammatical aspectual information encoded in the tense morphology very well. The important thing to notice here is that there is no possibility of accounting for the experimental performance in terms of lexical aspect. There is no bias at work for which they, certainly at an early age, use perfective/imperfective morphology in order to refer to lexical aspectual notions, as predicted by AFH. Children do not interpret *imperfetto* or *passato prossimo* systematically to refer to the ongoing/completed, they only do it at 4 years for *imperfetto* and the at 5 years for *passato prossimo*.

In next section we resume the data we have collected about the production and comprehension of *passato prossimo*, as it applies over telic transitives and atelic unergatives in order to complete the picture about the acquisition of the perfective morphology of *passato prossimo* along different verb classes marked for (a)telicity.

Our claim is that the perfective morphology of *passato prossimo* is present in child grammar as other past tense. Futhermore, the distribution interacts with lexical aspect encoded in the verb phrases but not as predicted by AFH, but effects linked to the compositional lexical aspect or to the lexical idiosyncratic properties of the root should interact with the comprehension and production of *passato prossimo*.

4. The Acquisition of Italian Perfective Aspect

This section is devoted to put forward the data about the use of perfective morphology of *passato prossimo* in Child Italian. In the first subpart we provide the data about the distribution of *passato prossimo* along verb classes in spontaneous speech. In the second section we present an experimental task in which the production of *passato prossimo* with different verb classes is visualized. The comprehension of perfective entailments of *passato prossimo* along verb classes, investigated through an experimental task is investigated in the third part.

4.1. Spontaneous Speech corpus

Methods

Our analysis of subject distribution along verb classes was performed on a longitudinal corpus of spontaneous productions of four Italian children aged between 18 and 36 months (Calambrone corpus: Diana, Martina, Raffaello, Rosa Cipriani et al 1989, CHILDES database MacWhinney & Snow 1985). In the corpus we analyzed just the declarative finite sentences. Over the 17573 sentences in the corpus we analyzed 2838 declarative sentences. We looked for the forms of *passato prossimo* and the verb classes they occurred with (Lorusso 2004).

Results

The general results of distribution of *passato prossimo* are stored in table 3. Children seem to use *passato prossimo* with all verb classes. The lowest number is found with unergatives: that is, the intransitives with external arguments, structurally atelic. The higher percentage of forms of *passato prossimo* is found with unaccusatives.

We also looked if children choose the correct auxiliary depending on verb classes: unaccusatives select *essere* 'to be' while transitives and unergatives select the auxil-

Table 3

Distribution of *passato prossimo* along Verb Classes

	Forms of *passato prossimo*	**Other Forms**
Unaccusatives	15%	85%
Transitives	14%	86%
Unergatives	2%	98%

iary *avere* 'to have'. In table 4 the results of the selection of auxiliary are collected. At first look, children seem to correctly assign the proper auxiliary to each verb class. We can not use the cases of omission, since the auxiliary is not expressed.

Table 4

Percentage of Selection of the Auxiliary in the Form of *Passato Prossimo* in Children's Productions

	Auxiliary *essere* 'to be'	**Auxiliary *avere* 'to have'**	**Omission of Auxiliary**
Unaccusatives	98%	0	2%
Unergatives	0	67%	33%
Transitives	0	75%	25%

The appearance of the first form of *passato prossimo* with different verb classes in the corpus is analyzed: in all children unergatives are the last verbs that appear presented with the morphology of *passato prossimo.* The results are collected in table 5.

Table 5

Age of First Appearance of *passato prossimo* (yy,mm,dd)

	First *passato prossimo* with Unaccusatives	**First *passato prossimo* with Unergatives**	**First *passato prossimo* with Transitives**
Diana	01;08,05	02; 06	01; 10, 07
Martina	doesn't use auxiliary	02; 04,14	01; 07, 18
Raffaello	02; 03 14	02, 05, 13	01, 11
Rosa	02; 01, 14	03;00, 24	02; 05, 25

Discussion

Children seem to correctly select the auxiliary with *passato prossimo,*[8] the data seem to confirm the predictions of the aspect of the AFH since atelic verbs such unergatives are the last ones in the corpus to show the morphology of *passato prossimo* (as in table 5). Furthermore the data about the distribution of forms of *passato prossimo* along verb classes (table 3) show that children use more perfective morphology with unaccusative, class of verbs that include the change of state verbs as *diventare* 'to become' as predicted by AFH. Anyway in the same corpus we looked at the form of imperfectives and following some predictions of AFH children are supposed to not be able to analyze past tenses. Furthermore, if perfective morphology is used to express telicity, complementary perfective morphology should express atelicity, but this is not the case. We have found in the corpus imperfective forms used with all verb classes productively from very early stages in all children. We report some examples in (11) (12) and (13) of the imperfective forms found with all verb classes.

[8] These results are consistent with the ones of Snyder & Stromswold (1997).

(11) Imperfective Form with Unaccusatives
eva, eva, <ere> (=sedeva) (Rosa, 01;09,11)
sit down-pr3s imperf
'(he/she) was sitted'

(12) Imperfective Form with Transitives
ettìa 0w ppallone (Diana, 01;10,07)
put -pr3s imperf the ball
'(he/she) put the ball'

(13) Imperfective Form with Unergatives
ava (=nuotava) (Martina, 01;11,20)
swim -pr3s imperf
'(he/she) swam'

The data about the distribution of *passato prossimo* seem to confirm the AFH, but the distribution of imperfective forms does not go in the same direction, that is why we need more experimental proof of the distribution of *passato prossimo,* because maybe we are in front of a different phenomena. In the next paragraphs we analyze the production and comprehension of *passato prossimo* with compositionally telic transitives and with atelic unergatives.

4.2. Production Task

Subjects

Adult Italian speakers and fifty children participated in the study: ten 3 year-olds, ten 4 year-olds, ten 5 year-olds, ten 6 year-olds and ten 7 year-olds. The ten adults were tested at their homes in Conversano (Bari, Italy) and the children were tested at school 1° Circolo didattico "G. Falcone" also in Conversano (Bari, Italy).

Procedure

This experiment is designed to recognize the pattern of expression of perfective/non perfective forms along ages and verb classes. The goal of the production task is to investigate when children start to produce *passato prossimo* with unergatives and transitives in a situation where children are forced to use this tense. Children in the early stage may not able to properly produce *passato prossimo* with unergatives, because they are not be able to identify the role linked to the presence/absence of a direct object in order to determine the compositional telicity as it happens for English and Dutch learners (van Hout 1998). The materials consisted of 8 silent digital videos in which a story was presented: the story involved four telic transitive verbs with an overt quantified object and five atelic unergatives without overt objects. Atelic events were represented with an endpoint in order to force a completed reading and, consequently, the use of *passato prossimo.* All events (telic and atelic) were presented in the same video in a random order. Then, children were asked to describe such ac-

tions in the past with the request: "cosa ha fatto Marta ieri?" that means "What has Marta done yesterday" (Lorusso 2005).

Results

The first general result we present is the attribution of perfective and imperfective morphology to the general verb classes of telic Transitives on one hand and atelic Unergatives on the other. The absolute numbers of the responses for telic transitives is summarised in table 6 while in figure 1 we give the percentage of *passato prossimo* used with telic transitives.

Table 6

Responses with Telic Transitives (absolute numbers)

Telic verbs		Perfective	Imperfective	Total
Age	3	31	9	40
	4	21	19	40
	5	29	11	40
	6	25	15	40
	7	32	8	40
	adults	33	7	40
Total		171	69	240

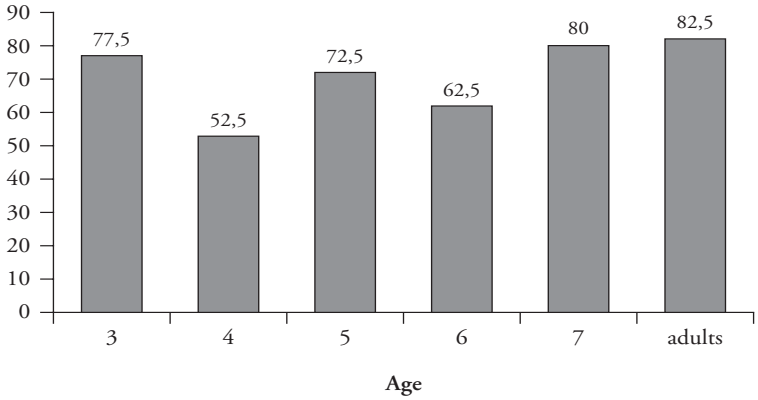

Figure 1

Percentage of Forms of *passato prossimo* Found with Telic Transitives

Atelic unergatives have different distributions of perfective morphology depending on age. In table 7 we give the absolute number of the responses while in figure 2 we present the percentage of perfective forms over the total.

Table 7

Responses with Telic Transitives (absolute numbers)

Atelic verbs		Perfective Responses	Imperfective Responses	Total
Age	3	19	31	50
	4	10	40	50
	5	23	27	50
	6	29	21	50
	7	28	22	50
	adults	34	16	50
Total		143	157	300

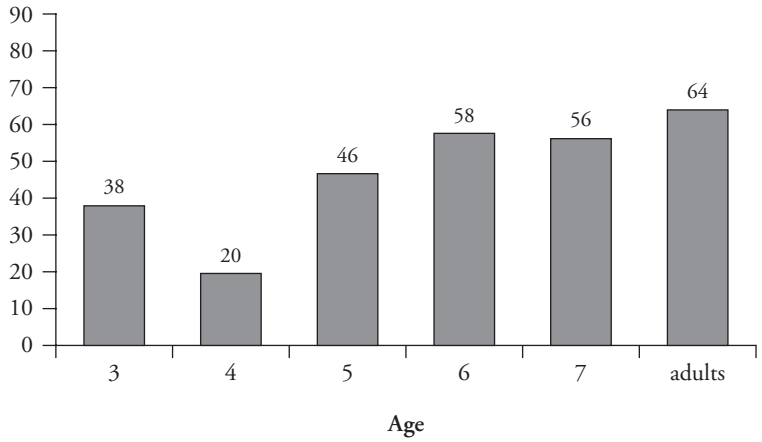

Figure 2

Percentage of Forms of *passato prossimo* Found with Aelic Unergatives

Discussion

Adults seem to behave in the same way with both verb classes: they show the tendency in selecting the *passato prossimo* when the action depicted has an endpoint without any differences among the two verb classes. Children aged between 5 and 7 years also show the tendency to select *passato prossimo* for both verb classes. So, adults and children aged between 5 and 7 years respond as the experiment requires. The use of perfective morphology is triggered by the presence of an explicit endpoint in the presentation. 3/4-year olds show systematic difference in the responses for each verb class. Atelic unergatives are expressed with a preferential imperfective morphology, while telic transitives are expressed with a preferential *passato prossimo*. This result is statistically significant by the Wilcoxon test:

it is –1.92 (p-value = 0.054). The same is true for 4 year olds. (The Wilcoxon statistic in this case is –2.23 (p-value = 0.026)). Tha is means that only 3 and 4 year-olds systematically attribute perfective morphology for telic transitives and imperfective for atelic unergatives.

Also this experiment does not contradict the AFH, since children use systematically preferential perfective morphology with telic verbs and preferential imperfective morphology.

4.3. Comprehension Task

Subjects

Adult Italian speakers and fifty children participated in the study: ten 3 year-olds, ten 4 year-olds, ten 5 year-olds, ten 6 year-olds and ten 7 year-olds. The ten adults were tested at their homes in Conversano (Bari, Italy) and the children were tested at school 1° Circolo didattico "G. Falcone" also in Conversano (Bari, Italy).

Procedure

The comprehension experiment is a sentence picture-matching task. Eight digital video stories were presented to the subjects: 4 presented telic transitives and 4 presented atelic unergatives. Then a question in the *passato prossimo* was asked. The task was to identify the (completed) event. Subjects were shown the videos. Each of the videos presented the two characters performing the same action, one of the two girls completed the action (completed situation) while the other was still performing it (ongoing situation). At the end of the video subjects were shown a picture representing the ongoing situation and a picture presenting the completed situation. Then they were asked to choose the picture in order to answer the question "Who has verb-ed?" The completed situation was the correct answer in all cases (Lorusso 2005).

Results

The results we present are relative to the completed interpretation assigned to the forms of *passato prossimo* with telic transitives (figure 3) and with atelic unergatives (figure 4) (Lorusso 2005).

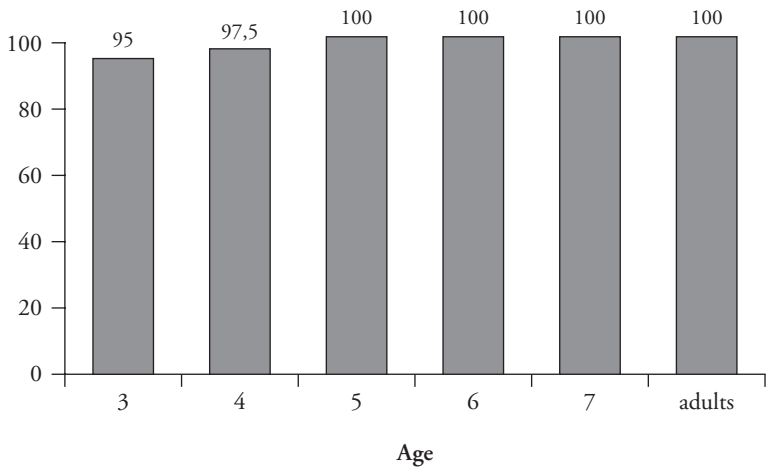

Figure 3

Percentage of 'completed' Interpretation with Telic Transitives

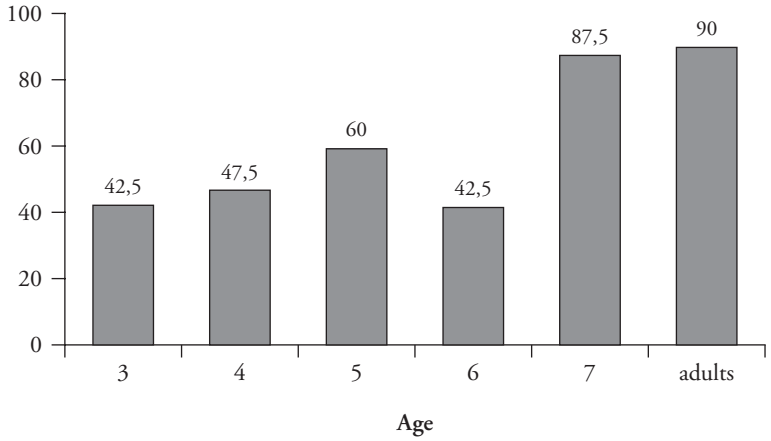

Figure 4

Percentage of 'completed' Interpretation with Atelic Unergatives

Discussion

The statistical analysis confirms that while adults and 7 year olds do not show any different behaviour in attributing the completed reading to both verb classes, children aged between 3 and 6 systematically attribute an non-terminated reading to the atelic verbs and a completed reading to the telic ones. The p-values of the likeli-

hood statistic are all $p < 0, 05$ for the children aged between 3 and 6 years. They distinguish between the tensed forms of the two verb classes for the different readings they attribute to them systematically. This comprehension task contradicts the assumption of AFH, since children are supposed to analyze both verb classes as telic and properly assign the completed reading, by the use of the perfective morphology in every situation, but this is not the case. In the next section we address a discussion about all the results we found.

5. Discussion and Conclusion

Children seem to have problems in the use of the perfective morphology of *passato prossimo* with atelic unergatives, while with transitives whose telicity is derived compositionally by the features of the direct objects they have an adult like pattern of production/expression of *passato prossimo*.

Transitives with compositional telicity are produced, in the production task, with a preferential perfective morphology as adults at all stages: namely, we do not find any relevant statistical difference between adults and children. Furthermore, infants correctly analyze the aspectual implications of *passato prossimo* in the comprehension task. This suggests that children are aware of the aspectual implication of perfective morphology with verbs whose telicity is inferred by the presence of an overt object. This does not contradict the data about Dutch and English of Van Hout (1998) for which at the age of 5 Dutch and English children start to analyze the features of direct object in order to determine telicity. We do not know at what stage Italian children start to use the feature of the direct object in order to determine the telic value of the verb. Anyway, the mere presence of the direct object seems to be a mark that helps children in using these verbs properly in the derivation of perfective morphology.

These data do not contradict either the findings of van Hout & Hollebrandse (2001). They found that children have problems in analyzing the grammatical aspect with telic verbs, but anyway the children they studied had more problem with the comprehension of imperfective morphology as it applies to telic predicates than with perfective morphology on telic predicates, since children at about 4 years old perform above average in analyzing *passato prossimo* (see table 2). First, we have not looked at the interpretation of imperfective and second, the design of the experiment is different. In our comprehension task children had to choose between two pictures: one presenting an ongoing situation and the other a completed situation, but before the picture matching task, they were presented with two videos: one involving the completed situation and the other involving the ongoing situation. In van Hout & Hollebrandse's experiment children had to conclude the story they were presented by choosing the completed or the ongoing situation: effects of the more complex cognitive task could arise. It was less redundant than our experiment, since children had less help by the stories and the pictures and the linguistic input is the only relevant information they have to conclude the story.

Atelic unergatives present more problems, since in the data from the corpus and in both experiments they are analyzed in a deviant way, comparing it with adults' performance. Children are not able to produce an adult-like distribution of perfec-

tive forms with atelic unergatives until the age of 5, as it has been found by the data coming from the corpus of spontaneous speech and the production task. This can be linked to the failure of applying the morphology of *passatto prossimo* to verbs whose telicity is not fully recognized. These types of verbs, in fact, do not present any overt object that helps children to determine telic values. Furthermore, unergatives in Italian can have a cognate object or be the intransitive alternation of a transitive. These characteristics of the distribution of unergatives in adult Italian could create problems for the analysis of the lexical aspect of such verb class as it results by VP structure. At the age of 5 children start to produce perfective morphology for some reason linked to the fact that they begin to assign negative lexical aspectual value to verbs that do not have a direct object, while in the earliest stage they need such an overt element. This could be also linked to the fact that they start to analyze the features of direct objects.

These data on production could confirm the assertion of the AFH of Antinucci & Miller (1978) that claims that children use perfective morphology to refer to telic situations and imperfective morphology to refer to atelic situations. Anyway, the data coming from the comprehension task show that children are not able to analyze the perfective aspect as it applies on atelic verbs, contrary to what AFH would predict, since the perfective aspect could have been analyzed as a telic marking on the verb, but this is not the case.

The problematic data about these experiments is the mismatch between comprehension and production of *passato prossimo* with atelic unergatives. Between 5 and 7 years children produce *passato prossimo* in an adult-like fashion but they fail to identify its aspectual values in comprehension. We propose that this is linked to the attribution of lexical aspect as it results by the interaction with semantic features. While in production the morphology of *passato prossimo* is applied to all verb classes independently of their lexical aspectual value as a pure morphological rule, in comprehension semantic factors may interact. The missing semantic features on the elements that enter in the derivation of the VP could influence the general data: that is, the aspect as it results by lexical insertion may have a differentiated and larger period of appearance in Child Italian.

Further studies are needed with unaccusatives and with atelic transitives, in order to have the complete picture. Anyway, we can conclude that aspect is acquired for stage and the different ways in which aspect can be encoded in a sentence have different place in the longitudinal process of the acquisition of a language: so the grammatical aspect of *passato prossimo* as it applies to telic transitives is acquired earlier than the *passato prossimo* as it applies to atelic predicates.

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ASPECTUAL INTERPRETATION AND CALCULATION

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In this paper I discuss several syntactic properties of inner aspect and what these properties tell us about derivations in narrow syntax (Chomsky 2001, 2006). I argue for the presence of an aspectual projection (AspP) between vP and VP (see also Travis 1991) that syntactically instantiates an object-to-event mapping. Furthermore, we see that AspP and everything dominated by AspP defines a syntactic space in which elements must appear in order to contribute to the aspectual interpretation of the predicate. Interestingly, however, the time at which these elements are calculated is not until later in the derivation, at the phase. This study contributes to our understanding of narrow syntactic derivations by providing alternative support from inner aspectual phenomena for a cyclic interpretation of the verbal predicate at the phase.

In section 1, I discuss the aspectual relevance of the durative phrase and the time span adverbial. In section 2, I discuss the distinct aspectual interpretations and distributions of bare plurals and mass nouns; we will see that a proper account of them includes an aspectual projection (AspP) between vP and VP. In section 3, I provide evidence for a domain of aspectual interpretation, a space in which elements must appear in order to contribute to the aspectual interpretation of the predicate. In section 4, we see that the time at which the aspectual character of the predicate is determined can only be at the phase.

1. The aspectual relevance of the durative phrase and time span adverbial

The durative phrase (e.g. *for an hour*) and time span adverbial (e.g. *in an hour*) are widely used in the literature on inner aspect as a test for the telicity of a predicate. For this reason it is important to clarify exactly what they tell us about the telicity of a predicate.

The standard assumption regarding the durative phrase is that it is incompatible with telic predicates and compatible with atelic predicates (Dowty 1979, Tenny 1987, Vendler 1967, etc.). This is illustrated in (1).

(1) a. John drank a beer #for an hour.
b. John drank beer for an hour.

The sentence in (1a) contains a telic predicate and the durative is incompatible. The sentence in (1b) contains an atelic predicate, and the durative is compatible. Although supported by the sentences in (1), the conclusion that the durative is incompatible with telic predicates and compatible with atelic predicates is a simplification

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 213-225.

of the facts; for, observe that the durative is in fact compatible with a telic predicate under an iterative interpretation of the predicate (Alsina 1999, Jackendoff 1996, Schmitt 1996, Smith 1991, Verkuyl 1972, and Vanden Wyngaerd 2001 observe this as well):

(2) a. John spotted a plane for an hour.
b. John carried a goat into the barn for an hour.

The interpretation of (2a) is that John spotted a plane over and over for an hour. The interpretation of (2b) is that John carried a goat into the barn over and over for an hour. Additionally, observe that the object undergoing the action of the verb is required to be the same object in each of the iterated events. That is, in (2a), the same plane must be spotted, and in (2b) the same goat must be carried into the barn over and over again. I refer to this type of telic iterative interpretation in which the same object undergoes the action expressed by the verb in each of the iterated subevents as a *Sequence of Identical Events (SIE)* interpretation.[1] Considering that an SIE interpretation is elicited by the durative in these utterances, we can explain straightforwardly why the durative in (1a) is incompatible; once a beer is drunk, under normal pragmatic circumstances, it cannot be drunk again (See Jackendoff 1996 for similar approach.). For the same pragmatic reasons, the durative is incompatible with the sentences in (3) below; the object undergoing the action expressed by the verb cannot undergo the action more than once.

(3) a. John ate a cake #for ten minutes.
b. John built a house #for a month.

The durative is only incompatible when an SIE interpretation is pragmatically odd, therefore, I conclude that syntactically the durative is compatible with all aspectual predicate types. Moreover, I assume that the durative adjoins to vP (or to an EP above vP (Borer 2005, Travis 2000)), and modifies the macro-event described by the predicate (Alsina 1999, Larson 2003). Observe in (4) that the durative is grammatical in the *do so* construction, which I take as evidence that it is adjoined higher up in the verb phrase.

(4) a. John drank beer for an hour and Frank did so for two.
b. Frank played soccer for ten minutes and John did so for twelve.

The interpretation elicited by the durative depends on the telicity of the predicate. An event described by a telic predicate is interpreted as having an end. The durative forces an interpretation in which the event must continue for the time that the durative specifies. Thus, a telic event with a durative is interpreted as reaching an end over and over for a specified amount of time; the durative forces the event to iterate. The result is an indefinite number of telic subevents that repeat for the amount of time specified by the durative.[2] Observe that the time span adverbial can target the end of each of these iterated subevents:

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[1] Filip (1999) refers to this as the "resettability of the denoted happening" (114).

[2] The SIE interpretation results only when the NPs are singular. With a bare plural a different type of iterative interpretation results. See section 2 for a discussion.

(5) a. John carried a goat into the barn in 30 seconds (for an hour straight).
b. John dragged a log into the shed in 10 seconds (for an hour straight).

In a situation in which a goat keeps running out of the barn, the sentence in (5a) is grammatical under the interpretation that each time the goat ran out it took John 30 seconds to carry it back into the barn and this occurred for an hour straight. A similar interpretation is available in (5b).

Atelic predicates describe events that are interpreted as not having an end (Thompson 2006). Observe that the time span adverbial is incompatible with atelic predicates (Borer 2005, Dowty 1979, etc.):[3]

(6) a. John drank beer #in ten minutes.
b. John carried the goat #in ten minutes.

In the presence of the durative an atelic event is interpreted as continuing essentially uninterrupted (i.e. without reaching an end) for the amount of time specified by the durative. Observe this in the activities in (7).

(7) a. John drank beer for an hour.
b. John drove the car for an hour.

I conclude that the durative phrase is syntactically compatible with all aspectual predicate types and depending on the telicity of the predicate it elicits different interpretations. With atelic predicates, an uninterrupted interpretation results, and with telic predicates an SIE interpretation results, in which an indefinite number of iterated subevents continue for the amount of time specified by the durative. Additionally, as is standardly assumed, the time span adverbial targets the end of the event expressing the amount of time that passes before the end takes place. As such, it is only compatible with telic predicates (But see footnote 3).

2. The aspectual distribution and interpretation of BPs and MNs

In this section, I discuss the distinct aspectual interpretations and distributions of bare plurals (BPs) and mass nouns (MNs). To account for BPs and MNs aspectually, I propose that there is an aspectual projection (AspP) between vP and VP with which they establish distinct relations.

The aspectual effect of BPs and MNs on a predicate is standardly taken to be the same; they turn a telic predicate into an atelic predicate (Borer 2005, Dowty 1979, Pustejovsky 1991, Thompson 2006, Verkuyl 1972, etc.). Consider data that seem to support this BP-MN assumption (8-9).

(8) a. John ate a pizza #for an hour.
b. John drank a soda #for an hour.

[3] The time span adverbial is not actually incompatible with atelic predicates, but it can target the beginning of the event. Dowty (1979), Filip (1999), and Thompson (2006) note this. This fact about the time span adverbial is not immediately relevant to the present discussion, thus when I point out the incompatibility of the time span adverbial, I mean that it cannot target the end of the event.

(9) a. John ate pizza/pizzas for an hour.
b. John drank soda/sodas for an hour.

The sentences in (8-9) show that the presence of a BP or MN internal argument makes the durative phrase compatible where it once was not. However, the presence of a time span adverbial shows that there is a difference in aspectual interpretation elicited by BPs and MNs:

(10) a. John ate pizzas in ten minutes for an hour straight.
b. John drank sodas in three minutes for an hour straight.

(11) a. John ate pizza #in ten minutes for an hour straight.
b. John drank soda #in three minutes for an hour straight.

With a BP internal argument (10a) the time span adverbial is compatible under an interpretation that for each pizza John ate, he ate it in ten minutes, and he did this for an hour straight.[4] This is reminiscent of the SIE interpretation discussed in the previous section, in which the time span adverbial targeted the end of iterating subevents. Here the time span is playing the same role, thus the predicates in (10) with a BP internal argument are telic. The durative forces the telic event to iterate an indefinite number of times and the BP provides an indefinite number of similar objects (i.e. different pizzas) to undergo the action expressed by the verb in each of the iterated subevents. In the presence of the BP there is a *Sequence of Similar Events (SSE)* interpretation: John ate one pizza, then another pizza and so on (10a). An SSE interpretation is available with the BP *sodas* in (10b) as well. No such interpretation is available in (11) in the presence of the MN. The MN elicits only an atelic interpretation, as is standardly assumed, and as such, the time span adverbial is incompatible. Given these facts, I conclude that BPs and MNs have distinct aspectual interpretations. MNs elicit an atelic interpretation of the predicate, and BPs elicit an SSE interpretation of the predicate. Let us consider the aspectual distributions of MNs and BPs. Consider the ditransitive structures in (12-13).

(12) a. John carried goats into the barn in ten minutes (for an hour straight).
b. John pushed carts into the store in three minutes (for an hour straight).

(13) a. John carried mud into the barn #in ten minutes (for an hour straight).
b. John pushed ice into the store #in ten minutes (for an hour straight)

In (12a) there is a BP internal argument and as expected an SSE interpretation is available in which one goat after another was carried into the barn in ten minutes for an hour straight. An SSE interpretation is also available in (12b). No such interpretation is available for the MN, and as such the time span adverbial is out in (13). The

[4] Note also that Filip (1999), referencing Fillmore and Kay (1991), observes a similar fact about the following datum: *Pat built houses (*) in six months.* She notes that it is "acceptable if it has a generic (habitual) interpretation...whereby each [building event] is associated with a different house whose construction took six months." (66). (10) above shows us that the time span adverbial is compatible with a BP under an episodic interpretation as well, resulting in a type of iterative interpretation.

MN, as expected, elicits only an atelic interpretation of the predicate. Consider BPs and MNs as the complements of a goal preposition (14-15).

(14) a. John carried a goat into barns for an hour.
b. John pushed a cart into stores for an hour.

(15) a. John carried a goat into water for an hour.
b. John pushed a goat onto mud for an hour.

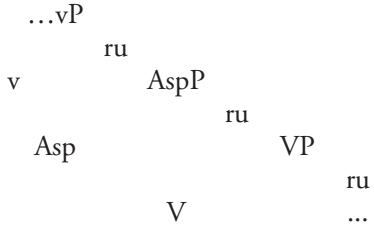
The BP in (14a) elicits an SSE interpretation in which a goat was carried into one barn, then another barn and so on for an hour. The MN in (15a) does not elicit an atelic interpretation; the only interpretation available is one in which a goat was carried into water, then back out, and back into it again for an hour. This is an SIE interpretation. Observe, as expected, that the time span adverbial together with the durative is compatible with both sets of sentences from (14-15) as illustrated in (16-17).

(16) a. John carried a goat into barns in ten minutes (for an hour straight).
b. John pushed a cart into stores in ten minutes (for an hour straight).

(17) a. John carried a goat into water in ten minutes (for an hour straight).
b. John pushed a cart into mud in ten minutes (for an hour straight).

These sentences are a bit pragmatically odd because the same goat and cart undergo the action expressed by their respective verbs in each of the iterated events; however, as long as there is a situation in which the same goat or cart is removed from the barn/water or store/mud respectively (perhaps in a competition in which John is timed to see how fast, or how many times, he can repeat these actions), the sentences are pragmatically fine. Once the contexts are set up, these predicates are perfectly compatible with the time span adverbial in conjunction with the durative phrase. Thus, as a complement of a goal preposition MNs do not elicit an atelic interpretation, while BPs do elicit an SSE interpretation. BPs and MNs have distinct aspectual distributions.

In order to account for the distinct aspectual interpretations and distributions of BPs and MNs, I claim that there is an aspectual head (AspP) between vP and VP with which BPs and MNs establish distinct relations (18).

(18)


I claim that BPs move to Spec, AspP and MNs Agree with Asp°. This straightforwardly accounts for their distributions. The most immediate consequence of this proposal is that neither BP nor MN external arguments can affect the aspectual interpretation of the predicate (see also Tenny 1987), because they are structurally higher than AspP. This expectation is shown to be borne out in (19-20).

(19) a. Wildlife ate a sheep in ten minutes/#for ten minutes.
b. Livestock destroyed the barn in ten minutes/#for ten minutes.

(20) a. Bears ate a sheep in ten minutes (#for an hour straight).
b. Animals destroyed the barn in ten minutes (#for an hour straight).

Observe in (19) that in the presence of a MN external argument the durative phrase is not compatible with these predicates. Recall that in the presence of a MN internal argument with predicates of this type (see 9) the durative becomes compatible; if the MN had an aspectual effect, we would expect the same results. Moreover, observe that the time span adverbial is compatible, and in (19a) it expresses that ten minutes passed before wildlife ate (and finished up) a sheep. Just as a MN external argument does not affect the telicity of the predicate, a BP external argument does not either. The BPs in (20) do not elicit an SSE interpretation of the predicates. Ignoring the time span adverbial for the moment, observe that the durative is simply ungrammatical. Recall from (9) that, like MN internal arguments, in the presence of a BP internal argument, the durative phrase becomes compatible. In the presence of the BP external argument in (20) the durative is not compatible. Moreover, note that crucially (20a) does not mean that one bear ate a sheep, then another bear ate a sheep and so on for an hour straight. Finally, note that the time span adverbial targets the end of the event, but there is only one event end to target; after ten minutes passed the single sheep eating event was over. Thus, MN external arguments do not elicit an atelic interpretation of the predicate, and BP external arguments do not elicit an SSE interpretation of the predicate. Under the hypothesis that MNs Agree with Asp° and BPs move into Spec,AspP to elicit an SSE interpretation, these facts follow straightforwardly. BP and MN external arguments cannot establish the necessary kind of relation with AspP because they are structurally higher than AspP.

I assume that on an SSE interpretation BPs behave like existential quantifiers.[5] I claim that they must bind a variable inside a syntactic domain of aspectual interpretation defined as AspP and everything dominated by AspP. For now I simply assume the existence of this domain, but in the section 3 I provide motivation for it. Evidence for the movement of BPs comes from what appears to be an island for BP movement in (21).

(21) a. #John destroyed a row of houses for a week.
b. #John ate a box of cookies for an hour.

The BPs in (21) do not elicit an SSE interpretation. (21a) does not mean that John destroyed one house, then another and so on for a week. Likewise, (21b) does not mean that John ate one cookie then another and so on for an hour. The lack of an SSE interpretation can be explained if we assume that the complex NPs in (21) do not allow the BP to move out to Spec,AspP to elicit the SSE interpretation. Let us consider the Agree account of MNs in more detail.

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[5] There does seem to be another reading of BPs available, most likely what Carlson (1977) refers to as a group reading of the BP in which the BP's denotation is vague. I claim that on an SSE interpretation BPs are existential quantifiers, and consequently they do not have the group reading.

I claim that Agree with Asp° is the syntactic instantiation of the object-to-event mapping well-known in studies on inner aspect (Verkuyl 1972, Krifka 1989).[6] The object-to-event mapping occurs when a property of the internal argument affects the telicity of the entire predicate. This is illustrated in (22).

(22) a. John drank a pitcher of beer #for ten minutes/in ten minutes.
b. John drank beer for ten minutes/#in ten minutes.

The noun phrase in (22a) *a pitcher of beer* has a property that elicits a telic interpretation of the predicate. The noun phrase in (22b) *beer* has a property that elicits an atelic interpretation of the predicate. This is the object-to-event mapping.

I refer to the property of an internal argument NP that participates in this object-to-event mapping as a [q] feature ([q] for *quantized* (Krifka 1989) and for *specific quantity of A* (Verkuyl 1972). If the NP that Agrees with and values Asp° is [+q] the predicate can be interpreted as telic.[7] If the NP that Agrees with and values Asp° is [–q] (e.g. a MN), the predicate will be interpreted as atelic. The Agree relation captures a local relation that an NP has with the verb phrase in which the core aspectual interpretation of the predicate is affected. The core aspectual interpretation of a predicate is the basic telic/atelic distinction. This local relation, and its effect on the core interpretation of the predicate, is on a par with the local relation between a verb and its DP complement. When the complement of the verb varies, the core meaning of the predicate varies as well (Marantz 1984).

3. Defining the domain of aspectual interpretation

The aspectual distribution of BPs and MNs already hint at a syntactic space below AspP in which elements must appear in order to contribute to the aspectual interpretation of the predicate; external arguments cannot contribute to aspectual interpretation, while internal arguments can. In this section, I consider more elements structurally higher and lower than AspP and their effect on the telicity of the predicate.

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[6] I do not assume a Krifkian homomorphism. The exact nature of this object-to-event mapping is tangential to the main focus of this paper. See Borer (2005), Filip (1999), Hay, Kennedy and Levin (1999), MacDonald (2006), Tenny (1987), and Verkuyl (1972) for different implementations of the object-to-event mapping.

[7] I say *can be interpreted as telic* because of the existence of transitive activity predicates in which the [+/–q] feature of the internal argument does not affect the aspectual interpretation of the predicate: *John pushed the car/stereo equipment for an hour/#in an hour.* Although note that when a goal phrase is added, these predicates behave exactly like the predicates in (22): *John pushed the car into the garage #for an hour/in an hour. John pushed stereo equipment into the garage for an hour/#in an hour.* MacDonald (2006) argues that the goal phrase here adds a property that the predicates in (22) already possess: an event feature that expresses that the event has an end. This property has certain parallels with the null telic morpheme of Snyder (1995). Transitive activities project AspP, but the object-to-event mapping is irrelevant without this extra property. Further discussion of these predicates takes us well beyond the focus of the present paper, thus I direct the reader to MacDonald (2006) for a full syntactic account of these predicates and the relevance of this extra property for deriving a syntactic typology of aspectual predicates types.

Hay, Kennedy and Levin (1999) observe that the Cause head that introduces the external argument causer in causative-inchoative alternations does not contribute to the telicity of the predicate. As is well-known (Borer 2005, Dowty 1979, Hay, Kennedy and Levin 1999, etc.), the predicates in (23) are ambiguous between a telic interpretation and an atelic interpretation.[8]

(23) a. The soup cooled for an hour/in an hour.
b. The kingdom expanded for a week/in a week.

Hay, Kennedy and Levin (1999) observe that when the external argument is added, the ambiguity is not affected (24).

(24) a. Neal cooled the soup for an hour/in an hour.
b. Neal expanded the kingdom for an hour/in an hour.

They rightly conclude that the Cause head does not contribute to the aspectual interpretation of the predicate. Now consider prepositional phrases.

As we have seen above, transitive activities (25) can be turned into accomplishments by the addition of a goal PP, as in (26); this is a widely observed fact (Borer 2005, Dowty 1979, Pustejovsky 1991, Verkuyl 1972).

(25) a. John carried the goat #in an hour/for an hour.
b. John pushed the cart #in an hour/for an hour.

(26) a. John carried the goat into the barn in an hour/for an hour.
b. John pushed the cart into the store in an hour/for an hour.

The time span adverbial in (25) is out because the predicate is atelic. In the presence of the durative in (25), there is an uninterrupted event interpretation. In (26), on the other hand the time span adverbial is compatible, and the durative elicits an SIE interpretation of the predicate. In the presence of the goal PP, the predicate is interpreted as telic. Observe that location PPs have no such effect (27):

(27) a. John carried the goat (in the barn) #in an hour/for an hour.
b. John pushed the cart (in the store) #in an hour/for an hour.

In contrast to goal PPs, location PPs do not affect the telicity of the predicate. Moreover, observe a structural difference between location PPs and goal PPs indicated by the ungrammaticality of goal PPs (28) and the grammaticality of the location PPs (29) in the *do so* construction:

(28) a. ??John carried the goat into the barn and Frank did so into the church.
b. ??John pushed the cart into the store and Frank did so into the church.

(29) a. John carried the goat in the barn and Frank did so in the church.
b. John pushed the cart in the store and Frank did so in the church.

