THE DOMAIN OF GLIDING IN FRENCH: AN OPTIMALITY THEORETIC APPROACH

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ABSTRACT

Gliding is a domain-sensitive phonological process of European French in which the high vowels /i/, /y/, /u/ become their corresponding glides [j], [ɥ], [w] in the presence of a following vowel, within the domain of the Prosodic Word. Previous studies have either ignored the fact that the phenomenon is sensitive to prosodic domains, or have established an unnecessary prosodic domain, i.e., the Clitic Group, in order to account for the behavior observed in prefix plus root sequences. A more updated study, conducted by Noske (1996), proposes an Optimality Theoretic account for the phenomenon without any consideration to prosodic domains. As a result, illicit forms are predicted. The purpose of this article is to provide an analysis for Gliding in French in which prosodic domains serve as loci for phonological processes. Accordingly, the study complements the work of Noske for Gliding in French, within the same theoretic framework.

1. INTRODUCTION

This article presents an analysis to determine the prosodic domain in which Gliding (also called Semivocalization, Devocalization and Glide Formation) applies in European French in the framework of Optimality Theory (OT) as outlined in Prince & Smolensky (1993). Gliding is a phonological phenomenon in which the high vowels /i/, /y/, /u/ become their corresponding glides [j], [ɥ], [w] when followed by another vowel, as illustrated in (1).

(1)   The Gliding phenomenon   (Hannahs 1995)

colonie [kɔlɔni] 'colony'	→ *colonial* [kɔ.lɔ.njal] 'colonial'
attribut [atriby] 'attribute'	→ *attribuable* [a.tri.bɥabl] 'attributable'
je joue [ʒu] 'I play'	→ *jouable* [ʒwabl] 'playable'

Phonological environment, however, is not enough to account for Gliding in French, since the process is also sensitive to prosodic domains. As I will show in the following section, Gliding does not apply in prefixation (e.g., *mi-août* /mi y/ → [mi.u], *[mju] 'mid-August'), in compounding (e.g., *saisie-arrêt* /seziarɛ/ [se.zi.a.rɛ], *[se.zja.rɛ] 'garnishment') or in

higher morphosyntactic contexts (e.g., *dû attendre* /dy atdr/ [dy.a.tãdr],
*[dчa.tãdr] '(he) had to wait') because the prosodic domains that these
morphosyntactic elements constitute in the phonology of French do not
conform to the one required by the Gliding phenomenon.

In this article, I argue that Gliding occurs at the lexical Prosodic Word
level. Prefixes, contra Hannahs (1995), are licensed at the post-lexical
Prosodic Word domain only, as both sisters and daughters to Prosodic
Words. This way, prefixes distinguish themselves from other function
words (i.e., clitics and other affixes) in the manner in which they are orga-
nized with respect to the constituent Prosodic Word, without resorting to
the Clitic Group as a prosodic constituent. Suffixes, on the other hand,
right-align with the lexical Prosodic Word, and consequently follow the
stress pattern of French: the syllable containing the rightmost vowel of the
word receives stress. Because the domain of word stress assignment in
French is the Prosodic Word (Charette 1991), I assume that suffixes
prosodicize as internal to the lexical Prosodic Word constituent.

1.1. The data

In (2) and (3)[1], I show the relevant data for my analysis, and the phono-
logical and morphosyntactic contexts in which Gliding applies. Observe
that in (2a) Gliding occurs within a monomorphemic word, and between a
root and a suffix in (2b). In (3a) through (3c), I illustrate the morphosyntac-

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[1] I remind the reader that the focus of this article is to determine the prosodic
domain in which Gliding applies (or is likely to apply) in European French;
therefore, I am not interested in the distinct outputs (variability) found in the
prosodic domain that I propose for the process. As an anonymous reviewer
pointed out, the phenomenon is not always obligatory. Noske (1996) provides
an analysis for the phenomenon in which he considers the variability aspect
(see also footnote 5). According to the author, three distinct patterns are found
in the prosodic domain of Gliding: (1) cases in which Gliding is obligatory
(e.g., *ouest* /uɛst/ → [wɛst] 'west' when spoken in isolation); (2) cases in which
the process is optional (e.g. *nier* /ni + e/ → [nje] and [ni.e] 'to deny'); (3) and
cases in which Gliding is forbidden (e.g. *grief* /griɛf/ → [gri.ɛf] 'grievance' or
[gri.jɛf] (Consonant Intercalation by insertion of the epenthetic glide [j]), as an
anonymous reviewer suggested). Hannahs (1995) points out that there is in-
dividual variation with the (non-)occurrence of Gliding before certain vowel-
initial suffixes (*-esque, -iste* and *-isme*) (e.g., *-isme* in *hinduisme* 'Hinduism'
/ɛduism/ → [ɛ.du.ism] and [ɛ.dwism]). For discussions concerning the phono-
logical constraints involved in the phenomenon and the determining factors
responsible for the three patterns discussed above, see Noske (1996).

