FEATURE LICENSING, MORPHOLOGICAL WORDS, AND PHONOLOGICAL DOMAINS IN BASQUE

Gorka Elordieta

(University of California, Los Angeles)
(University of Southern California)

1. Introduction*

In this paper we analyze the phonological process of Vowel Assimilation in Lekeitio Basque (henceforth VA and LB, respectively).[1] VA is a process in which a vowel assimilates in all its features to an immediately preceding vowel. The peculiarity of this process is its restricted distribution: it only applies in nominal and verbal contexts, between the final vowel of a noun or adjective and the initial vowel of a determiner or case marker, and between the final vowel of a lexical verb and the initial vowel of a following auxiliary verb. This property of VA poses serious problems for the theory of Lexical Phonology (Kiparsky 1982, Mohanan 1982, 1986) and theories of phrasal and prosodic phonology (Kaisse 1985, Nespor and Vogel 1986, Selkirk 1986), because the domains of application of the process have properties of both lexical and postlexical rules, and do not correspond to any constituent in the prosodic hierarchy.[2]

(1) There are six dialects of Basque, and each of these dialects is fragmented in several local varieties. Lekeitio Basque is a variety of the Biscayan dialect spoken in the coastal town of Lekeitio, of approximately 7,500 inhabitants. A descriptive grammar and vocabulary of Lekeitio Basque was prepared by Hualde, Elordieta and Elordieta (1994).

(2) See Elordieta (1994a, b) for discussion, and Elordieta (1996) for a critical overview of the theories of phrasal and postlexical phonology.

In this paper we attempt a solution to the problem by exploiting the observation that the rule applies to the initial vowel of inflectional morphemes, that is, elements realizing morphosyntactic features. These are bound elements which require the overt incorporation of another element, in the overt component of syntax or after Spell-Out, and we suggest that this dependency is associated to the general requirement in Universal Grammar that inflectional features be licensed at some point in the derivation. This licensing requirement is due to the inherent morphological weakness or deficiency of inflectional heads. That is, we propose the idea that the morphophonological component of grammar is an interpretive level where only linguistic expressions which are part of well-formed morphological words (which we call m-words, m-constituents or m-domains) are legitimate objects and receive an interpretation as well-formed elements. In the default case, lexical heads are independent m-words, but functional categories realizing morphosyntactic features are deficient in this regard, and thus need to associate with lexical heads in order to be part of well-formed m-words. This association can be done in overt syntax, by head incorporation, that is, a syntactic head may incorporate to the functional head containing morphosyntactic feature(s). This movement could be independently motivated by the operation of feature checking, when the raising syntactic head is inflected for the features present in the functional head. If the incorporating head is an independent m-word, the morphosyntactic feature in the functional head will be licensed morphologically. If the incorporating head is not an independent m-word, however, another syntactic head which is a well-formed m-word may raise to the functional head, so as to license it morphologically. This is the case of the Basque auxiliary, which although inflected for the features in I^0 is not an independent m-word, and thus cannot license the features in I^0 morphologically (more specifically, the feature Tense). The participial verb and negation are independent m-words, however, and they may raise to the auxiliary and then to I^0, thus licensing the features in I^0. When both are present, only negation raises, as it is the closest head to inflection.

Alternatively, a morphosyntactic feature may be licensed morphologically after Spell-Out, by merging with an adjacent head which is a well-formed m-constituent. This is the case of the Basque determiner, which appears attached to the rightmost element in the NP which has raised in syntax to the specifier position of DP. The determiner and this element merge into an m-word, and thus the determiner satisfies the well-formedness conditions of the morphophonological component.

We further propose the hypothesis that the morphological domains so formed can be mapped into the phonological component as phonological domains, where phonological processes may be specified to apply. VA would be one such process, specified to apply between two elements contained in the same morphological word. This hypothesis derives the descriptive observation that lexical heads are never affected by VA, since they form independent m-words. Perhaps more importantly, it allows us to explain the contrast between inflected auxiliary verbs, which may undergo VA, and modal particles, causative verbs and subordinating conjunctions, which cannot. The latter type of heads do not contain inflectional features to be licensed, and thus there is no need to assume that they are morphologically deficient. Positing an independent word status for them would account for the contrast.

If our hypothesis is on the right track, it will have consequences for our understanding of the mapping between syntax and phonology, since it will call for a rethinking of the algorithms for creation of phonological domains. We will have to pay more attention at how morphological relationships determine domains which are mapped as phonological constituents.

The paper is organized as follows: in section 2 we introduce the phenomenon of VA and provide the descriptive generalization that VA only occurs between nouns or adjectives and between determiners, and verbs and auxiliaries. In section 3 the structure of the clause in Basque is presented, showing the syntactic interactions between the elements participating in the process of VA and the requirement that a finite auxiliary be properly licensed. In section 4 we analyze the linear sequence *NP-determiner* as a result of the raising of the NP to the specifier position of DP, and suggest that the determiner is licensed morphologically by merging with the rightmost word in the NP, as a suffix. Section 5 contains the analysis to the problem, based on the idea that morphosyntactic features need to be licensed by receiving the incorporation of a syntactic head, and that the unit so formed is interpreted as a phonological domain where VA applies. Section 6 ends the paper with a summary and main conclusions.

2. Vowel assimilation in Lekeitio Basque

2.1. Morphosyntactic distribution

Vowel Assimilation in Lekeitio Basque is an optional rule of colloquial speech by which a syllable-initial vowel assimilates in all its features to an immediately preceding syllable-final vowel. This rule applies word-internally in nominal contexts and across word boundaries in verbal contexts, and it has a very restricted domain of application. In nominal contexts, it only applies between the final vowel of a noun or adjective and the initial vowel of a following inflectional head, i.e., a determiner or case marker. In verbal contexts, it applies between the final vowel of a verb and the following initial vowel of an inflected auxiliary. Let us consider each of these contexts in turn.[3]

2.1.1. *Nominal contexts*

Nominal inflection in Basque is morphologically attached to the last word of the last constituent of the Noun Phrase, not to every constituent contained in it. Thus, when a noun is followed by an adjective, the determiner and case markers or postpositions will be added to the adjective, the noun remaining in its bare uninflected form (cf. (1f, h) in the examples below). The determiner in Basque has

(3) VA may also apply in underived domains, i.e., roots, although the application of the rule seems to be lexically determined:

(i)	bi.ar / bi.ir	'to need'	si.ar / *si.ir	'through'
	si.es.ta / si.is.ta	'nap'	bi.á.je / *bi.í.je	'trip'
	ma.ri.a / ma.ri.i	'make/feel dizzy'	tri.an.gú.lo / *tri.in.gú.lo	'triangle'

distinct singular and plural forms, with a further distinction in the plural determiner between locative and nonlocative cases: -a is the singular determiner, -ak is the plural determiner, and -eta is the plural determiner for locative cases. For each of the underlying forms in (1) we can obtain two alternative outputs, which we separate with a slash. This slash indicates that the two forms are allowed in LB, the one on the left being obligatory and the one on the right representing the optional application of VA. The stem-final vowel is always high, due to the effects of a rule applying prior to VA, the rule of Vowel Raising (VR), which raises a syllable-final [-high] vowel when immediately followed by a following heterosyllabic vowel. We mark syllable boundaries with a dot notation, to show that VA does not apply within syllables, i.e., in diphthongs, and that it does not create tautosyllabic long vowels:[4]

(1) a. /orma-a/   → or.mi.a / or.mi.i [5]
         wall-det.sg.
         'the wall'
     b. /baso-ak*/ [6]   → ba.sú.ak / ba.sú.uk
         forest-det.pl.
         'the forests'
     c. /ume-en*/   → u.mí.en / u.mí.in
         child-gen.pl.
         'of the children'
     d. /gixon tonto*-ak*-k/   → gixon ton.tú.ak / gixon ton.tú.uk
         man stupid-det.pl.-erg.
         'stupid men'
     e. /etxe-a-n/   → e.txi.an / e.txi.in
         house-det.sg.-ines.
         'at/in the house'
     f. /kale estu-eta*-n/   → kale es.tu.é.tan / kale es.tu.ú.tan
         street narrow-det.pl.-ines.
         'at/in the narrow streets'

The affix expressing the meaning of superlative degree is attached to adjectival roots, and appears before a determiner. This affix also triggers VR on the last vowel of the root, and undergoes VA:[7]

---

(4) The following abbreviations will be used in the text: *abl.* = ablative, *abs.* = absolutive, *all.* = allative, *dat.* = dative, *det.* = determiner, *erg.* = ergative, *fut.* = future, *gen.* = genitive, *ines.* = inesive, *infl.* = inflected auxiliary, *neg.* = negation, *pl.* = plural, *prox.* = proximative, *rt.* = auxiliary root, *sbj.* = subjunctive, *sg.* = singular, *soc.* = sociative.

(5) It is possible to posit an intermediate step in the derivation, in which the low vowel becomes mid, i.e., *or.mi.e*, as this is the output in many dialects.

(6) An asterisk placed behind a morpheme indicates that that morpheme is accented, i.e., that it triggers penultimate stress on the phonological word resulting from concatenation. Morphemes with no asterisks are unaccented, i.e., they only surface with final stress when they are in phrase-final position. For details on the metrical analysis of the Lekeitio Basque dialect, see Hualde, Elordieta and Elordieta (1994), and for more general information on the accentual system of other dialects, see Hualde (1991: ch. 6, 1996).