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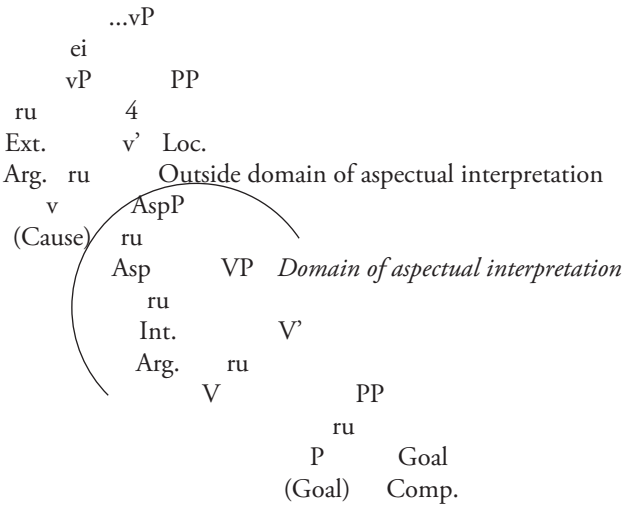
[8] Dowty (1979) calls these *degree-achievements* and assumes that there is an ambiguity between an achievement and an activity interpretation. Hay, Kennedy, and Levin (1999) assume that the ambiguity is between and accomplishment and an activity interpretation. The exact nature of the ambiguity is irrelevant here. What is important is that there is an ambiguity and that the causer does not affect this ambiguity.

That the goal PPs are ungrammatical suggests that goal PPs are lower in the verb phrase (see also Larson 1988), and that location PPs are grammatical suggests that they are adjoined to vP. A difference in ability to contribute to the telicity of the predicate corresponds to a difference in structural position.[9]

The Cause head that introduces an external argument does not contribute to the aspectual interpretation of the predicate. Location PPs, which are adjoined to vP, do not contribute to the aspectual interpretation of the predicate. BP and MN external arguments do not contribute to the aspectual interpretation of the predicate either. The only elements that contribute to the aspectual interpretation of the predicate are internal arguments (BPs and MNs), complements of goal prepositions (BPs) and goal PPs themselves. These findings are summarized in the tree in (30).

(30)



From the tree in (30), it is apparent that there is a limited syntactic space within which an element must appear in order to contribute to the aspectual interpretation of the predicate. I refer to this space as the domain of aspectual interpretation. It is defined as the aspectual projection AspP and everything AspP dominates. If this domain exists, we can explain straightforwardly why external arguments, location PPs, and Cause cannot contribute to the aspectual interpretation of the predicate. They are outside of the domain of aspectual interpretation.

4. Calculating aspectual interpretation at the phase

From the previous sections it seems clear that there is an aspectual projection between vP and VP and that this aspectual projection creates a domain of aspectual

[9] Note that being low in the verb phrase is a necessary but not sufficient condition for a PP to contribute to aspectual interpretation. Observe that directional PPs are not grammatical in the *do so* construction, suggesting that they are low in the verb phrase: *??John carried the bag **toward the store** and Frank did so **toward the church.*** Nevertheless, they do not contribute to the aspectual interpretation of the predicate: *John carried the bag (toward the church) #in ten minutes/for ten minutes.*

interpretation. Interestingly, although there is a syntactic space within which elements must be located in order to be able to contribute to the aspectual interpretation of the predicate, we will see in this section that the time at which these elements are calculated is higher up in the syntactic structure, at vP. That is, the time at which the elements that contribute to aspectual interpretation are calculated takes place at Transfer to CI (Chomsky 2006).

Consider the data in (31).

(31) a. **John** walked into a barn for ten minutes/in ten minutes.
b. **Wildlife** walked into a barn for ten minutes/#in ten minutes.

Observe that when the external argument is [+q] (31a) there is only an SIE interpretation elicited with the durative and the time span adverbial can target the end of the event. Observe that when the external argument is [-q] (31b) there is no SIE interpretation with the durative and the time span adverbial cannot target the end of the event. (31a) is telic and (31b) is atelic. Contrary to the conclusion from section 3 that external arguments are outside the domain of aspectual interpretation and cannot contribute to the telicity of the predicate, it seems that the external arguments in (31) are able to do so. Nevertheless, if the external arguments were able to contribute directly to the aspectual interpretation of the predicate, we would not expect the data to behave as it does in (32).

(32) a. John walked **a letter/Joe** into a post office for ten minutes/in ten minutes.
b. John walked **wildlife** into a barn for ten minutes/#in ten minutes.

In each of the sentences of (32) the external argument is [+q]. In (32a) the direct object is [+q] and the predicate is telic. In (32b) the direct object is [-q] and the predicate is atelic. The [q] feature of the direct object "overrides" the [q] feature of the external argument. If the external argument could directly contribute to the aspectual interpretation of the predicate we would not expect the direct object to affect the aspectual interpretation of the predicate as it does. Furthermore, Ritter & Rosen (1998) observe that the presence of the direct object in these sentences depends on the presence of the secondary predicate. The data in (33) show that the direct object is not licensed without the prepositional phrase.

(33) a. *John walked the letter.
b. *John walked Joe.[10]

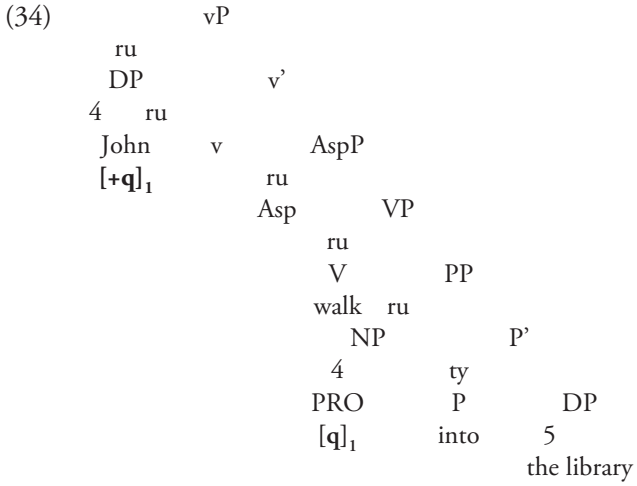
I assume that the secondary predicates in (31) also introduce an argument. I claim that the secondary predicates introduce a big PRO the [q] feature of which is controlled by the external argument. This is shown in (34).[11]

---

[10] Note that on a causative interpretation, i.e. *John made Joe walk*, sentence (33b) is fine. However, this is not the relevant interpretation, as we find in (32); the letter does no walking at all, and Joe does not have to walk to be walked into a post office.

[11] Note that Beck & Snyder (2000) also assume that the prepositional phrase has a specifier that is filled by big PRO. Note, nevertheless, that PRO could be in the specifier of a small clause the complement of which is the PP itself. These choices do not affect the main conclusions and claims of this section.

(34)



The [q] feature of PRO is controlled by the [q] feature of the external argument. Once the [q] feature on PRO is specified, it can enter into an agree relation with Asp°, contributing to aspectual interpretation. This entails that the telicity of the predicate cannot be calculated minimally until the external argument merges, otherwise PRO would not have a [q] feature to value Asp°. Although AspP defines a domain in which elements must appear to contribute to the aspectual interpretation of the predicate, the aspect of the predicate is not calculated minimally until the external argument merges, until vP. Note furthermore that there is evidence to suggest that the aspect of the predicate is not calculated any higher than vP either. That is, aspect is calculated at the phase (Chomsky 2001, 2006). Recall from above that degree-achievements can appear with both the time span adverbial and the durative phrase as a consequence of their aspectual ambiguity (35).

(35) a. John cooled the soup in ten minutes/for ten minutes.
b. The king expanded the empire in a month/for a month.

Interestingly, nevertheless, this aspectual ambiguity is lost when the same verbs are found in idioms (36).

(36) a. John cooled his jets in ten minutes/#for ten minutes.
b. John cooled his heels #in ten minutes/for ten minutes.

In (36a) the idiom roughly means to relax; only the time span adverbial is compatible. In (36b) the idiom roughly means to wait; only the durative phrase is compatible. Observe a similar set of facts with the verb *read*, which has been noted to be aspectually ambiguous as well (Borer 2005) (37a).

(37) a. John read her the newspaper in ten minutes/for ten minutes.
b. John read her the riot act #in ten minutes/for ten minutes.

Although both the time span adverbial and durative phrase are compatible with the predicate in (37a), when used idiomatically, only the durative phrase is compatible. At the very least the data in (35-37) indicate that the aspectual class of an

idiom is specified (see also McGinnis 2002). Independently, Svenonius (2005) observes a relation between phases and idioms; idioms do not seem to cross phase boundaries. If we take this observation together with the knowledge that the aspectual class of an idiom is specified, we can conclude that aspectual class is determined within the phase. Assuming this to be correct, and taken together with the conclusions from above that the aspect of a predicate cannot be calculated until vP, we can draw a more general conclusion that the aspect of a predicate is calculated at the phase, when a phase is transferred to CI (Chomsky 2006). This conclusion adds general support for a phase-based account of syntactic derivation. Moreover, it shows that the phenomenon of inner aspect is constrained by narrow syntax and by extension inner aspect is important for understanding the nature of narrow syntax.

5. Conclusions

I have argued that there is an aspectual projection (AspP) between vP and VP. One important consequence of the presence of this projection is a domain of aspectual interpretation defined as AspP and everything dominated by AspP. Only elements within the domain of aspectual interpretation can contribute to the aspectual interpretation of the predicate. Interestingly, nevertheless, these elements are not calculated until vP, until the phase. That is, the aspect of a predicate is not determined until Transfer to CI. In this way, inner aspect provides alternative support to a phased-based account of narrow syntactic derivation. It shows that the interpretation of a predicate occurs cyclically.

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ON INCREMENTALITY, OVERT AGREEMENT, THE DUALITY OF MERGE AND THE DUALITY OF SEMANTICS

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Introduction[1]

The goal of this research is to show how a close inspection of the properties of a parser/production system can help solve some of the challenges theoretical linguists face. Specifically, it is argued that Incrementality, a well-established principle in experimental research (e.g., Bock et al. 1992, Phillips 1996 and Ferreira 1996), is relevant for two theoretical debates:

i. how to reconcile the phase-based framework assuming Long-Distance Agreement (Chomsky 2004, 2005a, etc.) with the fact that across languages moved elements tend to trigger agreement as opposed to in situ elements
ii. how to derive the mapping between the duality of Merge and the duality of Semantics put forward within the said framework (cf. Chomsky 2004, 2005a, etc.)

With regard to (i), the crosslinguistic facts mentioned above were originally taken to constitute an argument for grammatically significant Spec,Head configurations, that is to say, for the existence of checking relations under m-command. These relations are, nonetheless, at odds with the phase-based framework. In this paper, it is argued that incremental computation of Agreement (cf. Barlow 1992) explains such paradigms in a way that is compatible with Long-Distance Agreement (Chomsky 2001, etc.). As far as (ii) is concerned, Chomsky (2004 and 2006) proposes that External Merge or movement is associated to discourse-related and scopal properties as opposed to theta roles. However, this researcher acknowledges that the correlation is not a logical necessity (Chomsky 2004: 11). It is argued that such mapping does not have to be stipulated but rather it can be derived from the workings of Incrementality.

Section 1 presents the relevant crosslinguistic generalizations concerning agreement paradigms and the role of Incrementality in this context. Section 2 discusses the mapping between the duality of Merge and the duality of Semantics and, again, the role of Incrementality in this context.

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[1] I would like to thank T. Fujii, N. Horstein, J. Lidz, C. Phillips, A. Pires, M. Yoshida and the audiences at WCCFL25, InterPhases 2006, BIDE 06 and MLS 36th for their comments and suggestions on parts of this paper. All errors are my own.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 227-240.

1. On crosslinguistic variation in agreement paradigms

It is often claimed in the literature that one can find languages where agreement follows the paradigms in (1) and (2) but not the one in (3) (where this is illustrated in terms of Probes (P) and Goals (G)):

(1) G $P_{\text{overt agreement}}$ vs. $P_{\text{overt agreement}}$ G √ across languages

(2) G $P_{\text{overt agreement}}$ vs. P G √ across languages

(3) G P vs. $P_{\text{overt agreement}}$ G * across languages

The crosslinguistic validity of this observation is present in some way or other in works such as Barlow (1992), Chomsky (2004), Corbett (1979), Franck, Lassis, Frauenfelder and Rizzi (2006), Koopman (2003) and (2006), Manzini and Savoia (1998), Moravcsik (1978), Park (2006) and Samek-Lodovici (2002), among others.[2] The following data from the Italian dialect of Ancona and French illustrate the generalization:

(4) Italian Dialect of Ancona
  a. Questo, lo f*a* / *f*anno* sempre i bambini.
  thisACC itACC does / do always the children
  b. Questo, i bambini lo f*anno* / *f*a* sempre.
  thisACC the children itACC do / does always (Cardinaletti 1997a: 38-9)

(5) *French*
  a. Jean a v*u* / *v*ue* la fille
  Jean has seen / seen.AGR.FEM the girl
  'Jean saw the girl.'
  b. Quelle fille Jean a(-t-il) v*ue* / *v*u*?
  which girl Jean has-he seen.AGR.FEM / seen
  'Which girl did Jean see?'
  c. Cette fille a été v*ue* / *v*u*
  this girl has been seen.AGR.FEM / seen
  'The girl was seen.' (Boeckx 2004: 23)

A number of languages, some of them genetically unrelated, follow this pattern, e.g., Arabic, Hungarian, and some African languages (see Samek-Lodovici 2002 for an overview), a fact that provides further evidence for the validity of the above generalization. Such facts have played a prominent role in syntactic theorizing because they provided and argument for the role of Spec,Head relations (cf. Kayne 1989).

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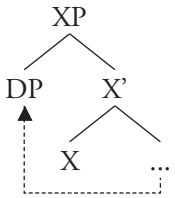
[2] For the time being I abstract away from anti-agreement effects, which are dealt with in section 1.4. Also, note that not every language shows such Agreement Asymmetries: some languages show overt Agreement irrespective of the precedence relations between the P and the G, others show no overt Agreement, etc. The existence of language-particular variation is beyond question. Still, the correlation in (1-3) seems to be robust, a fact that we would like to explain. Therefore, I do not take such crosslinguistic variation to question the relevance of such observation and, consequently, the general approach explored in this paper.

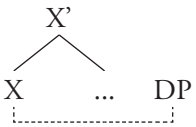
(6) *Spec,Head relations*



Within an approach to syntax which assumes grammatically significant Spec,Head configurations, the relation between the P and the G at the point of Spell-out is different in the in situ and the movement counterparts. Hence, it is natural to consider the Spec,Head relation the domain of (morphological) agreement (Kayne 1994) at least in the relevant languages. In keeping with this view, related discussions in the literature provide evidence for such grammatically significant Spec,Head relations both in theoretical and experimental research (e.g., Koopman 2003 and 2006 and Franck, Lassis, Frauenfelder and Rizzi 2005, respectively among others).

In contrast, the picture changes once one assumes Long Distance Agreement (Chomsky 2001, etc.).

(7) *Long Distance Agreement (LDA)*



Within such a system, there is no distinction between the moved and the in situ version in terms of the relation of P and G at the point of Spell-out: things move or do not move but the relation between P and G is the same no matter what. Therefore, such Agreement Asymmetries do not follow from the system, in contrast to an approach in terms of grammatically significant Spec,Head configurations or checking under m-command.

In fact, as Chomsky (2005: 13) states, as the role of Spec,Head relations is diminished, this calls for a reconsideration of a number of issues, Agreement being among the most relevant ones. Recent attempts to do so are discussed in the next section.

1.1. Previous approaches within the phase-based LDA framework

The literature includes (at least) the following attempts to deal with the above agreement facts within the LDA-based system:[3]

i. the data are not a reflex of the Spec,Head relation but of the way this configuration is established: internally Merge as opposed to external Merge (Chomsky 2004)
ii. Spec,Head configurations allow for local licensing, which is more direct than LDA, a fact reflected in the morphology. E.g., in the case of subject licensing

[3] Still another approach is to reject LDA and adopt a generalized Spec,Head analysis of (all) agreement configurations (Koopman 2003). This entails a radical readjustment/reconsideration of a number of standard structures and derivations. As a consequence, I abstract away from this possibility.

in English existentials, LDA between T and the subject takes place indirectly via agreement between T and the head of the VP phase which in turn, has agreed with the subject. This indirect agreement would be forced by the Phase Impenetrability Condition.[4] In contrast, elements that end up in a Spec,Head configuration agree directly with the Probe when escaping the VP phase (Legate 2005)

iii. the data follow from the properties of expletives present in the in situ counterparts and absent otherwise (Cardinaletti 1997b)

iv. rich agreement in the movement counterpart correlates with the presence of an (optional) agreement projection, absent in the case of the in situ counterpart (Boeckx 2004)

v. Spec,Head configurations entail double-checking the relation between the Probe and the Goal, hence their stricter agreement requirements (Frank, Lassi, Fraudenfelder and Rizzi 2005)

Although these approaches are interesting, they seem to have some limitations. Specifically, (i) seems to be a coding trick rather than an explanation. In turn, (ii) faces the challenge that such agreement asymmetries do not seem to correlate with the opacity effects caused by the Phase Impenetrability Condition (PIC). For example, in situ subjects of transitive verbs are available for direct agreement according the PIC and, nonetheless, might correlate with poor agreement in certain languages (cf. (4)). Similarly, with regard to (iii), it is worth noting that the Agreement asymmetries under discussion are found in contexts where the presence of expletives is implausible (e.g., internal to DP's or PP's as shown by Hornstein et al. 2006: 119). As a consequence, an analysis contingent on such elements (Cardinaletti 1997b), though relevant, is not general enough to capture the paradigm. As to (iv), it is at odds with the rejection of agreement projections within the minimalist enterprise and seems slightly ad hoc. Lastly, the solution in (v), even though it would generate the data correctly, does not provide any explanation of how such a Spec,Head checking mechanism would work in the context of the conceptual arguments made by Chomsky (2005, etc.) against this checking configuration (see below). The purpose of the next section is to address this concern, showing that Spec,Head configurations can indeed be grammatically significant.

1.2. Phase-based syntax allows for grammatically significant Spec, Head relations

According to Chomsky (2000-2006), the licensing of in situ Goals takes place via LDA. It is not clear how this approach can be made compatible with crosslinguistic tendencies for moved elements to trigger agreement as opposed to in situ elements, in spite of the fact that the literature includes a number of approaches to this issue

[4] According to the *Phase Impenetrability Condition* (PIC), in a phase α with head H, the domain of H is not accessible to operations outside α, only H and its edge are accessible to such operations; the domain of H is the sister of H, and the edge of H is a hierarchy of one or more Specs (Chomsky 2000: 108).

(cf. the previous section). In this section, it is argued that there can be checking relations in the Spec,Head configuration, though not the regular probing of the Spec by the Head under m-command.

The point of departure of this proposal is Chomsky's (2005: 13) observation that 'for minimal computation, the Probe should search the smallest domain to find the Goal: its c-command domain. It follows that there should be no m-command, hence no Spec,Head relations, except for the special case where the Spec itself can be a Probe.' As argued already, the agreement paradigms above remain cryptic under this approach, because Spec,Head relations are not allowed into the system.[5] Still, according to Chomsky (2005a: 13, cf. the quote above), Spec,Head relations can exist provided that the Specifier qualifies as a Probe.[6] It is unclear in which contexts Specs would qualify as Probes. At least the following proposals found in the literature are relevant:

i. Uriagereka's (1999) Multiple Spell-out
ii. Epstein & Seely's (2006) approach in terms of XP → X' demotion
iii. Starke's (2001) framework

Chomsky characterizes Probes in the following way:

i. Probes are/have uninterpretable features (e.g., Chomsky 2001: 6)
ii. only heads can be Probes (e.g., Chomsky 2004: 109)
iii. only phase-heads drive operations (e.g., Chomsky 2005a: 11)[7]

Under the assumptions that (a) arguments bear uninterpretable case features and (b) arguments are phases (e.g., they have a phase head capable of driving operations), it follows that arguments in Specifier positions can be Probes.[8] The only condition missing is that Specs would have to be heads. Fortunately, Uriagereka (1999) provides strong conceptual reasons in favor of this view.

Uriagereka's (1999) Multiple Spell-out proposal addresses some shortcomings of the Linear Correspondence Axiom as originally formulated (Kayne 1994). In Uriagereka's proposal, all Specs would be heads (cf. also Gelderen 2004 for relevant discussion). For current purposes, this would mean that Specs would qualify as Probes and, consequently, Spec,Head relations exist/may exist in the system. Why? Chomsky's argument against this is that checking would take place under m-command as opposed to c-command (cf. fn. 6 and related discussion). However, once

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[5] In fact, related questions would arise for any Specifier that is expected to participate in a checking relation with the head that does not c-command it (e.g., subject specifiers in need of a theta role or certain phrases generated in situ in A-bar positions). I abstract away from these issues in order to focus on agreement. Nonetheless, the present proposal would also be able to address such concerns.

[6] Cf. also Chomsky (2005b: 14) or Chomsky's (2004: 114) analysis of externally merged expletives, where the expletive probes the head of the projection hosting it.

[7] Needless to say, following Chomsky's framework, I am assuming a label-free system (Collins 2002) though I might occasionally use these for the sake of explanation. Furthermore, I assume that X'-projections are inert for syntactic purposes.

[8] Cf. Chomsky (2001: 14) for evidence that DPs are phases and cf. Soltan (2003) for evidence concerning PPs. Cf. also Hornstein (1995) for independently motivated arguments that PPs have uninterpretable features (other than those valued by their arguments).

one adopts Uriagereka's proposal, Specs can be shown to fulfill the three features that define Probes within Chomsky's system. As a consequence, the Spec can probe the head of the projection under c-command, not m-command.[9]

Next, I would like to discuss two other approaches, those of Epstein and Seely (2006) and Starke (2001). According to Epstein and Seely, at the time a Spec merges with the unit formed by the head and its complement, the following happens: right before merge of the Spec and the rest of the structure takes place, the unit formed by the head and the complement is a maximal projection in that it has projected as much as it can given the situation. According to Epstein and Seely, this makes the unit an XP as opposed to an X'. An X' is inert for the purposes of syntax, but an XP is not. Given that at the point the Spec is merged with the rest of the structure, such structure is an XP, this XP can establish an active (checking) relation with the Spec. Afterwards, this XP becomes an (inert) X'; but a relation analogous to the Spec,Head relation has already taken place. Aside from the fact that on conceptual grounds, this XP → X' demotion seems questionable, this (temporary) XP would not be a head and as such would not qualify as a Probe under the framework I am assuming.

Starke (2001), in turn, denies the existence of Spec,Head relations but allows Spec's to probe the structure. This approach sharply departs from the framework adopted in this work, and, most importantly, it is unable to deal with the fact that across languages moved elements tend to trigger rich agreement as opposed to in situ ones (cf. Starke 2001: 170). Given that such facts will play a major role in the argumentation below, I do not adopt this framework.[10]

To sum up, Uriagereka's (1999) proposal that Specifiers are heads allows Specifiers to function as Probes. This is the case because within such frameworks Specifiers have all the features of a Probe, as defined in Chomsky's work. According to this view, Probes are defined as follows:

i. Probes are/have uninterpretable features (e.g., Chomsky 2001: 6)
ii. only heads can be Probes (e.g., Chomsky 2004: 109)
iii. only phase-heads drive operations (e.g., Chomsky 2005a: 11)

Note that a Spec might probe a head and, nonetheless, that very head would label the resulting structure. I take this not to introduce a new assumption, but rather to follow from independent factors, namely, the subcategorization restrictions imposed by the head that would merge with the resulting structure. In fact, such restrictions might in certain cases allow/force the Spec that is probing a head to label the structure. (See Chomsky 2005: 12 and references therein for discussion).

To sum up, the LDA mechanism, a hallmark of phase-based syntax (Chomsky 2000-2006), fails to provide a proper understanding of agreement asymmetries

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[9] A priori it would seem that Uriagereka's Multiple Spell-Out would wrongly predict that in situ specifiers are islands. The reader can read Uriagereka (2002) and Hornstein (2005) for analyses on how to avoid such problems in spite of the claim that Specs are heads.

[10] Note that any approach that tries to argue that external merge (as opposed internal merge) allows for a checking relation between a head and a specifier-to-be misses the point that probe-goal relations are contingent on c-command/hierarchical structure. A head and a specifier-to-be do not qualify for such probe-goal relations and, as a consequence, cannot establish a checking configuration.

across languages. This section has shown how such facts can be reconciled with the phase-based framework under the assumption that under certain circumstances Specifiers can be heads (cf. Uriagereka 1999 and 2002) and that Probes are heads (Chomsky 2004: 119). Under this scenario, it follows that Specifiers can be Probes, as suggested, for instance, by Chomsky's (2004) analysis of externally-merged expletives. In this way, we can successfully address the puzzle that agreement paradigms across languages pose for the phase-based-system.

In the next section, some remaining issues concerning agreement are addressed. Specifically, the regularities in Agreement paradigms previously noted are reconsidered from the point of view of the computational dynamics of the interfaces, more specifically, from the incremental nature of the parser/production system (Levelt 1989) and its interaction with the syntax (e.g., Bock et al. 1992, Phillips 1996 and Ferreira 1996).

1.3. On the role of Incrementality in Agreement paradigms

With regard to regularities in Agreement paradigms across languages, it has been argued that such data provide evidence for the redefined Spec,Head relations proposed above. Nonetheless, one piece of the argument is missing. The above technology allows for 'rich' agreement under (local) Spec,Head configuration. A remaining question is, what underlies the existence of 'poor' agreement under LDA? Agreement is Agreement, whether local or long-distance in nature. Why would languages have a tendency to adopt the patterns in (1-3) as opposed to other possible patterns? This section focuses on this issue by discussing the role of Incrementality in the paradigm.

Recent research has provided evidence for:

i. the fact that overt agreement is a PFish/morphological phenomenon, not a syntactic one (e.g., Bobaljik 2004 and Sigurðsson 2006)
ii. the incremental nature of production (e.g., Bock et al. 1992, Phillips 1996 and Ferreira 1996)

According to the Principle of Incrementality 'different levels of processing can work on different pieces of an utterance at the same time. Thus, the phonological encoder can work on the early part of the clause while the syntactic encoder works on filling out what remains' (F. Ferreira 2000: 28; see also V. Ferreira 1996, and Schriefers et al. 1998, Levelt 1989 or Phillips 1996). This allows for fast/efficient computation in the sense that the production system does not have to wait for all elements of the sentence to be available before beginning the utterance. The syntactic framework that captures the incremental nature of production most naturally is Left-to-Right Syntax (Phillips 1996).[11] I will adopt this framework for the sake of exposition, though see below for an alternative compatible with bottom-up syntax.

Within the said framework, Agreement is computed from left-to-right (e.g., Phillips 1996, Legate 1999) and the top of the tree is assembled/made available earlier

[11] See Drury (2005), Guimarães (2004), Phillips (1996 and 2003), Richards (1999 and 2003) for syntactic evidence in favor of this framework.

than the bottom of the tree. Arguably, this state of affairs conspires to derive the above agreement asymmetries, an idea that goes back to Barlow (1992). Specifically, in the P-G order the production system works on P irrespective of whether the rest of the sentence has been coded or not, so as to allow for fast(er) production (cf. Phillips 1996).[12] Nevertheless, a P showing morphological/rich agreement cannot be uttered until G has been coded, because agreement causes P to "wait" for G to become available. Only then can P be spelled-out. Inasmuch as such a "wait" goes against the spirit of incremental production, one option to avoid it is to drop agreement markers or adopt default agreement.

In turn, in the G-P order (that is to say, in the Spec,Head configuration), the 'wait' for G takes place anyway because it precedes P. Hence, there is nothing to be gained by dropping agreement markers.

Notice that the uncontroversial assumption that production is incremental in nature together with the redefined Spec,Head relations posited above correctly derives the relevant paradigms.

Let's see how the proposal works with the data in (4). The crucial factor is whether the element triggering the agreement is already available in the structure or not, at the point that the element carrying the overt agreement morphology is hit.

(8) Course of production of (4)a
Questo – available for production
lo – available for production
fa(no) – production contingent on the availability of the subject
→ wait or adopt default
... Agreement.

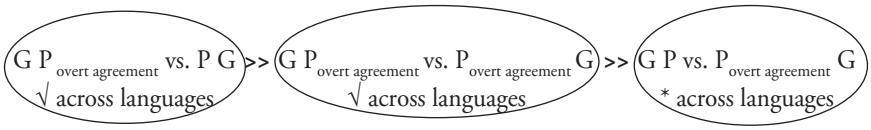
(9) Course of production of (4)b
Questo – available for production
i bambini – available for production
lo – available for production
fanno – subject is available so default Agreement is unnecessary
...

Notice that if overt Agreement is computed in a separate operation (completely different from LDA) after syntax (Bobaljik 2004) in the spirit of Distributed Morphology framework (Halle and Marantz 1993), this approach would be compatible not only with left-to-right syntax but also with standard bottom-up syntax. Assuming that such a computation of overt Agreement is incremental and that Spec,Head relations can indeed exist in the cases under discussion, we can derive the mentioned Agreement Asymmetries within the LDA framework (Chomsky 2000-2006).

[12] Cf. the crosslinguistic tendency for old information to come before the new information, in keeping with the idea that optional movement is related to surface semantics effects (Chomsky 2001 etc.).

Going back to the observation in (1-3), the present approach suggests the following ranking among Agreement patterns, from the most advantageous system in terms of Incrementality to the less advantageous one.

(10)



Given this, the system at the bottom of the ranking should be fairly uncommon if it exists at all, as seems to be the case.

Finally, it is worth mentioning that within the context of this research, crosslinguistic variation regarding agreement (and lack of thereof) with in situ elements comes from the fact that the strategies of the parser/production system are defeasible: e.g., central embedding in English is disfavored due to its costly nature, but it is not banned by the parser/production system. In this sense, the present approach succeeds in providing a rationale for the existence of the paradigms under consideration. The choice to follow the most incremental pattern or to 'defeat' the strategies of the parser/production system would be a language-particular matter.[13]

Next, I discuss one remaining issue, anti-agreement effects.

1.3.1. A note on anti-agreement effects

As far as anti-Agreement effects are concerned, A'-moved subjects may fail to trigger overt agreement in a number of languages in spite of the fact that they precede the subject:

(11) Quante ragazze gl'h*a* / *h*anno* telefonato?
how-many girls GLI has/ *have phoned? (Campos 1997: 94)

Note that within the current framework T is not in itself the locus of Case, Agreement or EPP features, rather the C/T complex is (e.g., cf. Chomsky 2004 & 2005). Hence, A'-moved elements in C can not only interact with EPP or Agreement features, they are indeed predicted to do so as in the above example (cf. Chomsky 2004: 116 for related discussion on the effects of successive cyclic A'-movement in the agreement system headed by C and, crucially, also on the agreement system headed by T). In that sense, Anti-Agreement effects are part of the system and the claim that overt Agreement is computed incrementally is not at odds with such effects.

1.4. Interim summary

It has been shown how evidence for grammatically significant Spec,Head relations can be accommodated within the phase-based Long Distance Agreement

[13] With regard to unbalanced coordination, in a number of languages such facts are found in the G-P order (Johannessen 1993), a fact incompatible with the current analysis. Furthermore, the contrast between full agreement and first/second conjunct agreement affects interpretation in some languages, (e.g., binding possibilities, see Aoun, Benmamoun and Sportiche 1994 among others), a fact at odds with a treatment of the phenomenon in terms of incrementality considerations.

framework (Chomsky 2000-2006). Specifically, Specifiers have been argued to be heads (cf. Uriagereka 1999) that, as such, can establish a Probe Goal relationship with the head of the projection hosting them. This relation would fulfill the minimalist desiderata of minimizing computations by restricting probing to c-command domains. The differences in agreement morphology found across languages depending on whether the Probe Goal relation is established locally (cf. Spec,Head relation) or long-distance (LDA) are explained by claiming that:

i. Agreement Asymmetries are not a purely syntactic phenomenon as suggested by recent research (Bobaljik 2004 and Sigurðsson 2006)
ii. Incremental production (e.g., Bock et al. 1992, Phillips 1996 and Ferreira 1996) conspires to derive the Agreement Asymmetries mentioned above

The discussion so far has illustrated how a close inspection of the properties of the parser/production system can inform linguistic research on morphological agreement. The purpose of the next section is to provide still another instance of such fruitful perspective by focusing on the relationship between movement and semantics.

2. On Incrementality and the duality of Merge and Semantics

The goal of this section is to consider the duality of semantics and its relationship to movement. According to Chomsky (2006: 8), 'the two types of Merge correlate well with the duality of semantics that has been studied from various points of view over the years. EM [External Merge] yields generalized argument structure, and IM [Internal Merge] all other semantic properties: discourse-related and scopal properties.' Nonetheless, Chomsky (2006: 8) notes that the correlation is not perfect, whereas Chomsky (2004: 11) acknowledges that the correlation is not a logical necessity. Therefore, a question suggests itself: why is the mapping between Merge and Semantics this way? It will be argued that Incrementality helps explain the said mapping.

2.1. On Incrementality and the Duality of Merge and Semantics

As stated above, Incrementality allows for fast/efficient computation in the sense that the production system does not have to wait for all elements of the sentence to be available before beginning the utterance. Given that narrow syntax is assumed not to encode order (e.g., Chomsky 1995 & 2005, following Reinhart 1979), word order differences might result from Incrementality. For instance, old information would become available earlier than new information and, therefore, the former would precede the latter in surface order. This view is supported by the following facts:

i. this crosslinguistic tendency seems to be robust, as frequently noted
ii. there is experimental evidence in favor of this view, (cf. V. S. Ferreira and Yoshita 2003 study on Japanese scrambling or Wind Cowles 2003)

Say this is right: it follows that word order variations, which we currently analyze in terms of movement, are closely related to the old vs. new information dichotomy.

Arguably, this can serve as a trigger causing the association between Internal Merge and surface semantics (assumed to form a natural class encompassing but not limited to the given-new ordering). It could be the case that the child acquiring language is sensitive to this trigger (present in spontaneous language production of the child itself and of its parents; cf. the above references to experimental work) or else this trigger might have caused the grammaticalization of the said relationship between Merge and Semantics in the history of particular languages. Once this relationship is grammaticalized, for sure, the child would be able to find evidence for it in language production.[14] Support for this view (and for previous claims concerning Agreement) comes from the following considerations:

i. language processing *is* Incremental (F. Ferreira 2000; V. Ferreira 1996, Schriefers et al. 1998, Phillips 1996 a.o.)
ii. There is no such a thing as a mechanism of Incrementality that needs to be justified, rather the computational dynamics of language allow for Incrementality
iii. The only 'technology' that this approach relies on, Incrementality, is a source of optimality and efficiency within the system, in keeping with the Minimalist emphasis on such concepts

Given this scenario, how did languages get to be divided into those that express surface semantics via movement (say, Spanish) and those that show surface semantics in situ (say English)? Assuming Bever's (2006) preference for canonical surface forms, a preference related to general cognitive principles, languages would have a choice to make this peculiarity of old information appearing first canonical or else make canonical any word order that arises in informationally neutral contexts. In turn, whenever we do not see such mapping (e.g., whenever movement takes place but this does not correlate with surface semantics), there is a third factor involved, namely, the fact that surface semantics is subject to economy. Hence, only optional movement would show surface effects (cf. the view that an optional rule can apply only when necessary to yield a new outcome; Chomsky 2001: 34, following Reinhart 1997 and Fox 1995, 2000).

If this view is on the right track, the mapping between the duality of merge and the duality of semantics (Chomsky 2006) does not have to be stipulated but rather follows from the computational dynamics of the system.[15]

It is worth noting that this proposal is not committed to a particular view on the relationship between the parser and the grammar: It could be that the parser and the grammar are the same thing (Phillips 1996), a state of affairs that would be compatible with the mentioned mapping of Merge onto Semantics. Nonetheless, it could

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[14] Cf. also Uriagereka's (2006) view that mapping a more or less entangled syntax specifically to a semantics of comparable complexity is realistic, both from a developmental (learnability) and, ultimately, an evolutionary (minimalistic) perspective. The present view, while compatible with such approach, provides another piece of the puzzle.

[15] For sure there are some remaining questions. E.g, one wonders why scope is associated to movement (cf. Uriagereka 2006) or whether scrambling correlates with surface semantics or not (cf. Miyagawa 1997 & Ishii 1997 vs. Saito 1989, 1992).

also be the case that the parser and the grammar are different from one another. Under the latter scenario, even though the parser and the grammar might be different, the workings of Incrementality may serve as the trigger to associate External Merge to Edge Effects, as stated before.

2.2. Interim summary

In the last section, still another instance of the relationship between the parser/production system and the grammar has been discussed. It has been shown that the mapping between the duality of Merge and the duality of Semantics (Chomsky 2004, 2005 and 2006) does not have to be stipulated but rather follows from the computational dynamics of the system in keeping with the stress that the Minimalist Programs puts on efficient/optimal computations.

3. General Conclusion

This research has shown that the Principle of Incrementality (e.g., Bock et al. 1992, Phillips 1996 and Ferreira 1996) allows us:

i. to reconcile the phase-based framework assuming Long-Distance Agreement (Chomsky 2000-2006) with the fact that across languages moved elements tend to trigger agreement as opposed to in situ elements
ii. to derive the mapping between the duality of Merge and the duality of Semantics (cf. Chomsky 2000-2006)

Furthermore, it has been shown how certain developments (e.g., Uriagereka's 1999 and 2002 theory of Multiple Spell-out) conspire to allow for grammatically significant Spec,Head configurations within the phase-based system. This is the case because conceptual arguments against such configurations (cf. Chomsky 2000-2006) do not apply to the present proposal.

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REANALYZING THE THEME VOWEL IN PORTUGUESE

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1. Introduction[1]

The aim of this article is to point out the differences in the functions of segments traditionally referred to as the 'theme vowel' in many morphological studies on Romance Languages (Rio Torto 1998, Villalva 2000, Mateus et al. 2003, Azevedo 2005). It is a general misconception to treat the segments, appearing between the root and the suffixes of nouns, adjectives and verbs, as having identical status in the morphological segmentation or as having the same functions. The traditional term 'theme vowel', used to designate them, already suggests that the three segments have parallel segmentational or functional status. For this reason, I am going to abandon this term, and will adopt a new term 'intermediate vowel' (IV), which purely refers to the position these vowels occupy.

(1) Theme Vowel: the 'Intermediate Vowel'

Root	IV	Suffix	
$[sec]_A$	[o]	[s]	'dry'
$[sec]_N$	[a]	[s]	'drought'
$[sec]_V$	[a]	[r]	'to dry'

This study is only interested in the difference between the intermediate vowels of nouns and adjectives, leaving the matter of verbal intermediate vowels aside for the moment, as possible subject of future research. In the following section, I am going to examine the view according to which the intermediate vowel functions as gender inflection in nouns and adjectives. In the third section, a different approach is going to be evaluated which considers the intermediate vowel of nouns as a marker of their grammatical subcategory i.e. declension. In the fourth section, I will examine whether we have any reason to believe that the intermediate vowel is a derivational suffix, and will present evidence to claim that the intermediate vowel of nouns and the intermediate vowel of adjectives are two different morphological entities.

[1] In preparing the present paper, I have benefited greatly from the comments of two anonymous BIDE'06 reviewers. Thanks also to the organizers and participants of BIDE'06 conference for listening to and commenting on the talk. I am grateful to Géza Balogh for his willingness to exchange ideas, for his valuable comments and for proofreading.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 241-250.

2. Gender Inflection

For more than three decades, the intermediate vowel of nouns and adjectives was considered to carry information about gender inflection (Câmara 1971, Cunha & Cintra 1984, Mateus et al. 1990). In this framework, a noun like the feminine noun *gata* 'female cat' is viewed as the inflected form of the masculine noun *gato* 'male cat', just like the feminine adjective *nova* 'new$_{Fem}$' is the feminine form of *novo* 'new$_{Masc}$' (Cunha & Cintra 1984: 192). These authors agreed that even pairs like *homem* 'man' and *mulher* 'woman' were inflectional pairs, formed on suppletive forms (Cunha & Cintra 1984: 192, Mateus et al. 1990: 370).