tic contexts in which the process does not apply, resulting in heterosyllabi-
fication of the two vowels involved. Gliding does not apply in sequences of
a prefix plus a root, as in (3a), between the two members of a compound,
as I illustrate in (3b), and across words in higher morphosyntactic domains,
shown in (3c).

(2)   Gliding contexts   (from Hannahs 1995 and Noske 1996):
   a.   In monomorphemic words:
      ouest   /uɛst/[2]   → [wɛst] 'west' (spoken in isolation)
      nuage   /nyaʒ/   → [nɥaʒ] 'cloud'
      chouette   /ʃuɛt/   → [ʃwɛt] 'owl'
   b.   In suffixation:
      attribut /atriby + abl/   → *attribuable* [a.tri.bɥabl] 'attributable'
      tue '(I) kill'   /ty + e/   → *tuer*   [tɥe] 'to kill'

(3)   Inapplicability of Gliding (from Hannahs 1995):
   a.   In prefixation:
      mi-avril   /mi avril/   → [mi.a.vril], *[mja.vril] 'mid April'
      semi-aride   /semi arid/ → [sə.mi.a.rid], *[sə.mja.rid] 'semi-arid'
   b.   In compounding:
      saisie-arrêt /sezi arɛ/   → [se.zi.a.rɛ], *[se.zja.rɛ] 'garnishment'
      tissu-éponge /tisy epɔ̃ʒ/   → [ti.sy.e.pɔ̃ʒ], *[ti.sɥe.pɔ̃ʒ] 'sponge-cloth'
   c.   In higher morphosyntactic contexts:
      (je) joue au football /ʒu o/   → [ʒu.o], *[ʒwo] 'I play (at) soccer'
      (il a) dû attendre   /dy atɑ̃dr/   → [dy.a.tdr], *[dɥa.tɑ̃dr] 'he had to wait'

1.2. Previous studies

Previous studies in generative phonology have failed in their attempt to
satisfactorily explain the Gliding phenomenon in French. Bibeau (1975),
Dell (1973) and Kok & Spa (1978) present linear analyses for Gliding which
do not fully capture the phenomenon, since they do not refer to domains
and besides predict illicit forms for the rules they propose.[3] Kaye &

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2 Noske (1996) assumes that forms such as *ouest* contain a high vowel underly-
   ingly because the vowel comes to surface in other contexts, e.g. *l'ouest*
   /l+uɛst/ → [lu.ɛst] or [lwɛst] (Gliding is optional here).

3 Bibeau (1975) proposes the rule [+cld] → [-voc] / VC_V, which does not ac-
   count for cases such as *ouest* /uɛst/ → [wɛst], *virtuel* /virtyɛl/ → [virtɥɛl] and
   jouons /ʒuɔ̃/ → [ʒwɔ̃]. Dell (1993), on the other hand, proposes the rule [+son,
   +hi] → [-syll] _V (or _[+syll]), which wrongly predicts *publier* /pyblie/ →
   *[py.blje] vs. [py.bli.e]. Kok & Spa (1978: 70) account for the phenomenon by
   the rule [+voc] → [+çons] / _V [+hi, -mid, -stress]; however, for cases of ob-
   struent + liquid sequences such as /pyblie/ → [py.bli.e], they propose the *ad*
   hoc universal constraint OLISEM: 'If a syllable edge underlyingly begins with