(7) Not all affixes indicating 'degree' behave similarly with respect to VA. The affixes expressing the comparative of superiority and the 'excessive' degree fail to undergo the rule, although they do trigger VR on the last vowel of the stem:

(2) /soro-en*-a/   →   soruéna / soruúna
crazy-sup-det
'the craziest'

Derivational morphemes are consonant-initial in LB, so it is not possible to test their behavior with respect to VA. Nevertheless, there is one example where a vowel-initial derivational morpheme is attached to a noun ending in a vowel, and interestingly, no VA occurs:

(3) /donosti-ar*-a/   →   do.nos.ti.á.rra / *do.nos.ti.í.rra
Donostia-from-det.sg.
'(a native of) Donostia/San Sebastian'

The rule of VA does not apply between two members of a compound or across words. See (4) and (5), respectively:

(4) a. /buru-andi/   →   bu.ru.án.di / *bu.ru.ún.di
head-big
'big-headed'

b. /etxe-ondo/   →   e.txe.ón.do / *e.txe.éndo
house-side
'side of house'

c. /soro-antz/   →   so.ro.án.tza / *so.ro.ón.tza
mad-look
'mad look'

(5) a. /seru asula/   →   seru a.su.la / *se.ru u.su.la
sky blue
'blue sky'

b. /etxe   andiža/   →   etxe an.di. a / *etxe endiža
house big
'big house'

(i) bero-ago*   →   beruá(g)o / *beruú(g)o   (ii) alto-egi*   →   altué(g)i / *altuú(g)i
hot-comp.   tall-exc.
'hotter'   'too tall'

We argue that the reason for the impossibility of having VA in (i) and (ii) is due to the process of /g/-deletion existing in Lekeitio Basque, by which intervocalic /g/ is dropped. After /g/-deletion has applied, a sequence of three vowels is formed, and no left-to-right assimilation is allowed in these sequences in Lekeitio Basque. This is also observed when the sociative singular morpheme /gas*/ is added to a nominal root:

(iii) /umi-a-gas*/ →   umi.á.as / *umi.í.as
child-det-soc.
'with the child'

I have no straightforward answer for the question of why the deletion of a consonant which does not intervene between the trigger and the target of VA may affect the application of the process. For the time being, I will simply leave it as a description of the facts.

2.1.2. *Verbal contexts*

The rule of VA can also apply between a lexical verb and a vowel-initial inflected auxiliary. The lexical verb is called 'participial verb' in the traditional literature, and we will use that term henceforth. The auxiliary is inflected for subject, direct object and indirect object agreement, tense, aspect, and mood. The vowel-initial auxiliaries relevant for our discussion correspond to transitive forms in the past tense whose initial vowel is a third person ergative marker, *e-*.[8] In this context no raising of the final vowel of the lexical verb occurs; VR is restricted to the boundaries created by nominal inflection and certain roots:

(6) a. / žo e-ba-n/   →   žo eban / žo oban
         hit 3erg.-rt.[9]-past
         '(s)he hit him/her/it'

     b. /galdu e-ba-s-an/   →   galdu ebasan / galdu ubasan
         lose 3erg.-rt-abs.pl.-past
         '(s)he lost them'

     c. /ikasi e-be*-n/   →   ikasi ében / ikasi íben
         learn 3erg.-rt.-past
         'they learnt it'

     d. /atrapa e-be*-s-en/   →   atrapa ebésen / atrapa abésen
         catch 3erg.-rt-past
         'they caught them'

VA does not apply between a lexical verb and a causative verb, which in linear sequence appears between the lexical verb and the inflected auxiliary:

(7) a. paga eraiñ neutzan   /   *paga araiñ
         pay make aux
         'I made him/her pay'

     b. altza eraiñ dotzat   /   *altza araiñ
         raise make aux
         'I have made him/her raise'

---

(8) The form of the inflected auxiliary for intransitive verbs in the imperative with a second person singular subject starts with a vowel in Standard Basque (i.e., *hadi*, with an initial *h* which is not pronounced in Standar Basque or in southern dialects). However, in LB this form is *yári*, and thus cannot undergo VA. The initial palatal fricative consonant derives from the verb *e(g)in* 'do' which is underlyingly inserted between the participial verb and the inflected auxiliary in imperative forms with a third person direct object (cf. Hualde, Elordieta and Elordieta 1994: 130-131). Nowadays this verb has lost all its segments except for the vowel *i*, which becomes a palatal fricative by onset fortition. Thus, no VA can apply to this inflected form:

   (i) etorrí e(g)in ari!   >   etorrí yari!
        come aux
        'Come!'

(9) To be more precise, we would have to follow traditional assumptions on Basque verbal morphology, which state that the root of the transitive auxiliary **edun* is *-u-*, which later becomes *-b-* by a process of intervocalic labialization. The vowel *a* then would be simply an epenthetic vowel inserted between this consonant and the *-n* marking past tense.

Some modal particles which constitute independent syntactic heads may intervene between the lexical verb and the inflected auxiliary. These particles do not contribute anything to the propositional content of a sentence, and their basic semantic function is to express epistemic attitudes of the speaker concerning the existence or non-existence of the state of affairs identified by other elements in the sentence. The modal particle *ete* appears in interrogative and exclamative sentences, and conveys a meaning of wondering, uncertainty, doubt, suspicion, on the part of the speaker about the event expressed in the sentence, and *ei* indicates that what is being expressed in the sentence has been reported by other people and that the speaker cannot fully assure the veracity of the event denoted by the proposition. We call the particles *ete* and *ei* 'dubitative' and 'evidential', respectively. Modal verbs in other languages also have epistemological usages (e.g., *may, might,* in English, *poder, deber* in Spanish), but the modal particles of LB should not be classified as modal verbs, since they are not verbs to begin with. They are not predicates, they do not take any arguments and they are never inflected, unlike regular verbs.[10] Moreover, Basque does have clear modal verbs (*nahi* 'to want', *behar* 'to need'), whose syntactic properties are very different from modal particles.[11]

Also, note that the use of the term "modal" for these particles is not related to the grammatical concept of *mood* (e.g., indicative mood, or subjunctive mood), as Basque has moods independently of the modal particles.

No VA occurs between a lexical verb and these particles:

(8) a. etorri ete díras?   /   *etorri ite díras?
         come dub. aux
         'I wonder whether they have come'
     b. atrapa ei dósu   /   *atrapa ai dósu
         catch evid. aux
         'I have heard that you have caught it'

In adverbial nonfinite clauses, the verb appears followed by a subordinating conjunction. No VA applies between these elements either:

(10) Tense and agreement are spelled out on the auxiliary, not on the lexical verb, but the lexical verb is inflected for aspect. Perfective aspect is realized by the suffixes *-i, -tu* and *-Ø*, to which the suffix *-ko* can be added to convey future tense, combined with the present tense appearing on the inflected auxiliary. Imperfective aspect is realized by the suffix *-t(z)en*.

(i) a. eros-i   dot   'I have bought it'   d. eros-ten   dot   'I buy it'
         buy-perf. aux   buy-imperf. aux
     b. gal-du   senduan   'you lost it'   e. eros-ten   neban   'I used to buy it'
         lose-perf. aux   buy-imperf. aux
     c. eros-i-ko   dot   'I will buy it'
         buy-perf.-fut. aux

(11) Cf. Euskaltzaindia 1985, Mujika 1988 for detailed descriptive analyses on these and other modal particles found in other dialects. For an overview of the main properties of modal particles in other languages, and discussion of previous work on the topic, see König 1991, §8.2.

(9) a. ekarri árren   /   *ekarri írren
          bring despite
      b. kompondu ezik   /   *kompondu uzik
          fix   unless

VA does not occur across any other two words, such as a direct or indirect object and a verb (cf. (10a,b), or a subject and the lexical head of a prepositional phrase (cf. (10c), respectively):

(10) a. arraña erosi dau   /   *arraña arosi dau
          fish   buy aux
          '(s)he has bought fish'
      b. amari   astu žako   /   *amari istu žako
          mother(dat.) forget aux
          'the mother has forgotten'
      c. amúma elixan dago   /   *amúma alixan dago
          grandmother church-ines. is
          'the grandmother is in church'

It could be objected that until an analysis of Basque clausal structure is laid out, we do not know whether there are any traces or empty projections intervening between the elements in (10) and whether these traces may be blocking VA. Wh-questions and focalization constructions seem appropriate examples to show that the (non)occurrence of VA is independent of traces or empty categories. There is a consensus among Basque linguists that the wh-phrase/focalized constituent and the verb+auxiliary complex are in a Spec-head relationship in CP (cf. Ortiz de Urbina 1989, 1994) or IP (cf. Artiagoitia 1992), and thus there should be no traces intervening between the wh-phrase or the focalized constituent and the following verb complex, i.e., these elements are strictly adjacent from a syntactic point of view. However, VA cannot take place in this context:

(11) a. nori   emon dótzo?   /   *Nori imon dótzo?
          Who-dat give aux
          'Who has (s)he given it to?'
      b. <u>umiari</u> emon dotzo   /   *<i>umiari</i> imon dotzo
          child-dat give aux
          '(s)he has given it <u>to the child</u>'

The data presented so far show that only the initial vowels of determiners or case markers and inflected auxiliaries can undergo the process of VA in the context of a preceding vowel-final lexical element. As we showed in Elordieta (1994a, b, 1996), the distribution of VA presents serious problems for the theory of Lexical Phonology (Kiparsky 1982, Mohanan 1982, 1986), as well as for theories of phrasal and prosodic phonology. Although for reasons of limit of space we will not be able to include in this paper the inadequacies of these theories to account for this process, we will briefly mention here the most important problems (cf. the above mentioned work for detailed criticism).

First, there is no prosodic constituent in the theory of Prosodic Phonology (cf. Nespor and Vogel 1982, 1986) which captures the domains of application of VA. It cannot be a prosodic word, because an inflected auxiliary can bear its own underlying stress (cf. (6c,d)), i.e., it constitutes a separate prosodic word.[12] It is not a phonological phrase, because that would also include modal particles and compounds. The existence of the clitic group has been independently called into question in the literature, being reduced instead to either a prosodic word or a phonological phrase.

Second, there is Selkirk's (1986) End-Based theory of prosodic domains. Note that the domains would have to be those contained between the left edges of lexical heads. This would include nouns or adjectives and determiners and case markers on the one hand, and participial verbs and auxiliaries on the other, and it would exclude two lexical heads. However, modal particles present a problem, because they are not lexical words, but function words.

Finally, an analysis in terms of c-command relationships between the trigger and target (cf. Kaisse 1985) will not work, because the same c-command relationships obtain between a participle and an auxiliary and between a participle and a modal particle, as we will see in section 5.

In the following section we will provide an analysis of the structure of the clause in Basque and the relationship among the different syntactic heads, as a prelude to our analysis of the problem.