Recently, this highly disputable theory has been rejected by morphologists. Villalva (2000), for example, argues that neither nouns nor adjectives are inflected for gender since there is no inflection for gender in Portuguese at all (Villalva 2000: 219). She bases this assumption on two arguments: i) gender inflection in Portuguese is not obligatory and ii) it is not systematic. By 'not obligatory', Villalva tries to capture the fact that there are a number of uniform adjectives in Portuguese, which cannot take an explicit masculine or feminine form. Adjectives like *leve* 'light' or *azul* 'blue' will appear with the same form, independently of whether they modify a masculine or a feminine noun (c.f. (2)). Furthermore, Villalva points out that not all nouns have two forms for the two genders, but only those marked with the quality [+ animate] may have variable forms (3).

(2) 'Not obligatory'

a. Variable adjectives

casa$_{Fem}$	nova$_{Fem}$	'new$_{Fem}$ house'
livro$_{Masc}$	novo$_{Masc}$	'new$_{Masc}$ book'

b. Uniform adjectives

casa$_{Fem}$	azul $_{?}$	'blue house'
livro$_{Masc}$	azul $_{?}$	'blue book'

(3)

[+animate]		[–animate]	
gato$_{Masc}$ / gata$_{Fem}$	'cat'	livro$_{Masc}$	'book'
tio$_{Masc}$ / tia$_{Fem}$	'uncle/aunt'	casa$_{Fem}$	'cat'

Villalva's second argument, where she claims that gender inflection is not systematic, is supported by the diverse forms of masculine endings (4a) and of feminine formation (4b).

(4) 'Not systematic'

a. Masculine nouns

-o	gato	'male cat'
-ø theme	inovador	'innovative$_{Masc}$'
athematic	bom	'good$_{Masc}$'

b. Feminine nouns

-a	gata	'female cat'
derived	actriz	'actress'
compound	pinguim fêmea	'female penguin'
suppletive	mulher	'woman'

The claim of unsystematicity, however, proves to be false with respect to adjective gender alternation. Adjectives either show the *-o/-a* alternation or they are uniform and undergo no formal change. The borderline between the two categories of

adjectives is also well defined. Masculine adjectives ending in the intermediate vowel *-o* assume the termination *-a*, and vice versa, when a change of gender is required.[2] On the other hand, the second category, athematic adjectives ending in a vowel different from *-o*/ *-a* or in a consonant are uniform.

(5) System of adjectives

a. Variable		b. Uniform	(ending)
novo/a	'new'	leve	[@/ï]
característico/a	'characteristic	simples	[S]
		ruim	[ĩ]

There are a few exceptions, though. Some adjectives, referring to nationalities and adjectives with a pejorative sense behave in an identically irregular fashion in Portuguese. The masculine forms are consonant-final while their feminine counterparts are formed with the addition of an *-a* (*português-portuguesa* 'Portuguese', *inglês-inglesa* 'English', *falador-faladora* 'who speaks much/chatterbox'). The reason for this irregularity is to be found in the nominal origin of these adjectives. The pairs of adjectives are taken from the nominal system without any formal change, which is the clear case of conversion (6). There is another very limited set of irregular adjectives in Portuguese such as *bom-boa* 'good', *são-sã* 'healthy'. All these exceptional cases are lexicalized and thus, are beyond the domain of Morphology.

(6) Conversion
comida portuguesa 'Portuguese food'
$[[\text{portugues}_{\text{Masc}}]_{\text{N}}\ [\text{a}_{\text{Fem}}]_{\text{Suf}}]_{\text{N, Fem}} \rightarrow [\text{portuguesa}]_{\text{Adj, Fem}}$

So far, we have seen that it is a false generalization to claim that nouns and adjectives behave in the same way in Portuguese with respect to gender alternation. It has been shown that while gender alternation of nouns is not systematic, adjectives have a regulated system of gender change. Now, let me return to Villalva's first argument against the inflectional status of the intermediate vowel, which claims that gender alternation is not obligatory. Here, we will also have to make a distinction between nouns and adjectives. Note that while in sentences like those in (7a) below the different nouns: *menina* and *menino* are chosen on a lexical basis, the choice of the adjectives in (7b) is driven by a syntactic rule. A choice like **menino nova*, where the adjective does not agree in gender with the noun it modifies, is marked as ungrammatical.

(7) a. Vejo uma menina. 'I see a girl.'
Vejo um menino. 'I see a boy.'
b. $*\text{menino}_{\text{Masc}}$ nova_{Fem} 'young boy'
$*\text{menina}_{\text{Fem}}$ $\text{novo}_{\text{Masc}}$ 'young girl'

(8) casa_{Fem} azul_{Fem} 'blue house'
$\text{livro}_{\text{Masc}}$ $\text{azul}_{\text{Masc}}$ 'blue book'

[2] The only exceptions here are adjectives formed with the *-ista* suffix, such as *comunista* 'communist', *feminista* 'feminist'. The final *-a* cannot be considered an intermediate vowel, since it patterns together with athematic words, assuming *-zinho* dimunitive (*comunistazinho* 'little communist' c.f. *cafezinho* 'little coffee', *manhazinho* 'dawn').

Agreement in gender, either expressed by the alternation of the intermediate vowel, or by lexical variation (c.f. *faladora, bom*), is obligatory for adjectives. Without exceptions, every adjective with alternating forms, will display gender alternation in the appropriate syntactic context. Gender alternation thus has an inflectional status in adjectives.[3] The gender inflection may be realized by the alternation of the intermediate vowel (5a) or by a zero inflection (2b, 8). In exceptional cases, the relevant lexicalized suppletive forms are inserted into the noun phrase (6).

3. Class Marker

In section 2, it has been shown that the intermediate vowel of adjectives has an inflectional status, but the question of what function the intermediate vowel of nouns has remains unanswered. It is easily proven that the nominal intermediate vowel cannot be a gender morpheme because the correlation between endings and genders is far from being perfect. There are a considerable number of masculine nouns ending in the general feminine intermediate vowel *-a*, and there are some feminine nouns ending in *-o*, while there are many nouns of both genders ending in consonants, diphthongs and stressed vowels where the gender is unpredictable from the form (9).

(9) Termination – gender noncorrespondence in nouns

trib**o**$_{\text{Fem}}$	‘tribe’
poet**a**$_{\text{Masc}}$	‘poet’
mulhe**r**$_{\text{Fem}}$	‘woman’
ma**r**$_{\text{Masc}}$	‘sea’
m**ão**$_{\text{Fem}}$	‘hand’
ch**ão**$_{\text{Masc}}$	‘floor’

Thus, I agree with Villalva that the intermediate vowel of nouns is neither gender inflection, nor any type of marker of it. Led by the same considerations, many authors of Romance morphology rejecting this view argued that the intermediate vowel of nouns is a class marker, the segment that decides to which inflectional class a noun belongs. Authors like Harris (1991) and Aronoff (1994), discussing Spanish morphology, defined three noun classes (10), purely distinguished by the intermediate vowels, while other authors set systems of 15 or even 23 classes for nouns (Villalva 2000, Mateus et al. 2003). However, I will argue that there is no correlation between intermediate vowels and noun classes; what is more, there is no reason to suppose inflectional classes for nouns (declensions) in Portuguese. Hence, the intermediate vowel cannot be a marker of (non-existent) inflectional subcategories.

(10) Noun Classes (Harris 1991):

1 -o	menino, tribo	‘boy’, ‘tribe’
2 -a	menina, poeta	‘girl’, ‘poet’
3 -ø	café, mulher	‘coffee’, ‘woman’

[3] The same conclusion was reached by Matthews for Italian (1974: 48) and Mateus & d’Andrade for Portuguese (2000: 69).

The definition of the inflectional class, according to Aronoff, is found in (11) (Aronoff 1994: 64).

(11) Inflectional Class
An inflectional class is a set of lexemes the members of which select the same set of inflectional realizations.

The above definition is illustrated by systems like the Latin declension system. An α set of lexemes, like *casa, terra* select an α set of inflectional realizations in the different morpho-syntactic categories, while a β set of lexemes, like *domus* and *servus* select a different, β set of suffixes to express the same morpho-syntactic categories (12). In Portuguese, the existence of inflectional classes is less obvious. The nominal morphology of Portuguese involves only one morpho-syntactic category expressed by an inflectional process, the plural. Furthermore, Portuguese nouns behave very similarly in the pluralization process: with few exceptions, they all take the plural suffix *-(V)s* (13).

(12) Latin plural formation

I.		II.		III.	...
cas-**ae**	'houses'	dom-**i**	'masters'	…	…
terr-**ae**	'lands'	serv-**i**	'servants'		

(13) Portuguese plural formation

'Class'[4]	**SING Gloss**		**PLURAL-INFL**
I	menino	'boy'	menino-**s**
	livro	'book'	livro-**s**
II	menina	'girl'	menina-**s**
	poeta	'poet'	poeta-**s**
III	café	'coffee'	café-**s**
	manhã	'morning'	manhã-**s**
III	mar	'sea'	mar-**es**
	monte	'mountain'	mont(e)[5]-**es**
III	caracol	'snail'	caraco-**is**
	cão	'dog'	cã-**es**
	lápis	'pencil'	$lápis_{\mathbf{Pl}}$

Looking at the table in (13), we can see that there is no difference between the behaviour of nouns ending in different intermediate vowels, namely in *-o*

[4] As defined by Harris (1991).

[5] The final vowel is parenthesized because in present day European Portuguese unstressed [ə] is unpronounced. For this reason, *e*-final nouns can be considered consonant-final (Villalva 2000), although in other studies *-e* is considered an intermediate vowel just as *-a* and *-o* (Mateus et al. 2003, Azevedo 2005). But in either case rule (18) (see later) holds.

like *livro* ('Class' I) and *-a* like *casa* ('Class' II) with respect to inflectional suffixation. Nor do nouns with no intermediate vowel (ending in a nasal or a stressed vowel) like *café* or *manhã* (Class III) differ. Recall that these sets of nouns are categorized into three different classes by Harris (10) and by several other authors. The only variation this table shows is within the group of nouns ending in a consonant or a nasal diphthong where the plural suffix is realized with an epenthetic vowel. [S]-final nouns stressed on the penult (*lápis*) do not change their form in the plural.

Now, one may wonder if it is the same *-(V)s* plural suffix which sometimes has different phonetic realizations or there are more than one plural morpheme in Portuguese. Let us return to Aronoff's definition of the inflectional class, stated in (11). There are two ways to interpret this definition. The 'strong' interpretation of the definition requires that a certain set of lexemes select the same set of inflectional realizations, where 'the same' is true for the underlying and the surface levels as well. In this case, illustrated in (14), only those nouns belong to the same class, the inflection of which is phonetically realized identically. This way, Portuguese will have numerous declensions for nouns; words like *meninos*, *mares*, *caracois, cães, lápis* will be included in distinct inflectional classes. Note however, that there is no way to differentiate *meninos*, *meninas, manhãs*, *cafés*, etc. They will all belong to the same class of nouns, which contradicts all noun categorizations ever made in Portuguese morphology (Villalva 2000, Mateus et al. 2003).

(14) Strong interpretation of (11) – same in the UR, same in the SR
/menin$_{\text{Root}}$ + O$_{\text{Intermediate Vowel}}$ + S$_{\text{Plural Morpheme}}$ /
/menin$_{\text{Root}}$ + A$_{\text{Intermediate Vowel}}$ + S$_{\text{Plural Morpheme}}$ /

(15) Weak interpretation of (11) – same in the UR, different in the SR
/livr$_{\text{Root}}$ + O $_{\text{Intermediate Vowel}}$ + S$_{\text{Plural Morpheme}}$ /
/caoN$_{\text{Inflectional Root}}$ + E$_{\text{Intermediate Vowel}}$ + S$_{\text{Plural Morpheme}}$/

The 'weak' interpretation will say that a set of lexemes belonging to the same inflectional class assume the same set of inflectional realizations in the underlying level, which may differ on the surface level if the phonology thus requires (15). In this case, we will find that all Portuguese nouns belong to the same inflectional class. Surprisingly enough, we find that most Portuguese phoneticians analyze nouns according to the weak interpretation, but they support the strong interpretation with respect to morphological categorization (Câmara 1970: 90, Mateus e d'Andrade 2000: 72-73, Mateus et al. 2003: 1019-1020, Veloso 2005: 330-336). This article is intended to resolve such confusions.

The aim of this section was to show that the intermediate vowel of Portuguese nouns does not function as a class marker. This was proven by data form Portuguese pluralization, whereby it was made clear that the difference in the intermediate vowel of nouns does not necessarily mean that they are inflected differently in the plural, nor is the reverse true, i.e., nouns with different inflectional realizations in the plural contain different intermediate vowels. Moreover, based on the weak interpretation of Aronoff's definition of the inflectional class (Aronoff 1994), it has been suggested that there are absolutely no inflectional classes for nouns in Portuguese.

4. Derivational suffix

Derivational patterns of Portuguese words suggest a different analysis of the facts. As it is apparent from (16) below, the intermediate vowel seems to share its position with the derivational suffix. In other words, there seems to exist a position where either an intermediate vowel or a derivational suffix appears. This apparent complementary distribution may at first sight suggest that the intermediate vowel is itself a derivational suffix, one which derives nouns and adjectives from roots unspecified for grammatical category (17).

(16) a. N → N Derivation

livr#o	'book'	cas#a	'house'
livr#aria	'book shop'	cas#eiro	'domestic'
livr#inho	'small book'		
mont(e)	'mountain'	mar	'sea'
mont#eiro	'hunter'	mar#ino	'related to sea'

b. Adj – N Derivation

nov#o	'new'	bel#o	'beautiful'
nov#idade	'news'	bel#eza	'beauty'
verd(e)	'green'		
verd#ura	'vegetables'		

(17) Derivation from roots underspecified for grammatical category

$[[\text{livr}_{\text{Root}}]_{\text{Not Specified}}\ [\text{aria}_{\text{Derivational Suffix}}]_{N}]_{N}$

$[[\text{livr}_{\text{Root}}]_{\text{Not Specified}}\ [\text{o}_{\text{Derivational Suffix}}]_{N}]_{N}$

There are serious problems with this analysis, though. Based on Aronoff's analysis of Latin theme vowels (1994: 45), I am going to list counter arguments against the analysis presented in (17). First, this analysis presumes that there are very few underived words (i.e. without an intermediate vowel or a derivational suffix, e.g. *café, mar*) in Portuguese. Second, derivational suffixes, different from *-o/ -a*, have to be analyzed as consisting of two suffixes: *livr#ari#a, cas#eir#o*. According to Aronoff, this is very improbable, since this analysis would mean that the majority of nouns would be derived from non-occurring nouns as **livrari-*, **caseir-*.

Alternatively, it is possible to view the complementary distribution of the intermediate vowel and the derivational suffix, illustrated in (16), as a consequence of a phonological constraint in Portuguese. In Portuguese, most derivational suffixes attaching to nouns and adjectives are vowel-initial. There is reason to believe that a final unstressed vowel (i.e. intermediate vowel) is deleted before vowel-initial suffixes to avoid cross-boundary hiatus. This constraint is stated in (18).

(18) Cross-boundary anti-hiatus constraint for nouns and adjectives[6]

V [-stress] → ï/ _#V

[6] An identical rule, called Vowel Deletion rule is assumed by Scalise (1983: 287 ff.) to operate in Italian suffixation.

Three pieces of evidence in favour of the cross-boundary anti-hiatus constraint are provided in (19). First, there are no nominal or adjectival forms attested in Portuguese where a final unstressed vowel is followed by a vowel-initial suffix (19a). Second, consonant-initial derivational suffixes do not provoke intermediate vowel deletion (19b), since consonant-initial suffixes do not constitute the hiatus context stated in (18). Third, nouns ending in a stressed vowel, thus not possibly affected by (18), never take vowel-initial derivational affixes. There are diverse strategies, which guarantee that the final vowel does not meet a vowel across the word-boundary (19c). The form *cafeteria*, for instance, contains an epenthetic [t], and in *cafezinho*, the marked consonant-initial allomorph of the diminutive suffix *-zinho* is chosen instead of the vowel-initial one.

(19) Hiatus avoiding

a.	*livroa#ria	‘library’	
	*casa#eiro	‘domestic’	
	*novo#idade	‘news’	
b.	livr**o**#zinho	‘booklet’	
	nov**a**#mente	‘newly’	
c.	*caf#aria	cafe#taria	‘café’
	*caf#inho	cafe#zinho	‘little coffee’
	*manh#inha	manha#zinha	‘dawn’

The cross-boundary anti-hiatus constraint gives a straightforward explanation of the facts in (16). Hence, there is no reason to believe that the intermediate vowel is a derivational suffix, sharing a position with other derivational suffixes. The anti-hiatus constraint, being a phonological constraint, is blind to morphology. It deletes all unstressed final vowels in adjectives and nouns, independently of the morphological status of that vowel. Thus, the gender inflection of adjectives, and the still undefined intermediate vowel of nouns equally provide context to (18).

5. Conclusions

In the previous sections, we have found that the intermediate vowel of adjectives has inflectional status. However, the status of the intermediate vowel of nouns has remained unclear. We have seen that there is evidence that the intermediate vowel of nouns is neither gender inflection, nor class marker nor derivational suffix. After so many negative answers, the question is in order as to whether the intermediate vowel of nouns has morphemic status at all. I assume that the usual but not exclusive pattern of nouns, ending in *-o/ -a* is independent of the morphology of the language.

The presence of the intermediate vowel in Portuguese and in other Romance languages is due to diachronic facts, *-o* / *-a* are the developments of the (Vulgar) Latin *-um /-am* endings respectively. The *-um /-am* desinences are the inflectional realizations of the accusative in Classical Latin, but already in Vulgar Latin they were used to substitute all non-nominative cases (Teyssier 1982). The arguments presented in this article have tried to show that this tendency was continued further, thus by the present state of Portuguese, the intermediate vowel of nouns has completely lost its morphological function. Furthermore, from (20) below, it becomes clear that today the *-o* / *-a* intermediate vowel is not a compulsory part of nouns, since there

are many nouns lacking these final vowels. In fact, most recent Portuguese nouns, mostly borrowings from English, contain no intermediate vowel. The fact that there is no tendency to adapt words to the *-o* / *-a* pattern shows that the intermediate vowel has no synchronic function.

(20) Recent borrowings into Portuguese

computador	'computer'
Internet	'internet'
faxe	'fax'
monitor	'monitor'
blogue	'blog'
plotagem	'plotting'
celular	'cell phone'

However, assuming that the intermediate vowel of nouns has no function is not sufficient to claim that it does not have a morphemic status. A stronger piece of evidence comes form the cross-boundary anti-hiatus rule introduced in section 4. It was claimed that unstressed vowels at a morpheme boundary followed by a vowel are deleted. The existence of such words as *névoa* 'mist', *póvoa* 'habitation', *tábua* 'tableau' proves that there is no morpheme boundary before the intermediate vowel, otherwise the preceding unstressed vowel would have to be deleted (**névø#a*). As no morpheme boundary is detected in nouns containing an intermediate vowel, we can now claim that the intermediate vowel of nouns does not have morphemic status. It is thus derived that there is no such independent morpheme as the intermediate vowel of nouns. Consequently, the segmentation of nouns and adjectives will differ in the following way:

(21) a. Noun
$[seca]_{N}$

b. Adjective
$[[sec_{Root}]_{Adj}[o_{Infl}]_{Masc}]_{Adj,\ Masc}$

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TWO LANGUAGES, TWO INTONATIONS? STATEMENTS AND YES/NO QUESTIONS IN SPANISH AND BASQUE

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1. Introduction[1]

One of the characteristics of yes/no questions in Spanish is that intonation may be the only indicator that makes them different from statements (Hualde 2005). It is well known that most Spanish varieties make use of final F0 rises (H%) from a low point on the last stressed syllable to indicate that the utterance is a yes/no question (Navarro Tomás 1974, Quilis 1987, 1988, Sosa 1999, Hualde 2005, Prieto and Roseano 2010, López-Bobo and Cuevas-Alonso 2010, Astruc *et al.* 2010 and Ortiz *et al.* 2010 *inter alia*). Nevertheless, it is the case that certain varieties make use of low boundary tones to express this pragmatic meaning. Some examples are Argentinian Spanish (Gabriel et al. 2010), Cantabrian Spanish (López-Bobo and Cuevas-Alonso 2010), Castilian Spanish (Estebas-Vilaplana and Prieto 2010), Cuban and Canarian Spanish (Dorta *et al.* 2011) and Bilbao Spanish (Robles-Puente, 2011a). This last variety is spoken in the Basque Country, an area in the north of Spain that is linguistically relevant due to the contact situation between Spanish and Basque.

2. The Study

This study concentrates on the productions of yes/no questions as well as statements in Spanish and two varieties of Basque. According to Cenoz (2005), 24.7% of the inhabitants in the Basque Country are bilingual (Spanish/Basque) and 16.3% are passive bilinguals. The main goal of the current study is to determine if there are any differences in the production of statements and yes/no questions in Spanish by groups with different language backgrounds (Spanish monolinguals, passive bilinguals and Spanish/Basque bilinguals). The study will also determine whether statements and yes/no questions in Basque and Spanish have similar intonational configurations among young speakers.

[1] I would like to thank J. I. Hualde and Gorka Elordieta for their helpful comments and suggestions. I would also like to express my gratitude to all the participants for their time and to the University of Southern California Dornsife College for the Del Amo Foundation Research Award that made this research possible.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 251-262.

2.1. Participants and methodology

Five speakers (Table 1) took part in the experiment: One Spanish monolingual (subject A), two passive bilinguals (subjects B and C) and two Spanish/Basque bilinguals (subjects D and E).[2] All of them were recorded in Bilbao (Basque Country, Spain).

Table 1

Study participants

	Language	City	Age	Sex
Subject A	Spanish monolingual	Bilbao	25	Male
Subject B	Passive bilingual (Spanish/Batua)	Barakaldo	24	Female
Subject C	Passive bilingual (Spanish/Batua)	Galdakano	27	Female
Subject D	Spanish / Gernika Basque bilingual	Gernika	29	Female
Subject E	Spanish / Gernika Basque bilingual	Gernika	26	Male

Their task was to provide a natural response to a given situation presented by the experimenter on a laptop screen. Responses in Spanish were statements (1) and yes/no questions (2) consisting of a verb and another word (normally with an article) following:

¿Qué hacía Marina? 'What was Marina doing?'
(1) Response: *Miraba la mano* 'She was looking at the hand'

Quieres saber si Marina miraba la mano. ¿Qué le preguntas a tu amigo?
'You want to know if Marina was looking at the hand. What do you ask your friend?'
(2) Response: *¿Miraba la mano?* 'Was she looking at the hand?'

The structure of the sentences in Basque was necessarily modified due to the different word orders in Spanish and Basque (SVO vs. SOV). Sentences consisted of a word (either a direct object or a prepositional phrase) and a verb in its auxiliary form. The reason to include only auxiliaries was to have sentences of comparable lengths in both languages.

All the participants produced fourteen sentences in Spanish with the two pragmatic meanings (statement and yes/no question). Passive bilinguals and Spanish/Basque bilinguals also produced twenty-four and sixteen sentences in Basque, respectively.[3]

[2] As Cenoz (2008) points out, there are practically no Basque monolinguals. Young speakers were selected in order to determine what the current status of the varieties under study is.

[3] Numbers varied because some of the sentences in Basque were not comparable due to different word choices by the participants.

2.2. Results

2.2.1. Statements in Spanish

The intonational configurations of statements confirm previous descriptions of these kinds of sentences in Peninsular Spanish (Beckman *et al.* 2002, Hualde 2005 *inter alia*): There is a pitch rise in the first stressed syllable but the maximum F0 value is located in the post-tonic syllable (L+ > H* and L* + H only in a few cases). The nuclear pitch-accent has a smaller pitch rise and a lower pitch overall but the F0 peak is located within the limits of the stressed syllable (L + H*). The nuclear pitch-accent is followed by a low boundary tone (L%). To capture the gradual pitch fall and following the aforementioned studies I use the symbol "!" to mark downstep. In Figure 1 an example of this configuration is presented (capital letters mark stressed syllables).

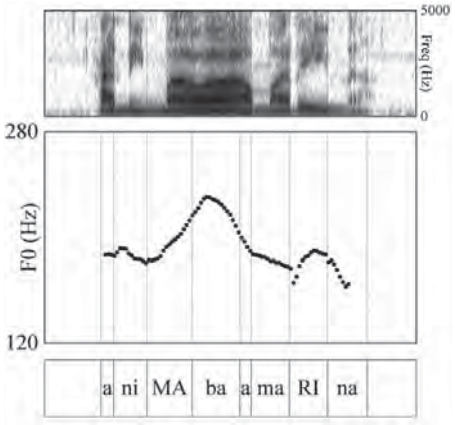

Figure 1
Subject C
Animaba a Marina – He was cheering Marina up

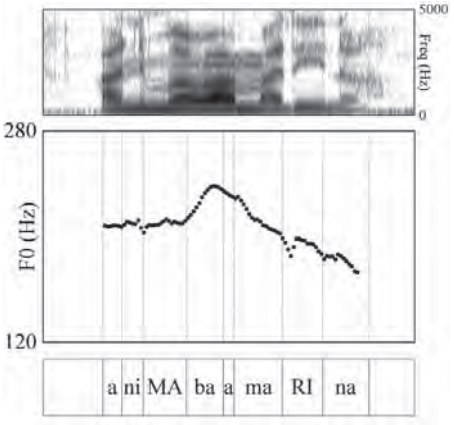

Figure 2
Subject B
Animaba a Marina – He was cheering Marina up

This configuration was always used by Speaker A, Speaker C, Speaker D and Speaker E; however, Speaker B did not show F0 rises in the nuclear pitch-accent (L*). Hualde (2005), Estebas-Vilaplana and Prieto (2010) and Robles-Puente (2011b) notice that this pattern can also be attested in Peninsular Spanish. Figure 2 shows an example.

2.2.2. Statements in Basque

As Table 1 shows, two different varieties of Basque were considered in the study: Batua Basque (a.k.a. Standard Basque) and Gernika Basque. Elordieta *et al.* (1999) point out that "the standard dialect cannot be studied, because there is no com-

monly agreed-on prosody (the Academy of the Basque language has not provided any rules or guidelines in this domain)". Thus, this dialect was included to provide at least a preliminary description of its main intonational characteristics in the northern area of Bizkaia. The Gernika dialect is considered part of the so called Getxo-Gernika variety (Elordieta *et al.* 1999, Hualde 2006) which includes the varieties spoken in Northern Bizkaia (except Standard Basque). Its main characteristic is that pitch is lexically distinctive since it can distinguish between accented and unaccented words. The Gernika variety is also interesting due to the intense contact with Spanish.

Passive bilinguals (Subjects B and C) attended bilingual schools (Spanish/Basque) for over 15 years; nevertheless, although they can speak and understand Basque perfectly, they consider Spanish their mother tongue. They also recognized that they barely use Batua Basque at home or with their friends. Probably due to this fact, the intonational patterns of their productions in Basque were identical to those in Spanish. Pre-nuclear pitch-accents had a L+ > H* pattern and nuclear configurations were L + H* L% (Figure 3) and L* L% (Figure 4) respectively.

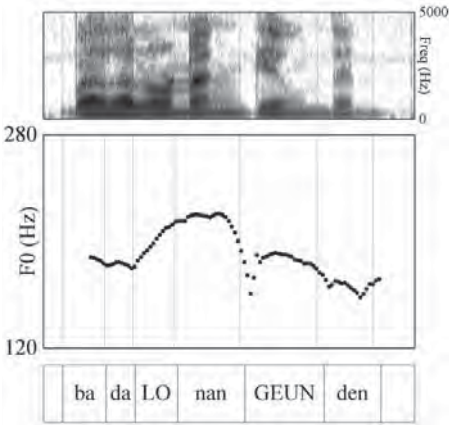

Figure 3
Speaker C
Badalonan geunden – We were in Badalona

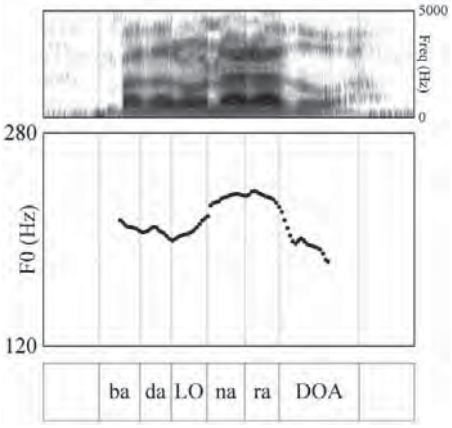

Figure 4
Speaker B
Badalonara doa – He goes to Badalona

Subject D's and most of Subjects E's utterances follow previous descriptions of dialects belonging to the Gernika-Getxo type (Elordieta *et al.* 1999, Hualde 2006). As pointed out in Hualde *et al.* (2002) and Elordieta *et al.* (1999), Northern Bizkaian dialects show a rise early in the phrase and a high plateau derived from an initial %LH- and a H* + L. The pitch falls after the accented syllable has been reached. When the word is unaccented, there is no pitch-accent unless it is in a phrase-final preverbal position or the synthetic verb following is accented. In these situations, a derived accent falls in the last syllable of the word. Both cases are exemplified in Figures 5 and 6 since the word "Badalona" is treated differently by both speakers. While Subject E (Figure 6) preserves the original Spanish stress in -lo- and consequently the

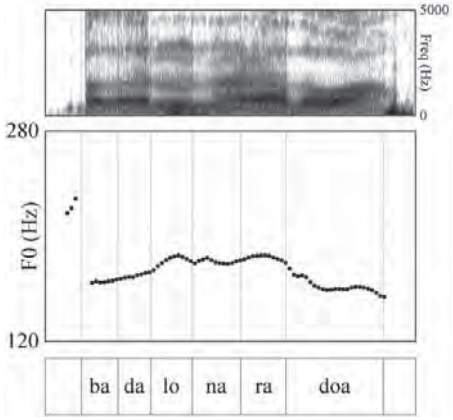

Figure 5
Subject D
Badalonara doa – He is going to Badalona

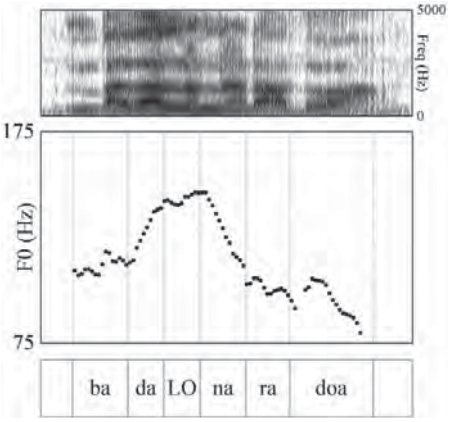

Figure 6
Subject E
Badalonara doa – He is going to Badalona

pitch falls right after it (i.e. in -na-), Subject D (Figure 5) treats this word as unaccented and the pitch does not fall until the end of the word (where *-ra* has a derived accent). Nevertheless, both subjects show F0 rises that do not correspond to those produced in Batua Basque or Spanish. Notice that the F0 in Figures 3 and 4 starts rising always in -LO- (the accented syllable), while in Gernika Basque the rise happens much earlier due to the %LH- boundary tone.

Interestingly, in two of the utterances, Subject E transferred the tonal configuration of Spanish to Basque, producing pitch contours very similar to those in Batua Basque (and Spanish) as shown in Figure 7.

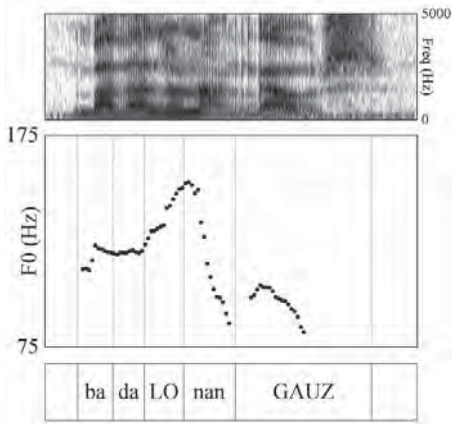

Figure 7
Subject E
Badalonan gauz – We are in Badalona

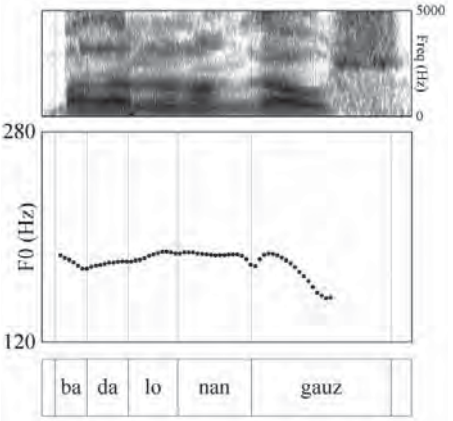

Figure 8
Subject D
Badalonan gauz – We are in Badalona

In addition, although synthetic vebs like "doa" (goes) are supposed to be lexically marked and therefore accented, there was variation.[4] Auxiliary verbs produced by Subject E tended to show more pitch movements than those by Subject D. For example, in Figure 5, "doa" does not show significant pitch movements while in Figure 6 it has a clear rise and fall. Similarly, "gauz" shows a clear fall in Figure 8 but a rise and a fall in Figure 7. It has to be pointed out that Subject D produced clear rises and falls in all the words in final position in Spanish sentences and therefore the lack of F0 movements only happened in her Basque productions. As I will demonstrate in section 2.2.4, variation in the accentuation was present in yes/no questions in Basque as well.

2.2.3. Yes/No Questions in Spanish

The patterns found in yes/no questions in Spanish resemble those presented in Robles-Puente (2011a). Although in that study a few instances of L* + H and unaccented pre-nuclear syllables are found, in the current study pre-nuclear pitch-accents are always L+ > H*.[5] Nuclear pitch-accents show a F0 rise from the stressed syllable but the maximum height is reached in the post-nuclear syllable as captured in Figure 9 and Figure 10.[6] As discussed in Robles-Puente (2011a), the late alignment is

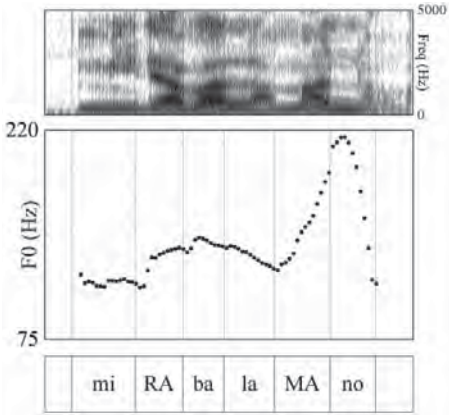

Figure 9
Subject E
¿Miraba la mano? – Was he looking at the hand?

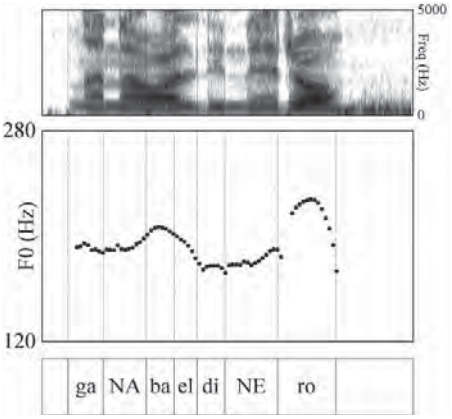

Figure 10
Subject D
¿Ganaba el dinero? – Was he earning the money?

[4] Elordieta (p.c.) points out that the synthetic form should be "doie" or "doia" and that "doa" is probably produced due to a Batua influence.

[5] As suggested in Robles-Puente (2011a), variation may be possible due to the perceptual importance of the nuclear pitch-accent and the boundary tone over the pre-nuclear pitch-accent.

[6] Subject C produced two yes/no questions with a L + H* LH% nuclear configuration. This configuration has also been noted in counterexpectational yes/no questions in Castilian Spanish (Estebas-Vilaplana and Prieto 2010) and Chilean Spanish (Ortiz *et al.* 2010).

caused by a high tone in the boundary tone (L + H* HL%). Gabriel et al. (2010), López-Bobo and Cuevas-Alonso (2010) and Estebas-Vilaplana and Prieto (2010) have also analyzed similar configurations as L + H* HL% or L + ¡H* HL%.

2.2.4. Yes/No Questions in Basque

Yes/no questions in Basque are produced in a very similar way as Spanish. Subjects B and C show F0 rises in the accented syllable of the auxiliary and the peak is reached in the following syllable to then fall due to the HL% boundary tone (e.g. Figure 11). Interestingly, both Gernika Basque speakers use a similar strategy. However, once again the accentuation of both speakers seems to vary. While Subject D's rises are found always in the last syllable of the auxiliary (see Figure 12 as an example, where the rise starts in -a), Subject E patterned with Batua Basque speakers producing earlier rises (see Figure 13). Pre-nuclear pitch accents have the same patterns as in statements for all subjects (i.e. L+ > H* for Subjects B and C and the characteristic %LH-H*L of Gernika Basque for subjects D and E).

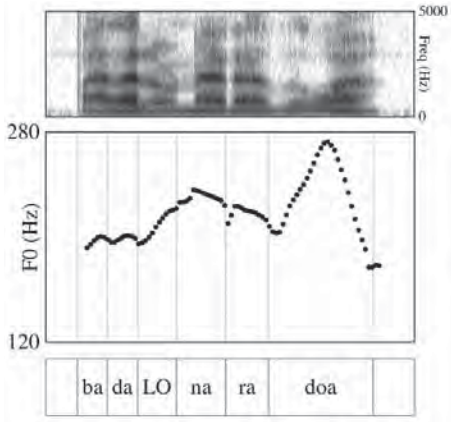

Figure 11
Subject C
Badalonara doa? – Is he going to Badalona?

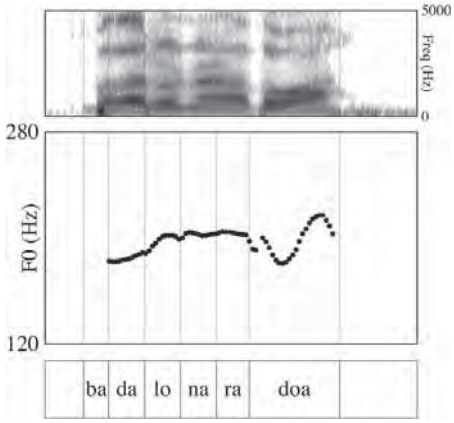

Figure 12
Subject D
Badalonara doa? – Is he going to Badalona?

Thus, different configurations were found. Subjects B and C produced pre-nuclear pitch-accents with the L+ > H* configuration, while Subjects D and E had a %LH-H*L one (F0 rise in -lo- vs. F0 rise from the beginning of the sentence); Subject E patterned with B and C in that F0 rises were found at the beginning of the auxiliary, while Subject D showed F0 rises toward the end of the word. Finally, Subject D, treated "Badalona" as an unaccented word, while the rest of the subjects considered it had stress in -lo- (reflected by a rise in Subjects B and C and by a fall in the following syllable in Subject E). Curiously, although in Speaker D's productions the time for F0 to rise and then fall is restricted due to the late rise, yes/no questions still have a circumflex pattern comparable to that in Spanish and all the other productions in Basque.

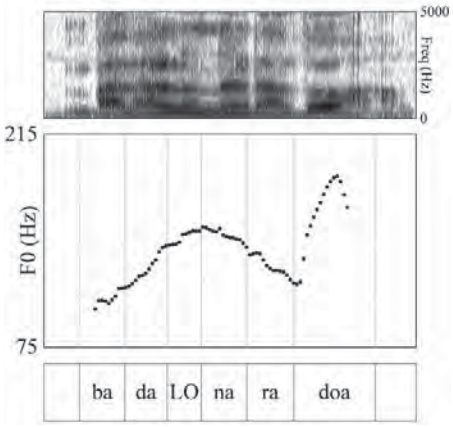

Figure 13

Subject E
Badalonara doa? – Is he going to Badalona?

3. Discussion: Statements and Yes/No Questions Compared

There are two main differences between statements and yes/no questions in Spanish. First, although the pre-nuclear pitch-accents are very similar, the alignment of nuclear pitch-accents is different. In statements, the highest F0 point is located within the limits of the nuclear syllable while in yes/no questions it is in the following syllable. Figure 14 shows the schematic representation of both alignments.

The second main difference between both types of sentences is the height of the nuclear pitch-accent. The high tone in the complex boundary tone (HL%) of the yes/no question makes the nuclear pitch-accent bear higher F0 values than in

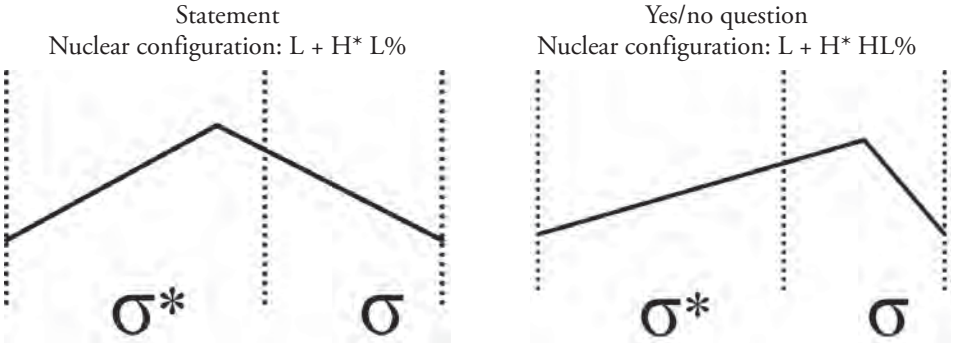

Figure 14

Schematic representation of the F0 peak alignments
in statements and yes/no questions

statements. The F0 values were measured at five different points in every sentence:[7] a) the beginning of the F0 rise in the pre-nuclear pitch-accent, b) the F0 peak in the pre-nuclear pitch-accent c) the beginning of the F0 rise in the nuclear pitch-accent, d) the F0 peak in the nuclear pitch-accent and e) the F0 value at the end of the sentence. Figure 15 shows the average F0 values in Hz of the five subjects in statements and yes/no questions in Spanish:

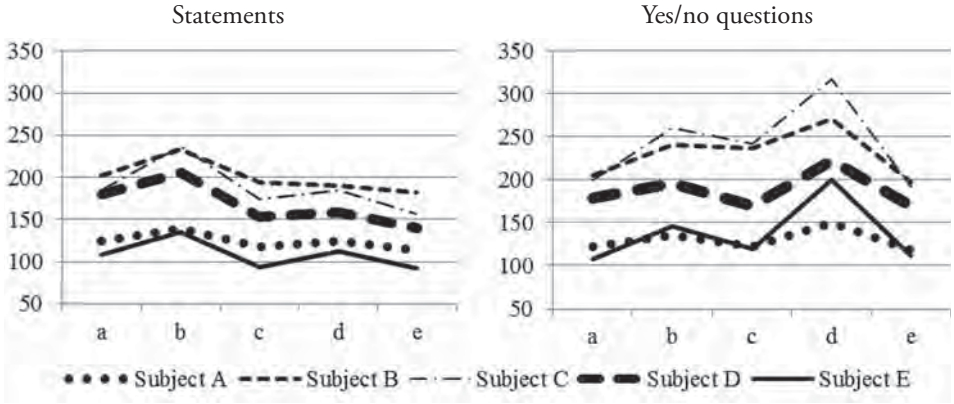

Figure 15

Average F0 values
in statements and yes/no questions in Spanish

If statements and yes/no questions are compared in Figure 15, it is obvious that yes/no questions show higher F0 values in their nuclear pitch-accents. This results in a circumflex contour where the pre-nuclear pitch-accent has lower F0 values than the nuclear pitch-accent. A Wilcoxon signed-rank test confirmed this observation by revealing that significant differences ($p < .05$) existed between points (c), (d) and (e) in statements and yes/no questions but not between points (a) and (b). The contrast in peak alignments between statements and yes/no questions in Basque (for Subject B, Subject C) is the same as in Spanish. In addition, the contours obtained with the average F0 values in Basque sentences by subjects B and E resemble those in Figure 14. A Wilcoxon signed-rank test revealed that significant differences ($p < .05$) existed again between points (c), (d) and (e) in statements and yes/no questions. Thus, yes/no questions seem to be produced with a higher pitch especially towards the end of the sentence in both Spanish and Batua Basque.

Subject D's and most of Subject E's statements clearly contrast with those produced by the other two Basque speakers in various aspects. First, the rise of the F0

[7] In the case of Subject B, point (c) was located at the beginning of the last accented syllable of the sentence; point (d) was in the middle of the stressed syllable and point (e) at the end of the utterance. The reason to analyze the utterances this way was to capture that there were no rises, but F0 falls throughout the nuclear pitch-accent.

tends to be at the beginning of the sentence (although it can have different shapes as pointed out by Hualde *et al.* 2002) while speakers B and C constantly show rises from the valley of the stressed syllable. Hualde *et al.* (2002) also notice this difference in the way Northern Bizkaian and Spanish convey lexical prominence. Synthetic verbs produced by Subject D are generally unaccented and therefore there are no notable F0 rises as shown in Figures 5 and 8. In contrast, Basque utterances produced by other subjects had F0 rises and falls within the limits of the last stressed syllable just like in their Spanish productions (except Subject B who showed only F0 falls as discussed before). This point is important due to the contrast found in yes/no questions. As can be noticed by looking at the questions in Figures 12 and 13, Subjects D and E produced pre-nuclear pitch-accents with the characteristic %LH- pattern of Bizkaian dialects also found in statements. It has to be pointed out that, like for the rest of the subjects, F0 values tended to be higher in yes/no question than in statements as well. It is also relevant that flat pitch tracks at the end of the statements were substituted with the rising-falling pattern also found in Spanish yes/no questions. Since the F0 rises occurred always in the last syllable of the utterances, sometimes F0 falls were not complete and yes/no questions in Basque showed slightly higher boundary tones than in Spanish.

4. Conclusions and Final Remarks

This study confirms that, although statements in Spanish produced by speakers of the Northern area of Bizkaia (Basque Country) resemble those produced in other Peninsular Spanish varieties (Beckman *et al.* 2002, Hualde 2005), yes/no questions show a characteristic circumflex pattern that ends in a low boundary tone - L + H* HL% (Robles-Puente 2011a) that contrast with the standard H%. Results also demonstrate that the standard variety of Basque (Batua) not only relies exclusively on intonation to obtain the pragmatic distinction between statements and questions, but also shares the intonational system with Spanish in spite of the fact that word orders in both languages are different. Finally, Gernika Basque speakers show variation. While Subject D showed exclusively intonational configurations characteristic of the Getxo-Gernika variety of Basque (%LH-H*L), Speaker E patterned sometimes with the Batua speakers. The circumflex pattern found in Spanish yes/no questions is still the same in Gernika Basque though. This was interesting for various reasons. First, it demonstrates that at least young bilingual speakers are using very similar intonational strategies in Spanish and Basque to convey two distinctive pragmatic meanings (statement vs. question). Subject D, who has two clearly different syntactic and intonational systems in Spanish and Basque, still uses the rising-falling configuration at the end of yes/no questions. In addition, although there is no post-nuclear syllable (the rise is always found in the last syllable of the sentence), the fall still happens. Finally, the current study shows evidence of the importance of Spanish as a dominant language in the area as also pointed out in Hualde *et al.* (2002). It is not surprising that the intonational system of Subjects B and C is identical in Spanish and Basque since Basque is their second language. However, Subject E, whose mother tongue is Gernika Basque, shows in some cases pitch contours more similar to those by Subjects B and C than to those by Subject D (the other

Gernika Basque speaker). Although these findings provide evidence that a simplification of the Basque intonational system may be taking place in the area of Gernika (presumably due to Batua or Spanish influence), it is necessary to conduct more research to determine if young speakers tend to preserve the original system like Subject D or also adopt the Spanish one like Subject E. Considering the current data, it is also reasonable to believe that the characteristic rising-falling pattern of yes/no questions in Spanish in the area of Bizkaia is closely related to (non-Standard) Basque. Nevertheless, data from older speakers of Gernika Basque as well as other varieties should be checked to see if they also produce yes/no questions ending in L + H* HL%.

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MOUTHING: A DISCOURSE STRATEGY IN SPOKEN LANGUAGE-TO-SIGNED LANGUAGE INTERPRETATION

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1. Introduction

Mouthing is the voiceless visual representation of words on a signer's lips produced concurrently with manual signs.[1] Mouthing of a spoken language during signing is the result of language contact. It is prevalent among English-dominant bilingual users of American Sign Language (ASL) such as professional sign language interpreters. However, it is well documented in the literature that mouthing in deaf native signers is regularized, serving an adjectival and/or adverbial function in the sign language (Wilbur 2000, ASL; Vogt-Svendsen 1981, Norwegian Sign Language; Padden 1990, Italian Sign Language; Engberg-Pederson 1993, Danish Sign Language) and that these mouthing patterns do not correspond to the phonetics of the majority spoken language, but are more likely a grammaticalization of universal gestures (see Janzen & Shaffer 2002). Interpreters have the advantage of *simultaneity:* the two channels of expression are distinctly different: one, a visual-gestural channel, the other oral-aural.

1.1. Categories of Mouthing

There are two categories of mouthing: (1) phonetically-intact mouthing[2] and (2) partial mouthing.[3] The former is significant because it surfaces in bilingual speakers and is measured as the dependent variable in the current study. Examples of category (1) appear below:

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[1] Mouthing has been observed in the discourse of many of the world's sign language users (Boyes-Braem 2001, Swiss German Sign Language; Schermer 1990 and Coerts 1992, Sign Language of the Netherlands, Ebbinghaus and Hessman 1996, German Sign Language; Wilbur & Peterson 1998[1], Wilbur 2000, Davis 1989, and Weisenberg 2003, American Sign Language (ASL) use by hearing bilinguals; Bridges & Metzger 1996 and Neidle et al 2000, ASL; Kourbetis & Hoffmeister 2002, Greek Sign Language; Detthow 2000, Swedish Sign Language use by hearing bilinguals; Quinto-Pozos 2004, Mexican Sign Language (LSM).

[2] Phonetically intact mouthing is indicated by brackets [ ].

[3] Partial mouthing is indicated by parentheses ( ).

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 263-276.

Mouthing: *[silicon] n_ to_ el_*
ASL gloss: fs-S-I-L-I-C-O-N CL:1 (rt) CL:B (lft) → ELEMENT
[right
CL:CC → ('squares in rows') CL:1

Mouthing: *ne_ xt to] [carbon]*
ASL gloss: (rt) CL:B (lft), fs-C-A-R-B-O-N
Spoken English text*: 'Silicon is an element, it is a metalloid, and not coincidentally, it's right next to carbon.'*

(+tech, -deaf, Subject JN) Weisenberg (2003)

Subject JN silently mouths the word 'silicon' on her lips while fingerspelling the word (S-I-L-I-C-O-N). Fingerspelling, a manual representation of letters, appears to be a wide-spread device among deaf signers resulting from language contact with the surrounding spoken language community (see Sutton-Spence 1994). The subject mouths 'right next to' while manually articulating the concept of 'element-adjacent to-element'. The subject utilizes a classifier handshape (CL:1), remaining in the locus of the signing space where the element 'silicon' was previously indexed. The subject's other hand forms a different classifier handshape (CL:B) and moves horizontally left, coming to rest at a locus that she identifies as 'carbon'. Complete mouthing accompanied by fingerspelling of 'silicon' is expected since it is a newly introduced term. Fingerspelled words begin to undergo lexicalization after approximately the third production (Brentari & Padden 2001).

An example of category (2) mouthing appears below:

Mouthing: *silicon (n_ to_ el_)*
ASL gloss: fs-S-I-L-I-C-O-N CL:1 (rt) CL:B (lft) -→ ELEMENT
right
CLCC → ('squares in rows') CL:1

Mouthing: *ne_ xt to carbon*
ASL gloss: (rt) CL:B (lft), fs-C-A-R-B-O-N
Spoken English text*: 'Silicon is an element, it is a metalloid, and not coincidentally, it's right next to carbon.'*

(+tech, -deaf, Subject JN), Weisenberg (2003)

Subject JN silently mouths the initial consonant of 'next' while setting up the signing space to reflect the locations of the elements using a classifier construction (CL:1 (rt) CL:B (lft)). She uses a reduced form of mouthing, the first part of the polysyllabic word, when manually signing ELEMENT.

In this paper I present the results of an experiment which show that sign language interpreters adjust their rate of English mouthing depending on their audience, namely a non-deaf audience causes a higher rate of mouthing than a deaf audience, and that in general, the perceived addressee has more of an effect on style shift than the topic under translation. I will also argue that mouthing is a type of borrowing and present some initial evidence that mouthing overlapped with signing seems to undergo a three-stage process during a single interpreting episode. Because a single sign-language interpreting event encapsulates the more lengthy process of a

sign's evolution, we can examine the role mouthing plays in the creation of neologisms.

1.2. Theories of Mouthing

There is widespread agreement that for both deaf natives and hearing bilinguals, mouthing appears to be systematic. Previous claims include that mouthing is (1) code-mixing employed to elucidate the translation (Davis 1989), (2) intrasentential code-mixing driven by discourse dominance (Weisenberg 2003), (3) a type of borrowing used to fill lexical gaps in the discourse (Boyes-Braem 2001), (4) a paralinguistic element whose appearance is influenced by the signer's motoric fluency or by spoken language-sign language syllable congruencies (Wilbur 1998).

Borrowings involve the insertion of single lexical items from a donor language that are filtered through the recipient language (Poplack & Meechan 1998). Insertions are typically (a) content words (b) morphologically integrated constituents, (c) selected elements (e.g., objects or complements) rather than adjuncts, (d) nested (i.e., the fragment preceding the insertion and the fragment following are grammatically related), (e) single constituents (Muysken 2000). It has been proposed that the matrix language determines the features of the inserted lexical item (Myers-Scotten 1993).

The English mouthing that sign language interpreters utilize is theorized to be a type of borrowing based on the fact that the borrowings are (a) content words (b) morphologically integrated constituents (c) selected elements (d) nested and (e) single constituents. Mouthing is coordinated with a manual ASL sign that has the same meaning (mouthing appears in bold):

"For example, everybody ***knows*** *that* ***water*** *is* ***$H_2 0$****"*
(Subject JN, +tech, -deaf) Weisenberg (2003: 23).

1.3. Sign Language Interpreting

Sign language interpreters are highly concerned with their deaf consumers' level of comprehension, especially when organizing highly abstract English discourse into a more concrete visual-spatial mode. They often resort to borrowing directly from the dominant language. They determine whether they should insert mouthing or not depending on their audience. The interpreter's ability to successfully accomplish translation in general is also affected by factors such as the familiarity with the source text, a speaker's rate of speech, and the fact that speech is linear. Interpreters also pay attention to cohesion. Cohesion is defined as "a network of relations that permits the listener to comprehend the interpreted discourse and is an important component in spoken language interpreting" (Shlesinger 1995). By virtue of their work, sign language interpreters must be able to identify these links in the source language and reproduce them in the output language, or there is the potential for the audience to misunderstand the message as it was originally intended. Given these facts, an experiment was designed to test the effects of audience on sign language interpreters' rate of borrowings.

2. Experiment

It is known in the interpreting profession that a deaf consumer's cultural status is a deciding factor of target language output since the interpreter is ethically bound to represent the message in the "language preferred by the client" (Humphries & Alcorn 1999). However, it is unknown to what degree other non-audience factors of the interpreting task contribute to the choice to borrow and whether these factors outweigh the effects of the addressee. The null hypothesis is that the addressee should have no effect on the rate of an interpreter's mouthing. If this hypothesis is correct, one would expect to find the same rate of mouthing in a translation task where the interpreter perceives the audience to be *culturally-deaf*[4] (affiliated with deaf culture) and an equivalent task where the audience is perceived to be *non-culturally* deaf (affiliated with *hearing* culture). If anything, we could expect other non-audience factors to affect mouthing such as the topic of the translated material (Bell 1984).

2.1. Design

2.1.1. Participants

There were a total of four participants (one man, three women) who were recruited through printed advertisements and electronic mail. Subjects were asked to fill out a questionnaire to determine level of proficiency in ASL and English. All the interpreters were nationally certified by the RID, and had three or more years of experience as an employed interpreter. Three of the interpreters used ASL a minimum of thirty hours per week and socialized with deaf people on a monthly basis. Two of the participants had ten or more years of experience using ASL. All indicated English as their first language. None of the interpreters had family members who were deaf, indicating they were not native signers of ASL. All of the interpreters had experience interpreting in post-secondary setting. This fact is important since all stimulus material was at college level.

2.1.2. Materials

Four lecture monologues were produced in English by three speakers (two females, one male) who were all teachers with experience at the post-secondary level. Two of the speakers were ESL teachers. One was a chemistry instructor. Their voices were recorded in a sound proof room of a phonetics laboratory. Speakers did not read from a prepared text, but rather were asked to speak extemporaneously on a familiar topic. Two of the speakers were instructed to lecture on a technical topic from their discipline, the third individual — a dramatic life event.

There were a total of four hypothetical interpreting lectures labeled A, B, C, and D. The deaf audience and the lecture topic were independent variables (see Fig-

[4] The term *culturally-deaf* refers to individuals who consider themselves members of a cultural and linguistic minority with its own set of norms and values that differ from the majority, *non-deaf* culture.

ure 1). Context A and B were considered more technical, the former — a Chemistry lecture on principles of electron affinity, the latter — a talk on computer architecture. Technical lectures are represented in Figure 1 as **Tech 1**. Context C and D were less technical, the first — instruction in applying for an educational grant, the second — tips on planning a wedding. A non-technical lecture is represented in Figure 1 as **non 0.**

In context A and C, the deaf client refers to himself as *hard-of-hearing,* this is represented in Figure 1 as **non 0**. In context B and D, the interpreter is working with a client who is second-generation deaf, with deaf children, and a graduate of a deaf-only school. His cultural identity is Deaf, represented in Figure 1 as **Deaf 1.**

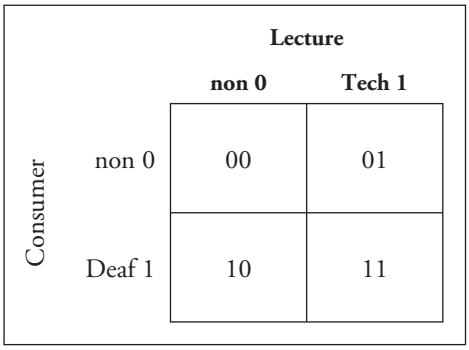

Figure 1

2.1.3. Procedure

Subjects were asked to fill out a questionnaire (see appendix) and read a card that depicted a hypothetical interpreting assignment. Context cards were given in random order. Each provided the name, age, cultural and linguistic background of the audience, and the setting and topic. Sign language interpreters regularly obtain this information when contracting for an assignment (Frishberg 1990). The participants were instructed to listen to a recorded excerpt of a spoken English lecture on audiocassette and interpret the source language (English) into target language (ASL) based on the information about each audience. Their signing was recorded digitally with a Canon Optura 200 and streamed into a Macintosh program called iMovie for analysis.

2.2. Analysis

Each audio-taped lecture was transcribed in English. The subject's signed output was analyzed frame by frame. The following measurements were taken: the total signs realized by each subject for a baseline (Figure 2) and the total number of mouthings per subject in each lecture (Figure 3). The dependent variable was the total number of English mouthings per subject.

Subject		LECTURE			
		Non deaf + non technical (00)	**Non deaf + technical (01)**	**Deaf + non technical (10)**	**Deaf + technical (11)**
	GG	695	685	628	677
	JN	593	542	620	479
	CC	831	695	780	588
	MP	725	666	715	595

Figure 2

Total signs realized per subject

Subject		LECTURE			
		Non deaf + non technical (00)	**Non deaf + technical (01)**	**Deaf + non technical (10)**	**Deaf + technical (11)**
	GG	179	388	344	225
	JN	87	154	114	129
	CC	76	122	478	67
	MP	276	274	236	137

Figure 3

Total mouthing per lecture

2.3. General results

Results indicate that the audience makes a difference in the rate of mouthing. Sign language interpreters produce more mouthing to a non-deaf audience than to a deaf audience, based on an analysis of variance (ANOVA), $F(1,3) = 11.11$, $p < .05$. These results are congruent with other studies of audience design (Bell 1984, Clark & Muphy 1981, Metzing & Brennan 2003, Lockridge & Brennan 2002). The audience has more of an effect on an interpreter's mouthing than the topic of the material under translation. On average one sign was produced in translation of every two English words heard. There was a higher percent of mouthed content words than function words.[5] This result reflects findings from studies on spoken language mixing (see Poplack & Meechan 1998). Nouns were mouthed more frequently than other categories across all four contexts.[6] There were cases where mouthing served the grammatical function of distinguishing homonyms. Finally, recurrent terminology was represented by the interpreters with a sign+mouthing combination, ex-

[5] For example, *determiners*: (00 = 0%; 01 = 4%; 10 = 3%; 11 = 2%); *prepositions*: (00 = 15%; 01 = 10%; 10 = 6%; 11 = 7%); *conjunctions:* (00 = 10%; 01 = 7%; 10 = 3%; 11 = 3%) in comparison to *nouns:* (00 = 39%; 01 = 26%; 10 = 26%; 11 = 21%) or *adjectives:* (00 = 39%; 01 = 26%; 10 = 26%; 11 = 18%).

[6] Mouthing of *nouns*: (00 = 39%; 01 = 26%; 10 = 26%; 11 = 21%).

hibiting a pattern of mouthing reduction while preserving the manual sign over the course of the experimental context.

2.3.1. Mouthing functions

The experiment provided a means to examine potential functions of mouthing. Interpreters utilize borrowing to avoid a homonym in ASL that could lead to miscomprehension. Avoidance of homonyms through lip movements has been discussed in other signed languages.[7] The following is an example of homonym avoidance. In context (-tech, -deaf) the speaker refers to a specific application form that must be *downloaded*. Subjects GG, CC and MP co-articulate the manual sign with mouthing:

(1) '***I downloaded*** *the RFP, which is the* ***request for proposals****, like I said earlier, and I read through it.* (Subject GG)

(2) '***I downloaded*** *the RFP, which is the* ***request for proposals****, like I said earlier, and* ***I read*** *through it.* (Subject CC)

(3) '**I downloaded** *the RFP, which is the* ***request for proposals****, like I said earlier, and I read through it.* (Subject MP)

(Weisenberg 2003: 25)

The interpreter is obliged to add mouthing to avoid potential homonyms for the chosen classifier (either MATERIALS-FLOWING-DOWN or PULL-DOWN) because of the introduction of the technical term *RFP* for which there is no equivalent manual sign in ASL.

The data also provided examples of cohesion. The interpreter utilizes mouthing to emphasize that a previously introduced concept is now contrasted.[8]

1. *English: 'two metals can not form a relationship in which they share electrons, but two nonmetals can… bonds in which atoms share electrons are called covalent bonds.*
   ASL: mean 2 people lose lose meet share can't. set-up connect can't. not share, not give.
   M: **share**
   ASL: But happen, not-metal can.
   M: **but** **can**

   Subject CC, Context [+technical, -deaf]

The interpreter mouths 'but' while using the manual sign BUT and manually produces CAN while silently pronouncing 'can'.

2. *English: 'two metals can not form a relationship in which they share electrons, but two nonmetals can… bonds in which atoms share electrons are called covalent bonds.*

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[7] The claims made here can extend outside the interpreting environment and seem to support previous analyses of bilingual data from deaf native signers (Boyes-Braem 2001 and Ebbinghaus & Hessman 1996).

[8] ASL = American Sign Language; M= mouthing.

ASL: understand metal metal connect can't. but not-metal can. Give-back-forth share-each-other.
M: **can**
share
ASL: Fs-but fs-atoms share E connect name fs-covalent-bonds.
M: **called**
Subject JN, Context [+technical, -deaf]

2.3.2. Mouthing metamorphosis

One result of the experiment was the discovery of a pattern of mouthing reduction. At least two contexts contained technical terminology that was repeated. Often there was no manual equivalent in ASL and therefore subjects had to translate these terms by overlapping mouthing and a manual sign with approximate meaning. Once the interpreter had expressed the mouthing+sign combination a few times, the mouthing was reduced or removed completely.

3. English: *So what happened was Robbie decided that he was gonna transfer to another university and he chose Rochester Institute of Technology…so I was pretty happy to see him go there.*
ASL: fs-Robbie decide transfer other university where-ret? Rochester…I…T (abbreviation)
M: Robbie decide transfer institute of technology
fs-RIT. happy see-him go Rochester fs-RIT **[no mouthing]**
happy to see him go
Subject GG: Context: [-technical, +deaf]

4. English: *…which is an old saying and really refers, in this case, to electrons…*
ASL: old quote really this fs-case quote refer to fs-electrons "E" (synonym established)
M**:** **old really refer this case to electrons** [no mouthing]
Subject GG: Context: [+technical, -deaf]

5. English: "…which is an old saying and really refers, in this case, to electrons…"
ASL: old story since know really point fs-electrons E (synonym established)
M: **saying really electrons electrons**

Later in the same context the interpreter produced *electrons* with reduced mouthing:

6. English: *…so atoms tend to come together, if you want to use the analogy of human relationships…*
ASL: so "E" connect same human connect
M: **so e—t—n** [mouthing reduced] **come together**

Further into the same context, the interpreter continued to use reduced mouthing for *electron.*

7. English: "…Clorox would do a good job of causing any material to lose its electrons…"
ASL: fs-clorox cause thing lose lose lose E. will lose its E
M: **cause e—t—n** [mouthing reduced]
Subject JN: Context: [+technical, -deaf]

2.3.3. Mouthing reduction

Just as the Drosophila fly is the workhorse for genetics research due to its gene mapping potential in a short life cycle, so too can a single sign-language interpreting event replicate the more lengthy process of a sign evolution in a much shorter *life cycle.* As more technical terms have been introduced to ASL, users of the language have been forced to create new signs, incorporating core-language synonyms with English initialization, English mouthing, and/or fingerspelling (Padden 2001). Interpreters however are actually engaging in mini-evolutions on a daily basis. The process of mouthing reduction in the creation of neologisms is diagrammed in Figure 4.

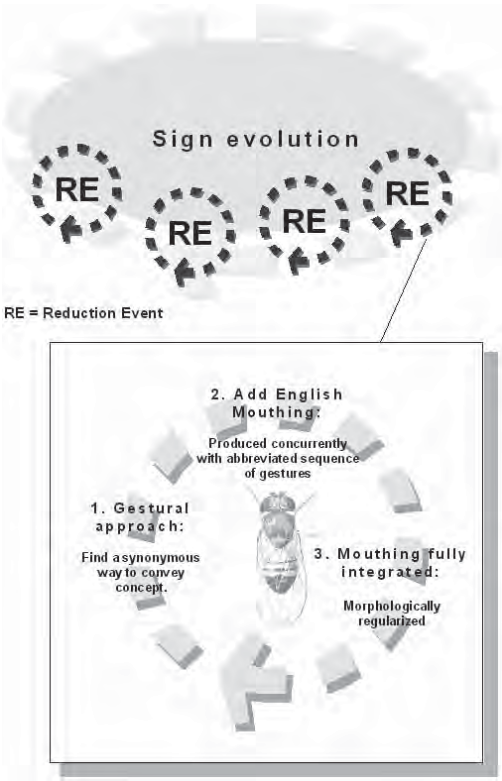

Figure 4

When an interpreter encounters a new term for which there is no equivalent in ASL, (s)he will first mentally search for a gestural synonym, or sequence of synonymous gestures in ASL and *test* this choice on the audience (Step 1). At some point further along in the interpretation, the interpreter will generally shorten the sequence and overlap it with English equivalent mouthing (Step 2). Later it is common to see the mouthing become more integrated with the sequence. This is evidenced by a reduction in the lip and overall jaw movement to usually just match the initial sounds

of the original English word being interpreted (Step 3). If at some point in the discourse the interpreter receives audience feedback that the concept is in fact clearly understood, the interpreter may even elect to drop the English mouthing all together.

The evidence of mouthing reduction in the current experiment points to a larger theory that mouthing undergoes a three-stage process which occurs naturally in the evolution of American Sign Language, and is replicated by interpreters in the reduction event. The entire process is referred to as a Reduction Event (RE) because the natural process of language is to convey one's message more efficiently and interpreting mimics that process.

3. Explanation and conclusion

We know that in the absence of the aural-oral channel, language will come through a visual-gestural one (Sandler in press). We also know that the very nature of sign language and spoken language allows for the two to be produced simultaneously. Speech is linearized while gesture is more holistic. It is apparent that speech and gesture can convey different information. While speech can label and classify an object, a deictic gesture may localize it: *The chair goes right there.* For bilingual signers, the opposite is occurring. The lips can show what the hands cannot. Mouthing gestures can supplement the signing. Furthermore, unique to the sign language interpreting profession is that language borrowing is the means by which interpreters fulfill the requirements of their service. They are expected to use the language preferred by the consumer. Interpreter borrowing is different from that of spoken language bilinguals by virtue of the fact that in an interpreting situation, (1) the interlocutors may or may not be bilingual and (2) the audience makes no decision about when and where to borrow. In contrast, these decisions fall to the interpreter based on their application of an *audience screen*.

Mouthing is a form of borrowing that can be used by sign language interpreters in translation from spoken English to American Sign Language. The factor that conditions the use of mouthing is the audience. In this case whether a consumer of the interpreting service is perceived to be culturally-deaf (+deaf) or not-culturally-deaf (–deaf). This factor is statistically more significant than the actual difficulty of the English material being translated. There were cases where the interpreters were trying to avoid potential homonyms by incorporating mouthing over the manual sign. There were also examples of mouthing for cohesion purposes.

The interpreting situation provides a unique look at sign change in general because interpreters are thrust into that sign-spoken language contact situation on a daily basis, and must often create approximates for concepts that do not exist in ASL. Thus using the drosophila analogy, interpreters accelerate what normally occurs over a longer period of exposure to other languages like English. It was speculated that mouthing follows a specific reduction process, though further development of this theory is beyond the scope of the present study.

Not only does this study confirm what is a commonly held notion in audience design, that people are adjusting their language in reaction to people, but also opens

up an inquiry to the use of the interpreting context as a means of examining neologisms and language variability.

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Appendix

Context A

Client name: Joseph Miller.

Age: 18.

Setting: Undergraduate Chemistry course at Columbia University. Day 10 of a fourteen-week session.

Topic: *"Neither a Borrower Nor a Lender Be": Electron Affinity*
The speaker is male, the instructor for this course. He is providing a brief overview of electron lending, borrowing, and sharing among the elements.

Background of

Your client: Joseph refers to himself as 'hard-of-hearing' and is considering having implant surgery. He prefers to voice for himself in class. He is the only deaf person in his family. He was mainstreamed K-12, and is now in his first year at Columbia University in New York. He hopes to work as a chemist for a pharmaceutical company.

Context B

Client name: Alice Ronin.

Age: 33.

Setting: Computer Training Center in Garden City. Day 2 of a ten-week course called "Computer Basics".

Topic: *"Why Computers Can't Write Jokes"*
The speaker is male, the instructor for this course. He will be explaining the chemical differences between the makeup of a computer's central processing unit (CPU) and the human brain.

Background of

Your client: Alice refers to herself as Deaf. Both her husband, daughter, and mother are deaf. This is her first class after taking a three year leave to be a full-time mother. She is a graduate of The American School for the Deaf, and has 12 undergraduate credits from Gallaudet University.

Context C

Client name: Bill Bartone.

Age: 28.

Setting: Undergraduate "Foundations of Education" course (required for teacher certification). Day 20 of a fourteen week session.

Topic: *"Understanding the Grant Application Process"*
The speaker is female, the instructor for this course. She is sharing with the class details of how she applied for a federal grant for her youth incarcerated literacy program.

Background of

Your client: Bill refers to himself as 'hard-of-hearing', the son of hearing parents, both of whom are teachers in a public school system. Bill was mainstreamed K-12, graduated NTID, and is now enrolled at Queens College. Like his parents, he hopes to be a high school math teacher, and does not see his hearing impairment as an obstacle to that goal.

Context D

Client name: Carol Federman.

Age: 50.

Setting: Adult Continuing Education (CE) evening class at local high school. Day one of the four week session.

Topic: *"Planning a Wedding"*
The speaker is female, the instructor for this course. She is sharing with the class the details of planning her wedding, which took place in Rochester, NY.

Background of

Your client: Carol is third generation Deaf. She lives in New York. She is the mother of two deaf children, and a grandmother of three. She was very active in the National Fraternal Society of the Deaf (NFSD), a former board member. She is a graduate of New York School for the Deaf, White Plains. She is taking this CE course to assist her daughter, who will be getting married next year.

HOW DOES GRAMMAR EMERGE FOR CHILDREN SIMULTANEOUSLY ACQUIRING BASQUE AND SPANISH AS L1S?

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Introduction

Within the last decades there has been a debate about the grammatical system of children acquiring more than one language as their first languages. These bilingual children in the early stages of the process of acquisition tend to code-switch all the time. Therefore, two main hypotheses have arisen: the Differentiation Hypothesis (Meisel 1989, De Houwer 1995, Paradis & Genesee 1997, among others) and the Fusion Hypothesis (Leopold 1949, Volterra & Taeschner 1978, and others). The first one claims that these children have separate grammars for each of the languages they are acquiring. The second one supports the idea that a plurilingual child creates a unique grammatical system by combining the several first languages. I have studied the utterances produced by 3 year-old Basque-Spanish bilingual children who are simultaneously acquiring both languages, and I have carried out two analyses based on the typological differences between both languages. The basis of the first analysis is the postposition-preposition typological difference, whereas the second analysis highlights the difference between ergative and accusative languages. The data for the analyses have been taken from *talkbank* databank. These are transcriptions of the conversations held in school classes for a period of 4 months. The results reveal that children seem to have separate grammars for Basque and Spanish from the first stages of acquisition. In any event, this is a work in progress and I am currently analyzing more data in order to find more evidence that supports my conclusion.

1. Theoretical background

This study analyses the language uttered by bilingual children in the early stages of acquisition. Therefore, first of all it is necessary to define the type of bilingualism I am dealing with. The children in the study are 3 years old and they are in the process of simultaneously acquiring Basque and Spanish. Nowadays linguists agree that simultaneous acquisition of several languages must happen within the first five years of life. Thus, I am not dealing with the acquisition of a second language, nor with the successive acquisition of a first language. Gass & Selinker (2001: 5) define the acquisition of L2 as 'the process of learning another language after the native language has been learned'. Therefore, I could not be dealing with the acquisi-

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 277-283.

tion of a L2 unless the process of acquiring one of them had ended. Although these authors admit that the borders between different kinds of acquisition are somewhat arbitrary, they (2001: 100-101) delimit them like this: 0-5 years, simultaneous acquisition of L1s; 5-9 years, successive acquisition of L1; and after 9 years, acquisition of L2. Consequently, we are dealing with the simultaneous acquisition of two languages.

Once this remark has been done, and in order to understand the goal of this paper, I am going to present the different hypotheses originated as a result of the study of the early bilingualism. Children in the process of acquiring more than one language tend to produce utterances where they mix the different L1s. Consequently, one must wonder if the grammatical systems are being differentiated or not. In that respect, two main hypotheses have arisen:

(i) On the one hand, the Differentiation Hypothesis (Meisel 1989, De Houwer 1995, Paradis & Genesee 1997, among others). These authors claim that these bilingual children have separate grammars for each of the languages they are acquiring.
(ii) On the other hand, the Fusion Hypothesis (Leopold 1949, Volterra & Taeschner 1978, and others). The idea that a plurilingual child creates a unique grammatical system, by combining the several first languages. According to this hypothesis, the different grammatical systems will only be separated at a later stage.

The goal of this paper is to bring forward data which supports one or the other hypothesis. Lastly, we need to define Basque and Spanish in accordance with the typological universals.

For the present study I focus on two main typological differences between these two languages. First, while Spanish is a prepositional language, Basque has postpositions, both suffixal and free. The second typological difference that I analyze is that Basque is an ergative language and Spanish is an accusative language. So they have different ways of marking transitivity.

2. Goal and methodology

The object of investigation of this paper is to see how the universal language typologies are observed by Basque and Spanish L1 bilingual children. For that purpose, and taking into account the typological differences between Basque and Spanish described above, I look at utterances that present postpositions or/and prepositions, and at those utterances with a transitive structure. Depending on whether these typologies are constraining the sentences uttered by the children or not, I should be able to make predictions about the differentiation or fusion of their grammatical systems.

The data for the analysis have been taken from *talkbank* databank (March 2005). These are transcriptions of the conversations held in school classes for a period of four months. Each recording comprises a class approximate one hour long, where children carry out various activities, such as games, informal conversations, story-telling, and picture descriptions. All the children in class are Basque-Spanish bilinguals

and they are 3 years old. For the analyses I have taken into account all the interactions that happened in class, both child-to-child interactions and teacher-child interactions.

3. Analysis

3.1. First analysis: postpositions *vs.* prepositions

In the first part of this study, as I said, I analyze all the sentences that contain a postposition or/and a preposition. These are different tools to transmit the same semantic content. We can express direction, position, possession, goal, causality, etc. with a preposition in Spanish, but we must do it with a postposition in Basque, either a free morpheme or an oblique case marker. This way, if these young children have different deep structures for Basque and Spanish, then they should restrict the use of postpositions to Basque utterances and the use of prepositions to Spanish utterances. In the data, I found several pairs of sentences like those in (1) produced by the same child:[1, 2]

(1) a. ANA: Baina eman dau ipin-teko oinak.
But give aux put-to feet
'But she has given it to put your feet'.
b. ANA: *Yo tengo un misil. Pero lo tengo para volar.*
I have a missile. But it have.1sg to fly
'I have a missile. But I have it to fly'.

In both (1a(and (1b) Ana is expressing the idea of goal: to put your feet and to fly. Nonetheless, she makes it through the use of an oblique case-marker in Basque *-teko*, while she is using the Spanish preposition *para* in the second sentence. This child necessarily has different tools to express the same idea, and what is more significant is that she is using them in the right linguistic context. All the examples that I found in the data agree with the typological differences of Basque and Spanish. The results of the analysis appear in 2:

(2)

	Postpositions / Case-markers	**Prepositions**	**Typological constraints**
Basque	15	0	100%
Spanish	0	6	100%

I found 15 postpositions, all of them in Basque utterances and none in sentences uttered in Spanish. I did not find any prepositions in Basque utterances, while I found 6 prepositions in Spanish utterances. It seems that typological constraints are being applied in 100% of the cases.

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[1] The names of the children are the ones which appear in the databank. I have taken for granted that their parents or tutors have given permission for that, so I have used the same names.