3. Head movement and Infl licensing in Basque

3.1. Clause structure in Basque

I want to suggest that Basque has a head-initial clause structure, with the following hierarchical organization among the different projections (for reasons of simplicity, possible agreement and tense projections are included in IP) (for related discussion see Albizu this volume):

---

(12) The participal verb and the inflected auxiliary constitute separate domains of stress assignment in the following contexts: in utterance-initial position, when the event expressed by the participial verb is the main assertion in the sentence, and in adjunct clauses (cf. Hualde, Elordieta and Elordieta 1993, 1994). Observe the following example, where focus stress is indicated by a cricumflex accent:

(i) atrapâ ebésen
     catch 3erg.-rt-past
     'They DID catch them'

(12)

```
                        CP
                      /    \
                   C⁰        IP
                           /    \
                        I⁰        AuxP
                                /      \
                            Aux⁰         ModP
                                       /      \
                                   Mod⁰         NegP
                                              /      \
                                          Neg⁰         VP
                                                     /    \
                                                  DP        V'
                                                          /    \
                                                       V⁰        DP
```
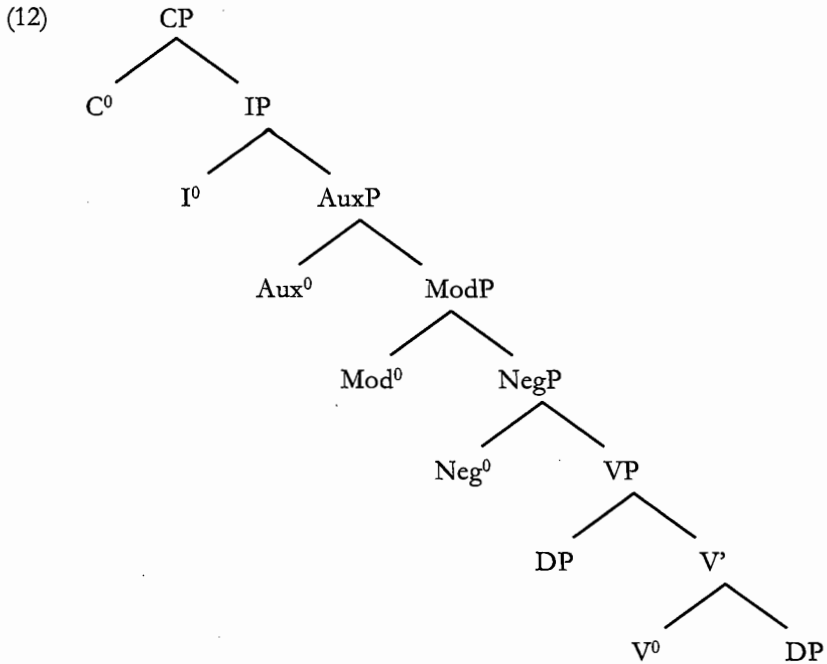
This proposal runs against most of the earlier analyses of the clause structure of Basque. Generative grammarians have been assuming head-final struct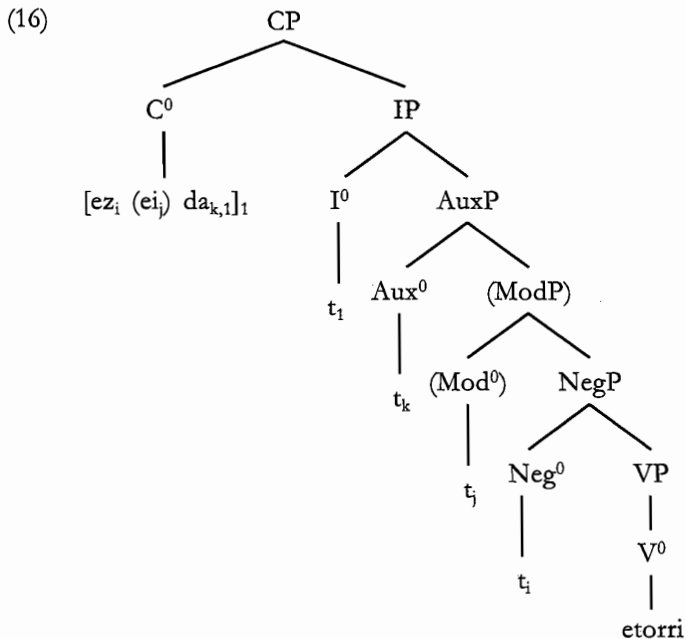ures for this language, following descriptive observations that heads follow their complements across almost all categories. Ortiz de Urbina (1989) provided evidence that C^0 is initial, however (cf. also Ortiz de Urbina 1994, to appear, and Albizu 1991, 1992). The main argument is that in constructions involving operators, such as wh- and yes/no questions, focus constructions, and negative sentences, the inflected auxiliary occurs on the left edge of the sentence. In interrogative sentences and focus constructions the participial verb appears left adjacent to the inflected auxiliary, forming a verbal complex, and in negative sentences only the auxiliary appears following negation, leaving the participle stranded, in its in-situ position (cf. (13) below). No element can intervene between a wh-phrase, the target of a yes/no question, a focalized constituent or negation and the verbal element(s) that follow. This pattern suggests the verbal elements raise to C^0 to enter in a Spec-head relationship with the element in Spec,CP, along the lines of Rizzi's wh-criterion extended to all operator-involving constructions. This is unexpected under the assumption that all heads are final in Basque:

(13) a. Zer   esan dótzo Péruk Mirenéri?
          what-A say aux   Peru-E Miren-D
          'What has Peru said to Miren?'
      b. Péru etorri da gaur goixian?
          Peru come aux today morning
          'Was it Peru that came this morning?'

   c. <u>Péruk</u> ekarri dau liburúa gaur goixian
      Peru-E bring aux book-A today morning
      '<u>Peru</u> brought the book this morning'
   d. Ez dozu ekarri liburúa gaur goixian
      neg aux bring book today morning
      'You didn't bring the book this morning'

Other researchers have claimed head-initial status for projections below CP. For instance, Laka (1990) proposes a head-initial ΣP, located between CP and IP, and Artiagoitia (1992) argues that I^0 is initial. Thus, even under the assumption that Basque is head-final, not all projections can be analyzed as head-final. The structure I am positing constitutes simply a step forward towards coherence in the head directional parameter, maintaining the relative hierarchical order among heads suggested by Ortiz de Urbina (1994, to appear). This alternative proposal is compatible with Kayne's (1994) theory of the correspondence between linear order and hierarchical structure, namely that asymmetric c-command maps into linear order. The consequence of this hypothesis is that all languages are head-initial underlyingly and that they display a universal SVO word order, with a specifier-head-complement linear order. In this theory, SOV languages differ from SVO languages in that they involve movement of the object past the verb to a higher functional projection. Working within Kayne's system, Albizu (1994) and Ormazabal, Uriagereka and Uribe-Etxebarria (1994) have recently proposed a head-initial clause structure for Basque.

3.2. Head movement

The structure I am positing predicts the correct surface linear order among the non-nominal heads in a clause. Let us present all the different linear orders observed:

(14) a. Participle - inflected auxiliary: etorri da
                                          come aux
     b. Participle - modal - inflected auxiliary: etorri ei   da
                                          come mod aux
     c. Negation - inflected auxiliary ... verb: ez   da   iñor   etorri
                                          neg aux anybody come
     d. Negation - modal - inflected auxiliary ... verb: ez ei da iñor   etorri
                                          neg mod aux anybody come

Assuming that only left-adjunction is possible (cf. Kayne 1994), the order in (14a) is derived by movement of the participial verb to Aux^0 and then to I^0 in declarative sentences. The order in (14b) is obtained in a similar way, with the participial verb raising to Aux^0 and then to I^0 by head-to-head movement, incorporating the modal particle on its way up. These configurations are represented in (15) below:

(15)

```
                        IP
                   ┌─────┴──────┐
                  I⁰           AuxP
                   │         ┌───┴───┐
          [etorri_i (ei_j) da_{k,1}]_1   Aux⁰   (ModP)
                             │        ┌───┴───┐
                            t_k    (Mod⁰)     VP
                                     │        │
                                    t_j       V⁰
                                              │
                                             t_i
```

In (14c) negation raises to Aux^0 and I^0 on its way to C^0, which I assume is the landing position of negation, without recurring to a ΣP projection located between CP and IP (cf. Laka 1990). I follow Ortiz de Urbina (1989, to appear) in claiming that the raising of negation is prompted by the need to occupy the head position of a projection containing an operator, in this case a negative operator. This explains the left-edge position that negation and a following inflected auxiliary occupy in negative sentences. In (14d) the same process applies, with the modal head being incorporated by negation. We represent these derivations in (16):

(16)

```
                        CP
                   ┌─────┴──────┐
                  C⁰           IP
                   │        ┌───┴────┐
        [ez_i (ei_j) da_{k,1}]_1   I⁰    AuxP
                                │     ┌───┴───┐
                               t_1  Aux⁰    (ModP)
                                     │     ┌───┴────┐
                                    t_k  (Mod⁰)    NegP
                                          │      ┌──┴───┐
                                         t_j   Neg⁰    VP
                                                │      │
                                               t_i     V⁰
                                                        │
                                                      etorri
```

3.3. Infl licensing

An interesting point to notice in these structures is that movement of the participle is not obligatory in all contexts. In negative clauses, it is negation that raises to Aux^0, and the participle remains in situ inside the VP, as evidenced by the fact that arguments and adjuncts may intervene between negation and the inflected auxiliary and the participial verb (cf. (14c,d)). Only in declarative and interrogative sentences does the participle raise to Aux^0 and I^0 (cf. (13a,b) for examples of interrogative clauses). Why do we find this contrast? Ortiz de Urbina (1994) argues that this distributional pattern is due to the weak morphosyntactic character of tensed Infl, based on the observation that verbal forms containing tense features cannot occur in sentence-initial position in verbal focalization constructions or in yes/no questions, in which the verb ends up in C^0. This is the case with synthetic verbs, which are formed by the amalgamation of a verbal root and agreement and tense markers.[13] The following examples from Standard Basque illustrate this behavior (focalized constituents are underlined):

(17) a. Jonek liburua dakar   b. *<u>Dakar</u> Jonek liburua
          Jon   book brings   brings Jon   book
          'Jon is bringing the book' c. *<u>Dakar</u> Jonek liburua?