[2] In the examples regular writing corresponds to Basque whereas Spanish phrases appear in italics.

Although these quantitative results seem to be conclusive to prove that speakers are constraining their utterances in different ways for Basque and Spanish, there are even further examples that make this hypothesis stronger. Let us look at an utterance in which children code-switch:

Let us look at 3:

(3) TEACHER: Zer dauka amatxok hemen begietan?
What have.3sg mum here eyes.the.in
'What does mum have here in the eyes?'
OTHERS: Betaurrekoak.
'Glasses'.
[…]
IKER: Nik dekot *de bicicleta.*
I have.1sg of bicycle
'I have bicycle (glasses)'.

Here, the child has not only used a Spanish preposition instead of the Basque particle, but he has switched the whole phrase to Spanish within the Basque sentence and conversation. He could have said *de txirrindula* 'bicycle' in Basque, but he chose to say the Spanish word *bicicleta* instead.

The fact that children do not insert a Spanish preposition within a Basque utterance, but they are forced to change the language of the whole prepositional phrase, shows that they do not consider the possibility of a prepositional structure for Basque. On the contrary, as we have seen in (2), they do not have any problem inserting prepositions in Spanish utterances. So, as it happens with adults (Muysken 1995), these bilingual children only code-switch at a level of maximal projections.

This first analysis, then, is supporting the Differentiation Hypothesis, according to which children have two different grammatical systems.

3.2. Second analysis: ergative vs. accusative

The second analysis is going to prove if children make some kind of distinction between Basque and Spanish in transitive structures. Spanish is an accusative language (D'Introno 2001, Zagona 2002), where the subject of a transitive sentence is nominative and the direct object is accusative. These case marks have been mostly lost in the morphology of Spanish. Nowadays we can only find an accusative mark in direct object pronouns, as it happens in English, and also the personal *a* in animate direct objects. The Spanish verb, on the other hand, does not show any mark of transitivity. As for Basque, it is an ergative language, where the subject of a transitive sentence is ergative and the direct object is absolutive (Ortiz de Urbina 1989). Basque marks both constituents, with an ergative marker and with an absolutive marker for each case. Moreover, the verb shows a very rich morphology, with special marking for transitive structures. For this analysis, I looked at every transitive structure from the data. Then I looked at the way children marked the different elements of these structures. The results appear in (4):

(4)

	Transitive utterances	Correctly marked	Typological constrains
Basque	20	17, 3?	100%
Spanish	9	9	100%

I found 20 transitive utterances in Basque and 9 in Spanish. All of them were correctly marked as for my analysis. So all of them were marked as expected, in the case of Basque with the ergative-absolutive marks, and in the case of Spanish with the nominative-accusative marks when there were any. Thus, again it seems that the speakers have different grammatical systems for each of the languages that they are acquiring. However, not all the utterances were completely correct. There were 3 problematic utterances. But, as I will show now, the mistakes that the children made do not have a relevant effect for the current analysis:

(5) ARGIÑE: Ni-k kolunpio-ak egingo *dot*.
I-ERG swing-ABSpl will make aux.ABS3sg.ERG1sg
'I will make swings'.

In (5) the morphology of the verb shows the transitivity of the sentence. In the auxiliary *dot* we find the morphemes of the ergative subject *-t* and of the absolutive object *d-*. The ungrammaticality of the sentence is due to the fact that although the object is plural, the verb refers to a singular object (if you look at the absolutive marks in the object *kolunpioak* and in the auxiliary *dot* you will see that).

In (6) another child commits exactly the same mistake:[3]

(6) IRUNE: Jani, (ni-k) nahi *dut* artazi-ak.
Jani, (I-ERG) want aux.ABS3sg.ERG1sg scissors.ABSpl
'Jani, I want the scissors'.

Again, even when we have a plural object "scissors", the auxiliary alludes to a singular object. In these two examples, children are having problems with the number, but not, recognizing and expressing the transitivity of the structures. And, since that is precisely the theme of this analysis, these two mistakes do not say anything against the capacity of children to mark the ergative and absolutive cases.

A different kind of mistake is made in the utterance in 7:

(7) ANA: Baina *hau* eroaten dau porkeria bat.
But this bring aux.ABS3sg.ERG3sg trifle.ABS a
'But this brings a trifle'.

In this example the subject of the transitive sentence *hau* does not have the mark for the ergative case, which is a *-k*. However, this is a common mistake that even adult people make. Basque is a subject-prodrop language, so the subject of the sentences is almost always implicit. Therefore, the verb is the element where most information about the sentence appears. As we have seen, it contains information

[3] The auxilaries are different in both examples —*dot* and *dut*— because they are different dialects.

about the subject and the object, and it also contains the tense, aspect, etc. If we look at the morphology of the auxiliary verb in (7), we do find the ergative mark from the subject.

So, (5), (6) and (7) do not contradict the fact that children are marking transitivity in Basque as it is expected. (5) and (6) because they present a plural marking error, and (7) because marked subjects are a problem even for adults, and because they are expressing the transitivity in the auxiliary.

Some examples that strengthen the belief that children are dealing with different grammatical systems are those in (8) and (9):

(8) ANA: Es que da *una moto* eta…
But is a motorbike and
'But it is a motorbike and…'

(9) ANA: Da *motobomba* eh!
Is fire engine eh
'It is a fire engine eh!'

The speaker in (8) and (9) begins the utterances in Basque, and then she switches to Spanish. All the examples of code-switch between the subject phrase and the VP that I found, occur when the verb is intransitive. This is the only case when Basque subject does not require ergative marking. That is, in an utterance with a transitive verb in Basque, we never find a Spanish subject. This proves that speakers do not deal with the possibility of a Spanish DP with an ergative marker.

Again, the results of the second analysis are against the Fusion Hypothesis. Children do not seem to constrain Basque and Spanish utterances in the same way, but rather it seems quite clear that they have different constraints for each language.

4. Conclusion

To conclude, it is difficult to think that the utterances that I analyzed have been randomly produced, or that they are the product of a fusion of grammars. Two typologically different languages —Basque and Spanish— have been chosen for the analysis. Nevertheless, 100% of the data show that the utterances are being constrained by either the Basque grammar or the Spanish grammar in each case. This supports the Differentiation Hypothesis.

Furthermore, this study makes an important prediction: that parameters are already fixed in the first years of life. If children notice typological differences in the early acquisition, it is very probable that all the parameters are fixed at this point.

The study has also its weak points. The source of data has only enabled me to deal with production data. The presence of the children would have given me the option to attend to gestures, phonetics, and even to make some tests to reveal the speakers competence.

In any event, as I said at the beginning, this is a work in progress. I am currently analyzing more data, in order to find more evidence that supports my conclusion.

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UNIQUENESS AND PERTAINEDNESS IN GENITIVE CONSTRUCTIONS

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Introduction

Much has been written concerning the semantics and pragmatics of genitive constructions such as:

(1) My cat is orange.

(2) I loaned John my car.

According to the traditional view, the contribution of *my* to a sentence of the form *my P is Q* is that of picking out a unique member x of the set of objects denoted by *P* and asserting that some relation —canonically that of ownership or possession— obtains between that object and the speaker. In this view, the meaning of *my* thus serves two semantic functions: 1) that of picking out the object x; and 2) that of asserting that the speaker bears some relation to this object. So according to this view, the logical form of a sentence of the form *my P is Q* is thus something on the order of

(3) $Q(\iota x.[own(I,x) \wedge P(x)])$

where ι corresponds to Russell's definite description operator and *I* denotes the speaker.

It is evident, however, that (3) fails to account for two straightforward observations. First, it is easy to construct cases in which an utterance of *my P is Q* would customarily be interpreted as being true but which require us to interpret *my P* so that the object it denotes bears some relation other than that of possession (in either a legal or figurative sense) to the speaker. Consider, for instance,

(4) My painting is hanging in the museum

as uttered respectively by an artist, model, and a gallery owner: call these respectively (4'), (4'') and (4'''). It seems reasonable to say that we would find (4') true if the speaker bore the relation of having created the contextually salient painting, (4'') true if the speaker was depicted in this painting and (4''') if the speaker legally owned or bore some other custodial relationship to it. It already seems difficult to construct a natural, nondisjunctive characterization of these relations. And this fact is further confirmed by consideration of sentences such as

(5) a. My horse is going to win!
b. My country is occupied by the United States.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 285-294.

which can also be felicitously uttered in contexts which require us to interpret the relation in question as deviating substantially from any narrow notion of ownership, possession or control.

The second obvious problem faced by the traditional analysis of the genitive concerns the uniqueness requirement which comes along with Russellian semantics for the definite description operator as it appears in (3). There are, of course, some instances in which a requirement appears to be in force. For instance, it appears infelicitous to say

(6) #My cat is orange; my other cat is black

But at the same time, the following parallel sentence seems perfectly fine

(7) My brother got married last month; my other brother was the best man

when uttered in a situation where the speaker has more than one brother.

Problems for current analyses

I will refer to the fact that felicitous uses of genitive constructions in English deviate from the Russellian analysis embodied by (3) respectively as the *relational problem* and the *uniqueness problem*. It is my contention that an adequate analysis of the semantics and pragmatics of genitive constructions ought to explain both.

The relational problem is dealt with in a number of recent treatments of the genitive: e.g. Jensen & Vikner (2004), Storto (2004). These proposals attempt to handle the potential variability in the relation which may obtain between a speaker and the object denoted by a successfully-denoting utterance of a genitive expression *my P* in two different but related ways: a double semantic analysis, and a recourse to the lexicon. They appear to approach the problem by shoehorning the source of this relation into the semantics (and sometimes the syntax) of either the genitive, the head noun of the object *P*, or both.

The first way includes two separate semantic representations for the pre-nominal genitive.[1] These two representations, their *Constructional interpretation* and *Control interpretation,* are as follows:

Constructional: $\lambda P[\lambda R[\lambda P[P(\lambda u[\exists x[\forall y[R(u)(y) \leftrightarrow y = x] \,\&\, P(x)]])]]]$

Control: $\lambda P[\lambda Q[\lambda P[P(\lambda u[\exists x[\forall y[[control(u)(y) \,\&\, Q(u)] \leftrightarrow x = y] \,\&P(x)]])]]]$

The Constructional interpretation is meant to represent the type of relation that is available when the genitive combines with a relational N-bar, the relation being derived "either from the Argument structure, or from the Constitutive role, or from the Agentive role of the head noun" [Jensen & Vikner 2004: 9]. The Control interpretation takes care of the remaining cases, presumably those where a more clear-cut "control" type relation can be posited to obtain between the two nouns. It appears

[1] Their analysis focuses on the 's construction, however it is intended to cover all relationships potentially categorized as genitive, including the possessive pronoun cases.

that they did attempt to work in a Montague-style quantificational interpretation of the definite article, as seen in the lambda expressions above.

The use of the universal quantifier in this way seems to be intended to ensure that there is only one x satisfying the condition, thus ensuring definiteness. However, as their analysis progresses, they drop this feature from their interpretation and are left with an indefinite expression. This is a problem because although the issue of uniqueness does not appear to be constantly present in all genitive constructions, it is clear that many do implicate, if not entail, that there be no more than one object standing in the relation. Indeed, the very sporadic nature of this uniqueness requirement should be explained by any analysis of the genitive.

But lack of definiteness is not the only flaw in their analysis. Jensen & Vikner also rely heavily on the lexicon to provide their relation in each case. This is the second way in which they attempt to account for the variability of the nature of the relation that obtains. According to their analysis, "the control interpretation is the interpretation that is most salient in examples such as *Ann's car, Bill's pencil, her pearl, his stone, my monkey, your apple, our room,* when the context does not indicate a particular pragmatic interpretation" (Jensen & Vikner 2004: 11). But note that it is difficult to imagine how to go about figuring out what it might mean for one interpretation to be "most salient" if the context does not supplying such information. In fact, it doesn't seem possible to define what "salient" might mean without recourse to the idea of a context. Take an example sentence such as "The sheep strolled across the meadow." Outside of any context, it is impossible to know whether the sheep, or the meadow, or the act of strolling itself is the most salient constituent of that sentence. For note that the sentence could be uttered in response to a number of different questions, such as "where did the sheep go?" or "which animals have been by here?" It is certainly true that *salient* is a term that has a number of varying definitions in the current literature; however they all do make reference to a context or a discourse in which the salient element is embedded.

If proponents of this view are not able to rely on the context to provide the nature of the relationship in question, then given that it is not unambiguously determined by their semantic interpretation of the genitive (nor could it possibly come from the syntax), the only remaining place to look in order to determine the nature of the relation which is required for the interpretation of the sentence in question is in the semantics of the head noun itself.

The primary component of Jensen & Vikner's analysis is in fact taken up by an elaborate explanation of how the various possible relations which a speaker can bear to an item falling under a head noun *P* may be taken to be stored along with the lexical entry for *P*. One of the cases they consider is nouns denoting regions of the earth: e.g. *forest, lake, sea, city, country, island,* etc. As these terms denote physical objects, their denotations have physical parts, which are in turn denoted by another class of nouns such as *rock, soil,* and *water*. According to Jensen & Vikner, what licenses the acceptability of constructions such as

(9) the lake's surface water

(10) the island's fertile soil

is that terms such as *water* and *soil* are marked *in the lexicon* in some manner that encodes the fact that the items in the classes of objects they denote may be material constituents of the objects denoted by other concrete nouns like *lake* and *island.*

Regions can also designate habitats, and so any nouns referring to types of plants or animals must also be listed in the lexicon as possible parts of a region (Jensen & Vikner 2004: 15), thereby licensing *the lake's fish* and *the island's birds*. They go on to note that a "social region noun" can also refer to the human society which is located in the region. And parts of human societies are their physical and cultural artifacts. So *Iceland's chieftains* can be explained due to the fact that *chieftain* is listed in the lexicon as a part of human society, and therefore part of a region, and this lexical item passes the nature of its status as a potential part of human society to the genitive particle, thereby selecting which of the relations is to be interpreted. The mechanics of how this selection occurs is via a meaning-shifting operator which takes the noun in question as an argument and returns a particular argument which is then itself passed to the genitive construction.

Despite the apparent ability of Jensen & Vikner's analysis to explain the broad variance in the relations which may link the speaker to the denoted object in genitive constructions, their proposal suffers from a significant drawback. In particular, they rely so heavily on the lexicon in order to account for the acceptability of various genitive constructions that if their aim is to achieve full generality, their analysis must become extraordinarily complex and domain specific. Note, for instance, that one of the possible relations which may obtain between the speaker and the object denoted by the expression *my horse* as it occurs in (5a) is that of the former having bet on the latter. According to J & V's account, this would be explained in terms of storing this potential relation in the lexical entry for *horse.*

But on this sort of account, the noun *dung beetle*, for example, is presumably not listed in the lexicon as an animal that is customarily raced, and upon which bets can be placed. However, nothing prevents us from starting to race dung beetles as a sport, at which point one might felicitously exclaim, "My dung beetle is going to win." At this point Jensen & Vikner would presumably have to predict that the lexical entry for *dung beetle* would be updated so as to include *bet on* as a potential relation in which a speaker may hold to a dung beetle in order to license the use of "my dung beetle."

An even worse problem arises when we note that the sentence "My dung beetle is going to win" seems to be felicitous if we are to imagine the sport of dung beetle racing. So is the notion of "potential to be raced" currently stored in the lexical entry for *dung beetle* as it stands now? The complexity of the lexicon on the Jensen & Vikner account is bounded only by our imaginations, in that case.

Pertainedness and the *Per* relation

I will now advance an analysis of genitive constructions which I believe remedies these problems while also solving the uniqueness problem which Jensen & Vikner do not attempt to address directly.[2] On this proposal, the semantic contribution of

[2] At one point in their paper they present a derivation which includes definiteness, but they go on to discard this portion of the analysis (somewhat inexplicably). See "leaving out this subpart..." on p. 9 of Jensen & Vikner (2004).

the genitive construction is to determine a relation *R* —which I will refer to as a *pertainedness relation*— which serves to link a speaker and an object. While in statements of the form *My P is Q* the head noun will contribute to the manner in which *R* is determined, *R* is not itself determined exclusively by the lexical information conveyed in an utterance of such a statement. Rather, I maintain that the context in which such a statement is uttered plays an essential role in the determination of *R*.

To a first approximation, my proposed account of the logical form of a statement *my P is Q* will thus take the form

(3') $Q(\iota x \exists R[Per(R,P) \wedge R(I,x) \wedge P(x)])$

Note that this formula does not assert that the speaker bears any particular relation to any particular object, but rather that *there exists* a pertainedness relation which bears the relation I have denoted by *Per* to the head noun *P*. This relation is intended to correspond to a higher-order notion of relatedness which holds between a relation *R* and a property *P* just in case in a given context (which, as will emerge below, I am assuming has an effect by delimiting the range of the initial existential quantifier) the speaker would be entitled to refer to an object satisfying *P* as "*my P*" if he bore *R* to it.

In order to illustrate how the analysis operates in practice, consider again the sentence

(5 a) My horse is going to win!

as it might be uttered respectively by a horse breeder (context c1), a jockey (context c2) and a bettor (context c3). Examining these contexts in more detail will shed light on precisely how *Per* works. In c1, sentence 5a is uttered by a horse breeder. Presumably, his interlocutor is aware that he is the breeder of a horse in the race, the sentence is uttered at the racetrack (or some other venue where watching the race is possible), and he is not in contact with additional horses at the time of utterance. The context c1 thus is involved in the work of *Per* as it restricts the set of relations which might hold between the speaker and the horse. So looking at the expression in (3') (reprinted here), we see a context-sensitive relation *Per* which picks out all potential relationships which could conceivably hold between the speaker and the object in question, and as long as one of those relations does hold, and the x is unique, then the sentence is true.

(3') $Q(\iota x \exists R[Per(R,P) \wedge R(I,x) \wedge P(x)])$

In other words, *Q* holds of the unique *x* such that there exists a relation *R* which bears an appropriate pertainedness relation to *P* according to the context, is such that *R* holds between the speaker and *x*, and is such that it additionally satisfies *P*.

This analysis, with its reliance on pragmatics and underspecification, has the added feature of tolerating ambiguities as to the appropriate notion of relatedness between the speaker and the referent of *my P*, as occasionally occur in ordinary discourse. For instance, if (5) were overheard at the racetrack, a hearer might fail to realize what relationship the speaker was asserting to hold between himself and the horse he takes to be the likely winner. But uttered in the context of a discussion on betting, a hearer could employ the Gricean Maxim of Relevance (Grice 1975) to

conclude that the relevant *Per*-licensed relation between the speaker and the horse was that of the former having bet on the latter.

Explaining uniqueness

The remaining phenomenon to be explained is that of uniqueness. In some instances, it appears to be completely felicitous to utter *my P is Q* when there is more than one object satisfying *P* to which the speaker bears the appropriate contextually determined relation. An example such as

(11) My sister is a doctor and she recommends vitamins

can, for instance, be felicitous in a discourse concerning dietary supplements, even if the speaker has more than one sister. However, if the speaker is involved in a discourse concerning siblings, where speaker B has more than one sister, the following example appears infelicitous:

(12) A: Do you have any siblings?
B: Yes, my sister is a doctor and my brother is a teacher.

In uttering the first conjunct of his reply in (9), B has strongly implicated that he only has only one sister. However the speaker in example (8) has done nothing of the sort.

To explain this apparent conflict, I propose a solution which involves function composition, triggered by the salience of the predicate *Q* (in a construction such as *my P is Q*) to the context of the discourse. Function composition has been put forth as an explanation for a variety of phenomena (e.g. Dowty 1988, Jacobson 1992, Barker 2004). To function compose two functions, f and g, is to create a new function $f \cdot g$ that is the result of applying f to the result of applying g. So $f \cdot g(x)$ is equivalent to $f(g(x))$. It is vital to note that the final outcome of composing two functions and then applying the resulting function to an argument is equivalent to applying the two functions in order, the second taking the output of the first.

I extend the work of Barker (Barker 2004) on possessive weak definites, which observes that constructions of the form

(13) I hope the cafe is located on the corner of a busy intersection

do not require that there be a unique corner of the intersection; in fact they are completely felicitous in occurrences such as (13) where it would be impossible for the corner to be unique. In order to formalize this intended reading, he employs an analysis based on composing the semantics constituents in a non-standard order. As Barker puts it,

…the composition of two functions f and g, written as $f \cdot g$, is defined as in (70):

(70) Function composition: $f \cdot g \equiv \lambda x.f(gx)$

This definition gives rise to the simple theorem (given in (71))

(71) Theorem: $(f \cdot g)h = (\lambda x.f(\mathrm{gx}))h = f(gh)$ (Barker 2004).

By way of illustration, if f = [[*the*]], g = [[*corner*]], and h = [[*of the intersection*]], the two available readings are the standard

(14) $f(g(h))$ = *the*(*corner*(*of the intersection*))

and the function-composed reading

(14') $(f \cdot g)(h)$ = (*the* · *corner*)(*of the intersection*)

In the second of these analyses, the determiner combines first with the relational noun [[*corner*]], and then with the prepositional phrase. This yields the interpretation that it is the corner (and not the middle, or the side) of the intersection that is denoted, thereby preserving uniqueness in picking out one possible location related to the intersection, not one possible corner.

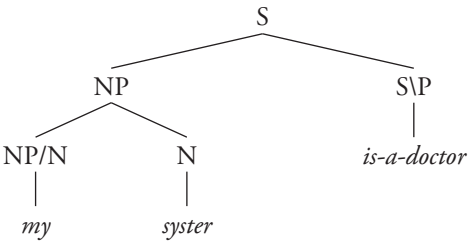
I propose to use a similar analysis of possessives of the form *my P is Q*, illustrating the function compositional approach with categorial grammar. Much like simple-typed lambda calculus, categorial grammar can capture the combinatorial possibilities of various elements in a sentence, but unlike lambda calculus, which only has one function type, categorial grammar has directional function types which specify whether their argument comes from the right or left. The notation as standardly used employs left-leaning and right-leaning slashes to indicate this difference. Expressions are written as the category of expression they yield, followed by a slash indicating the location of their argument (either \ to indicate the argument is to the left of the expression or / to indicate that the argument is to the right), followed by the type of expression they take as an argument. To illustrate, a determiner can be considered to be of type *NP**N*, indicating that it takes an argument of type *N* to its left, yielding an expression of type *NP*.

Note that expressions can use parentheses as a means of expressing more complicated types. A transitive verb could be written as (*S**NP*)/*NP* indicating that it is an expression which takes an expression of type *NP* to its right, yielding an expression of type (*S**NP*), which reflects its status at this point in the derivation as a partially saturated verb, equivalent to an intransitive verb in that both are looking for an argument of type *NP* to the left in order to form a complete sentence of type *S*.

As detailed by Jacobson (Jacobson 1999), the function composition operator can be viewed combinatorily as taking an expression of category *A*/*B* and one of type C into one of category (*A*/(*B**C*))/*C* . To break this down further, it will be useful to look into how these expression types take the same arguments and ultimately yield the same result. The difference is in the order in which the arguments are applied. An expression of type *A*/*B* is an expression that takes an expression of type *B* to the right and yields an expression of type *A*. If the function composition operator is applied to this expression, it results in an expression of type (*A*/(*B**C*))/*C*. This is an expression which takes an argument of type *C* to its right and yields an expression of type *A*/(*B**C*). This last expression is one which takes an expression of type (*B**C*) to its right, and yields an expression of type *A*. And an expression of type *B**C* is one that takes a *C* to its left and yields an expression of type *B*. So ultimately in both cases we have applied arguments and ended up with an expression of type *A*. Semantically, this operator can be seen as shifting a function f to $\lambda gh.f(gh)$.

Taking the examples (11) and (12), a standard categorical grammar account of the constituent *my sister is a doctor* is illustrated in the following:

(15)



As we see above, the verb phrase *is-a-doctor* is an expression of type *S\NP*, which is to say it is an expression which takes an expression of type *NP* to its left and yields a sentence (type *S*). The expression *my* is very much like a determiner in that it takes an expression of type *N* to its right and yields an expression of type *NP*. The expression *sister* is this *N*, and the expression *my sister* is the *NP* which forms the argument to the verb phrase *is-a-doctor*.

Example (15) illustrates the standard account with no function composition. This would be the reading which requires uniqueness, as in example (12). However, we also need to account for the additional reading as available in (11), where no uniqueness appears to be required for the sentence to be felicitously interpreted, as it would be in (12). In order to achieve the second reading, note that the function composition operator can take [[*is a doctor*]] and lift it, as in

(16) $S\backslash NP \rightarrow (S\backslash(NP/N))\backslash N$

Recall example (11):

(11) My sister is a doctor and she recommends vitamins

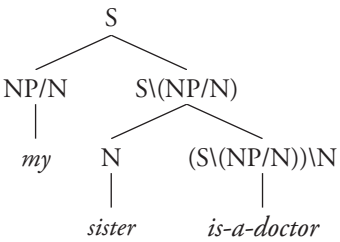
In this example, because the discourse has made the medical profession particularly salient, the predicate *Q* ([[*is a doctor*]]) is able to compose with the predicate [[*sister*]] and yield the correct result. Assuming that f = [[*my*]], g = [[*sister*]], and h = [[*is a doctor*]], we see that both readings are possible:

(17) (f(g))(h) = (*my*(sister))(is-a-doctor)

(18) $(f)(g \cdot h) = (my)(sister \cdot is\text{-}a\text{-}doctor)$

The tree in (15) corresponds to (17), the first reading. The illustration of the second reading, (18), is as follows:

(19)



The tree in (19) shows the effect of function composition. The predicate *is-a-doctor* has been lifted by the function composition operator from type *S\NP* to become one of type (*S*\(*NP*/*N*))*N,* that is to say, it has become an expression which takes an expression of type *N* to its left, and yields and expression of type *S*\(*NP*/*N*). This latter expression, which is a result of the application of the *N sister* to the lifted *is-a-doctor*, itself takes the expression *my* which is of type *NP*/*N* and results in the correct sentence type *S*.

The standard interpretation, as shown in (15), requires that the speaker have only one sister, given that [[*my*]] combines directly with [[*sister*]] and must pick out the unique object which bears the sister relation to the speaker. However, we see in (18) and (19) that the functional composition of [[*sister*]] and [[*is-a-doctor*]] allows [[*my*]] to combine with the complex [[*sister* · *is-a-doctor*]], thus discharging its uniqueness requirements on the set of salient "doctor-sisters", and allowing the utterance to be felicitous when the speaker has more than one sister.

Conclusion

The analysis presented in this paper has the advantages of failing to over-burden the lexicon with potential control relationships as well as accounting for the uniqueness requirement that appears to be part of genitive constructions. It also neatly explains how the same sentence can incur different felicity readings in contrasting contexts. Note that this analysis has the added benefit of explaining why although some speakers do find sentences such as

(20) ?My cat is orange, and my other cat is black

felicitous in some cases, a sentence such as

(21) #My orange cat is fat, but my black cat is not

is clearly infelicitous when the speaker has more than one orange cat.

This function composition based analysis, an extension of work by Barker (Barker 2004), solves the problem of explaining how definiteness requirements seem to be in effect in some instances and not in others. Future work in this area could explore whether the analysis given here is flexible enough to extend to other types of constructions which appear to require definiteness.

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ANDALUSIAN VOWEL HARMONY AND MORPHOLOGY-PHONOLOGY INTERFACE

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1. Introduction[1]

Vowel systems can differ from one language to another in several ways. Their inventories, for instance, can vary with regard to their number and contrastive features. Eastern Andalusian Vowel Harmony (henceforth, EAVH) illustrates the way in which morphology and phonology interaction can result in a complex vocalic system. EAVH shows [RTR] alternation, which is very significant if we consider that this feature has no phonemic status in Spanish. The process was studied as early as 1939 by Navarro Tomás, who, among other scholars (Alonso et al. 1950, Salvador 1957, 1977), proposed a complete doubled vowel system (*desdoblamiento*).[2] That is to say, that a simple five-vowel set would turn into a ten-vowel one in Eastern Andalusian. The weakening process affecting word-final /s/, which is the plural marker and also corresponds to several verbal inflections, was stated to be the trigger for the alternation.

Be that as it may, and in the light of the data from Granada collected by Sanders (1994), the process is completely predictable (although some variation within the region of Andalusia is found), so it would indicate that only five vowels are phonemic, and that the openness alternation should be explained through (at least) phonological processes. Following Sanders (1994), Jiménez & Lloret (2007) argue that EAVH is *favored* but *not determined* by the fact that vowel quality is often the only exponent of grammatical contrasts. These authors propose a phonetic account of vowel opening which is triggered by a following (dropped) fricative. They claim that the feature

[1] I am grateful to Eulàlia Bonet, Joan Mascaró, Pilar Prieto, Clàudia Pons and Teresa Cabré for their useful comments and suggestions. I also want to thank all the participants from Úbeda as well as my contact person there.

[2] The defenders of this ten-vowel system based their proposal on the fact that native speakers of Eastern Andalusian can distinguish between minimal pairs like singular *perro* 'dog' ['pero] and plural *perros* 'dogs' ['pɛrɔ] thanks to the different vowel quality. This semantic contrast was therefore understood as a sign of the phonemic status of [RTR] vowels. However, as more recent works point out (Sanders 1994, 1998), Jiménez and Lloret 2007), the opening of the rightmost vowel within the word can be easily explained as an articulatory consequence (cue preservation) of the deletion of the final consonant.

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 295-307.

[RTR] comes from the laryngeal[3] specifications for fricatives. In such a case, vowels would open as cue preservation, even though the complete loss of /s/ is not guaranteed. In other varieties, however, other consonants undergoing deletion and causing the opening of the preceding vowel are not fricatives, and they are not supposed to have any feature referring to glottis articulation.

The present work focuses on the description and analysis of a concrete variety of Eastern Andalusian. New data from the area of Jaén (the town of Úbeda, to be precise) was collected and analyzed for that purpose. Section 2 is devoted to this description. Section 3 discusses the results and tries to shed light on the morphological incidence that the data seems to show. An alternative interpretation of the process as well as its appropriate analysis within the OT framework is also proposed. I present the conclusions in section 4.

2. EAVH in the Úbeda (Jaén) variety

2.1. Experimental design

The main goal of the present study is to describe in detail the pattern of vowel quality alternations not only in singular and plural forms but also in other forms that may be relevant. The results obtained are expected to show the extent to which morphology is implied in the Jaén variety.

A questionnaire containing 148 items was prepared in the shape of 4 sets of slide presentations. The first set consisted of 61 slides and the target words were mainly nouns, both singular and plural. A second set corresponded to 49 slides in which there were sentences that the informants had to complete with a word, being it a noun, an adverb, and even a construction formed by a verb and a clitic. The third set was made of 12 slides in which the participants were asked to conjugate the present tense indicative of several verbs. Finally, 26 mixed slides constituted the fourth set. They contained a picture that was probably less obvious, and for this reason an additional written sentence served as a hint to help the informants in recognizing the object.

The questionnaire was presented to 10 female native speakers, all of them aged between 25 and 50, and residents in Úbeda, Jaén. Two of the informants had to be discarded[4] for the present study, the final results of the fieldwork, thus, being based on the other 8 speakers. The test took around 30 minutes and an average of 100 words per informant was digitally recorded with a Marantz Professional PMD 660 Portable Solid State Recorder. The analysis was done with Praat.

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[3] Vaux (1998) and Gerfen (2002) point out that fricatives /s, h/ in codas are [spread glottis]. See also Gordon (2001), who claims that [spread glottis] refers to an articulatory gesture like the opening of the glottis.

[4] One of the discarded speakers was a well-educated person; she probably studied abroad and had contact with other more standard varieties of Spanish. Although her speech was more likely related to Eastern Andalusian, the formant values for her vowels completely disagreed with those of the rest of the group. The second discarded participant was some years older than the rest of the group. When analyzing the data, and perhaps due to a loss of flexibility of the vocal cords (presbyphonia or aging voice), the spectrograms were not as clear as they should be to carry out a precise analysis.

2.2. Description and results of the Jaén variety

2.2.1. Coda weakening

Both medial and final codas are highly penalized in Eastern Andalusian. Apart from some few cases (*cactus*, *futbolín*), medial codas are restricted to liquids, nasals and fricatives, all of them coronal. These internal consonant codas can undergo either aspiration or deletion. Alveolar fricatives and velar stops undergo aspiration and cause the gemination of the following consonant (1a). Alveolar fricatives can be deleted, however, when followed by a nasal which, in turn, geminates as well (1b). Other stops undergo deletion (1c).

(1)	a.	cactus	['ka^{h}ttʊ]	'cactus'
		césped	['θe^{h}ppɛ]	'lawn'
	b.	esmalte	[em'malte]	'polish'
	c.	futbolín	[fu'βoliŋ]	'table football'

Unlike what is found in other varieties, in the Jaén variety (henceforth, JVH) final codas only undergo deletion while aspiration is not found among the data. Final consonants are also restricted in Spanish: only liquids, nasals and fricatives (always coronal) are permitted, other kind of consonants being extremely rare. Every obstruent, whatever its place of articulation is, undergoes deletion without exception (2).

(2)	tarot	[ta'ɾɔ]	'tarot'
	anorak	[ano'ɾæ]	'anorak'
	nariz	[na'ɾɪ]	'nose'
	reloj	[re'lɔ]	'watch'

Nasals are preserved, showing a clear tendency to velarization (3). Concerning liquids, there exists some variation, depending on the speaker: some informants show deletion of laterals and preservation of rhotics, and others show the opposite pattern. Others delete or preserve both of them (4).

(3)	melocotón	[meloko'toŋ]	'peach'
	cantan	[caɲ'taŋ]	'(they) sing'
(4)	girasol	[xiɾa'sol] ~ [xiɾa'sɔ]	'sunflower'
	tambor	[tam'boɾ] ~ [tam'bɔ]	'drum'

In any case, what is significant is the consistency that speakers show in this respect, since only the deletion of any liquid (whatever its manner is) causes the opening of the preceding vowel.

An interesting point to bear in mind is that a rhotic in coda position can entail morphological information when it corresponds to the infinitive marker in verbs. According to the results of the present work, the infinitive suffix /r/ triggers the harmony the same way that morphological /s/ does (§ 2.2.2). This fact will shed some more light on the motivation of the process studied here.

2.2.2. [RTR] alternation and morphological codas

In the whole set of possible consonant codas in Spanish, there are some that can correspond to suffixes containing morphological information (this is what I call *morphological coda*). The more studied morphological coda is that of the plural marker /-s/: *perro* 'dog' vs. *perro**s*** 'dogs'. Furthermore, the alveolar fricative is also present in some conjugated verbal forms, as it is the case of the second person singular and part of the first and second person plural: *come**s*** '(you SG) eat', *comemo**s*** '(we) eat' and *coméi**s*** '(you PL) eat'. The alveolar nasal occurs as well in verbal inflection, corresponding to the third person plural suffix: *come**n*** '(they) eat'.

The loss of a morphological coda can lead to a misinterpretation of the utterance: The plural marker, for instance, is most of the times the only existing difference between a singular form and its plural counterpart (5.a). Within the verbal inflection, also the second and the third person singular would become homophonous unless some process applied: *come* '(s/he) eats' vs. *come**s*** '(you SG) eat' (5.b).

(5)	a.	ídolo	['iðolo]	*'idol'*	ídolos	['ɪðɔlɔ]	*'idols'*
		abeto	[a'βeto]	*'fir'*	abetos	[æ'βɛtɔ]	*'firs'*
	b.	como	['komo]	*'(I) eat'*	comemos	[kɔ'mɛmɔ]	*'(we) eat'*
		comes	['kɔmɛ]	*'(you SG) eat'*	coméis	[kɔ'mɛj]	*'(youPL) eat'*
		come	['kome]	*'(s/he) eats*	comen	['komeŋ]	*'(they) eat'*

In the light of these examples, it seems that the deletion of morphological codas do not only trigger the preceding vowel opening but also the spreading of this new feature [RTR] to the rest of the vowels within the word. The fact that both the plural and the second person singular markers correspond to the same underlying phonemic form, may lead us to think of the properties of the alveolar fricative as being responsible for the process. If this was the case, any other non-morphological alveolar fricative codas would trigger the harmony as well. Among the data collected in Jaén, some target words were chosen to cover this point. What is found is that non-morphological final /s/ does not trigger the spreading process (6).

(6)	revés	[re'βɛ]	'back'
	estrés	[eʰt'tɾɛ]	'stress'
	Burgos	['buɾɣɔ]	'Burgos'

Besides the alveolar fricative, the alveolar rhotic, which can correspond to the infinitive marker in verbs, has to be considered as a morphological coda as well. During the recording, one of the speakers spontaneously pronounced the infinitive form when conjugating verbs, showing that this suffix also triggers the spreading process. Examples (7-8) below illustrate how the differences between morphological and non-morphological final /ɾ/, respectively:

(7)	comer	[kɔ'mɛ]	'to eat'
	destrozar	[dɛʰttɾɔ'θæ]	'to sing'
(8)	yogur	[ʒo'ɣʊ]	'yogurt'
	extintor	[eʰttiɰ'tɔ]	'fire extinguisher'

2.2.3. Spanish and Andalusian vowels. Acoustic evidence

Table 1 shows the average values of Jaén mid vowels, taken from the whole conjugation (present, indicative) of the verb comer *'to eat'* of the 8 speakers. These vowel values are compared to those of Spanish and Catalan, a language in which mid vowels differ in height underlyingly (this fact might explain the difference with respect to the degree of openness between the two languages). There are also differences in the values for close vowels between Castilian Spanish[5] and Eastern Andalusian.

Table 1

Formant values average and comparison

Jaén Spanish	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	500	630	550	630
F2	2235	2086	1153	1257
Catalan [Recasens, 1986]	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	362	543	422	634
F2	2161	2045	717	863
Spanish [Quilis et al., 1983]	**[e]**	**[ɛ]**	**[o]**	**[ɔ]**
F1	492	—	511	—
F2	2253	—	981	—

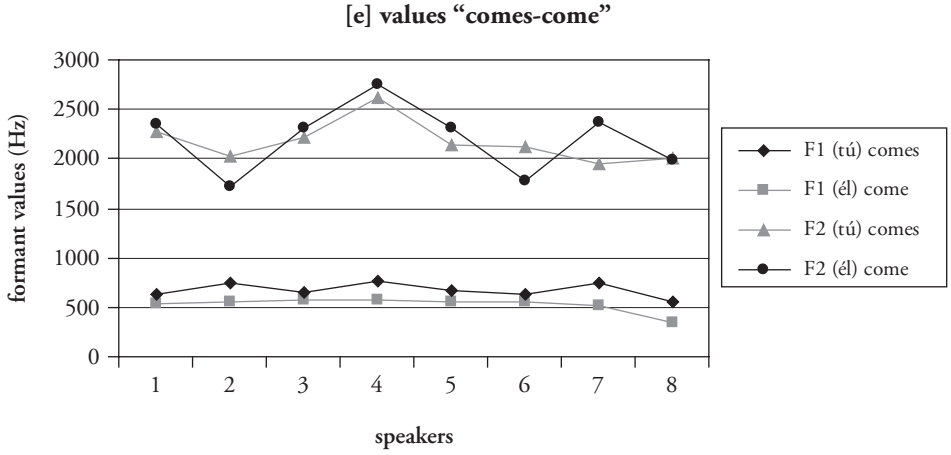

Figure 1

Formant values of the rightmost vowel

[5] The origin of the female speakers of these Spanish values was both South America and Spain, being unspecified the very concrete linguistic area.