They contrast with periphrastic verbal forms, formed by the combination of a participial verb (with an aspectual marker) and an inflected auxiliary (with agreement and tense morphology):

(18) a. Jonek liburua erosi du   b. <u>Erosi du</u> Jonek liburua
          Jon   book buy aux   buy aux Jon   book
          'Jon has bought the book'   'Jon <u>has bought</u> the book'
                                       c. Erosi du Jonek liburua?
                                           'Has John bought the book?'

The starred examples in (17) become acceptable when the particle *ba* appears to the left of the synthetic verb, to shield it from sentence-initial position:

(19) a. Ba-<u>dakar</u> Jonek liburua   b. Ba-dakar Jonek liburua?
          'Jon <u>is bringing</u> the book'   'Is Jon bringing the book?'

Negation also counts as first element in the sentence:

(20) a. *dator Jon   b. Ez dator Jon
          comes Jon   neg comes Jon
                                           'Jon is not coming'

Wh-phrases shield a synthetic verb from sentence-initial position as well:

---

(13) Nowadays only approximately twenty verbs can be inflected synthetically. The paradigms they form are defective, in that only present and past tense forms are possible, and some verbs only allow present tense forms. There is no semantic or syntactic criteria determining the synthetic class, in what seems a lexically idiosyncratic distinction. For a list of synthetic verbs, see the grammar of Euskaltzaindia (1985), the Academy of the Basque language.

(21) a. Zer dakar Jonek?   b. Nor dator?
          what brings Jon   who comes
          'What is Jon bringing?'   'Who is coming?'

Inflected auxiliaries are always preceded by participial verbs in the standard and southern dialects, so we cannot find cases in which the inflected auxiliary could be potentially sentence-initial by focalization or yes/no question formation in these dialects. However, in northern dialects it is possible to front the inflected auxiliary alone in constructions involving operators, i.e., in interrogative sentences and focus constructions:

(22) a. Zer   du Jonek erosi?   b. Liburua du Jonek erosi
          what has Jon   buy   book   has Jon   buy
          'What has John bought?'   'Jon has bought the book'

Crucially, inflected auxiliaries pattern exactly like synthetic verbs in all dialects:

(23) a. *du Jonek liburua eros   (24) a. *du Jonek liburua erosi?
          has Jon   book buy   b. Ba-du Jonek liburua erosi?
      b. Ba-du Jonek liburua erosi   'Has Jon bought the book?'
          'Jon has bought the book'

Synthetic verbs in the imperative mood constitute evidence that it is the feature Tense that has this property, and not all the features included in Infl, such as agreement. Imperative forms are inflected for agreement but not for tense, and they do not show the limitations that finite synthetic forms present:

(25) Betor aita!   (From Ortiz de Urbina 1989: 154)
      come father
      'Let the father come!'

Based on Rivero's (1993) analysis for similar facts in Breton, Ortiz de Urbina (1994) proposes that this prohibition against having an element inflected for Tense on the left edge of a clause is due to the fact that Tense is a feature that needs to be licensed overtly in its checking domain, that is, in the projection it ends up in overt syntax. The licensing is done either by the incorporation of a lexical head onto I^0, or by the presence of an element in the specifier position of the projection whose head I^0 occupies in syntax. The participial verb and negation are heads which can license finite Infl by incorporating onto it, and wh-phrases and focalized constituents also license Tense by virtue of filling the specifier position of CP, which is the projection where I^0 ends up in interrogative sentences and sentences containing focalized constituents (i.e., I^0-to-C^0 movement is assumed in those constructions).[14] Negation is assumed to raise to C^0, as its occurrence on the left edge of the clause suggests, and thus it must raise first to the auxiliary and to I^0. Negation licenses I^0 with its incorporation. As for the particle ba-, I agree with Ortiz de Urbina in assuming that it is a particle introduced by last resort to license Tense,

---

(14) Cf. Rivero 1994 for similar treatments of the clitic nature of auxiliaries in the Balkan languages.

in the absence of another head or element in the specifier position of CP. This particle in inserted in C^0.[15] These constraints resemble Wackernagel effects, already noted by Michelena (1957), who mentions the enclitic nature of finite verbal forms, at least auxiliaries (Michelena 1957: 177, fn. 32).

A schematic representation in (26) illustrates the configurations where Infl is licensed. This configuration is the checking domain of Infl, in Chomsky's (1993) sense:

(26)

```
                        CP
                 ┌──────┴──────┐
                XP            C'
                        ┌──────┴──────┐
                        C            IP
                        │
               (Participle+) Infl
               Neg+Infl
               Ba+Infl
```
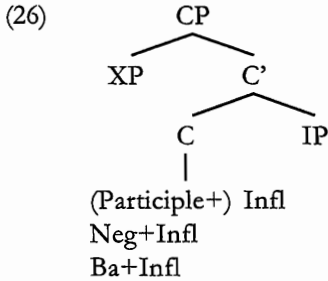
The parenthesis surrounding the participle indicates that it never needs to raise to C^0 in periphrastic constructions in northern dialects (cf. (22)). In southern dialects such as LB the participial verb has to raise to I^0 and then to C^0 even in the presence of an element in Spec,CP. Thus, compare (22) with (27):

(27) a. <u>Liburua</u> erosi du Jonek   b. Nork erosi du liburua?
          book   buy   aux Jon   who buy aux book
          'Jon has bought <u>the book</u>'   'Who has bought the book?'

Ortiz de Urbina (1994) maintains that the overtly realized XP in Spec, CP is sufficient to license Infl, and that the participial verb raises to Infl for other related reasons: he argues that Infl needs to be lexicalized in Basque, that is, a lexical head must move to it (cf. Tuller 1992 and Horvath to appear for original proposals for other languages). Thus, in non-negative clauses, both declarative and interrogative, V-to-I movement is obligatory in synthetic and periphrastic constructions. In negative sentences, negation raises to Infl alone, without the participle, providing lexical support for it. The participial verb stays behind, without raising to I^0. No explicit explanation is offered by Ortiz de Urbina for the absence of participial verb raising in negative sentences, although the implicit idea is that the raising of one head which is able to provide strong morphological support for Tense is sufficient. We will return to this issue below.

Modal particles do not provide enough lexical support, as shown in (28) and (29). The participial verb has to move with the modal to license Infl, or the particle

(15) In this respect, I disagree with Ortiz de Urbina, who assumes *ba-* to be inserted in the specifier of CP. I take *ba-* to be a last resort spell-out of the affirmative and question morphemes in C^0, introduced in the absence of an element in Spec,CP and/or a lexical head in C^0. In this view, C^0 would be a head that needs to be lexically filled, i.e., licensed, by elements with the relevant features. If no such elements are available in the sentence, *ba-* is inserted, possibly in PF (see Elordieta in preparation).

ba- will have to be inserted, in the absence of a participial verb, negation or an element in Spec,CP:

(28) a. *ei dator   b. Ba ei dator
          evid. comes   'I have heard that (s)he is coming'

(29) a. *ei   dau Jonek liburua erosi   b. Erosi ei   dau Jonek liburua
          evid. has Jon book buy   buy evid. has Jon   book
          'I have heard that Jon has bought the book'

It is important to underline one aspect of Ortiz de Urbina's analysis, which is that syntactic movement may be triggered not only for feature checking purposes, but also for lexicalizing features. In Basque, the participial verb raises to the inflected auxiliary to provide lexical support. The question is whether this movement is also motivated by the necessity to check features in I^0. I will assume here that I^0 has verbal features that need to be checked by a head with verbal features. Apart from this, I^0 (more specifically, the feature Tense) needs to be provided with lexical support by a head which is a free morpheme and also has verbal features. We are going to assume here that the auxiliary is a verbal head that checks the V-features in I^0, but is a bound root, that is, only the root of the auxiliary appears attached to the inflectional morphemes. From the transitive auxiliary **edun*, for example, only *-u-* surfaces (cf. the glosses in (6)). Thus, the tensed I^0 requires the raising of a verbal head which is morphologically strong, i.e., free or independent. The participial verb is such a candidate.

Negation raises to I^0 on its way to C^0, and it suffices to license tensed I^0 morphologically, as it is a free morpheme and thus can provide strong morphological support to I^0. As for the other requirement, that negation be a verbal head, we could assume that negation has verbal features, as evidenced more clearly in other languages such as Arabic, where negation appears followed by agreement and tense suffixes (cf. Benmamoun 1992 for an analysis of these facts).[16] Meeting all the requirements imposed by I^0 regarding its morphological licensing, the raising of negation is sufficient to provide independent morphological support for this head. Thus, the participial verb does not need to raise to I^0.

A question that can be raised at this point is whether the participial verb and negation are inflected for features present in I^0. The conclusion must be that they are not, assuming that those features have already been checked by the auxiliary. According to the assumptions in the minimalist framework, the features contained in a head cannot be checked more than once (i.e., they disappear once they are checked). If negation and the participial verb were inflected for inflectional features, they would be unable to check them against the features in I^0, since they would have been checked already. The raising of negation is independent of I^0; it moves attracted by features in C^0. The raising of the participial verb is the only one which is motivated by the morphological deficiency of I^0 (and the auxiliary verb).

---

(16) I owe this suggestion to Jean-Roger Vergnaud.

A modal particle does not realize syntactic features of the inflectional sort. Its function in the sentence is discourse oriented, expressing subject oriented attitudes about the event expressed in the utterance, and thus contributing more to the pragmatics of the speech act than to the real truth value of the proposition. Unlike Case and agreement markers, which relate the event with the participants and encode grammatical functions, or unlike tense and aspect morphemes, which specify features of the event itself, modal particles do not relate the event to syntactic elements in the sentence. That is, in contrast to those morphosyntactic features, modal particles are not necessary for the event to be expressed. The constraints licensing their occurrence in a sentence are of a semantic nature, rather than syntactic. Thus, the evidential particle *ei* cannot appear in an interrogative sentence, because the reportative meaning that this particle has is incompatible with a question, in which the main objective is to obtain information. This particle is also ruled out in subjunctive clauses or imperatives, which are not assertions. Albizu (1991) relates these characteristics to the fact that these particles can appear in parenthetical constructions and argues that modal particles are adverbial elements with relative autonomy from the propositional content of the clause and with licensing conditions which are independent from the syntactic structure of the clause. Thus, we believe it is warranted to assume a contrast between participial verbs or negation on the one hand and modal particles on the other in terms of grammatical feature realization. This contrast could suggest that modal particles are not verbal elements, or do not have verbal features, and thus cannot license tensed I^0.