The following figures correspond to the formant values of the mid vowels contained in both forms *come* '(s/he) eats' and *comes* '(you SG) eat', which differ in the surface only thanks to the [RTR] alternation. Figure 1 shows the values for the rightmost vowel /e/, which, in the case of the second person singular, *comes* ["kɔmɛ] '(you SG) eat', becomes open as a consequence of the deletion. There is a slight but consistent difference in the first formant, which is the responsible for the height, although F2 values are less uniform.

The results corresponding to the harmonizing vowel are even more convincing (Figure 2). F1 values are clearly of an open vowel in the second person singular, which is the form undergoing harmony. F2, which indicates vowel fronting, seems not to be that regular again, but apart from speakers 1, 2 and 5, there is a regular difference as well.

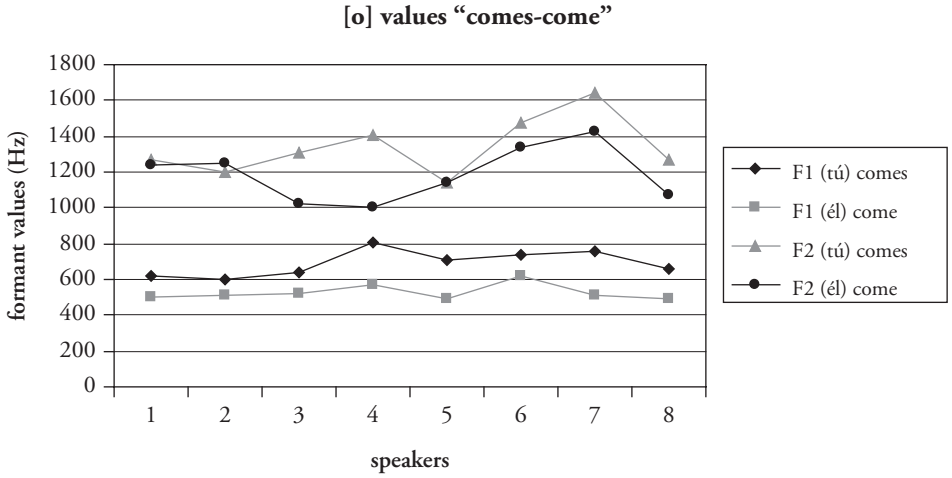

Figure 2

Formant values of the harmonizing vowel

2.2.4. Scope of the harmony

Regarding the behavior of the different vowels in the spreading process, the results show that there are neither blocking nor transparent vowels in this system. The high vowels /i, u/ undergo harmony, showing [RTR] counterparts. The low vowel /a/ undergoes fronting and laxing, becoming slightly velar (/æ/). Mid vowels are easier to identify even in direct speech. Actually, the close realizations of /e, o/ appear to be even closer than in standard Spanish varieties, as was already said. The open counterparts, even less close than in languages with a phonemic distinction for [RTR] vowels, are clearly open allophones, and they are even more perceptible when the harmony occurs in domains containing only mid vowels.

As regards the scope of the harmony, the results show differences in prosodic boundaries. On the one hand, any plural clitic pronoun attached to a verb trig-

gers the harmony to the rest of the vowels of the word, no matter where the stress is placed (9). This is not surprising if we consider a verb and a clitic to form a single prosodic word. On the other hand, compound nouns pattern in a different way: Only the vowels of the second part of the compound undergo opening. This is so because each of the parts constitutes a separate prosodic word (10). Finally, in the light of the examples in (11), we can discard stress effects as playing a role in the process, since it does not block the harmony at all.

(9)	recógelos	/rekoxe#lo+s/	[rɛ'kɔxɛlɔ]	'pick them MASC up'
	consíguelas	/konsige#la+s/	[kɔn'sɪɣɛlæ]	'obtain them FEM'
	súbelos	/sube#lo+s/	['sʊβɛlɔ]	'put them MASC up'
(10)	rompeolas	/rompe##ola+s/	[ˌrompe'ɔlæ]	'breakwater'
	cuentaquilómetros	/kwenta##kilometro+s/	[ˌkwe̪ntakɪ'lɔmɛtɾɔ]	'speedometer'
(11)	ídolos	['ɪðɔlɔ]	'idols'	
	monederos	[mɔnɛ'dɛɾɔ]	'purses'	
	cotillones	[kɔtɪ'ʒɔnɛ]	'party-favours'	
	encubrís	[ɛŋkʊ'βɾɪ]	'(you PL) conceal'	

3. Formalization within OT

3.1. Morphological and Licensing constraints in OT

Jiménez & Lloret (2007) suggest an OT analysis of EAVH. Their proposal is based on the fact that morphology favors but does not motivate the harmony. Following Walker's (2006) *Generalized Licensing*, they appeal to perceptual markedness constraints to account for the spreading process. Licensing and faithfulness constraints, on the other hand, serve as the motivation for the opening of the rightmost vowel in the word; that is, cue preservation.[6] To avoid disharmonic roots in which [RTR] only targets the leftmost vowel, they appeal to an anchoring constraint. No constraint referring to morphology plays a role in their analysis.

One of the problems in formalizing the process within OT is to account for the source of the [RTR] feature. [spread glottis] and the constraints MAX(Lar) and MAX(Sib) cannot predict the opening of a vowel when the deleted consonant is not a sibilant or a fricative. MAX(Place), also proposed by Jiménez & Lloret to account for vowel fronting in those cases of deletion of coronals, is not enough if we consider that in JVH also non-coronal consonants (*anorak*, *nariz*) cause vowel aperture as well.

Turning to Walker's (2005) *Weak Triggers,*[7] her account cannot predict JVH since stress does not determine the domain of the spreading. For example, in forms

[6] Under Jiménez & Lloret's view, all [RTR] vowels spread their acquired feature when it originates in an underlying sibilant or [spread glottis] element in the Granada variety. They also account for the variation that exists regarding the scope: while in some realizations the initial unstressed vowel undergoes harmony, in others it does not.

[7] This work is based on the idea that a feature that originates in a suffix migrates to the most prominent position to become more perceptible.

such as that of *miércoles* (['mjeɾkolє]) 'Wednesday', the harmonic feature would be expected to target the first syllable, which is the stressed one. Therefore, this proposal would fail in accounting for those cases of singular forms, in which the spreading process does not take place in the Jaén variety. The main problem, thus, is that this theory can account for harmonies in which all vowels will trigger the spreading but it cannot predict those cases in which harmony takes place only under very specific morphological conditions. Therefore, some constraint referring exclusively to the morphosyntactic information contained in the suffixes triggering JVH is needed.

One possibility is to consider inflectional affixes to be weak triggers. Since the morphosyntactic information is lost in coda deletion, the strategy would be to take the appeared feature and spread it as a floating morpheme. By accepting this, licensing constraints should be reformulated as LICENSE(affix/PrWd), where affixes are licensed to be realized in the domain of the prosodic word.

Kurisu's (2001) REALIZEMORPHEME, even though directly related to morphology, seems not to be as precise as it should: there are cases in which the deleted consonant is not a morpheme but only part of an inflectional affix. It can be interpreted, then, that the morphological information is maintained in the preserved part of the suffix, as it happens in certain verbal forms. If applying this constraint to these forms, the harmony would indicate that a morpheme is realized twice in the surface.

General Alignment constraints (McCarthy & Prince 1993) are not enough to explain the process unless competing at the same time with some morphological constraint. A reformulation of the Alignment family is found in Akinlabi's (1995) work *Featural Affixation*. He considers that phonological features may function as grammatical morphemes. Featural affixes can get realized as part of the stem, and they have to be licensed to become phonetically realized. These features must be associated with a licensor in the stem or elsewhere. Under this view, JVH can be understood as a case of featural misalignment: the morpheme ends up being realized in an unexpected position. Featural Alignment adapts Generalized Alignment constraints to the scheme in (12).

(12) ALIGN(PFeat, Gcat)
A prosodic feature is aligned with some grammatical category.

3.2. Attempting a solution within OT

Apart from the morphological conditioning, the source of the [RTR] is also difficult to capture within OT. According to the results, the opening of the rightmost vowel cannot be explained as a compensatory lengthening, since the differences in length are not significant enough in final open vowels. For that reason, a constraint such as MAX-μ, has to be ruled out. In the light of the data, the deletion of any consonant with the exception of nasals, regardless of its place of articulation, causes the opening of the preceding vowel. Returning to cue preservation, it seems that there is some gestural constraint involved in this openness. Here, it is understood that the realization of the consonant is intended even though it is not finally produced, and the special constriction that this pseudo-articulation provokes in the oral cavity makes

these differences in height appear in vowels. Further research on this possible articulatory explanation should be carried out in depth.

For the sake of the argument, the present proposal uses a generic constraint, here called MAX(GESTURE), which serves as the one which marks the deletion of any final consonant leaving a trace in the shape of the [RTR] feature on the preceding vowel. By doing so, the proposal can better focus on what causes the spreading of this new appeared feature.

To capture the morphological conditioning in JVH, Featural Affixation may be suitable for that purpose: morphological misalignment takes place under pressure from other (phonological) constraints. A latent morphosyntactic feature is licensed by phonological constraints to be realized —in this case— in a spreading environment. PARSESUFFIX[8] avoids the loss of the morphosyntactic information that is contained in the deleted coda and ALIGNSUFFIX indicates the domain in which this feature applies. These two constraints will license the realization of the morpheme in the shape of the spreading of the [RTR] feature, which appears as a result of cue preservation by means of the MAX(GESTURE) constraint.

With respect to the locality of the assimilation, a constraint indicating the adjacency of the feature that spreads is needed. NOGAP[9] prevents features skipping over potential targets. Faithfulness constraints regarding the deletion of the final consonant as well as the harmonic feature in vowels are needed: MAX penalizes deletion; IDENTITY prevents the surface realization to have a feature (here, [RTR]) that does not exist underlyingly.

The analysis of JVH is illustrated in tableaux (14-16).[10] On the one hand, the CODACONDITION constraint has to outrank MAX to force coda deletion. IO-CONTIGUITY, penalizes the deletion of medial codas while permitting that of the final. MAX(GESTURE) and PARSESUFFIX, on the other hand, are the constraints responsible for the appearance and the spreading of the feature, respectively. ALIGNSUFFIX/PrWd and NOGAP are directly related to the domain of the harmony. The first allows the feature to spread until the left edge of the prosodic word, and the second militates against skipping any potential target vowel. Finally, IDENTITY-IO(RTR) penalizes any instance of the feature [RTR] in the output. The full hierarchy, given in (13), involves a ranking in which some constraints are undominated (IO-CONT, CODACOND, MAX(GEST) and PARSESUFX). These constraints are responsible for the main motivation of the process and they outrank others more related with the spreading process of the appeared feature. At the bottom of the hierarchy, we find MAX and IDENTITY-IO(RTR), penalizing the deletion and the presence of the harmonic feature.

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[8] These constraints can be defined in more detail by specifying the kind of morphosyntactic information that is contained in the suffix; that is, SUFFIX can be replaced by PLURAL, by 2ND.SG, or by INFINITIVE. In this work, Featural Affixation constraints are unified in order to simplify the formalization. Therefore, the following tableaux show these constraints as PARSESUFFIX and ALIGNSUFFIX/PrWd.

[9] Archangeli & Pulleyblank (1994), Kirchner (1993), Beckman (1995).

[10] Processes that are not explained in this study (stress assignment and spirantization) are not taken into account in the present formalization, and only candidates that satisfy the stress and spirantization patterns of Spanish are considered.

(13)

IO-Cont, CodaCond, Max(Gest), ParseSfx >> AlignSfx/PrWd >> NoGap, Max, Ident-IO(RTR)

Tableau (14) illustrates how this hierarchy correctly predicts the realization of a plural form. Faithful candidate (14a) fatally violates CodaCond. Next, candidate (14b) represents a form in which the morpheme has no exponence. It violates both Max(Gest) and ParseSuffix. But also (14c) fails to become the optimal: cue preservation is not enough as far as this change does not spread to the rest of the vowels within the word. Candidate (14e) violates the alignment constraint since the harmonic feature spreads only up to the stressed syllable. In (14f) the feature skips one of the vowels within the prosodic word, violating NoGap. Therefore candidate (14d) is optimal even though it has one violation of Max and four of Identity-IO(RTR).

(14)

/monedero+s/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. [mone'ðeɾos]		*!						
b. [mone'ðeɾo]			*!	*			*	
c. [mone'ðeɾɔ]				*!	*		*	*
☞ d. [mɔnɛ'ðɛɾɔ]							*	****
e. [mone'ðɛɾɔ]					*!		*	**
f. [mɔne'ðɛɾɔ]						*!	*	***

Tableau (15) shows how the same hierarchy works out for those forms undergoing final coda deletion and having no harmonic process. Since the final coda consonant does not entail morphological information, ParseSuffix is not violated. Max(Gest), however, discards candidate (15b), which has no phonetic mark for the deleted consonant. Candidate (15d) is ruled out because it has one violation more of Identity-Io(RTR) than (15c), that becomes the optimal one.

(15)

/trebol/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. ['treβol]		*!						
b. ['treβo]			*!				*	
☞ c. ['treβɔ]							*	*
d. ['trɛβɔ]							*	**!

Finally, tableau (16) shows the role of the alignment constraint: compound nouns have strong morphological boundaries, and as a consequence, they are built up from two prosodic words. AlignSuffix/PrWd militates against surface forms such as those of (16c) and (16e), in which the domain for the harmony is not the prosodic word. All vowels in candidate (16f) undergo harmony (that is, both prosodic words). Although it does not violate AlignSuffix/PrWd, it is ruled out because of Identity-Io(RTR). Candidate (16d), therefore, is the optimal one since it shows both cue preservation and spreading of the harmonic feature and moreover, this feature spreads within the right domain.

(16)

/rompe##ola+s/	IO-Cont	CodaCond	Max(Gest)	ParseSfx	AlignSfx/ PrWd	NoGap	Max	Ident-Io(RTR)
a. [ˌrompe]['olas]		*!						
b. [ˌrompe]['ola]			*!	*			*	
c. [ˌrompe]['olæ]				*!	*		*	*
☞ d. [ˌrompe]['ɔlæ]							*	**
e. [ˌrompɛ]['ɔlæ]					*!		*	***
f. [ˌrɔmpɛ]['ɔlæ]							*	****!

4. Conclusions

JHV sheds some light on the distinction between phonological harmonies and morphological harmonies. The former are not able to make grammatical contrasts and are the source of allomorphy. The second are the ones creating those grammatical contrasts, and exist independently of whether there is harmony throughout the language or not (Finley 2005).

More specifically, the morphological conditioning in JVH is the result of an unexpected situation in which a phonological process (coda deletion) removes the phonetic material corresponding to a morpheme or part of a morpheme. The same phonological constraint that removes this morphosyntactic information is also responsible for the appearance of a new feature, [RTR], which is not distinctive in the language, as a result of cue preservation. Morphology takes this new feature and spreads it to the rest of the vowels within the word in order to license the exponence of the otherwise-lost morphosyntactic information. Harmony becomes, this way, the alternative realization of the morpheme that is indispensable in the language.

Akinlabi's *Featural Affixation* serves here to appeal for an explanation of the process based on featural morphemes. Many languages show non-concatenative morphology, and although this is not the case in Romance languages, Jaén Spanish seems to resort to this alternative as well. By doing so, featural affixes in general, and those of JVH in particular, are of a great complexity: they are morphemes in the shape of a

feature that target other segmental material contained in a root that, in turn, has its own functional value already.

This and other cases of featural morphemes are certainly worthy of an in-depth study. JVH can be easily related, in this sense, to languages like Basque or Mapundungun, in which the infixation of a feature, [palatal], creates grammatical contrasts, indicating [+affective].

Finally, I would like to leave open the question of how and to what extent cue preservation is the source for the opening of the rightmost vowel in JHV. This is an empirical issue that definitely needs to be answered.

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WAS MIDDLE ENGLISH A TEMPLATIC LANGUAGE?

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0. Introduction: late Old English and Middle English sound changes

Late Old English (OE) and Middle English (ME) up until approximately the fourteenth century is a period characterised by a number of sound changes that have presented phonologists working in various frameworks, ranging from possibly the first all-encompassing Neogrammarian attempt by Luick (1914) to the contemporary Optimality Theoretic approach (e.g. Bermúdez-Otero 1998), to devise a complete picture for what appears to have been a series of interrelated quantitative changes. Between these two 'extreme' points of reference, various SPE-type of analyses have been presented in the past (see 1.1). The issue was also taken up by Trubetzkoy (1939) and Murray (2000), for example, arguing for syllable cut prosody. More recently, the interest has also been revived in the framework of Natural Phonology as presented in Ritt (1994), for example, from whom the short-hand terminology to be used has been adopted. The principle of mora-preservation, foot structure (and closely connected to it, the so-called Germanic foot) and the like have been argued for (Dresher & Lahiri 1991, Lahiri & Fikkert 1999, etc.). Open syllable lengthening and trisyllabic shortening coupled with analogy, to be discussed shortly, have also been resorted to as a means of explaining the somewhat irregular behaviour of open syllable lengthening (Lahiri & Dresher 1999). These changes, in a rather non-chronological fashion, include MEOSL (the topic of this paper), TRISH (trisyllabic shortening), SHOCC (shortening before consonant clusters) and HOL (homorganic lengthening). Some of these issues have been tackled in Starčević (2006) where the possibility of an analysis couched in terms of CVCV phonology is sketched out. A somewhat revised version will be presented in what follows.

1. MEOSL

This section offers a discussion of MEOSL, concerning its result on OE short vowels, some of the attempts made to describe it and its place in the history of the language with respect to other OE and ME changes.

1.1. MEOSL -some of the attempts

Middle English Open Syllable Lengthening, or MEOSL, is one in a series of sound changes affecting ME which, in standard textbook analysis, affects the OE

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation,*
Anuario del Seminario de Filología Vasca «Julio de Urquijo» XLVI-1 (2012), 309-336.

short stressed vowels in open syllables. The change seems to have started earlier in the North (twelfth century) than in the South (thirteenth century). The five inherited short vowels of OE, i.e. /i/, /e/, /a/, /o/ and /u/, were lengthened to /eː/ ę̄, /ɛː/ ę̄ , /aː/, /ɔː/ ǭ and /oː/ ǭ (e.g. Moore 1929, Brunner 1970, Wright & Wright 1928, Wardale 1958). There is general disagreement over how and when the two high vowels /i/ and /u/ were lengthened and/or lowered. In standard textbook analyses these two vowels are not invariably included as target vowels for MEOSL. What seems certain is that by the thirteenth century, in a first wave, the three non-high vowels lengthened in open syllables spreading to the South. Somewhat later in the thirteenth century, in a second wave, in the Northern dialects the two remaining OE short vowels also underwent MEOSL also spreading to the South but never affecting as many words as in the case of the non-high vowels (see, for example, Lieber 1979).

If MEOSL had simply involved a change in the quantity of the vowels affected, the following ME rhyming pairs would be expected, the first one showing the ME continuation of the OE short vowel, the second an original OE long vowel (adapted from Lieber 1979: 5f; examples from the same source):

(1) ME rhyming pairs

ME ī (< OE i) – ME ī (< OE ī)
ME ū (< OE u) – ME ū (< OE ū)
ME ę̄ (< OE e) -–ME ę̄ (< OE ē)[1]
ME ǭ (< OE o) – ME ǭ (< OE ō)
ME ā (< OE a) – ME ā (< OE ā)[2]

Yet, the only possible rhyming pairs attested in the thirteenth and fourteenth century are those listed below:

(2) attested ME rhyming pairs

ME ę̄ (< OE i) – ME ę̄ (< OE ē)
ME ǭ (< OE u) – ME ǭ (< OE ō)
ME ę̄ (< OE e) – ME ę̄ (< OE ǣ)
ME ǭ (< OE o) – ME ǭ (< OE ā)
ME ā (< OE a) – ME ā (< OE ā) (cf. footnote 2)

The following pairs are all attested in Barbour's Bruce and Cursor Mundi: *stere-were*, with *stere* showing ME ę̄ (OE *styrian* 'to stir' with the regular late OE change

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[1] Note that in OE there was no opposition between *ę̄* and *ę̄* The vowel shown as *ē* was /eː/. This is also supported by the ME rhymes cited in (2).

[2] This last rhyming pair would only be viable in the Northern dialects where the spontaneous (in other words, environment-independent) change OE *ā* > ME *ǭ* (e.g. OE *bān* > ME *bone ǭ* 'bone') did not occur or was sporadic. Wardale (1958: 49) claims that this 'isolative' (i.e. not 'combinative' in her use of the term) change appears first in the East Midlands from where it spreads gradually but never reaches those areas beyond the Humber. See also Dobson (1968: 469, §7 and Note 1 and 2) on the question of quantity variation inherited from ME in sixteenth to eighteenth century English.

i < OE *y*)[3] rhyming with *were* (OE *were* 'man'),[4] *gome -dōme,* the former representing OE *guma* 'man', the latter OE *dōm* 'judgement' (the vowel here being ME o̧). Since the traditional sources take the lengthening (and lowering) of the OE non-high short vowels to be uncontested, explicit rhyming data are lacking on these vowels. Yet, according to MEOSL, the following words were possible rhymes: *beren* (< OE *beran* 'to bear') - *leren* (OE *lǣran* 'to teach'), the rhyming vowel being ȩ; *bore(n)* (OE *boren* 'born') - *stroke(n)* (OE *strācian*), with o̧ as the rhyming vowel. For a classical SPE-type of analysis involving ordered rules, disjunctive environments, the Elsewhere Condition (Kiparsky 1973, 1985) see Anderson (1974), Lieber (1979) and Malsch & Fulcher (1975), for example. As an illustration, consider Minkova's (1982) formulation of MEOSL:

(3) MEOSL - traditional formulation

$[_1(C)V[_2C^1_1]_1\ e\ \#]_2$

Some clarification is in order at this point: the round bracket shows the optionality of the word-initial consonant (C), the second C enclosed in square brackets is ambisyllabic, i.e. it belongs to both the first ((C)VC) and the second syllable (C e) indicated here with subscript '1' and '2' that encroach upon each other's domain; in addition, the notation suggests that the rule applies only to words that contain a single intervocalic consonant; the 'e' at the end of the structural description stands for /ə/, the '#' for a (strong) morpheme boundary. The process in Minkova (1982: 167) is claimed to involve rhythmic weight conservation whereby the initial stressed vowel acquires an additional mora: the stressed syllable becomes heavy to preserve the perceptual isochrony of the foot. From the point of the disyllabic trochaic foot this is tantamount to compensatory lengthening: the schwa is lost and its mora is transferred to the stressed short vowel. There is no difference in the number of morae between the input and the output of the rule. The motivation (however teleological it might seem to be) behind the rule is the preservation of the overall weight of a word. Some of the claims and implications made in Minkova (1982) were revisited by Lass (1985) and Minkova (1984, 1985).

One of the drawbacks of Minkova's (1982) analysis, as pointed out by Kim (1993), is the general consensus on the dating of schwa loss. Schwa loss is traditionally taken to be a later change than MEOSL and as such is still considered to be part of Chaucer's and Gower's poetry and as such it is hardly likely to have been

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[3] In citing OE data the following standard conventions are assumed: <y̆> /y/, <ġ> /j/, <þ/ð> /θ/ or /ð/ (depending on the environment), <sċ> /ʃ/, <æ̆> /æ(ː)/ and <ēo> /eo/ (?/eːo/) as one member of the contested class of the so-called long diphthongs.

[4] Note that, strictly speaking, this particular rhyming pair given by Lieber (1979: 6) is incorrect and does not support her general analysis of MEOSL and, especially, the contested lowering of the high vowels. This is shown by her reluctance to give the actual rhyming sound (*e̞* vs. *e̝*). The problematic bit is disentangled once the three-fold development of OE *y̆* is taken into account: it shows dialectal variation in OE continued into ME (**y̆* remains *y̆* in the South-West (as represented by the so-called classical West Saxon variety of OE), in the South-East (Kentish) it surfaces as *e̞* and in the Midlands (Anglian) it is recorded as *i̞*). Since ME *were* can only be the continuation of OE *were*, the other party of the rhyme must show the south-eastern variety of OE *y*. In all likelihood, the rhyming sound is *e̝*. Correctly then the pair is ME *we̝re* (< OE *were*) - *ste̝re* (Kentish *sterian*) (cf. Dobson 1968: 566f).

completely lost by the thirteenth century (for further details see Minkova 1982). If schwa then coexisted with a lengthened vowel, the analysis relying on mora-preservation and metrical compensatory lengthening is at best suspect: on the face of it, if schwa (and every pronounced vowel) is granted a mora, then the OE word *boren* (2 morae) yielded ME *bǭren* (3 morae). If anything, schwa can be seen as a catalyst for MEOSL, not as a contributor to (moric) weight (the formal problems with the transference of the mora linked to schwa to the stressed vowel will not be discussed). A similar situation is encountered in the continental Germanic languages such as German and Dutch which also underwent open syllable lengthening in the thirteenth century but the schwa is still present (Prokosch 1938): e.g. Middle High German *pflĕgen* > Modern German *pflēgen* with unstressed <e> representing /ə/. This is not a conclusive counter-evidence to Minkova's claim on the moric-swap and augmentation between the stem final schwa and the stressed vowel in ME because this process may be parametrically controlled, but certainly points in the direction of an alternative view: the analysis of MEOSL as 'merely' lengthening in open syllables is not exhausted by this approach (for reasons to be discussed), as opposed to MHG which is 'merely', as the term suggests, OSL, i.e. open syllable lengthening.[5]

There is room to consider yet another traditional explanation of MEOSL, Kim's (1993: 276) solution, essentially a reformulation of Minkova's (1982) original wording, is given in (4a) and (4b):

(4a) Kim's environment for MEOSL:

$\#\ C_0V][C_1ə\#$

(4b) Kim's final formulation of MEOSL[6]

$V \rightarrow [+lg]\ /\ C_0\_\_\ ][C_1ə\#$

In other words, MEOSL is considered a case compensatory lengthening which was only activated when the vowel of disyllabic words was weakened to schwa. Crucial here is the identification of the environment: the change is not linked to the loss of schwa, but rather to the second vowel's weakening to schwa. As such, the rule circumnavigates some of the major problems of MEOSL, viz. the absence of MEOSL in disyllabic words whose second vowel is not weakened to schwa (the usually cited example is that of the OE suffix *-iġ* which appears as *-y* in ME). Note that Kim's (1993) formulation in (4b) does not restrict the number of C's after the stressed vowel (and before schwa) that undergoes MEOSL, which is certainly a drawback since MEOSL applies only to words containing a single intervocalic C, or, possibly, clusters like *st*/*sp*/*sk* (data from Minkova 1982): *host*, *taste*, *yeast*, *feast*. Of these, *yeast* (< OE *ġest*/*ġist*) is the only candidate that contains an OE short vowel which could be fed into the rule (the actual ME long vowel is due to the disyllabic form this word

[5] For further arguments on the general dating of MEOSL, its dialectal extension and, crucially, the loss of schwa see Dobson (1962/1963: 132).

[6] Note that the notation [+lg] in (4b) means, in all likelihood, that the stressed vowel acquired an additional mora, i.e. it was lengthened.

had in the oblique forms), the rest is of Old French origin and may already have entered the language with a long vowel.[7]

1.2. MEOSL -a historical perspective

MEOSL is part of a chain of processes, both lengthening and shortening in their effect, that have defied a unified representation over the centuries.[8] These changes are usually summarised chronologically under the following four headings:

(5) HOL (Homorganic lengthening)

OE	ME	
clĭmban	clīmbe(n)[9]	'climb'
wĭndan	wīnde(n)	'wind (verb)'
cĭld	chīld	'child'
săng/sŏng	sāng/sōng[10]	'sang, pt.'
căмb/cŏmb	cōmbe/cāmb	'comb'
fĕld	fēld	'field'

This change seems to have taken place in late OE. The input vowels were short, the output vowels long. The conditioning environment, in all traditional descriptions, is the voiced cluster after the vowel, i.e. /mb/, /nd/, /ŋg/, /rd/, /rð/ and /rz/.[11] Note that although this change seems natural in the sense that a vowel before a voiced cluster is longer than the corresponding vowel in a voiceless environment (cf. Kavitskaya 2002), a fact which has been noted a long time ago and has become a commonplace in many modern phonetically-oriented accounts, the phonological

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[7] The other examples supplied by Kim (1993: 275; taken from Wright 1898; data appear as in the original source), *hasp* [ha:sp], *cast* [ka:st] and *fast* [fa:st], are outside the frame investigated here. Lengthening in monosyllables like *casp* [ka:sp] (as opposed to [kæsp]) is not a ME change at all. If it had been (assuming the word had a bisyllabic pronunciation in its oblique forms and thus a long stressed vowel) it should be [keɪst] after the Great Vowel Shift, which translates as /keɪst/ in mainstream phonological representation.

[8] See Ritt (1994: 2), for example, for an explanation on why the Neogrammarian attempt failed. Paradoxically, it was the very notion of 'sound laws' that initially sparked off the non-intuitive thinking about (diachronic) linguistic changes in the first place, coupled with the rather varied picture of OE and ME sound changes that made the unification attempt impossible: vowels undergoing the changes were both long and short, they both lengthened and shortened in environments that simply could not be subsumed under one all-encompassing rule.

[9] For expository reasons, OE short vowels have been marked with a breve. Traditionally, it is only the long vowels that are philologically disambiguated with a macron. In citing ME data, breves and macrons are also used for expository reasons. In neither of these periods is there a systematic differentiation of long and short vowels in the orthography.

[10] On the ME variation between *ā* (< OE *a*) and *ǭ* (< OE *ā*), as well as their short counterparts *a*/*o* in case they underwent shortening, is a complex issue which is due to dialectal variation. The present-day English picture, as on many other occasions, shows a 'cross-contaminated' state, to use a metaphorical expression (see Dobson 1968: §7 and §71).

[11] Campbell (1959) assumes some further voiced cluster in late OE. These will not be discussed here because they are of no relevance.

structure is rather marked: a long vowel is followed by a falling sonority cluster, i.e. a coda cluster which creates a closed syllable (see (6)).

(6) MEOSL (Middle English open syllable lengthening)

OE	ME	
wĭcu	wę̄ke	'week'
wŭdu	wǭde	'wood'
mĕte	mę̄te	'meat'
tălu	tāle	'tale'

Some aspects of this change have already been covered in the foregoing section.

(7) SHOCC (Shortening before consonant clusters)

OE	ME	
lǣdan ~ lǣdde	lę̄de(n) ~ lĕdde[12]	'lead ~ led'
fēdan ~ fēdde	fę̄de(n) ~ fĕdde	'feed ~ fed'
mētan ~ mētte	mę̄te(n) ~ mĕtte	'meet ~ met'
sōfte	sŏfte	'soft'

The examples in (7) show a common ME characteristic in the verbal paradigm: shortening of the original long vowel before a consonant cluster in infinitive ~ past tense alternations. This change is not bound to the class of verbs alone; it occurs across-the-board before all those clusters that could not tolerate a long vowel, i.e. before non-HOL clusters (as in *sŏfte*). The vowel that appears in the past tense, for example, is short as a consequence of the consonant cluster that follows.[13]

There is yet another process that is not exclusively of ME provenance but also occurs in late OE (see Luick (1914), Lahiri &Fikkert (1999), for example), called TRISH, see (8).

(8) TRISH (Trisyllabic shortening)

OE	late OE (early ME)	
cīcen	cĭcenu	'chicken, sg. ~ pl.'
hǣring	hæringas	'herring, sg. ~ pl.'
sūþerne	sŭþerne	'southern'

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[12] The vowel in the past tense is also recorded as 'short a', *lădde* (see Moore 1929, for example). This alternative vowel appears as a consequence of the time of the dialectal appearance of SHOCC: *lădde* points to an early shortening when the OE vowel was not yet raised to ME *ę̄;* the shortening of OE *ǣ* resulted in ME *a*. This has no bearing on the present discussion, however.

[13] There are other clusters, too, before which shortening occurred, usually containing a velar as their first member: e.g. OE *þōhte* > ME *tho(u)ghte* 'thought'. The modern sound shows a ME diphthong which is due to the glide that appeared between the 'short o' (a consequence of SHOCC) and the velar fricative (conventionally spelt <gh> when citing ME data) modified by later sound changes. Other clusters before which SHOCC occurred are more difficult to assess because these clusters could support a long vowel before them in ME: e.g. OE *fēng* 'seized', *fēnd* 'fiend', *frēnd* 'friend', etc., of which the last two can still have a long vowel before the cluster (the cluster is coronal), as opposed to *fēng* (the cluster is non-coronal and before such clusters only a short a vowel is possible in present-day standard English). In non-standard British dialects (as well as in American English), a long vowel can appear before /ŋ/: e.g. *long* /lɔːŋ/. This lengthening is a post-ME development (cf. Dobson 1968: §53, especially Note 2).

This process, which is responsible for the short vowel in the third last syllable, can also be seen at work in compounds:

(9) TRISH in compounds

OE	ME	
hālidæġ	hŏliday/hăliday	'holiday'
bēoferlic	Bĕverly	a personal name
frēondscipe	frĕndshipe	'friendship'

TRISH, as we will see below, counteracted MEOSL. TRISH has been a recurrent problem in the history of English phonology and its consequences can still be observed in etymologically related pairs of words like *sane ~ sanity*, *divine ~ divinity*, etc. The issue of whether TRISH is still an active process is intimately linked to the issue of how much leeway one allows etymology to have in a synchronic analysis. There is little synchronic validity behind linking the stressed vowel of *divine* to that in *divinity.* Needless to say, an SPE-type analysis can readily come up with a rule that derives one from the other, but the validity of such rules can questioned: in synchronic English phonology there is nothing apart from the rule itself (TRISH) that makes reference /aɪ/ and /ɪ/, for example, and not, say, /əʊ/ and /ɪ/. The alternating vowels in *flower* /aʊ/ *~ florid* /ɒ/ *~ floral* /ɔː/ can also be related, but hardly in a synchronic sense of the term 'rule'. With the advent of Lexical Phonology (see Kiparsky (1985) and McMahon (2000) on the implications this has on historical phonology), TRISH essentially became a Level 1 rule which is only a step away from the lexicon. As a lexical rule TRISH can show exceptions (*obese ~ obesity*) and it is also curtailed by the Revised Alternation Condition which prohibits abstract SPE-type representations that lead to absolute neutralisation on the surface in case a word shows no alternations (this is why *nightingale* is stored with underlying /aɪ/ and cannot be fed into TRISH: TRISH cannot be activated because the word is underived). For further elaboration on how Natural Phonology can handle the TRISH issue, as well as how phonology has become lateralised and how the burden on the lexicon has increased as the means of derivation and feature-manipulation have been impoverished in the last few decades see Scheer (2004; Ch. 3).

2. MEOSL -the details

The following sections will give an overview of how MEOSL worked and in what way it was blocked by TRISH.

2.1. The various ME 'templates'[14]

One of the changes leading up to early ME is the levelling of unstressed vowels to a vowel spelled <e> and, by common consent, pronounced /ə/. Although the actual phonetic reality behind <e> has not been contested, its phonemic status certainly has (cf. Minkova 1982, 1985, 1991). This issue of the phonemehood of schwa, however, has no bearing on the discussion.

[14] The term 'template' in this section will be used to describe superficially adjacent vowels and consonants, hence the inverted commas.

The table in (10) shows the only one point in the process of MEOSL which can be taken for granted: if the early ME stressed short vowel is followed by schwa, lengthening will take place:

(10) OE stressed short vowels in the $C_0V_1CV_2$ (V_2 = /ə/) template

OE INPUT	ME OUTPUT	CONDITIONING	EXAMPLES
SHORT	LONG	MEOSL	tălu > tāle mĕte > mēat

This corresponds to the traditional formulation of MEOSL. The rest of the picture, however, is less straightforward and shows that original OE short and long vowels can end up both short and long in ME. The tables in (11) offer a summary of the changes affecting OE vowels in bisyllabic words whose first vowel is either short or long.

(11) The $CV(V)_1CV_2C$ template

(11a) OE short vowels in ME in the $C_0V_1CV_2C$ template

OE INPUT	ME OUTPUT	CONDITIONING?	EXAMPLES
SHORT	SHORT	MEOSL vs. TRISH	ŏfen > ŏven săddol > săddle
SHORT	LONG	MEOSL vs. TRISH	æcer > ācre crădol > crādle

(11b) OE long vowels in ME $C_0VV_1CV_2C$ template

OE INPUT	ME OUTPUT	CONDITIONING?	EXAMPLES
LONG	LONG	original vowel vs. TRISH	bēacen > bēakon æfenn > ēven(ing)
LONG	SHORT	original vowel vs. TRISH	bōsm > bŏsom dēofol > dĕvil

The summary of changes in (12) below show that original OE short vowels in monosyllabic words can surface as both short and long in ME.

(12) The C_0VC template

OE INPUT	ME OUTPUT	CONDITIONING?	EXAMPLES
SHORT	SHORT	original vowel vs. MEOSL	gŏd > gŏd þæc > thătch
SHORT	LONG	original vowel vs. MEOSL	hwæl > whāle hŏl > hōle

As opposed to the indeterminacy of the ME outcome for OE bisyllabic words with stressed short and long vowels, as well as OE monosyllabic words with a short stressed vowel, there is no change affecting the original OE long vowels in monosyllabic words:

(13) OE long vowels in monosyllabic words

OE INPUT	ME OUTPUT	CONDITIONING	EXAMPLES
LONG	LONG	no ME rule can apply	mǣd > mead fūl > foul

The vowel cannot be shortened because it is not followed by a shortening cluster and there are no disyllabic suffixes that could create a trisyllabic environment with the original vowel.

2.2. Further details

The following declensional charts show how the effects of MEOSL were counteracted by TRISH or by the original vowel. As can be seen, the MEOSL proper is only found in cases where the original short stressed vowel is followed by a schwa.

(14) unpredictable vowel length in the $\mathbf{C_0}\boxed{\mathbf{V_1}}\mathbf{CV_2C}$ template (MEOSL vs. TRISH)
'saddle/cradle'

	Singular	*Plural*
Nom.	sā**d**el/crā**d**el	s**ă**deles/cr**ă**deles
Acc.	sā**d**el/crā**d**el	s**ă**deles/cr**ă**deles
Gen.	s**ă**deles/cr**ă**deles	s**ă**deles/cr**ă**deles
Dat.	s**ă**dele/cr**ă**dele	s**ă**deles/cr**ă**deles

(15) unpredictable vowel length in the $\mathbf{C_0}\boxed{\mathbf{VV_1}}\mathbf{CV_2C}$ template (MEOSL vs. TRISH)
'herring/beacon'

	Singular	*Plural*
Nom.	h**ē**ring/b**ē**ken	h**ĕ**ringes/b**ĕ**kenes
Acc.	h**ē**ring/ b**ē**ken	h**ĕ**ringes/b**ĕ**kenes
Gen.	h**ĕ**ringes/b**ĕ**kenes	h**ĕ**ringes/b**ĕ**kenes
Dat.	h**ĕ**ringe/b**ĕ**kene	h**ĕ**ringes/b**ĕ**kenes

From the point of view of ME synchronic grammar, these two tables are identical. They show that a long vowel (either originally long or lengthened by MEOSL) can be counteracted by TRISH.