3.4. Other alternative proposals on phrase structure and head movement

Other possible alternatives to the analysis of the clause structure and head movement in Basque proposed in this paper do not seem to be able to account for the whole range of facts in a nonstipulatory way. For instance, Laka (1990) suggests that the participial verb does not raise higher than the head position of an Aspect Phrase, located immediately above VP. If we do not assume that the participial verb incorporates to the auxiliary and then to Infl, we cannot explain why the participial verb appears together with the inflected auxiliary forming a complex head in C^0 in interrogative sentences and focus constructions. We would be forced to assume that the rest of the material in the sentence has extraposed to the right of IP or CP, without a clear motivation for that.

Another possibility would be an analysis in which the participial moved to the position occupied by the auxiliary in a long head movement fashion, in a similar way to what has been proposed by Lema and Rivero (1989, 1991) for Old Spanish, and Rivero (1991, 1993, 1994) and Borsley and Rivero (1994) for Slavic and Balkan languages. Albizu (1991) follows this approach, and suggests that a principle similar to the Tense c-command of Laka (1990) motivates the raising of the auxiliary to C^0 in interrogative and focus constructions, incorporating on its way the inflection and the modal particle. He locates the modal projection above IP, and claims that the auxiliary adjoins to the right of the modal particle. Then he argues that the participial verb raises to C^0, triggered by a wh- or focus operator in Spec,CP.

Although the author is not explicit about this, we assume that he refers to the need to fulfill the wh-criterion of Rizzi (1991). The participle adjoins to the left of the complex formed by the modal particle and the inflected auxiliary, to derive the right word order. This analysis presents two problems: first, the author does not argue convincingly in favor of a motivation for the raising of both the auxiliary and the participial verb in independent movements. The proponents of Spec-head agreement relations between an operator and a head with the relevant features argue that it is the head Infl that carries the features +wh or +focus, not a lexical verb (Rizzi 1991, Horvath to appear). Suggesting two different principles for what seems to be the same triggering element, i.e., the presence of an operator in Spec,CP, seems unwarranted. Second, in order to derive the right order among heads, the analysis suffers from the fact that it has to assume bidirectionality in the adjunction operations; the inflected auxiliary adjoins to the right of the modal, and the participle adjoins to the left of this complex. Notice that these problems arise whether we assume a head-initial or head-final analysis of Basque clause structure.[17] Our analysis does not have to face these problems, since the raising of the participle is motivated by the lexicalizing constraints imposed by these tensed Infl. auxiliary, and the movement of the participle is always to the left of the heads it adjoins to. We only have to assume that the modal projection is located below the auxiliary and above the verbal phrase.[18]

A question that all analyses would have to answer is how the logical scope of the modal particle over the whole clause can be obtained in affirmative declarative sentences, with the neutral word order SOV. We would have to assume that the wide scope of the modal particle is obtained by LF-raising of the modal particle to a projection where it c-commands the whole clause, most likely CP.

To summarize, in this section I have discussed and presented the syntactic configuration that I assume for the structure of the clause in Basque. We have seen that Tense is a morphological feature that needs to be syntactically licensed

---

(17) Similar problems would arise with any other alternative analyses based on long distance movement. Somebody could propose an analysis in terms of VP-movement, such that the VP moves to the specifier of ModP, located above IP. This analysis would face two additional problems: first, there is the lack of explanation for why all argumental and nonargumental material inside the VP must have raised out of it before the VP moves, and second, this analysis would have to assume that in interrogative and focus sentences the participial head can be extracted out of the VP, violating the principle against extraction out of a CED (Huang 1982), or the more general principle against extraction out of a specifier (cf. Ormazabal, Uriagereka and Uribe-Etxebarria 1994).

(18) The main reason Albizu gives to locate ModP above IP is the existence of data like the following, involving the modal particles *ote* and *omen* (in LB, *ete* and *ei*, respectively):

    (i)   —Nork dauka dirua?   —Mikelek omen
           who   has   money   Mikel   evid.
           'Who has the money?'   'I have heard that Mikel does (have the money)'
    (ii) —Loteria tokatu zaizu   —Bai ote?
           Lottery touch aux   yes dub.
           'You won the lottery'   'Maybe yes? (i.e., I wonder whether that is true)'

He takes this to indicate IP ellipsis, but Euskaltzaindia's (1985) grammar cites similar examples in which they state that the modal particles can be pronounced after a pause, dislocated. In fact, these particles may sometimes appear as parentheticals, as if they were used in an adverbial manner. Thus, it is not clear that the modal particles in these constructions are in their regular position in the clause. Moreover, the type of sentences illustrated in (i)-(ii) are ungrammatical in LB.

in its checking domain. In the case of synthetic verbs, the presence of an element in the specifier position of the projection occupied by inflection is sufficient to license tensed Infl. In periphrastic constructions, however, the participial verb has to raise to I^0 together with the auxiliary in order to achieve its licensing. In negative clauses, it is negation that raises to I^0 together with the auxiliary. Following Ortiz de Urbina's (1994) analysis of these facts, we have suggested that tensed Infl. is a weak morphological category that needs to be supported by a head with enough morphological strength and with verbal features, i.e., the participial verb or negation. For our present purposes of trying to explain the phenomenon of VA in LB, the relevant configuration is the one concerning the inflected auxiliary.

Having established the properties of finite Infl, we turn our attention to the other inflectional head in the language, the determiner, to see whether it has similar licensing requirements to Infl, and thus whether we can draw a parallelism between verbal and nominal inflection.

4. Determiners

Maintaining head-initiality for Basque across all categories, we would derive the order *noun/adjective - determiner* either by head movement of the noun or adjective to the determiner or by raising of the NP to the specifier position of DP. Given the fact that the determiner always appears attached as a suffix to the last element in the NP, instead of to the head noun, the latter option seems the most straightforward one. The example in (30) illustrates a sequence noun-adjective-determiner:

(30)   NP [gixon argal] D [-a]
             man   thin   det
        'the thin man'

Note that determiners can occur attached to the last element in a phrase with an empty head noun, as in the relative clause in (31), thus providing even stronger evidence that the nominal constituent preceding the determiner is a maximal projection, not a head noun. Within the assumption of a uniform head-initial structure for Basque, the relative clause must have raised to the left of the noun (cf. Kayne 1994), and then the whole NP moves to the specifier position of DP, plausibly to check the NP-features of the determiner.

(31)   DP [NP [CP [gaur goixian   etorri dan]] D [-a]
                   today morning come aux   det
            'the one that came this morning'

The determiner is a bound morpheme, a suffix, and it attaches to the last element of the phrase that precedes it. Thus, it would be a phrasal clitic (of the type discussed in Nevis 1985, Poser 1985, Zwicky 1987, and Miller 1992), or a lexical clitic, in Halpern's (1995) terms. We could assume that the suffixation process is done at PF, and that this process serves to license and lexicalize the determiner, by

providing lexical support to it. This operation would then have the same results as the process of incorporation discussed in the preceding section for Tense. Nevertheless, it still remains to be clarified whether the suffixation is done by raising the determiner to the last word in the specifier of DP, by lowering this word to the determiner, or by some other alternative movement. If we are right in treating the determiner as a phrasal clitic, then we should adopt the first option, since it is standardly assumed that phonological clitics attach themselves to adjacent elements, rather than the other way around. In this respect, the morphological licensing of the determiner is different from that of Tense, which is done by the incorporation of another syntactic head. These and other differences can be expected, however, given the fact that these two processes apply in different components of grammar; the incorporation onto I^0 occurs in syntax, and the suffixation of the determiner is done in the morphological component, where the mechanisms for movement are different from those of syntax (cf. for example the operations of merger, fusion, and fission among morphemes discussed in Bonet 1991, Noyer 1992, Halle and Marantz 1993, and references there).

The morphophonological operation of suffixation could then be represented as in (32):

(32)

DP

NP

[gaur goixian etorri dan]$_i$-a$_j$

D'

D   NP

t$_j$ t$_i$
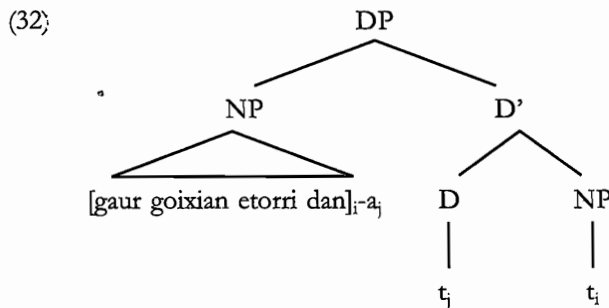
The simpler case of a noun or adjective to which the determiner is suffixed, such as *arrebi-a* 'the sister', would have the following representation:

(33)

DP

NP

[arrebi]$_i$-a$_j$

D'

D   NP

t$_j$ t$_i$
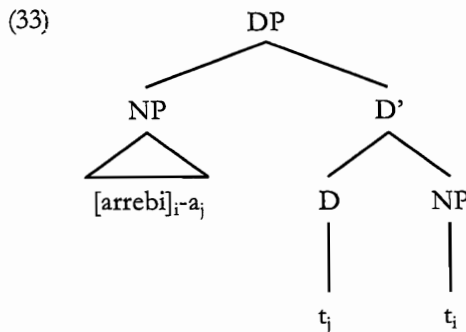
5. An analysis in terms of morphological licensing

What does all we have argued for so far tell us about the domain of application of VA? Note that it is not sufficient to say that the domain of application of VA is an X^0, formed in syntax or phonology, because although that eliminates sequences of a noun and an adjective, a subject and a verb, a subject and a direct object, and so on, it does not account for the absence of VA between a participial verb and a modal particle, which end up in an X^0 in overt syntax (cf. section 3). Nor can it explain why there is no VA between a participial verb and a causative verb, which also end up in the same X^0 in syntax. In (34) below we illustrate a schematic derivation involving movement of a participial verb onto a causative verb which selects it:[19]