(16) unpredictable vowel length in the $\mathbf{C_0\boxed{\bar{V}}C}$ template (MEOSL vs. original vowel)
'hole/god'

	Singular	*Plural*
Nom.	h**ŏ**l/g**ŏ**d	h**ō**les/g**ō**des
Acc.	h**ŏ**l/g**ŏ**d	h**ō**les/g**ō**des
Gen.	h**ō**les/g**ō**des	h**ō**les/g**ō**des
Dat.	h**ō**le/g**ō**de	h**ō**les/g**ō**des

On the face of it, no detail in the environment can explain why lengthening is preserved in one word, but lost in the other. The examples that follow in (17) show those environments in which the ME vowel length is predictable.

(17) predictable vowel length in the $\mathbf{C_0\boxed{VV}C}$ template
'boat'

	Singular	*Plural*
Nom.	b**ō**t	b**ō**tes
Acc.	b**ō**t	b**ō**tes
Gen.	b**ō**tes	b**ō**tes
Dat.	b**ō**te	b**ō**tes

(18) predictable vowel length in the $\mathbf{C_0\boxed{V_1}CV_2}$ template if $\mathbf{V_2 = ə}$ (MEOSL proper)
'tale'

	Singular	*Plural*
Nom.	t**ā**le	t**ā**les
Acc.	t**ā**le	t**ā**les
Gen.	t**ā**les	t**ā**les
Dat.	t**ā**le	t**ā**les

Strictly speaking, another table should be added. The description applies to original trisyllabic words (with a short stem vowel, as in *wdewe* 'widow, or a long one, as in *rende* 'errand'). Such stems are extremely rare in Germanic. Trisyllabic forms are due to suffixation and, if they survive into ME, they show no alternation as they satisfy TRISH.

(19) predictable vowel length in original OE trisyllabic words
'widow/errand'

	Singular	*Plural*
Nom.	w**ĭ**dewe/**ĕ**rende	w**ĭ**dewes/**ĕ**rendes
Acc.	w**ĭ**dewe/**ĕ**rende	w**ĭ**dewes/**ĕ**rendes
Gen.	w**ĭ**dewes/**ĕ**rendes	w**ĭ**dewes/**ĕ**rendes
Dat.	w**ĭ**dewe/**ĕ**rendes	w**ĭ**dewes/**ĕ**rendes

2.3. Can this pattern be explained?

Lahiri & Dresher (1999; 4.4.) propose analogical restructuring because there is simply no way in which a phonological rule can be salvaged from the alternating patterns presented above. They contend further that disyllables with an original long vowel surfacing with a short vowel (e.g. OE *ǣwpen* 'weapon') are matched in almost the same proportion by disyllables with original short vowels having long vowels (*cradol* 'cradle'). They discuss Kuryłowicz's (1945-49) first law, according to which a distinction is likely to be preserved in cases where it serves the purpose of enhancing morphological distinctions between members of related words. German offers an example for this: umlaut as a marker of plural (*Kopf ~ Köpfe* 'head sg. ~ pl.') is a process which was generalised to originally non-umlauting plurals (*Topf ~ Topfe* → *Töpfe* 'pot') where it now enhances the difference between singular and plural (which is now doubly marked). In ME, however, this morphological rule is not available because lengthening does not go hand in hand with number marking. The long vowel can be a property of both the singular and the plural.[15] Thus, a morphological rule is not available either.

It is also assumed that in ME schwas were lost in plural markers, first after vowels to avoid hiatus (*tree-(ə)s*), later in polysyllabic words (*argument(ə)s*) and finally across the board (cf. Lass 1992: 111), and thus the once transparent system was disturbed leaving the learner at a loss as to the phonological grounding of the process. In (20) Lahiri & Dresher's (1999: 698) Table 33 is reproduced.

(20) Expected vowel length alternations before and after schwa loss in plural

a) Before loss of inflected vowel

SG	PL	SG	PL	SG	PL	SG	PL
stōn	stōn**e**s	bōdi	bodi**e**s	bēver	bever**e**s	god	gōd**e**s

b) After loss of inflected vowel

SG	PL	SG	PL	SG	PL	SG	PL
stōn	stōns	bōdi	bodis	bēver	bevers	god	gōds

As expected original OE monosyllables with a long vowel will show no alternation. The rest of the words will, in a bidirectional fashion, once the motivation for the long vowel (as a result of MEOSL) and the short one (as a result of TRISH) was lost. 'On our account, the language learners despair of a rule, and opt instead to choose a consistent vowel quantity on a word-by-word basis' (Lahiri & Dresher 1999: 698). The modern pattern of short and long vowels vis-à-vis their OE coun-

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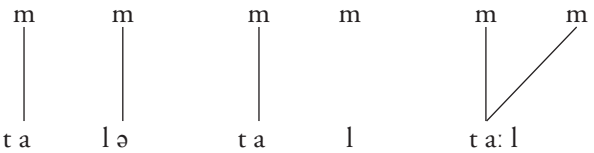
[15] One must mention at this point the *staff - staves* pair which, for some speakers, not only shows the (now lexicalised) retention of the voiced fricative in the plural but also the length of the vowel. Note that in standard British English the length of the vowel in *staff* is a post-ME development. This would be a unique example for the retention of length as an added plural marker (cf. the case of synchronically 'exceptional' Dutch plurals, discussed in Lahiri & Dresher 1999: 681, such as *dag ~ da:gen* 'day, sg. ~ pl.' where both lengthening and the regular plural *-en* marker coexist). The only surviving diachronically regular pattern of this kind is disturbed in English, however: *staff* and *stave* are differentiated semantically and both have acquired the synchronically regular plurals, *staffs* and *staves*. In English, there are other, derivationally related, examples of this pattern: *grass ~ graze*, *glass ~ glaze*, etc.

terparts are reflections of patterns of quantity levelling that followed MEOSL (counteracted by TRISH: *bōdi ~ bodies*) and TRISH (in the case of long vowels: bēver ~ beveres). In the case of CVC stems, MEOSL could be counteracted by the original vowel, as here there is no possibility for TRISH to apply (*god ~ gōdes*).[16] As can be seen, in this analysis both MEOSL and TRISH were ME phonological rules obscured by the later loss of schwa, followed by analogical restructuring (lexicalisation of one of the alternating forms) in response to finding a unique underlying representation on the part of the speakers.

Lahiri & Dresher (1999) also tackle the various proposals made to account for MEOSL. They remark that Minkova's (1982) account of MEOSL in terms of compensatory lengthening (also tackled in section 1 above) begs the question of why the mora formerly associated to the lost schwa is not salvaged by re-associating it to the word final consonant. Hayes' (1989) formulation of this ME process is shown below:

(21) Hayes' representation of MEOSL (simplified)



If schwa had been re-associated to the final consonant it would have made it moraic. Lahiri & Dresher (1991) remark that a possible ***tal* would qualify as a minimal word, similarly to OE *hwæl* 'whale' and *sċip* 'ship'. They also assume that English words of the C_0V size are sub-minimal, so a word like *ship* must contain a moraic consonant.

Against this interpretation, one can argue that since word-final single C's allow both a short and a long vowel before them (cf. *hot* vs. *heat*/*shine*), they do not make the preceding syllable heavy (i.e. they do not form a complex rhyme with the preceding vowel(s), which essentially means that there can be superficial super-heavy word-final syllables seen in *heat*, for example. Traditionally, this was analysed as word-final consonant extrametricality: *heat* is actually *hea*<*t*> and as such the phonotactic rules of English are blind to its existence (<*t*> is later integrated into a higher-level constituent, the foot, for example). Since extrametrical material is only allowed at the edges of words, this would explain why word-internal long vowel/diphthong plus coda sequences do not generally occur in English (apart from some exceptions involving coronal clusters). So, the fact that the mora was re-associated to the vowel,

[16] In connection with OE CVC stems (usually a-stem masculine and neuter nouns, like *god* cited above) Lahiri & Dresher (1999: 700) say that "it is no mystery that almost all CVC stems having *vocalic endings* in the singular and plural end up with long vowels, while the CVC a-stems with *no vocalic ending* in the singular show more variation due to analogy" [emphasis mine]. It is not clear at all what the authors mean by this. All CVC *a*-stem nouns (like *hole* and *god*) would have had to have vocalic endings in both the singular and plural (e.g. *gōdes*, *hōles*). Their Appendix 1 shows two such CVC *a*-stem nouns: *whale* (< *hwæl*) and *hole* (< *hol*), both of which have a long vowel. *God* is not listed (an *a*-stem masculine/neuter noun), but it is highly unlikely that this noun (and other CVC nouns of this class) should have had no vocalic ending(s) in the singular.

rather than to the word-final C, seems to be a matter of parameter. If it had associated to the C, one would expect a change to have taken place in English phonotactics, as a consequence of which long vowel/diphthong sequence word-finally would be banned from that point on. This, however, was not the case: during the ME period (and continuing), English adopted a large number of words which still allow superficial super-heavy rhymes word-finally (e.g. *sane*, *vain*, etc.)[17] in addition to those continued from OE (e.g. *boat*).

Ritt (1994: 95f) working in a version of Natural Phonology tries to give a unified picture of the various ME processes and offers an apologetic explanation for Luick's failed Neogrammarian account. He states the changes in a probabilistic formula shown in (15).

(22) ME quantity adjustment

The probability of vowel lengthening was proportional to

a) the (degree of) stress on it
b) its backness
c) coda sonority

and inversely proportional to

a) its height
b) syllable weight
c) the overall weight of the weak syllables in the foot.

The probability of vowel shortening is inversely proportional to the probability of lengthening. Ritt argues that this probabilistic formula accounts more appropriately for the varying degree of the implementation of the various ME changes as represented by the modern English reflexes.

Bermúdez-Otero (1998: 176f) argues in favour of compensatory lengthening in word of the *tale*-type, i.e. in the only type which unfailingly shows lengthening after the loss of schwa. To account for the variable degree of lengthening in the original CVC-type of words, he argues that monosyllables with a long vowel were more harmonic. They better satisfied a proposed set of constraint hierarchy. This strife towards harmonicity, via lexical diffusion, provided a pressure for original OE words of the CVC-type to assume a long vowel. Admittedly, this did not affect all the eligible words in the lexicon at the time: *lot*, *bath* (the length in standard British English is not a ME development) and *fish* still have a short vowel.[18]

Bermúdez-Otero (1998) goes on to posit a third mechanism to account for the long vowels in words like *raven.* He assumes that the second syllable varied between a syllabic and a non-syllabic pronunciation of the sonorant, i.e. /ravən/ ~ /ravn̩/. If, through an accident of performance, the listener perceived a stimulus /raːvn/, the listener's grammar could then parse this as a well-formed representation for original

[17] The observation that word-final C do not count as coda consonants has received an explanation in Government Phonology (X), where a word final single C is actually the onset of the following unpronounced nucleus.

[18] Some words such *hen* (OE < *henn*), *cat* (< *catt*), for example, can be exempted from this process because presumably at the time of MEOSL, these words still contained a geminate and as such the stressed vowel was never in an open syllable when the process was active.

/ravən/. It seems that somehow the mora associated with the underlying non-syllabic sonorant was attracted into the stressed vowel. The problems with this is that something essentially non-phonological (performance accident) is used to explain something essentially phonological (lengthening). In addition, /ravən/ went from a two-mora stage to three-mora stage. If the same process is at work in the tale-type of words, one would expect a non-syllabic pronunciation for the sonorant in *raven* after the mora-transfer (similarly to the lost schwa in tale). This is not the case, however. In addition to this, this analysis goes against Bermúdez-Otero's own analysis that ME allowed mora-transfer but not mora-insertion. He does not account for the shortening of original long OE vowels either.

2.4. MEOSL -a summary of what we know and what has gone unnoticed

In what follows a short summary is given on what is known for fact about MEOSL:

(i) MEOSL operates unfailingly only in C_0VCə words (*talu* > *tāl*)
(ii) OE C_0VVC (*bāt*) words surface with a long V in ME; original trisyllabic words come down with a short vowel (*wĭdewe*)
(iii) TRISH operates in OE C_0VVCVC(C)VC words turning them into C_0VCVC(C)VC words (*hāringas* > *hĕringes*)
(iv) TRISH counteracts the effects of MEOSL (ME *sādəl ~ sădeles*; *hāringas* > *hĕringes*);[19] in other words, the processes in (iii) and (iv) are in complementary distribution.

The problematic areas concern the following issues (cf. also Starčević 2006):

(i) ME words in *-y* (OE < *iġ* or vocalised /ɡ/ in a palatal environment) seem to inhibit MEOSL: e.g. OE *belġ* > ME *belly* 'belly', *felġ* > *felly* 'outer rim of a wheel', *byrġan* > *burye(n)* 'bury', *bisiġ* > *bisy* 'busy', *bodiġ* > *body* 'body', *myriġ* > *mirry* 'merry', etc.

In these words there is variation in ME (Wright & Wright 1928: §91, Dobson 1968: Ch. VI): both original long and short vowels appear as both short and long, respectively: e.g. OE *ānig* > ME *ēny/ĕny/ăny* 'any', *bodig* > *bōdy/bŏdy*) but in standard English there are no long vowels surviving before the OE suffiy *-iġ*. One of the explanations for the prevalence of short vowels in these words is secondary stress on the suffix (Lass 1992: 73).

(ii) There is another source of complications: the vocalisation of OE /w/ and /ɡ/ > /u/ or /o/ (Dobson 1968: §295).[20] In such cases there is hardly any

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[19] Note again that, from the point of view of ME, *hāringas* can as well be taken to come from OE ***hĕring* with regular lengthening in open syllables (MEOSL). It is only OE that disambiguates the situation.

[20] The best formulation would be to say that OE [ɣ] (an allophone of /ɡ/) merged first with /w/ from where they share the same path of development. Already in late OE West-Saxon texts (before the vocalisation of the velar fricative) a 'parasitic' vowel (Campbell 1959: §365) /i/ <i> or /u/ <u> develops after a short syllable and before /j/ <ġ> and /w/ which later appears as <i> (or less frequently <e>) and <u> (which is also recorded as <o> or <e>), respectively: *heriġas* (< *herġas*) 'armies', *byriġ* (< *byrġ*) 'city, dat.sg.', *byriġan* (< *byrġan*) 'bury', *beaduwe* (< *beadwe*) 'beetle, dat.sg.', *seonuwa* (< *seonwa*) 'sin-

convincing evidence for long vowels (Dobson 1968; Ch. VI): e.g. OE *ăr(e)we* > *arrow*, *sċeădwe* > *shăd(o)we*, *bĕlgan* > *bĕll(o)we(n)* 'roar', *bĕlga* > *bĕllow* 'belly', *bŭrg/bŭrh* > *bŭrrow* 'borough', *fĕalg/fĕalh* > *făllow* 'fallow', *fĕlga* > *fĕllow* 'outer rim of a wheel', *fĕalwe* > *făllow* 'red', *tălg* > *tăllow* 'tallow', *wălwian* > *wăll(o)we(n)* 'wallow', *spĕarwe* > *spărwe* 'sparrow'. etc.

These examples are usually grouped together under the label of "other words that present some kind of special circumstance" (Lahiri & Dresher 1999: 694), such as the presence of a consonant cluster after the vowel or the presence of a trisyllabic form, which for ME *shadwe* 'shadow' seems impossible (***shadweəs* 'pl.'); there is no evidence (e.g. metrics and scansion) to support a trisyllabic pronunciation. Secondary stress, to my knowledge, has not been claimed to account for the absence of lengthening in (ii).

These two sources are the only native sources for ME unreduced unstressed vowels. The rest of the unstressed vowels, i.e. *a*, *o*, *e* and *u*, were levelled to schwa between OE and early ME and disappeared altogether in late ME.[21]

(iii) One of the other overlooked or rarely discussed issues is the shortening of original OE long vowels before ME /i/ and /u/ (from the sources in (i) and (ii) above): e.g. *ānig* > *any*, *sărig* > *sorry*, *(ge)rādig* > *ready*, *mādwe* > *meadow*, *hāligdæġ*> *holiday*, *hālybut* (recorded in the thirteenth century) > *halibut* (also as *holibut*) 'flatfish', *hāliġdom* > *halidom* 'holy relics', *hāliġ*> *holly* 'holy, dial'. These words also show a great deal of variation between short and long vowels in ME.

The problematic areas listed in (i) -(iii) will be tackled in 3.

(iv) HOL is traditionally claimed to be counteracted by SHOCC: cf. *chīld* vs. *children*/*childer* (dial.), *wīld* vs. *wilderness*/*bewilder*, *old* vs. *alderman* 'high ranking council official' (<a> /ɔː/ is a later development). In view of a 'natural' phonetic account of lengthening in closed syllables before a voiced cluster, it is difficult to understand why another voiced consonant (a sonorant, which is either syllabic or not, cf. Dobson 1968: §319-§332) should shorten the very same vowel. If anything, it should support the length of the affected vowel.
Closely connected to this is the absence of lengthening before OE sonorant geminates: e.g. OE *wĭlla*, *sĕllan*, *tĕllan*, *w(e)ăll*, *sŭnne* > ME *sĕlle(n)*, *tĕlle(n)*, *wăll*, *sŭnne* 'will, sell, tell, wall, sun'. This also seems to run counter to the

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ews', *swaluwe* (< *sw(e)alwe*) 'swallow'. Campbell says that /ij/ can be monophthongised to *i* (sic!): *byriweard* (< *burġweard*) 'townguard', *fylian* (< *fyliġan* < *fylġan* < **fylgjan*) 'follow'. It is not clear whether he means /i/ or /iː/, but the ME developments (the stability of this *i* to reduce to schwa, cf. *belly* < *beliġ* < *belġ*) suggest a long vowel. If this monophthongisation already took place in OE, then the long vowel may also have joined the short vowels in the reduction process between OE and ME, the only difference being that here reduction meant loss of length. If so, this vowel is short in ME. Campbell is silent on whether the same happened to /uw/ > /uː/. Yet, the ME developments show that this vowel also failed to become a schwa. Also, the <w> that appears in spelling may simply show a hiatus filler: /folu(ː)wən/.

[21] Apart from, for example, *borough* /bʌrə/, which is standard pronunciation now (but the rest of the words in this group can also end in schwa in certain dialects or sociolects, especially *fellow*). Even granting this, these schwas do not originate in ME schwas.

expectations that a short vowel was perceived longer (and later lexicalised as such) in a (fully) voiced environment.[22]
It has also gone unnoticed that OE monomorphemic words whose vowels would qualify as input to HOL have not undergone lengthening and there is almost no variation recorded in the sixteenth to the eighteenth century (cf. Dobson 1968). Some modern examples follow: *behīnd* vs. *hinder*, *clīmb* vs. *clămber*, *bound* vs. *asunder*, *wīld* vs. *bewĭlder*, etc.

(v) There is another source of indeterminacy in the outcome of the OE short vowel: cf. *saddle* (< *sadol*) vs. *cradle* (< *cradol*). In Bermúdez-Otero's (1998) account, as pointed out earlier, the sonorant of the coda (cf. /ravən/~/ravn̩/) contributed to lengthening. Ritt (1994), see above, similarly, attributes the probability of lengthening to coda sonority. Jones (1989: 118) comes to the opposite conclusion: when the coda of the second syllable is a sonorant, lengthening is blocked. Whatever the exact phonological conditioning behind this change, both approaches have to face the fact that levelling occurs in both directions. The descendants of disyllabic nouns with a short stressed vowel and a sonorant coda are both long and short in modern English (cf. Lahiri & Dresher 1999: 691). It seems as if the theories on the relevance of the coda consonant describe two disparate events. The phonological reason (as opposed to various dispersion theories of individual lexical items) for the varied modern English picture probably lies in a better understanding of how MEOSL was implemented in the various dialects of English in ME.

These problems will not be tackled in this paper.

3. Was there a ME template in a phonological sense?

In this section some evidence will be given in support of a ME template. This template will be a CVCV template. Now the word template is not understood as a description for surface-adjacent vowels and consonants, but as a CVCV template in the strict sense of the term.

3.1. The background in a nutshell

The following sections will investigate whether there existed a ME template responsible for some of the changes described in the foregoing section. The analysis will be couched in terms of CVCV phonology which aims at being maximally lateral, local, non-derivational and doing away with disjunctive contexts in favour of

[22] One could argue that degemination postdates MEOSL, i.e. the short vowel was in a closed syllable when the rule operated. This would bring it in line with OE words containing a non-sonorant geminate (e.g. *bedd*; ME *bed ~ beddes*), as well as the class of newly created non-sonorant (monomorphemic) geminates (OE *mētan ~ mētte* > *mēte(n) ~ mĕtte* 'meet ~ met'). As can be seen, original obstruent geminates fell together with the new geminates. The absence of lengthening can be explained by closed syllable shortening. Yet, the question remains: why were sonorant geminates as opposed to sonorant plus voiced consonant clusters (subject to HOL) less sonorous, not allowing for phonetic (and phonological) reinterpretation of the short vowel as long.

uniform phonological explanations behind apparently disparate contexts (such as 'l-vocalisation happens word-finally and before a consonant'). This means in essence that complex arboreal structures characteristic of post-SPE decades revolving around the rediscovery of the syllable as a unit of phonological analysis have been completely done away with. CVCV phonology is an offspring of Government Phonology (Kaye et al. 1985, 1990) but is even more radical than its predecessor and brings some of its conclusions to a maximal level of generality. Every string of adjacent consonants (C's) and vowels (V's) is only virtual (see e.g. Lowenstamm 1996, 1999, Ségéral & Scheer 1999, and, for a full exposition of these ideas, Scheer 2004; as well as Cyran 2006 for a critique of Scheer 2004). There is the skeleton that is built of C's and V's. Below the skeleton is the melody that is responsible for such contrasts as /ɑ/ vs. /o/, for example (see Harris & Lindsey (1995) for an exposition). Above the skeleton there is government and licensing, the only two 'forces' that CVCV phonology admits into its toolbox. It is also assumed that these two forces always operate from right to left. Metaphorically speaking, licensing is a 'good' force (as suggested by its name), it supports C's in their melodic integrity (a C which is targeted by licensing is backed up by the following V and is, both synchronically and diachronically, more resistant to melodic decomposition; C's are strong in word-initial position and after a consonant).[23] Government, on the other hand, is a 'bad' force which destroys melodic material and leads to lenition.[24] Of the two phonological primes, it is pronounced V's that (generally speaking) can always license and govern; C's are less endowed: they cannot license a V, nor govern it and C-to-C government and licensing is a disputed issue (cf. Sheer 2004: 176 for a more elaborate discussion). Consider the following representations of long V's/diphthongs and geminate C's in (16).

(23) long vowel/diphthong[25] geminate

[23] This may sound like a typical disjunctive context known from SPE times, but this is merely a description with a unique explanation behind it: licensing, which can be observed word-initially and after a consonant (also known as the Coda Mirror in CVCV phonology).

[24] This division of labour does not mean that a C hit by government will necessarily be less complex at any given stage of a language than a C targeted by licensing. A C hit by government can be as complex as one hit by licensing and can survive as such for an indeterminate amount of time (from a diachronic perspective). The opposition between licensing and government means that one can predict what will happen to a C and where (the when part is left out of the equation, of course, because the actuation of a process is beyond phonology as yet): word-initially and after a C, if followed by a V, C's are strong and as such one can predict that these C's will be relatively stronger than their intervocalic, pre-consonantal or word-final peers when a change sets in. The difference between the two sources allows one to make predictions.

[25] The difference between the two is just a matter of how many melodic 'bundles' there are: one (associated to two V's) in the case of a long V and two associated to two V's in the case of a diphthong. A similar explanation pertains to full (e.g. bb/bː) and partial geminates (e.g. mb): again, two C positions are occupied by either one or two melodic 'bundles', respectively.

3.2. V-to-V licensing and government

Licensing was described above as a force which supports melodic material (or, at least, makes it less prone to reduction/simplification). Government, on the other hand, was a destructive force which is responsible for melodic decomposition. If government from a V hits another V, this V is expected to undergo lenition, which in the case of a V means that it will alternate with zero. This is called syncope or vowel-zero alternation. This means that a V will disappear if hit by government, it if it is followed by another vowel. In case it is not followed by a V, it will surface again, i.e. there will be no syncope. Consider the examples shown in (24) where Ø shows an unpronounced/syncopated or zero vowel.

(24) V-to-V government (vowel-zero alternation/syncope)

DESCRIPTION		OPEN SYLLABLE	CLOSED SYLABLE
PHENOMENON		Ø	V
examples/languages			
	English	*festØring* /festrɪŋ	*fester* /festə/
	Hungarian	*karØmot* ‘claw’	*karom* ‘id. acc.’
	Croatian	*festØma* ‘fair ground’	*sajam* ‘id. gen.’

As opposed to this, V-to-V licensing is the exact opposite of the pattern in (24). Here, a long V is found in an open syllable, i.e. when it is supported by the following vowel (recall: all forces apply from right to left), and a short one in a closed syllable (i.e. when no support is possible). A selection of examples is taken from Scheer (2004: 180), shown in (25).

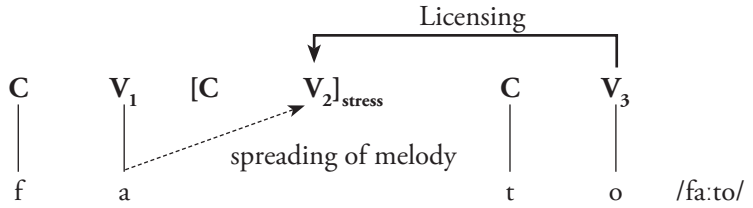
(25) V-to-V licensing

DESCRIPTION		OPEN SYLLABLE	CLOSED SYLABLE
PHENOMENON		VV	V
examples/languages			
	Czech	*žába* /ʒaːba/ ‘frog’	*žáb* /ʒab/ ‘id. gen. pl.’
	Icelandic	*lúða* /luːða/ ‘halibut’	*harka* /harka/ ‘severity’
	Italian	*fato* /faːto/ ‘fait’	*parco* /parko/ ‘park’
	Southern French	*fêter* /fete/ (+ATR) ‘to celebrate’	*fête* /fɛt/ (–ATR) ‘feast’

Scheer (2004) claims that open syllable lengthening and tonic lengthening is the same process because there appears to be no examples for open syllable lengthening

unless the vowel is stressed. It is also claimed that open syllable lengthening involves the addition of an empty CV unit to the stressed vowel in case this unit is licensed by the following vowel. The V part of this additional CV unit will be the target of spreading of melody from the preceding V: in other words, lengthening can only be found in open syllables if the melody-to-spread linked to V is stressed.[26] Consider the representation in (26).

(26) Tonic/Open syllable lengthening in Italian



If Italian allowed lexical words to end in consonants, the expectations are that this vowel would surface as short, i.e. as /fat/.[27] This expectation is borne out in Czech: *žába* vs. *žab*. As can be seen, V-to-V licensing is CVCV phonology's answer to open/tonic syllable lengthening: V3 licenses (supports) the introduction of a CV unit into the structure onto which the original melody linked to V_1 spreads creating a long V (superficially a V_1V_2 structure).

3.3. Has there ever been a CVCV template in English?

The discussion of this topic would present too much of a diversion at this point because ME processes would have to be evaluated against OE and Germanic data (see e.g. McCully (1996) for a discussion of poetic templates).

There is, however, indication that OE shows a number of regularities that are sensitive to the so-called Germanic foot, proposed by Dresher & Lahiri (1991). The Germanic foot is an attempt to demonstrate that a heavy syllable (H) is phonotactically identical to a sequence of a light syllable (L) followed by either a light or a heavy syllable. This can be seen in (27)

(27) The Germanic foot

H = **L X**, where **X** is either **H** or **L**

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[26] It is claimed (Scheer 2004: 176) that "it would be bewildering if closed syllable lengthening were found in natural language". It seems then that HOL in ME is a process unexpected. As we have seen, HOL seems to be blocked exactly in those circumstances in which some clever trick (typically a homorganic voiced cluster counted as a single C, as in Ritt 1994) could produce an open syllable: cf. *behind* vs. *hinder*. This aspect of the process will not be discussed here.

[27] The issue is complicated by alternating and non-alternating long vowels, which coexist in Czech, for example: *žába ~ žab* vs. *flámové* 'Flemish person, nom.pl.' ~ *flám* 'id. nom.sg.', respectively. Data like this suggests a different representation for these two phonetically identical vowels. Scheer suggests a difference between head-final (*flám*) and head-initial long vowels (*žába*). Note that this does not help in deciding what sort of a long vowel Italian /a:/ is (it cannot be tested).

The proof for this equation comes from a number of sources in OE:

(i) *High Vowel Deletion*: this process deletes pre-OE **i* and **u* if followed be either a stressed H syllable or a L syllable and another syllable. They remained after a stressed L syllable or a stressed H syllable followed by a L syllable: e.g. *word* (< **word<u>u</u>* H) 'words' vs. *sċip<u>u</u>* (< **scip<u>u</u>* L) 'ships', *fēt* (< **fēt<u>i</u>* H) vs. *hnyt<u>e</u>* (< **hnyt<u>i</u>* L, with <e> representing pre-OE **i* not lost to this process), *we(o)rod* (< * *weorodu* L L) 'troops', *færeld* (< **færeldu* L H) 'journeys', *hēafod<u>u</u>* (< **hēafod<u>u</u>* H L) 'heads'. As can be seen, word (H) patterns together *we(o)rod* (L X),[28] cf. Campbell 1959: §345-§354 for further details.[29] So, phonotactically **H** is identical to **L X**.

(ii) *Main stress assignment*: *hĕafod*, *wéorod*, etc. (see Suphi 1988 and Fran 1994 for a different view).

(iii) *Resolution* in poetic meter (Sievers 1893, Kuryłowicz 1948/1949, etc.), discussed in Kaluza 1896, Lass 1983, Dresher & Lahiri 1991, Fulk 2002, Cable 2003, etc.
Lahiri & Dresher (1991: 261) claim that "The correspondence between H and L X is evident in the rule of Resolution [...] which plays a role in Old English verse: in a metrical pattern, a light stressed syllable followed by any unstressed syllable is considered equivalent to a single heavy stressed syllable". Their examples, taken from Beowulf, are *sel* (H) = *hete* (L L) = *sigor*/*cyning* (L H).

Fulk (2002) comes up with a generalisation: (i) under primary stress resolution is obligatory, (ii) under secondary stress, it is optional, but if it occurs, it is only possible if the endings involved after the stressed vowels are etymologically short and (iii) if no stress, there is no resolution. The remark on etymologically short vs. long endings is in order at this point: etymologically short endings come historically from Germanic short vowels or long vowels with the so-called normal tone, whereas etymologically long vowels come from the so-called trimoraic vowels of Germanic, those with abnormal intonation or Schleifton (see Campbell 1959: Ch. VII for further clarification).[30]

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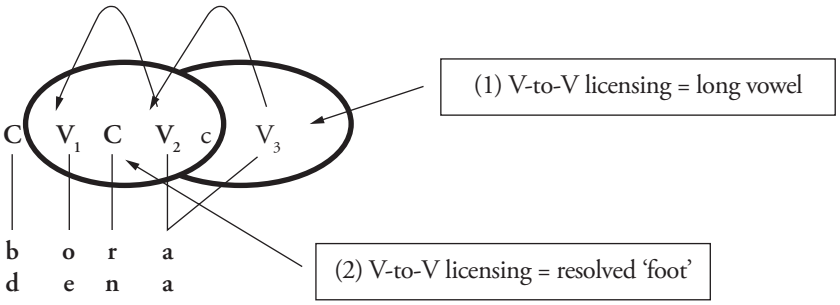
[28] The stressed syllable of *weorod* does not contain a diphthong, as suggested by the spelling <eo>. These controversial sounds are the so-called short-diphthongs that were L, hence the notation *we(o)rod* at this point.

[29] Note that *hēafodu* (up to the plural suffix *-u*) is H L and as such preserves the **u* (H L L). Similar forms are *nītenu* 'creatures', *mæġdenu* 'girls'. A monomorphemic word having the H H pattern followed by **u* where the second H is supplied by a long V or diphthong is a possibility to consider. Such examples are impossible to find as unstressed long vowels and diphthongs underwent shortening in pre-OE times. The expectations are that **i*/**u* would have been lost in such cases as they are preceded by a H syllable. There are, however, examples where the second H syllable is supplied by a consonant cluster, e.g. *īsern* 'iron'. Again, the loss of **u* is expected.

[30] Some examples follow: short endings (*ō*-stem nom. sg. fem. OE *-u* < Germanic **-ō*, *i*-stem nom. sing. masc. OE *-e* < **-i* < Germanic **-iz*) vs. long endings (*a*-stem gen. pl. OE *-a* < Germanic **-ôm*; *ō*-stem nom. pl. OE *-a* < Germanic **-ôm*). Probably, abnormal tone was reinterpreted as length, so vowels with abnormal tone counted as long; by this time, however, the original long vowels (with normal intonation) fell together with the short ones. The shortening of vowels with abnormal intonation is later (pre-OE) than the West-Germanic shortening of long vowels with normal intonation (cf. Campbell 1959: §331 and §355). Note that long vowels with abnormal intonation are only found in suffixes, never word-internally. As observed in the previous footnote, this is why in OE it is impossible to find long unstressed vowels/diphthongs supplying the second H in the Germanic foot.

This distinction seems to have been preserved until very early OE and was later maintained in poetic tradition although by the earliest written documents its phonological basis was probably lost altogether (cf. Hogg 1992: 232). As a result of this, in OE poetry there is no resolution in words like *bora* (OE *-a* < **-ô*) 'ruler' and *Dena* (OE *-a* < **-ôm*) 'of the Danes'. The reason for this is the (original) length of the second vowel. More precisely then, *borā* and *Denā*. The question arises why resolution (H = L X) is banned if the vowel to be resolved is long. CVCV phonology's answer that I propose reads as follows: no sharing of licensing between vowels (see 28)).[31]

(28) 'No sharing of licensing'



Fulk (2002: 333), discussing evidence from OE poetry, remarks that unresolved sequences like *Dena lēodum* 'to the Danish people' in either half of an OE line are vanishingly rare and can be treated as textual corruption. This is not surprising in view of the constraint proposed above. Resolution is in fact impossible if there is a vowel (V_2 above) that would have to straddle two domains (a resolved foot and a long vowel). This lends some evidence in favour of regarding some phenomena of OE as templatic.[32] For lack of space, other possible evidence in favour of a template will not be considered here. Yet, this argumentation will hopefully put in perspective the ME changes.

4. MEOSL as template superimposition

The following sections will try to account for MEOSL in terms of a CVCV template inherited from OE.

4.1. What we know and how we can account for it

It would be impossible to assess the changes affecting the various dialects of English, but what we do know about standard British English is that there are no

[31] A similar constraint is proposed by Szigetvári (1999). This one, however, bans a long vowel before a coda-onset cluster, i.e. it explains a common phenomenon in language, closed syllable shortening.

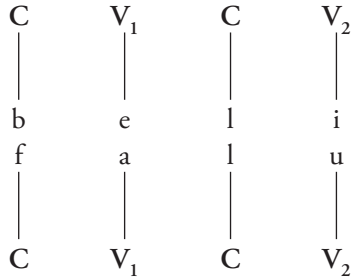
[32] Fulk also discusses resolution in Poema Morale, a very early ME piece of poetry, which shows that two L syllables were resolved and were equivalent to a H syllable in the same position. The possibility of resolution is lost altogether in later ME poetry.

long vowels before *-ow* in words of OE origin (cf. *wallow*, *fallow*, *borough*, etc.)[33] and there are also no long vowels in monomorphemic words before *-y* (*belly*, *felly*, *body*). Dobson (1968) does record ME variation before *-y* continued into the sixteenth century, but variation before *-ow* is almost non-existent. This fact could be explained by the fact that *-ow* was never regarded as a suffix (which is certainly true from the diachronic perspective) and words containing it were analysed (or rather, were continued to be analysed) as morphologically simplex since there was no ground for morphological reanalysis. As opposed to this, words having the suffix *-y* could have been subjected to morphological reanalysis under the influence of the suffix *-y* (< *-iġ*) in which case, regardless of the fact whether the word was originally monomorphemic like *body* or morphologically complex like *holy*, a greater degree of variation is to be expected. Even granting this source of variation, standard British English shows no long vowels before monomorphemic words ending in *-y*.

If one assumes that a monomorphemic word showed no lengthening in open syllables, this can be an indication of a ME template that looked for melodically specified vowels to 'hook onto'. Melodically specified here means a vowel other than schwa (which stands for a melodically empty V which is not governed and thus has to be pronounced). This is disputed by Scheer (2004) but is not directly relevant for this analysis.

If two melodically specified V's were found, the CVCV template was superimposed and there was no lengthening. The only two melodically specified V's word-finally in disyllabic words were /i/ and /u/. The templatic account is shown in (22).

(29) ME /beli/ and /falu/ < *bel(i)ġ* and *fealg*



This would explain one of the often-cited exceptions to MEOSL.

In case, the word-final vowel in disyllables was a schwa, the template looked for the nearest melodically specified V, which could only be found word-initially, as the continuation of the original OE stressed short vowel. In this case, there was an additional CV to be occupied (shown as c_2V_2 in (30))[34] and the melody of the initial vowel was free to spread onto it creating thus a long vowel. Note that this is only pos-

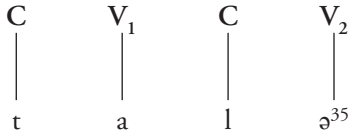
[33] A word like *halo* (forming a 'minimal pair' with *hallow*) was first recorded in the sixteenth century (ODEE). It probably entered the language with a long stressed vowel.

[34] In VC phonology (Szigetvári 1999) 'c' represents an empty, i.e. unpronounced consonant, as this one which is found inside a long vowel.

sible if there is a pronounced vowel (a schwa in our case) after the template that licenses the template and, indirectly, the spreading of melody. This is reminiscent of Italian Tonic lengthening. The ME vowel was a head-initial vowel under this analysis.

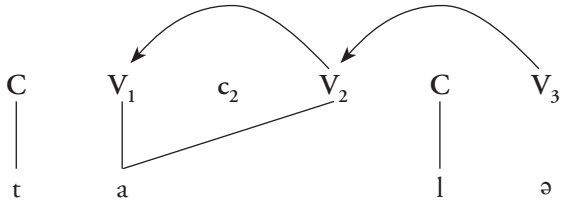
(30) MEOSL 'proper'

Before the application of the template



[35]

After the application of the template



This case of MEOSL was referred to above as MEOSL 'proper', i.e. lengthening that applies unfailingly.

This process explains why there is no templatic superimposition in monosyllables. There is no schwa to license the template. Of course, one of the problematic areas of MEOSL is presented by OE monosyllabic words that end up with a long vowel in ME (e.g. OE *hŏl* > ME *hōlə*). This class of words was analysed by Lahiri & Dresher (1999) as analogical levelling from the oblique forms (cf. *hŏl* 'nom. sing' ~ *hōləs* 'nom. pl.'). Under the analysis suggested here, and allowing phonology to explain phonological effects, one has to admit that the OE word *hŏl* was lexicalised as *hŏlə* before MEOSL became active. After this moment, *hōlə* is just like *tālə* (< *tālu*). Monosyllables, under this account, are just apparently problematic.

4.2. Shortening in *sorry*-type words

The problems concerning words like *sorry* (< *sārig*) and *meadow* (< *mædwe*) will not be exhaustively described here because it seems to be one of those problematic areas that are intertwined with the notion of TRISH, both in native and French loan words.