(34)   a.   Jonek Mireneri etorri eraiñ dotzo
            Jon-E Miren-D come caus aux
            'Jon has made Miren come'

       b.
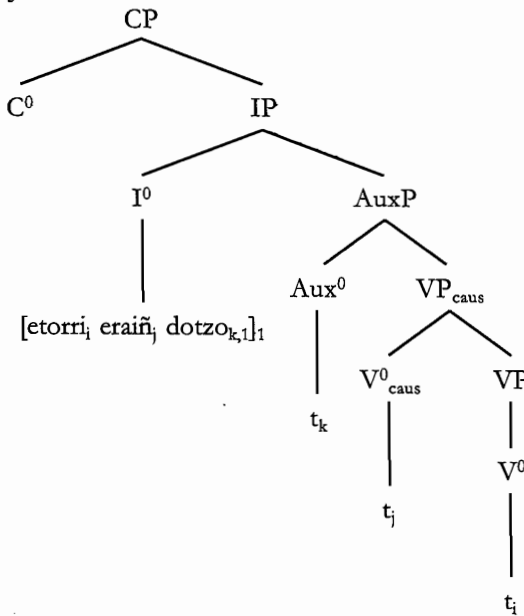
As we can see in the diagrams in (35), the adjunction structure that obtains when a participial verb raises to Aux^0 and then to I^0 is the same as the one obtained when it raises to a modal particle and a causative verb:

(19) The causative verb *eraiñ* may well select an IP in Basque, instead of a VP, on the basis of the diagnostics provided for causative verbs by Ritter and Rosen (1993). But even in such a case the participial verb and the causative verb would appear in the same X^0 on surface, so in the end whether the causative verb selects an IP or a VP does not matter for our present purposes. As for the motivation for the movement of the participial verb to the causative verb, we could follow an anonymous reviewer's suggestion that this movement could be semantic in nature, in particular for complex predicate formation.

(35)   a. I^0 b. Mod^0 c. $Caus^0$

                  Aux^0 I^0 V^0 Mod^0 V^0 $Caus^0$

            V^0 Aux^0
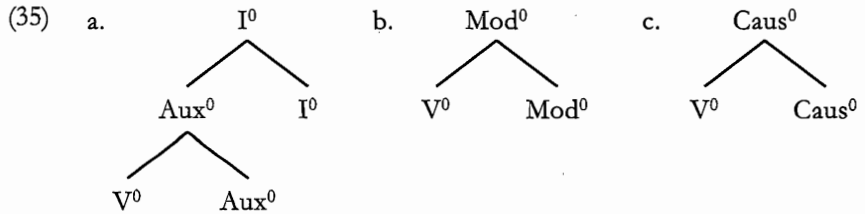
Then, what is the difference between (35a), which is a potential context for VA, and (35b,c), which are not? There is no hope in an analysis in terms of prosodic cliticization of the auxiliary to the participial verb for reasons of stresslessness of the inflected auxiliary. On the one hand, as we mentioned in section 2.1.2, the inflected auxiliary may bear its own underlying stress (cf. (6c,d)), and the participial verb and the auxiliary may form independent domains for stress assignment (cf. fn. 12). Still, VA may apply, as illustrated in (36a) below. On the other hand, causative verbs and modal particles may sometimes be integrated in the same stress domain with the participial verb and the inflected auxiliary, but no VA occurs (cf. (36b, c)), where the stress domain is indicated with a bracket:

(36) a. /atrapa e-be*-s-en/   → (atrapá) (ebésen) / (atrapá) (abésen)
          catch 3erg.-rt-past
          'They DID catch them'
      b. /atrapa eraiñ neutzan/ → (atrapa eraiñ neutzan) / *(atrapa araiñ neutzan)
          catch caus aux
          'I made him/her catch'
      c. /atrapa ete* eban/   → (atrapa ete éban) / *(atrapa ate éban)
          catch dub. aux
          '(I wonder whether) (s)he caught them'

We argue that the difference lies in the distinction between functional categories which carry morphosyntactic features to be checked or licensed and functional or lexical categories which do not. I follow original ideas of the minimalist framework that all functional heads containing morphosyntactic features (e.g., agreement, tense, aspect, definiteness) have to be checked at some point in the syntactic computation for the linguistic derivation to converge (cf. Chomsky 1993, 1994, 1995). That is, a feature needs to enter in a checking relationship with a lexical head specified for the same feature in overt or covert syntax, i.e., before Spell-Out or after Spell-Out, in LF. The configurations in which these checking operations may take place are either a spec-head relationship, or head incorporation, i.e., the licensing takes place in the functional head's checking domain. In minimalist terms, all movement is triggered by checking purposes. I want to suggest, however, that this is not necessarily so. As we mentioned before, the participial verb only raises to Aux^0 and then to I^0 in affirmative declarative sentences and interrogative sentences. When negation is present, however, it is negation that raises to the auxiliary and to I^0, the participial verb staying behind. This asymmetric behavior in participial verb raising between negative and nonnegative sentences shows that

feature checking is not the operation triggering participial verb movement, or alternatively, that the participial verb is not inflected for the features in I^0 (cf. the discussion at the end of section 3.3). That is, if the movement of the participial verb is overt in some contexts, and we attribute it to feature checking requirements, we would expect overt movement of the participial verb in all instances. Thus, Tense is triggering the raising of the participial verb or negation for other purposes different from feature checking. We argued that Tense is a weak morphological feature that requires morphological support, achieved with the incorporation of another head which is sufficiently strong to provide such support. Now we need to explain what this lexicalizing requirement really means. I want to suggest that this requirement responds to a general overriding principle of UG, the Principle of Full Interpretation (FI), first discussed in Chomsky (1986).

FI subsumes many of the principles present in a Principles and Parameters theory of Universal Grammar, such as the Binding Theory, c-selection, s-selection, or the Theta Criterion. Ultimately FI requires that every element of PF and LF must receive an interpretation, that is, it must be licensed in an appropriate fashion: an operator is licensed by binding a variable in a local domain, a variable must be bound, referential dependencies must meet the conditions of Binding Theory, every complement of a head must be s-selected by it, an element that assigns semantic roles must have recipients in appropriate syntactic positions, an element that requires a semantic role must be assigned such a role, a predicate must have a subject which is syntactically defined, and so on. The principle of Visibility, which derives the Case Theory ("an element is visible for θ-marking only if it is assigned Case") is also an instantiation of the more primitive principle of FI. I want to suggest that FI also requires linguistic elements to be licensed morphologically, by being part of a well-formed word. A linguistic element may be licensed (i.e., receive an interpretation) as a word by itself, if sufficiently strong. If it is weak or deficient to stand as as independent word, it will need to associate with another head and form a complex head with it. This association can be done by overt syntactic movement or by morphological movement in the morphophonological component (i.e., by PF-movement). In the default case, referential expressions and lexical categories in general form independent words, whereas morphemes or functional categories carrying bundles of morphosyntactic features are deficient words. This is reflected overtly by the fact that functional categories appear quite regularly as bound forms, attached to lexical elements either as affixes or as clitics.

The idea that functional heads spelling out morphosyntactic features need to be morphologically licensed if they are weak morphological words is not independent of the minimalist idea of feature checking. In the minimalist framework, it is claimed that all features must be checked in the syntactic derivation, overtly or covertly, i.e., before Speel-Out or at LF. By the operation of feature checking, morphosyntactic features form complex X^0s at LF with syntactic heads inflected for those same features. This is the way morphosyntactic features are licensed in the syntactic derivation Now, we could interpret this general principle of grammar in the following terms; the functional heads containing bundles of morphosyntactic features do not form legitimate LF words by themselves, and need to be licensed by

the incorporation of another head with the right features. Then, we propose that parallel to the necessity to license morphosyntactic features in the syntactic computation, there is the necessity to license these features morphologically, due to their inherent morphological deficiency. In other words, functional heads realizing morphosyntactic features are not legitimate morphological words by themselves, and need to be licensed morphologically by forming legitimate m-words. The level of grammar where morphological well-formedness is checked would be the level of Morphological Structure, after the operation of Spell-Out has sent the linguistic derivation to PF (cf. Halle 1990, Bonet 1991, Noyer 1992, Halle and Marantz 1993).

The perfect coincidence of syntactic and morphological feature licensing is observed when a syntactic head checking a feature or a bundle of features in a functional head is an independent morphological word by itself. Then the features in that functional head get licensed ot the LF and MS levels of grammar. There is however the possibility that the syntactic head checking the feature(s) is weak or deficient morphologically. In this case no morphological licensing will have been achieved by the operation of syntactic feature checking. The Basque auxiliary is an example: it checks the features in I^0 but is itself deficient morphologically (it is a bound root, represented by a single vowel). Then, there are two mechanisms available in order to achieve morphological legitimacy: the syntactic raising of another head which is morphologically strong, or an operation of cliticization, in the morphophonological component. The case of the Basque auxiliary represents the first option: another head which is morphologically strong raises to solve this deficiency, of both I^0 and the auxiliary. The participial verb is a possible candidate, and raises to Aux° and I^0, thus licensing theses categories morphologically. Negation raises to C^0 for independent reasons, and on its way up it incorporates onto Aux° and I^0, thus also licensing them morphologically.

The determiner in Basque exemplifies a case of morphological licensing done in the morphophonological component, after Spell-Out. We showed that it does not receive the syntactic incorporation of a head, but it is suffixed to the last word in the phrase in Spec,DP.[20]

To summarize our hypothesis, all morphosyntactic features need to be licensed by associating with a syntactic head with lexical import, a head which constitutes an independent word by itself. The morphemes realizing syntactic features are integrated within the same linguistic unit, call it a word, with the syntactic head that licenses them. We characterize this as follows:

(37) $[\alpha]_{w(\text{lic.})}$ $[\beta]_{+F}$ → $[\alpha \, \beta]_w$

(20) The reader may have noticed that our proposal is similar to Lasnik's (1981) Stray Affix Filter. This filter states that every morphologically realized affix (i.e., inflectional affix) must be a syntactic dependent of a morphologically realized category at surface structure. However, the Basque auxiliary shows perhaps that Lasnik's filter is not inclusive enough, and it should be extended to all phonetically realized morphosyntactic features, whether they are affixes or not. Classifying the Basque auxiliary as an affix would seem unwarranted, given the fact that it can bear its own underlying stress, and that it displays relative freedom in host selection (a participial verb or negation can serve as hosts). Finally, we have argued that the Basque determiner is a suffix, and that the suffixation proper is done after Spell-Out, so in this case we would diverge from Lasnik in allowing an affix to find its host after Spell-Out, i.e., after 'S-structure'.