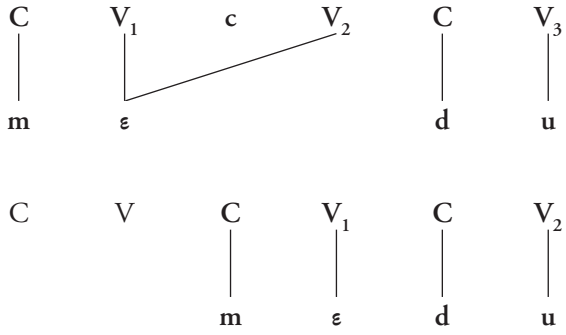
In the previous section the direction of template superimposition was not mentioned, but it was assumed that it proceeded from the left edge of the word. This would be in line with the Germanic pattern of stress placement which is fixed on the stem of the word in case of non-compound words. Whether the suggested CVCV template and stress placement are coextensive still awaits further research, but there is indication that OE secondary stress depended on the vowel that followed the ac-

[35] The absence of an association line above schwa is not accidental: schwas can be considered to be the realisations of V's having no melodically specified melody, as already discussed.

tual secondary-stressed vowel (for details see Campbell 1959: §87-§92): it seems that secondary stress only appeared on vowels followed by a vowel. This suggests that primary and secondary stress were calculated differently: primary stress was fixed (and dependent on morpho-syntactic information, such as noun vs. verb), whereas secondary stress was calculated from the end of the word if the right environment was met (i.e. if there was a following vowel after an eligible unstressed one). The calculation of stress in English in the ME period was disturbed by French loan words whose stress pattern in some cases was radically different from the Germanic pattern: generally, it was more back-stressed than fore-stressed (the usual pattern in OE). Some aspects of TRISH are discussed in Lahiri & Fikkert 1999. Romance loans had a great impact on the pattern of stress placement and this is mirrored in theory by the fact that stress is calculated from the end, i.e. the right edge of the word (cf. Hogg & McCully 1987 and the references cited therein) involving extrametricality that works differently for nouns as it does for verbs. Actually, Germanic words hardly ever feature prominently in such analyses because they are simply too short to be subjected to various tests.

One impact that Romance loans might have exercised on ME was the change in which the inherited ME template was superimposed. This could explain the shortening in monomorphemic words like *sorry* and *meadow* (shown below). This issue cannot be taken up here but some discussion, albeit not in terms of a template, is offered in Kim (2002) who takes up the problem of the simultaneous application of the Germanic and the Norman French stress rules to native and borrowed words. It is argued, in essence, that there was a tug of war between the old Germanic and the new Romance accentuation pattern with the observable drive to place primary stress on the first syllable. It is conjectured here that this may also have resulted in changes in the native vocabulary (contra Kim who claims that native words can only be subject to the Germanic stress rule and as such are always stem-stressed or, less typically, prefix-stressed). The relationship between the two stress rules and the supposed templatic superimposition cannot be satisfactorily answered here.

(31) Shortening in *sorry* and *meadow*



As can be seen, the template is applied from the right edge and as a result the vowel is shortened. This also involves re-lexicalisation, because the initial CV slot

is now empty and gets deleted. This is a diachronic process which is reflected in the synchronic reality of the language. This analysis leaves many questions open, e.g. (i) how exactly is the material found under the first C moved to the originally empty c, (ii) was this right-to-left template superimposition a feature of some dialects only, (iii) can TRISH in ME be re-analysed along this templatic line (note that sanity was originally stressed on its last syllable when adopted into ME, as it still is in French, and was preceded by two syllables, of which the stressed one comes down as short in modern English). Some doubts about TRISH are tackled in Starčević (2006).

4.3. The *cradle/saddle~ beacon/herring*problem

This is also one of the problematic areas that can only be mentioned in passing here. If one believes that phonology still deals with phonological matters at the stage when a process is active (this leaves disturbing background noises such as analogy and the like out of the picture), then one has to assume that modern English shows a 'cross-contaminated' state which translates into how and when, if at all, the various ME dialects implemented the suggested CVCV template. This is probably one of the aspects that no account can ever hope to handle satisfactorily. The predictions, however, can still be salvaged and this is what phonology is about. Note that OE final vowels were all merged into schwa. If we accept that the template looked for melodically specified V's, then *saddle* (< *sadol*) can come from a dialect which had not levelled its unstressed vowels into schwa when the template was superimposed. If such a dialect existed, it treated *belly* and *sadol* alike. This explains the short vowel in *saddle. Cradle* (< *cradol*), on the other hand, comes from a dialect which levelled its OE unstressed vowels into schwa before the template was superimposed. The issue is also connected to syllabic consonant formation, a process which had already begun in OE, was continued into ME and later stages. The issue is described at length in Dobson (1968: 887-915). A similar assumption can be made about *beacon/herring*. The details of this analysis are still in its infancy.

4.4. Conclusion: what is MEOSL then?

This discussion has hopefully shed some new light on MEOSL: it may be a ME process but it is far from being purely an instance of OSL. The data simply speak against it. It has been argued that MEOSL is actually a templatic change that had its roots in OE and was continued into ME. In the absence of melodically specified vowels (*belly/shadow*), the CVCV template looked for the nearest vowel which was lengthened as a result of melodic spreading to the empty CV slot. This spreading was only possible if the template was licensed by the following vowel (schwa in our case). The template explains why lengthening never fails if the original vowel is followed by schwa and also why there are no long vowels in standard English before *-ow* and *-y*. The rest of the data still defy a unified analysis, but some signposts for further research have been set.

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DEFINITE, EXPLETIVE AND SILENT ARTICLES: [+REF] ELEMENTS HEADING THE DP

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1. Introduction: Definite *vs.* Expletive Articles

When we think of a definite article, we usually think of the form *el/la* in Spanish, *the* in English, *le/la* in French. However, these forms can be either definite articles or expletive articles. Traditional grammars of Spanish (R.A.E. 1973, Alarcos Llorach 1994) only mention definite articles, and they define them as just a feature holder. They claim that the definite article determines the noun in the sense that it carries the gender and number morphemes, and they have to match with those present in the noun. This definition works perfectly for expletive articles. However, they do not mention the fact that sometimes this definite article specifies the noun; it limits the scope of the noun. This would be the main difference between definite and expletive.

Abney (1986, 1987) claims that determiners are functional elements since they fulfil all the features he uses to describe functional elements:

1. they belong to a **closed class** (*el/la/los/las* in Spanish, *the* in English, *-a* in Basque);
2. they are **morphologically dependent** on the noun they accompany

(1) a. l'amie
the-friend

b. laguna
friend-the

3. they **allow only one complement**

(2) a. el cigarro y la pipa
the cigarette and the pipe

b. *el cigarro y pipa
the cigarette and pipe

4. they are **inseparable from their complements**

(3) a. LA MANTEQUILLA puse en la nevera
the butter put in the fridge
'THE BUTTER I put in the fridge'

b. *MANTEQUILLA puse la en la nevera
butter put the in the fridge
'*BUTTER I put the in the fridge'

Rebeka Campos-Astorkiza & Jon Franco (eds.), *Papers in linguistics by the BIDE generation, Anuario del Seminario de Filología Vasca «Julio de Urquijo»* XLVI-1 (2012), 337-344.

5. they have **no semantic meaning,** they lack descriptive meaning since they mark grammatical or relational features, rather than picking out a class of objects.

(4) a. me gusta el café
me like the coffee
'I like the coffee/I like coffee'

b. *me gusta café
me like coffee
'I like coffee'

According to Abney, and especially to this last feature, determiners can spell-out the definiteness of the NP they are heading, but they may also be present in a DP with non-specific interpretation, just as an expletive element which needs to be present in the sentence when a bare NP is not grammatically allowed, as in (4b).

Bernstein (1991b) points out that there exist two types of nominal head movement inside the Romance DP. The first one corresponds to Rumanian DPs (Dobrovie-Sorin 1987), where the noun syntactically adjoins to the left of the determiner, because the article is enclitic to the noun:

(5) băiat-ul
boy the

The second case of syntactic and LF N-to-D movement has been proposed by Longobardi (1990). This second type of movement is the one that allows the noun to assume its referential function, the one concerning word order relationships among adjectives, internal and external arguments, and nouns. In their way towards D°, nouns need some intermediate landing sites where they can check different features. This is a third type of movement proposed in Cinque (1994), where a syntactic N-movement is forced by the checking of strong morphological features of the noun, such as Number or Gender, overtly present in the different Romance languages. Departing from this point, many authors have proposed several functional projections to the structure. Mallén (1989, 1990a, 1990b) argues for a QP/Nominal INFL Phrase; Bernstein (1991b, 1992, 1993), for a Number Phrase, and Bernstein (1993) for a Word Marker Phrase (WMP); Picallo (1991), for a NumP and Gender Phrase; Valois (1991a), for NumP and Case Phrase; Delfitto and Schroten (1991) and Cinque (1994), for an Agreement Phrase (AGRP), and Ishikawa (1997) for an Affix Phrase.

2. The silent article *art*

2.1. Bare NPs

In Spanish, as well as in other Romance languages, we can find bare NPs in several positions. This would not be a rare case if these bare NPs appeared in non-argument positions, such as appositions or vocatives (6-7), since NPs in argument positions must check a [R(eferential)] feature with D° in the derivation (Longobardi 1990, 1994); nonetheless, we will see that we can also find bare NPs in argument positions (8-9):

(6) Ecuador, equipo revelación de la temporada, pasó a la segunda ronda
Ecuador team revelation of the season passed to the second round

(7) Dime, reina, ¿dónde vamos?
tell-me queen where go
'Tell me, sweetie, where are we going?'

(8) Ayer compré flores
yesterday bought flowers
'I bought flowers yesterday'

(9) Anoche llegaron visitantes inesperados
last night arrived visitors unexpected
'Unexpected visitors arrived last night'

We are going to show that this fact depends not only on the position they occupy, but also on the type of noun present in the DP. Chierchia (1998) proposes his Nominal Mapping Parameter,[1] a semantic typology of languages depending on the fact that a language can choose its NPs to denote only kinds, only predicates or either one or the other. Chierchia claims that NPs denote predicates of type <e,t>, whereas DPs denote arguments of type <e>; therefore, an NP must be embedded in a DP in order to occupy an argument position. Nevertheless, as we have already mentioned, it is the language that chooses what its NPs denote. The typology is as follows:

(10) Nominal Mapping Parameter:
  a. [+arg., –pred.] (e.g. Chinese)
    i. generalized bare arguments
    ii. all nouns are mass nouns
    iii. no plural morphology
    iv. generalized classifier system
  b. [–arg. +pred] (e.g. French)
    i. no bare nominals in argument position
    ii. count and mass nouns
    iii. morphological plural
  c. [+arg., +pred.] (e.g. English)
    i. bare mass nouns and plural count nouns in argument position
    ii. no bare singular count nouns in argument position
    iii. plural morphology
  d. [–arg. –pred.] (do not exist)

Paying attention to Chierchia's Nominal Mapping Parameter, we find that Spanish, like English, belongs to group C, [+arg., +pred.], although we will see that they vary in their distribution, as we have already mentioned, depending on their position in the sentence and on the type of noun.

[1] For a complete discussion against Chierchia's Nominal Mapping Parameter see Munn and Schmitt (1999a, 1999b). They present evidence against this classification for Brazilian Portuguese.

2.2. Types of nouns

We need to distinguish first between proper and common nouns. The first difference between them is that, in Spanish, as in many other Romance languages[2] proper nouns do not need a determiner; in Longobardi's (1990, 1994) terms, they are referential in themselves, this is, they can check the feature [R] present in Dº by raising to this position, without the necessity of an article. On the other hand, common nouns are not referential in general, although we must make another distinction here: mass nouns and plural count nouns vs. singular count nouns.

(11) a. He visto Bilbao
have seen Bilbao
'I've seen Bilbao'

b. He comprado leche
have bought milk
'I've bought mik'

c. *He comprado lápiz
have bought pencil
'*I've bought pencil'

d. He comprado lápices
have bought pencils
'I've bought pencils'

As we can see in these examples, the only noun that cannot appear without a determiner is the singular count noun in (11c). All the others are able to check their referentiality without needing the presence of the article or any other determiner. Traditional grammars (R.A.E. 1973, Abad Nebot 1977, Alonso 1982, Alarcos Llorach 1984, Gili Gaya 1985) usually comment on the fact that singular nouns without determiners represent classes, but they do not refer to individual entities. We can translate this into Longobardi's (1990, 1994) terms, by saying that the Nº position refers to universal concepts, whereas the Dº position determines the particular designation of the whole DP delimiting the broad reference made by the noun. This last claim implies that the Dº position possesses a [R] feature that must be checked in all DP arguments. According to Longobardi (1990, 1994) proper nouns are [+R] in Italian, therefore they must raise to Dº in order to check this feature; nonetheless, common nouns are [–R], they do not need to move, or they cannot move, to check [R], thus, the article is needed on the derivation.

Following Longobardi (1990, 1994), we can consider that, in Spanish as well as in Italian, proper nouns contain the [R] feature, and, since it is a strong [+R], it triggers the movement of the proper noun to Dº:

---

[2] We can find some counterexamples like Catalan, since although it is a Romance language, in Catalan the use of the article with person proper nouns is obligatory, which in these terms would mean that proper nouns in Catalan do not contain the [+R] feature, therefore they cannot check the [R] feature present in Dº:

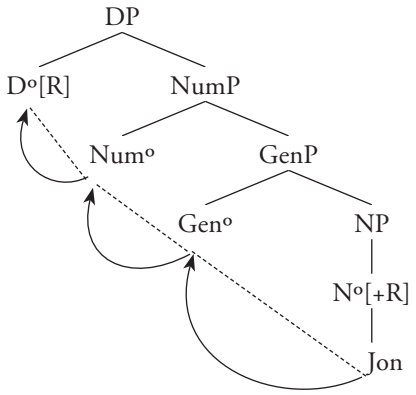
i. va arribar el Joan (Catalan)
past arrive the Joan
'Joan arrived'

Some other counterexamples are some dialects of Spanish, as well as some dialects of Portuguese and Galician:

i. llegó el Juan (Spanish)
arrived the Juan
'Juan arrived'

ii. chegou o Xan (Galician)
arrived the Xan
'Xan arrived'

(12) Proper noun:



As we have seen in examples (11b) and (11d), mass nouns and plural count nouns seem to behave exactly like proper nouns. They can appear as bare NPs. However, there exists a crucial difference between proper nouns and these common nouns: definiteness. Proper nouns are definite by definition, whereas bare common nouns, as we have already said following traditional grammars, represent classes, but they cannot refer to individual entities. This can be considered a reason for singular count nouns to be unable to appear without a determiner heading them. We have to notice that if the definite article is present together with the mass noun or the plural count noun, the DP will be definite, and they will refer to a determined quantity in the case of mass nouns, as we can see if we compare examples a and b in (13) or to a determined group of items in the case of plural count nouns, as shown in examples (14 a&b):[3]

(13) a. He comprado leche
have bought milk
'I've bought milk'

b. He comprado la leche
have bought the milk
'I've bought the milk'

(14) a. He comprado flores
have bought flowers
'I've bought flowers'

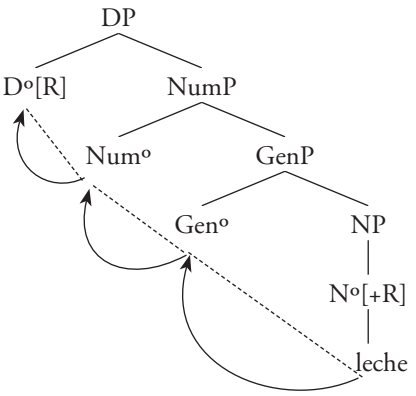
b. He comprado las flores
have bought the flowers
'I've bought the flowers'

2.3. The silent article *art*

Now, we can consider two different structures for bare mass or plural NPs; first, we can think that, since they look like proper nouns, they can contain the same [R] feature:

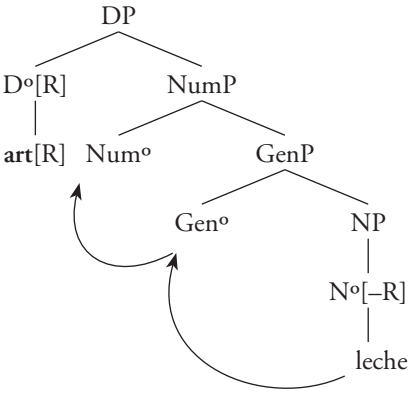
[3] Note that I am only using direct objects in these examples. The argument position they occur in is important, therefore I will devote future sections to the analysis of bare NPs in subject position.

(15)



Nevertheless, this referentiality, understood in Longobardi's terms (1990, 1994), must be some kind of definiteness; thus, since these mass and plural count nouns always have an indefinite sense, they cannot check [R] in Dº. We can now consider the second option we have. All bare common nouns are indefinite, this is [–R], by definition, despite their distribution in the sentence. Therefore, there must exist some element that checks the [R] feature present in Dº in the derivation. I argue that this element is the silent article *art* which will check [R], which must be present in order for the derivation to converge:

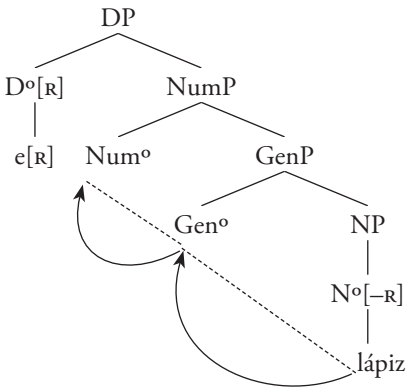
(16)



If we assume the existence of this silent article *art* we can explain the existence of bare NPs in Spanish and some other languages, such as English, although, their distribution in the sentence is different.

Therefore, the existence of this silent article allows us to unify the structure of DPs in argument positions containing common nouns in Spanish, which can never appear without an article, either silent or visible, since now we can easily account for the structure of complete definite DPs:

(17)



2.4. Proper nouns

Longobardi (1994) claims that proper nouns are referential in nature; thus, they do not need any overt article in order to check the [Ref] feature present in the DP, they can raise themselves to Dº in order to check it. Nevertheless, with this approach, we can say that in languages such as Italian or standard Spanish, the silent article *art* is present and this is the element that checks their referentiality. However, in other languages such as Catalan, Portuguese, and some dialects of Spanish, we can find the expletive article.

3. Conclusion

As we have seen in these sections, I argue for the necessity of an article in every DP, therefore I argue for the existence of three different types of articles. First, we have seen that there exists an expletive article which appears in the DP in languages such as Spanish, with singular count nouns in argument position, although it does not need to check definiteness, only referentiality.[4] Secondly, we have seen that the silent article *art* must be present in DPs with mass nouns and plural count nouns when they have an indefinite interpretation, since, although indefinite, they must check their [+Referential] feature. And finally, we have the traditional definite article, the article that really checks both definiteness and referentiality, and it can appear with mass and count nouns, as we can see in table (18):

(18)

	XXX-features	**Definiteness [± Def]**	**Referentiality [± R]**
Definite	✓	✓	✓
Expletive	✓	—	✓
Silent *art*	✓	—	✓

[4] This is the type of article present in DPs with proper nouns in Catalan.

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AION = *Annali dell'Istituto Orientale di Napoli,* Napoli, 1979-

ASJU = *Anuario del Seminario de Filología Vasca "Julio de Urquijo". International Journal of Basque Linguistics and Philology,* Donostia-San Sebastián, 1954-1955, 1967-

Azk = Resurrección M.ª de Azkue, *Diccionario vasco-español-francés,* Bilbao, 1905-1906 [1969[2], 1984[3]].

Azk *Morf* = Id., *Morfología vasca* (*Gramática básica dialectal del euskera*), Bilbao, 1923-1925 [1969[2]].

BAP = *Boletín de la Real Sociedad Vascongada de Amigos del País,* Donostia-San Sebastián, 1945-

BGS = Beitrage zur Geschichte der Sprachwissenschaft, Münster, 1991-

BISS = *Boletín de la Institución "Sancho el Sabio",* Vitoria-Gasteiz, 1957-81. Vide *Sancho el Sabio*.

BMB = *Bulletin du Musée Básque,* Baiona, 1924-43, 1964-

BRAE = *Boletín de la Real Academia Española,* Madrid, 1914-

BRAH = *Boletín de la Real Academia de la Historia,* Madrid, 1877-

BSL = *Bulletin de la Société de Linguistique de Paris,* Paris, 1884-

BLS = (*Proceedings of the*) *Berkeley Linguistics Society,* Univ. of California, Berkeley, 1975-

CAJ = *Central Asiatic Journal,* Wiesbaden, 1955-

Campión = Arturo Campión, *Gramática de los cuatro dialectos literarios de la lengua éuskara,* Iruñea/Pamplona, 1884 [1977[2]].

CEEN = *Cuadernos de Etnografía y Etnología de Navarra,* Pamplona, 1969-

CIL = *Corpus Inscriptionum Latinarum,* Berlin, 1863-

CLAO = *Cahiers de Linguistique - Asie Orientale,* Paris, 1971-

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DCECH = Juan Corominas & José Antonio Pascual, *Diccionario crítico etimológico castellano e hispánico.* Madrid, Gredos, 1980-1991.

DELL = Alfred Ernout & Antoine Meillet, *Dictionnaire étymologique de la langue latine. Histoire des mots,* Paris, 1932 [1939^2, 1951^3, 1959^4].

DGV = vide *OEH*.

Diachronica = *Diachronica. International Journal for Historical Linguistics,* Amsterdam-Philadelphia, 1984-

DRA = Manuel de la Sota, Pierre Lafitte, Lino de Akesolo. et al., *Diccionario Retana de Autoridades de la Lengua Vasca*, Bilbao, 1976-1989.

Euskera = *Euskera. Euskaltzaindiaren lan eta agiriak,* Bilbao, 1920-1936, 1953-

EAA = *Estudios de Arqueología alavesa,* Vitoria-Gasteiz, 1966-

EFDA = Luis Michelena, *Estudio sobre las fuentes del diccionario de Azkue,* Bilbao, 1970 [= Azk 1984].

EFOu = *Études finno-ougriennes,* Paris, 1964-

EH = Ibon Sarasola, *Euskal hiztegia,* Donostia-San Sebastián, 1996.

EI = Ana M.ª Echaide (arg.), *Erizkizundi irukoitza,* Bilbao, 1984.

EJ = *Eusko Jakintza,* Baiona, 1947-1957.

ELH = *Enciclopedia Linguística Hispánica,* Madrid, 1959-

FEW = W. von Wartburg, *Französisches Etymologisches Worterbuch,* Bonn, 1928-

FHV = Luis Michelena, *Fonética histórica vasca,* Anejos de *ASJU* 4, Donostia-San Sebastián, 1961, 1977^2 [1985, 1990].

FLV = *Fontes Linguae Vasconum. Studia et documenta,* Iruñea/Pamplona, 1969-

FL = *Folia Linguistica. Acta Societatis Linguisticae Europaeae,* Berlin-New York, 1967-

FLH = *Folia Linguistica Historica. Acta Societatis Linguisticae Europaeae,* Berlin-New York, 1980-

GH = *Gure Herria,* Baiona, 1921-

HEL = *Histoire, Epistémologie, Langage,* Paris, 1979-

HL = *Historiographia Linguistica: International Journal for the History of the Language Sciences,* John Benjamins, 1974-

HLEH = Ibon Sarasola, *Hauta-lanerako euskal hiztegia,* Donostia-San Sebastián, 1984-1995. Vide *EH*.

HLV = Luis Michelena, *Historia de la literatura vasca,* Madrid, 1960 [1988].

HLV = Luis Villasante, *Historia de la literatura vasca,* Bilbao, 1961, 1979^2.

HomUrq = *Homenaje a don Julio de Urquijo e Ybarra,* Donostia-San Sebastián, 1949-1951.

HSLV = Ibon Sarasola, *Historia social de la literatura vasca,* Madrid, 1976 [1982].

IEW = Julius Pokorny, *Indogermanisches Etymologisches Wörterbuch,* Berna, 1951-1969.

IF = *Indogermanische Forschungen,* Berlin, 1892-

IJAL = *International Journal of American Linguistics,* Chicago, 1917-

IL = *Indian Linguistics. Journal of the Society of India,* Pune (India), 1931-

IMU = *Italia medioevale e umanistica,* Padova, 1958-

Incipit = *Incipit. Seminario de edición y crítica textual,* Buenos Aires, 1981-

JALL = *Journal of African Languages and Linguistics,* Berlin-New York, 1979-

JEAL = *Journal of East Asian Linguistics,* Berlin, etc., 1992-

JWAL = *Journal of West African Languages,* Dallas, 1964-

Lexicographica = *Lexicographica. Internationales Jahrbuch für Lexikographie,* Tübingen, 1985-

Lg = *Language,* Baltimore, 1924-

Lh = P. Lhande, *Dictionnaire basque-français,* Paris, 1926.

LH = Luis Michelena, *Lengua e historia,* Madrid, Paraninfo, 1985.

LI = *Linguistic lnquiry,* Cambridge (Mass.), 1971-

MDEV = Manuel Agud & Antonio Tovar, *Materiales para un diccionario etimológico vasco (A-orloi),* Anejos de *ASJU* 13, 19, 24, 26, 30, 33, 37, Donostia-San Sebastián, 1989-1994.

Memoriae = Joseba A. Lakarra (ed.), *Memoriae L. Mitxelena Magistri Sacrum,* Anejos de *ASJU* 14, Donostia-San Sebastián, 1991.

NLLT = *Natural Language and Linguistic Theory,* Dordrecht, 1983-

NTS = *Norks Tidsskrift for Sprogvidenskap,* Oslo, 1928-

OEH = Luis Michelena, *Diccionario General Vasco. Orotariko Euskal Hiztegia,* Donostia-San Sebastián, 1987-2005.

OL = *Oceanic Linguistics,* Univ. of Hawaii, 1962-

Phonology = *Phonology,* Cambridge, 1984-

PT = Luis Michelena, *Palabras y textos,* Bilbao, UPV/EHU, 1987.

PV = *Príncipe de Viana,* Pamplona, 1940-

RDTP = *Revista de Dialectología y Tradiciones Populares,* Madrid, 1944-

REW = W. Meyer-Lübke, *Romanisches etymologisches Worterbuch,* Heidelberg, 1930^{3}.

RFE = *Revista de Filología Española,* Madrid, 1914-

RIEV = *Revista Internacional de los Estudios Vascos,* Paris-San Sebastián, 1907-1936, 1983-

RLPhC = *Revue de Linguistique et Philologie Comparée,* Paris, 1867-1916.

RPh = *Romance Philology,* Berkeley (CA), 1947-

SAL = *Studies in African Linguistics,* Bloomington (Indiana) / Columbus (Ohio), 1970-

Sancho el Sabio = *Sancho el Sabio: revista de cultura e investigación vasca = euskal kultura eta ikerketa aldizkaria,* Vitoria-Gasteiz, 1991-

SHLV = Luis Michelena, *Sobre historia de la lengua vasca,* Anejos de *ASJU* 10, J. A. Lakarra (ed.), Donostia-San Sebastián, 1988.

Symbolae = José Luis Melena (ed.), *Symbolae Ludovico Mitxelena Septuagenario Oblatae,* Vitoria-Gasteiz, Instituto de Ciencias de la Antigüedad-Antzinate-Zientzien Institutua, 1985.

Syntax = *Syntax, A Journal of Theoretical, Experimental and Interdisciplinary Research,* Oxford, etc., 1998-

TAV = Luis Michelena, *Textos arcaicos vascos,* Madrid, Minotauro, 1964 [= Luis Michelena - Ibon Sarasola, *Textos arcaicos vascos. Contribución,* Anejos de *ASJU* 11, Donostia-San Sebastián, 1989].

TPh = *Transactions of the Philological Society,* London, 1842-

UAJ = *Ural-Altaische Jahrbücher,* Wiesbaden, 1981-

Vinson = Julien Vinson, *Essai d'une bibliographie de la langue basque,* París, 1891-1898 [vide Vinson-Urquijo].

Vinson-Urquijo = Julien Vinson, *Essai... con las anotaciones del ejemplar de Julio de Urquijo,* Anejos de *ASJU* 9, Donostia-San Sebastián, 1984.

ZRPh = *Zeitschrift für romanische Philologie*, Halle, 1877-

EGILEENTZAKO OHARRAK

ASJU-n euskaraz edo nazioarteko zientzi elkarteetan ohiko diren hizkuntzetako batean idatziriko euskal linguistika eta filologiazko lanak argitaratzen dira, baita eremu ezberdin edo zabalago bati atxikiak izan arren, euskalaritzarako interesgarri izan daitezkeenak ere. Originalak helbide honetara bidali behar dira: Joseba A. Lakarra, Hizkuntzalaritza eta Euskal Ikasketak Saila, Letren Fakultatea, Unibertsitateko ibilbidea 5, 01006 Gasteiz (joseba.lakarra@ehu.es).

ASJU-ra igorritako artikuluak gutxienez bi aztertzailek irakurriko dituzte, haien iruzkinak kontuan izanik atera edo ez erabakitzeko; erabakia ahalik eta lasterren gaztigatuko zaie egileei. Artikulua onartzekotan, oztopo, akats edo aldabeharren zerrenda ere emango zaie. Egileek lehendabiziko inprenta probak jasoko dituzte (eta originalarekin batera itzuli beharko dituzte); eskuratzen dituztenetik astebeteko epea izango dute zuzentzeko. Argitaratzailearen baimenik gabe ezingo dute garrantzizko aldaketa, gehiketa edo kenketarik egin. Egileei *ASJU*-ko zenbakiaren ale bana eta lanaren separata elektronikoa emango zaie.

Ez da inongo murrizketarik originalen luzeraz, baina ez lukete izan behar berez behar baino gehiagokoa; lanek zehatzak eta argiak beharko dute izan. Berariazko abegia egingo zaie ohar laburrei, batez ere dagoeneko argitaratu beste lanen bat kritikatzen edo garatzen dutenean.

Originalen hasieran egilearen/egileen helbidea, telefonoa eta helbide elektronikoa ezarriko dira; biko espazioan, orrialde bakarrean, eta zein-nahi argitasun edo zuzenketarako albo guztietan zuriune zabalekin idatzirik aurkeztuko dira lanak. Orrialdeak eta oin-oharrak segidako zerrendan zenbatuko dira. Lana euskarri elektronikoan (programa erabilienetako batean) eta paperean (3 kopia) bidaliko da. Horrekin batera 10-20 lerroko laburpena ere erantsiko da. Aurkeztu baino lehen zuzen bedi ahalik eta hobekienik originala, inprenta hutsak gutxitzeko; orobat, argazki, lauki, mapa, grafiko, taula, irudi, etab. emanez gero, izan bitez kalitaterik handienekoak gardentasunik gal ez dezaten. Hauek guztiak zenbatuko dira eta ezagutzeko oinperpaus laburra erantsiko zaie, testuan ere non jarri nahi diren argiro markaturik. Adibideak zenbatu egingo dira: (1), (2)a, (2)b, etab.; testuan aipatzerakoan egin bedi era honetan: (2a), (2b), (2a, b), (4d-h), etab. Inprentan ohiko ez den zein-nahi zeinu, letra edo diakritikoren azalpen argia ezarriko da lehendabiziko agerraldiaren testu aldameneko zuriunean.

Testua honako arauok beteaz aurkeztuko da: Aipu luzeak ahapaldi berezian joango dira, sangratuta, hasiera eta amaiera kakotxik gabe, letra borobilean; aipu laburrak ere borobilean, testuan bertan eta kakotx bikoitzen artean (“ ” edo « »). Kakotx bakunak (‘ ’) adierak edo hitz solteen itzulpenak emateko baliatuko dira. Metalinguistikoki erabilitako edota artikulua idazteko erabili den hizkuntzaz beste bateko hitzak letra etzanean ezarriko dira.

Liburu eta aldizkarien izenei letra etzana dagokie, eta kakotxak artikuluei. Aldizkarien zenbaki, urte eta orrialdeak eta liburuen argitaletxe eta edizio (ez inprimatze) tokia emango dira. Hala dagokionean, berrinprimatzea, berrargitalpena edo itzulpena den zehaztuko da. Aipuetarako erabil bedi urte-egile sistema, ahal den neurrian, eta urte bereko egile baten lan bat baino gehiago aipatu bada, a, b... hurrenkeran bereiziko dira: adib. (Vinson 1897a: 35-38), (ikus Lacombe 1924, Azkue 1923-25, Uhlenbeck 1947b). Amaierako bibliografiarik ez bada, eman bitez bibliografia zehaztasunak oro soilik lehen agerraldian, eta ondokoetan egilearen deitura eta lanaren izenburu laburtua bakarrik, *op. cit.* eta *ibidem* direlakoak saihestuaz: adib. Guerra, *Cantares,* 22-24. Bibliografia ere biko espazioan idatziko da, eta honako formatu honi atxikiko zaio:

Mitxelena, K., 1950b, “La aspiración intervocálica”, *BAP* 6, 443-449. Berrarg. bere *Sobre historia de la lengua vasca, ASJU*-ren Gehigarriak 10, Donostia 1988, I, 191-202.

—, 1981a, “Lengua común y dialectos vascos”, *ASJU* 15, 291-313. Berrarg. bere *Palabras y Textos,* UPV/EHU, Vitoria-Gasteiz 1987, 35-55.

Ortiz de Urbina, J., 1989, *Some parameters in the grammar of Basque,* Foris, Dordrecht.

Rijk, R. P. de, 1985, “Un verbe méconnu”, in J. L. Melena (arg.), *Symbolae Ludovico Mitxelena Septuagenario Oblatae,* UPV/EHU, Vitoria-Gasteiz, II, 921-935.

Sarasola, I., 1986, “Larramendiren eraginaz eta”, *ASJU* 20: 1, 203-216.

Bibliografi laburduretarako erabil bedi ale honetan bertan erantsi den laburdura gomendatuen zerrenda. Beharrezkoa balitz, egileak besterik ere erabili ahalko luke, beti ere esangura lehendabiziko agerraldian azaldurik.

INFORMATION FOR AUTHORS

Papers on Basque linguistics and philology, and more general fields related or of interest to Basque studies are accepted, provided they are written in the languages most used by the international scientific community. Submissions should be send to: Joseba A. Lakarra, Department of Linguistics and Basque Studies, Letter Faculty, Unibertsitate Etorbidea/Paseo de la Universidad 5, 01006 Vitoria-Gasteiz (joseba.lakarra@ehu.es).

Papers received by *ASJU* are submitted to at least two reviewers; the decision on publication is communicated to the author(s) within as short a time as possible. Should a paper be accepted, a list of objections or changes deemed necessary will be sent to the author(s). When the authors receive the first proofs of their work, these should be returned to the editor together with the original within one week. No changes, additions or deletions may be made without the permission of the editor. Authors receive a copy of the *ASJU* volume in which their article appears and an e-offprint of the work.

There is no restriction on the maximum length of submissions, but they should be no longer than is necessary; authors must be concise and clear. Preference will be given to short notes, especially when they offer critique or elaborate on previously published papers.

The originals, which should include the address, telephone number(s) and e-mail of the authors(s) in the first lines, must be typed and double-spaced throughout on single-sided sheets; this also applies to the notes. Wide margins for possible corrections or clarifications are required. Pages are to be numbered serially, as are the notes. Manuscripts must be submitted in digital format (in one of the commonly used program formats) together with three printed copies, and must include an abstract of 10-20 lines. It is recommended that the paper be carefully corrected before presentation to avoid possible errors, and that photographs, pictures, maps, graphs, tables, figures, etc. be of the best possible quality to avoid loss of detail in reproduction. These graphics should all be numbered and have a short footnote or key for identification; their approximate position in the text should also be indicated. Examples should be labelled consecutively by numbers enclosed in brackets: (1), (2)a, (2)b, etc.; these bracketed numbers should be used in the body of the text when referring to examples, like so: (2a), (2b), (2a, b), (4d-h), etc. A clear description of any unusual symbols, characters or diacritics should be provided in the margin on their first occurrence.

The text must be formatted as follows: long quotations must be indented, without inverted commas at the beginning and end of the text, in plain type; short quotations, also in plain type, must be enclosed by double inverted commas (“ ” or « »). Single quotation marks (‘ ’) are to be used to denote translations of isolated terms. Terms used metalinguistically or in a language different to that of the text should be in italics.

The titles of books and journals should be in italics and those of papers between inverted commas. The issue, year and page numbers of journals should be given, and for books, the publisher’s name and place of edition; where relevant, state whether the quotation is from a reprint, reedition or translation. Where possible use the author-year system for quotation, e.g. (Lafitte 1976a: 35-38), (see Schuchardt 1900, Azkue 1923-25, 1935). Otherwise, the complete bibliographical information should be given only on the first occurrence, limiting any subsequent references to the surname of the author and the abbreviated title (avoiding notations such as *op cit.* and *ibidem*), e.g. Altuna, *Versificación,* pp. 43-57. The bibliography must also be double-spaced, with the following format:

Mitxelena, K., 1950b, “La aspiración intervocálica”, *BAP* 6, 443-449. Reed. in *Sobre historia de la lengua vasca*, Supplements of *ASJU* 10, Donostia 1988, I, 191-202.

—, 1981a, “Lengua común y dialectos vascos”, *ASJU* 15, 291-313. Reed. in *Palabras y Textos,* UPV/EHU, Vitoria-Gasteiz 1987, 35-55.

Ortiz de Urbina, J., 1989, *Some parameters in the grammar of Basque,* Foris, Dordrecht.

Rijk, R. P. de, 1985, “Un verbe méconnu”, in J. L. Melena (ed.), *Symbolae Ludovico Mitxelena Septuagenario Oblatae,* UPV/EHU, Vitoria-Gasteiz, 921-935.

Sarasola, I., 1986, “Larramendiren eraginaz eta”, *ASJU* 20: 1, 203-216.

For abbreviations of secondary sources the “Abbreviation Index” published in this issue should be used. If necessary, other abbreviations may be used, and these should be made explicit on their first appearance in the text.

INFORMACIÓN PARA LOS AUTORES

ASJU publica artículos sobre lingüística y filología vasca y campos más generales relacionados con o de interés para la vascología, escritos en euskera o en cualquiera de los idiomas utilizados por la comunidad científica internacional. Los originales se enviarán a: Joseba A. Lakarra, Depto. de Lingüística y Estudios Vascos, Facultad de Letras, Paseo de la Universidad 5, 01006 Vitoria-Gasteiz (joseba.lakarra@ehu.es).

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Los originales, al comienzo de los cuales se hará constar la dirección, el teléfono y la dirección electrónica del(os) autor(es), se presentarán escritos a doble espacio y por una sola cara, con márgenes amplios para posibles correcciones y aclaraciones. Las páginas irán numeradas correlativamente, así como las notas. Los manuscritos se enviarán en soporte electrónico (en alguno de los programas más usados) y en papel por triplicado, e irán acompañados de un resumen de entre 10 a 20 líneas. Se recomienda que el original sea corregido antes de su presentación para minimizar las erratas, y que fotografías, cuadros, mapas, gráficos, tablas, figuras, etc., sean de la mejor calidad posible para evitar pérdidas de detalle en la reproducción; todos ellos irán numerados y llevarán un breve pie o leyenda para su identificación; se indicará asimismo el lugar aproximado de colocación en el texto. Los ejemplos irán numerados: (1), (2)a, (2)b, etc.; al referirse a ellos en el texto se usará el formato (2a), (2b), (2a, b), (4d-h), etc. Se aclarará al margen en su primera aparición en el texto cualquier símbolo, carácter o marca diacrítica inusual.

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—, 1981a, “Lengua común y dialectos vascos”, *ASJU* 15, 291-313. Reproducido en su *Palabras y Textos,* UPV/EHU, Vitoria-Gasteiz 1987, pp. 35-55.

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Sarasola, I., 1986, “Larramendiren eraginaz eta”, *ASJU* 20: 1, 203-216.

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