In Basque, the determiner and finite Infl are functional heads that need to be licensed overtly, i.e., they are strong heads or bundles of features. The determiner is licensed morphologically by suffixing to the last element in the NP. In the case of I^0, the participial verb or negation serve as morphosyntactic licensers. Negation is an independent syntactic head, which can stand in isolation in a sentence, and whose licensing properties are shown independently by its ability to license negative polarity items.

In (38a,b) below we provide examples of the instantiation of (37) in nominal and verbal contexts, respectively:

(38)   a.   [umi]$_{w(lic.)}$ [-a]$_{+F}$ →   [umi -a]$_w$
            child   det-sg   'the child'
       b.   [ekarri]$_{w\ (lic.)}$ [eban]$_{+F}$ →   [ekarri eban]$_w$
            bring   aux   '(s)he brought it'

If our working hypothesis is on the right track, then we could begin to grasp the nature of the contexts of application of VA. This process occurs in the context formed by a lexical verb (a participial verb) and an auxiliary inflected for tense and agreement, and in the context of a noun or adjective and a determiner, inflected for number, case, and specified for definiteness. That is, VA occurs between a lexical category and a morpheme realizing inflectional features. Phonological processes of assimilation and dissimilation are more likely to occur when the boundaries between two elements are weaker, or the two elements are in the same domain. Our proposal is that VA occurs when an element which needs to be licensed gets associated with a syntactic element that can license it, that is, after they are integrated into the same word. Following the formulation in (37), we could state that the initial vowel of the inflectional morpheme (β) assimilates to the final vowel of a preceding element licensing it (α). This amounts to saying that the word is mapped at PF as a domain for the application of VA. Moreover, if there is a level of Morphological Structure located between the syntactic and phonological components, after the derivation is sent to PF cf. Bonet 1991, Noyer 1992, Halle and Marantz 1993, it would be natural to assume that this is the level where the word is visible as a morphological domain, and that this domain is later mapped as a phonological domain, where phonological rules may apply. In (39) we express the domain of application of VA, as the phonological component would interpret it. The subscript *m* stands for the morphological domain mapped from Morphological Structure:

(39)   Domain of VA: [α β]$_m$

(40)   a.   [umia$_\alpha$ $_\beta$-a]$_m$ →   umii
       b.   [ekarri$_\alpha$ $_\beta$eban]$_m$ →   ekarri iban

With this analysis we can explain the fact that VA does not occur between two lexical categories: because they are not part of the same m-domain, but of separate ones. This would include causative verbs as well:

(41) a. [lora]$_m$ [ederra]$_m$ → lora ederra   *lora adarra
           flower beautiful
      b. [salta]$_m$ [erain̄]$_m$ → salta erain̄   *salta arain̄
           jump   make

As for the absence of VA between members of compounds, we would assume that each member is an independent word, which combines with the other to form another word:

(42) [[etxe]$_m$ [ondo]$_m$]$_m$ → etxeondo   *etxeendo
           house side

What remains to be explained now is why VA does not apply between a verb and a following modal particle, even though a modal particle could be classified as a function word (cf. section 3). We argue that this is because modal particles do not realize inflectional features. As we stated in section 3.3, their function in the sentence is discourse oriented, and the constraints licensing their occurrence in a sentence are of a semantic nature, rather than syntactic. Thus, it seems warranted to assume that they do not have any morphosyntactic features which need to be licensed or checked.

They would thus constitute separate morphological words, and that is why no VA is observed between participial verbs and these elements:

(43) [ekarri]$_m$ [ete]$_m$ → ekarri ete   *ekarri ite

Although according to our theory modal particles are not incorporated into an m-word with a lexical category, we must note that modals are also deficient syntactically, because they are not sufficiently strong to license an auxiliary. Recall that a participial verb has to raise to the inflected auxiliary even in the presence of an intervening modal particle, and that the modal particle cannot start a clause (cf (28), (29) above). Still, we maintain that a modal particle is not a morphologically bound element, unlike an inflected auxiliary. We would argue that the former is a head which is syntactically deficient, whereas the latter is morphologically deficient, by virtue of carrying morphosyntactic features which need to be licensed in the linguistic derivation. A modal particle is simply a syntactic head with epistemological meaning. To put it in simple terms, the intuition we are expressing is that a modal particle is a "weak" syntactic head which cannot license another head, but which does not need to be licensed.

Another piece of evidence showing that there is a substantial difference between finite Infl and modal particles is the phenomenon of n-deletion, by which the final /n/ of a participial verb gets deleted in the presence of a following vowel-initial auxiliary. This rule of n-deletion provides the context for VA:

(44) a. erun eban   → eru eban / eru uban
           take aux
           '(s)he took it'
      b. žan ebasan   → ža ebasan / ža abasan
           eat aux
           '(s)he ate them'

No other elements following a participial verb trigger such a rule. Thus, the outputs in (45) are not acceptable:

(45)   a. erun ete dábe?   →   *eru ete dábe?
             take dub. aux
             '(I wonder whether) they have taken it'
         b. žan éi dau   →   ža éi dau
             eat evid. aux
             'I have heard that (s)he has eaten it'

This contrast between auxiliaries and modal particles shows that the degree of cohesion between participles and finite Infl is closer than the one between participles and modal particles. We argue that this is a reflection of the fact that finite Infl are licensed by participial verbs.

Similarly, we would only have to assume that subordinating conjunctions such as *ezik* 'unless' and *arren* 'despite' do not intervene in phonological relationships with participial verbs because they are syntactic connectives with lexical meaning. They are not inflectional categories whose features need to be licensed. Thus, they are not morphologically deficient, and would not constitute a single m-word with the participial verb.

Our analysis then makes a prediction: functional categories which contain morphosyntactic features to be checked will be in the default case weak morphological constituents, and thus need to form part of a well-formed m-word with an adjacent independent m-word. As a consequence, they will be potential targets of VA, if they are vowel-initial. On the other hand, functional heads which do not contain morphosyntactic features to be checked constitute independent m-words. They are then predicted not to undergo VA. As an anonymous reviewer rightly points out, the correlation made by our analysis is further supported by the absence of VA between a noun or adjective and a following quantifier, which is not inflected for features that need to be checked:

(46)   etxe asko   → $_m$[etxe] $_m$[asko]   etxe asko / *etxe esko
         house many
         'many houses'

The same reviewer asks what the behavior of demonstratives is with respect to VA, since they are all vowel-initial: *hau* 'this', *hori* 'that', *ha* 'that one over there'; *hónek* 'these', *hórrek* 'those', *hárek* 'those over there' (as in all southern dialects, the *h* is not a pronounced consonant in LB). Unlike Standard Basque, demonstratives in LB precede the NP, except for *hau* and *hori*, which can appear following the last element in the NP, like determiners. In fact, like determiners, they trigger the rule of VR, by which the final nonhigh vowel of a stem becomes high, when followed by a vowel-initial suffix (cf. (47), and compare it with the examples in (1), in section 2.1.1). The prediction would thus be that demonstratives display the same behavior as determiners with respect to VA. Nevertheless, VA does not apply to demonstratives in LB:

(47) a. /etxe-au/   →   etxiau / *etxiiu or *etxiii
          house-dem.
          'this house'
      b. /etxe-ori/   →   etxiori / *etxiiri
          house-dem.
          'that house'

The explanation for the contrast with determiners is phonological in nature: these forms begin with a diphthong and a round vowel, respectively, which are not affected by assimilation. Determiners beginning with a round vowel do not undergo VA, for instance. Consider here the plural proximative determiner -ok, which unlike the plural determiner -ak does not undergo VA:

(47) a. /umí-ak/   →   umíak / umíik
          child-det.pl
          'the children'
      b. /umí-ok/   →   umíok / *umíik
          child-del.pl.prox.
          'the children (proximative)'

No additional examples of functional categories with initial diphthongs failing to assimilate can be found in LB. All other cases involve lexical heads such as the verb *ein* 'to do', or the evidential modal particle *ei,* so these do not help us show that initial diphthongs never assimilate (i.e., lexical heads or modal particles are categories which are predicted not to undergo VA). However, there is evidence from other dialects of Basque that shows that complex syllable nuclei are resistant to vowel assimilation. In Arbizu, for instance, long vowels fail to undergo the partial assimilation rule that raises a low vowel and turns it into a mid vowel (examples from Hualde 1988, chapter 2, section 3.1.):

(48) a. /mendi-ak/   →   mendijek
          mountain-det.pl.
          'the mountains'
      b. /mendi-aa-n/   →   mendijaan *mendijean or *mendijeen
          mountain-det. sg.-ines.
          'in the mountain'

Hualde (1988) analyzed this contrast as due to the inalterability of geminates (cf. Hayes 1986, Schein and Steriade 1986). Our proposal would then be that diphthongs in Basque are like geminate vowels in that they are complex nuclei, and as complex nuclei they are resistant to assimilation.

6. Summary and conclusion

In the analysis provided in this paper for the problem of identifying the domain for the phonological process of VA we explored the idea that morphemes realizing inflectional features such as agreement, tense, or aspect are weak or deficient mor-

phological words, that is, that they inherently lack an independent morphological structure of the form $_m[\ ]$. We proposed the hypothesis that in the morphophonological component, at the level of Morphological Structure, all linguistic expressions must be contained in a constituent of the form $_m[\ ]$, that is, a well-formed m-word. Otherwise they will be judged to be illegitimate objects at this level. In the default case, lexical heads are independent m-words, whereas functional categories realizing morphosyntactic features are not. Given this hypothesis, morphosyntactic features need to be licensed morphologically in order to receive an interpretation as well-formed words. The licensing is done by forming a morphological unit with an element which is an independent m-word, and this unit may be formed by syntactic incorporation of that head, or by morphological movement between the two heads. In LB we argued that the auxiliary is insufficient to license Infl morphologically, and that it needs to be licensed by the incorporation of another head, such as the participial verb or negation. The determiner is another inflectional head whose features have to be checked, and that needs to be licensed morphologically. This is achieved by the suffixation of the determiner to the rightmost word in the NP, in the morphological component.

Modal particles, subordinating conjunctions and causative verbs, on the other hand, are syntactic heads which do not carry features to be checked. Thus, their morphological properties need not be similar to those of functional heads carrying morphosyntactic features to be checked. Indeed, they could be independent m-words. Our analysis of VA provides evidence in favor of the latter possibility. We suggest that an m-constituent may be interpreted in the phonological component as a domain of application of phonological rules, and the m-constituent formed by the union of an inflectional head and a morphologically strong head can thus be a phonological domain. We saw that the auxiliary and the participle formed one domain for the application of VA, as well as a noun or adjective and a determiner. However, no VA applies to modal particles, subordinating conjunctions and causative verbs. If our hypothesis is correct, then we have established an independent empirical confirmation of the reality of morphological licensing in Universal Grammar. We suggested that the minimalist notion of feature checking overlaps with morphological licensing, in the sense that a feature which is overtly checked by a head which is morphologically strong is automatically licensed morphologically.

Finally, our analysis avoids the problems that other theories of phrasal and prosodic phonology have to face to account for the phonological phenomena discussed in this paper because it looks closely to the syntactic and morphological relationships existing between the different heads, thus showing that the information deriving from morphosyntactic operations is more important to phonology than what has been assumed so far in the area of prosodic phonology.

References

Albizu, P., 1991, "Sobre la existencia del movimiento largo de núcleos en euskera", ms., Instituto Universitario Ortega y Gasset, Madrid.

——, 1992, "Where is COMP in Basque?", ms., University of Southern California.

——, 1994, "Word order in Basque and its implications for the theory of focus", ms., University of Southern California.

Artiagoitia, X., 1992, *Verbal projections in Basque and minimal structure*, Doctoral dissertation, University of Washington. Published in 1995 as a supplement of the *ASJU. International Journal of Basque Linguistics and Philology*, Donostia-San Sebastián.

Benmamoun, E., 1992, *Functional and inflectional morphology: Problems of projection, representation and derivation*, Doctoral dissertation, University of Southern California.

Bonet, E., 1991, *Morphology after syntax: Pronominal clitics in Romance languages*, Doctoral dissertation, MIT.

Borsley, R., and M. L. Rivero, 1994, "Clitic auxiliaries and incorporation in Polish", *NLLT* 12, 373-422.

Chomsky, N., 1986, *Knowledge of language: Its nature, origin and use*. New York: Praeger.

——, 1993, "A minimalist program for linguistic theory", in K. Hale and S. J. Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, MIT Press, Cambridge, MA, 1-52.

——, 1994, "Bare phrase structure", *MIT occasional papers in linguistics* 5, Department of Linguistics and Philosophy, MIT. To appear in H. Campos and P. Kempchinsky (eds.), *Evolution and revolution in linguistic theory: Essays in honor of Carlos Otero*, Georgetown University Press, Washington, D.C. Also published in G. Webelhuth (ed.), *Government and Binding Theory and the Minimalist Program*, Blackwell, Oxford, 1995.

——, 1995, *The Minimalist Program*, MIT Press, Cambridge, MA.

Elordieta, G., 1994a, "Vowel Assimilation in Lekeitio Basque and its implications for the minimalist theory". In S. Hargus, G. R. McMenamin and V. Samiian (eds.), *Proceedings of the twenty-third Western Conference on Linguistics* 6, 81-93.

——, 1994b, "On prosodic government", in Ch. Giordano and D. Ardron (eds.), *MIT Working Papers in Linguistics* 23, 115-133. Proceedings of the Sixth Annual Student Conference in Linguistics, University of Rochester, New York, May 8-9, 1994.

——, 1996, *Functional categories and the PF interface*, Doctoral dissertation, University of Southern California.

Euskaltzaindia (Royal Academy of the Basque Language), 1985, *Euskal gramatika: Lehen urratsak-II*, Institución Príncipe de Viana, Iruña.

Halle, M., 1990, "An approach to morphology", *Proceedings of NELS* 20, University of Massachusetts, Amherst, GLSA, 150-184.

——, and A. Marantz, 1993, "Distributed morphology and the pieces of inflection", in K. Hale and S. J. Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, MIT Press, Cambridge, Massachusetts, 111-176.

Halpern, A., 1995, *On the placement and morphology of clitics*, CSLI Publications, Stanford.

Hayes, B., 1986, "Inalterability in CV phonology", *Lg* 62, 321-351.

Horvath, J., to appear, "Structural focus, structural case and the notion of feature-assign-ment", in K. E. Kiss (ed.), *Discourse configurational languages*. Oxford University Press, New York.

Hualde, J. I., 1988, *A lexical phonology of Basque*, Doctoral dissertation, University of Southern California.

——, 1991, *Basque phonology*, Routledge, London and New York.

——, 1996, "Basque accentuation", in H. van der Hulst (ed.), *Word-prosodic systems of the languages of Europe*, Mouton, Berlin.

——, G. Elordieta, and A. Elordieta, 1993, "Focalización y prosodia en vascuence vizcaíno", *ASJU. International Journal of Basque Linguistics and Philology* 27, 731-749.

——, ——, and ——, 1994, *The Basque dialect of Lekeitio*, Supplements of the *ASJU. International Journal of Basque Linguistics and Philology*, vol. 34, Universidad del País Vasco / Euskal Herriko Unibertsitatea and Diputación Foral de Gipuzkoa, Bilbo and Donostia.

Huang, J., 1982, *Logical relations in Chinese and the theory of grammar*, Doctoral dissertation, MIT.

Inkelas, S., 1990, *Prosodic constituency in the lexicon*, Garland Publishing, NewYork/London.

Kaisse, E., 1985, *Connected speech: The interaction of syntax and phonology*, Academic Press, Orlando.

Kayne, R., 1994, *The antisymmetry of syntax*, *LI* Monograph 25, MIT Press, Cambridge, Massachusetts.

Kiparsky, P., 1982, "Lexical morphology and phonology", in I.-S. Yang (ed.), *Linguistics in the morning calm*, Hanshin Publishing Co., Seoul, 3-91.

König, E., 1991, *The meaning of focus particles*, Routledge, London and New York.

Laka, I., 1990, *Negation in syntax: On the nature of functional categories and projections*, Doctoral dissertation, MIT.

Lasnik, H., 1981, "Restricting the theory of transformations: a case study", in N. Hornstein and D. Lightfoot (eds.), *Explanation in linguistics*, Longman, London, 125-145.

Lema, J., and M. L. Rivero, 1989, "Long Head Movement: ECP vs. HMC", Proceedings of *NELS* 20, 333-347.

——, 1991, "Types of verbal movement in Old Spanish: Modals, futures and perfects", *Probus* 3, 237-278.

Longobardi, G., 1994, "Reference and proper names", *LI* 25, 609-665.

Michelena, L., 1957, "Las antiguas consonantes vascas", in D. Catalán (ed.), *Miscelánea homenaje a André Martinet*, La Laguna, 113-157. Reedited in *Sobre historia de la lengua vasca*, Supplements of the *ASJU. International Journal of Basque Linguistics and Philology* 10, Donostia-San Sebastián 1988, I, 166-189.

Miller, P., 1992, *Clitics and constituents in Phrase Structure Grammar*, Doctoral dissertation, Utrecht University.

Mohanan, K. P., 1982, *Lexical Phonology*, Doctoral dissertation, MIT. Distributed by Indiana University Linguistics Club.

——, 1986, *The theory of Lexical Phonology*, Reidel, Dordrecht.

Mujika, J. A., 1988, "Partículas modales de la flexión verbal", *ASJU. International Journal of Basque Linguistics and Philology* 22, 463-478.

Nespor, M., and I. Vogel, 1982, "Prosodic domains of external sandhi rules", in H. van der Hulst and N. Smith (eds.), *The structure of phonological representations (PartI)*, Foris, Dordrecht, 225-255.

——, 1986, *Prosodic phonology*, Foris, Dordrecht.

Nevis, J., 1985, *Finnish particle clitics and general clitic theory*, Doctoral dissertation, The Ohio State University. Published by Garland in 1988.

Noyer, R., 1992, *Features, positions, and affixes in autonomous morphological structure*, Doctoral dissertation, MIT.

Ormazabal, J., J. Uriagereka and M. Uribe-Etxebarria, 1994, "Word order and wh-movement: towards a parametric account", paper presented at GLOW 17, University of Vienna.

Ortiz de Urbina, J., 1989, *Some parameters in the grammar of Basque*, Foris, Dordrecht.

——, 1994, "Verb-initial patterns in Basque and Breton", *Lingua* 94, 125-153.

——, to appear, "Residual verb second and verb first in Basque", in K. E. Kiss (ed.), *Discourse configurational languages*, Oxford University Press, New York.

Poser, W., 1985, "Cliticization to NP and Lexical Phonology", in *Proceedings of WCCFL* 4, CSLI Publications, Stanford, 262-272.

Ritter, E., and S. T. Rosen, 1993, "Deriving causation", *NLLT* 11, 519-555.

Rivero, M. L., 1991, "Long head movement and negation: Serbo-Croatian vs. Slovak and Czech", *The Linguistic Review* 8, 319-351.

——, 1993, "Finiteness and second position in Long Head Movement languages: Breton and Slavic", paper read at the Lund April 1993 meeting of Eurotyp Project Group 3.

——, 1994, "Clause structure and V-movement in the languages of the Balkans", *NLLT* 12, 63-120.

Rizzi, L., 1991, "Residual verb movement and the wh-criterion", ms. University of Geneva.

Schein, B., and D. Steriade, 1986, "On geminates", *LI* 17, 691-744.

Selkirk, E., 1984, *Phonology and syntax: the relation between sound and structure*, MIT Press, Cambridge, Massachusetts.

——, 1986, "On derived domains in sentence phonology", *Phonology Yearbook* 3, 371-405.

Tuller, L., 1992, "The syntax of postverbal constructions in Chadic", *NLLT* 10, 303-334.

Zwicky, A., 1987, "Suppressing the Z's", *Journal of Linguistics* 23, 133-148.

Department of Linguistics
UCLA
405 Hilgard Avenue
LA CA90095 - 1543
e-mail: elordie@ scf-Fs.usc.edu