Lowenstamm (1984) and Kaye (1989) provide a more accurate linear analysis for the phenomenon in which syllabic structure is taken into consideration.[4] As a result, the problems present in the aforementioned studies were solved. However, the domain subject remains untouched and the illicit forms in (3) are wrongly predicted. Inspired by the work of Mohanan's (1982) Lexical Phonology, Johnson (1987) proposes that prefixation (since it does not trigger word-internal processes in French) and compounding occur at a third lexical level, while Gliding occurs at levels 1 and 2. She rejects the possibility of prefixation applying at the post-lexical level because she believes that such a category-changing morphological process must occur in the lexicon. She also notes that certain prefixes behave as 'separate words' insofar as phonological processes do not operate across the boundaries that divide them from their stems. The first attempt to explain Gliding through Prosodic Domains was that of Hannahs (1995), in which stressed and unstressed prefixes are assigned the status of Prosodic Words, bearing the same status as other stressed, lexical words. Thus, prefixes and roots both constitute Prosodic Words (e.g., ((mi)$_{PWd}$ (avril)$_{PWd}$)$_{CG}$), strictly dominated by the unnecessary Clitic Group in order to comply with the Strict Layer Hypothesis. As I will show later, my analysis differs from that of Hannahs' because prefixes need not constitute Prosodic Words in French, and the relationship that exists between the prefix and the host word is in terms of sisterhood and motherhood with respect to the constituent Prosodic Word only, without recourse to the Clitic Group. Finally, Noske (1996)[5] proposes an Optimality account for

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       one or more obstruents plus one or more non-nasal sonorant consonants, plus a closed vowel, the edge of the syllable must be the same at surface level.'

[4] Kaye & Lowenstamm (1984) and Kaye (1989) propose the rule [+syll +high] → [-syll] / ~[C Liq] __ [+ syll]. Furthermore, they argue that for sequences of obstruent-liquid-glide such as *trois* [trwa], the obstruent-liquid sequence is syllabified as an onset cluster while the liquid surfaces in the nucleus position and not in the onset ([wa] is therefore a light diphthong, or a phonemic diphthong in Noske's (1996) terms).

[5] Noske's (1996) analysis for Gliding and its variability results from the interaction of the following constraints: PARSE-SEGMENT (no deletion of underlying material), NO-COMPLEX-ONSET/RHYME (complex onsets and rhymes are disallowed) and MONO-SYLLABICITY (forms should be monosyllabic), whose ranking is PARSE-SEGMENT >> NO-COMPLEX-ONSET/RHYME, MONO-SYLLABICITY. Due to space limitations, I will constrain myself to illustrate two cases: the first table illustrates a case of obligatory Gliding (only one winner: Gliding), while

Gliding in French without any consideration for what happens between prefix and root sequences, and between the two words that form a compound. In his analysis, he wrongly predicts the illicit forms in (3), since there is no reference to domains. My study, therefore, complements that of Noske's (1996) in an optimality theoretic framework.

2. THE ANALYSIS

2.1. The domain of Gliding in French

As I have shown, the Gliding process is sensitive to prosodic domains inasmuch as its application cannot be determined purely on a phonotactic basis. In order to provide a prosodic domain analysis for the phenomenon, I assume Selkirk's (1978, 1984, 1996) and Nespor & Vogel's (1986) view that phonological constituents are a hierarchically arranged set of phonological domains, and phonological phenomena must refer to the edges of these constituents, to the constituent itself as a whole, or to the juncture between two constituents. Nevertheless, such an approach makes rigid use of the Strict Layer Hypothesis (see (5) below), as originally proposed by Selkirk (1978), and therefore results in the assignment, by default, of Prosodic Word Status to usually unstressed, non-lexical words in order not to violate the Strict Layer Hypothesis. Within this context, an OT approach is preferable because it presents a more elegant analysis in which constraints are violable, and the violation of well established principles, such as the Strict Layer Hypothesis, is best accounted for without recourse to the Weak Layering Hypothesis (Itô & Mester 1992) or Stray Syllable Adjunction (Hayes 1980).

the second table illustrates optional Gliding (two winners: Heterosyllabification and Gliding):

Table a: Obligatory Gliding

/uɛst/	PARSE-SEGMENT	NO-COMPLEX-ONSET/RHYME	MONO-SYLLABICITY
.u.st.		*	*!
☞ .wst.		*	

Table b: Optional Gliding

/nie/	PARSE-SEGMENT	NO-COMPLEX-ONSET/RHYME	MONO-SYLLABICITY
☞ .ni.e.			*
☞ .nje.		*	

Following Selkirk (1996), I believe that function or non-lexical words may appear in a variety of prosodic configurations, depending on the interaction of well-attested types of constraints on prosodic structure. According to the author, non-lexical words may be licensed as Prosodic Words, free clitics, affixal or internal to the Prosodic Word, as I illustrate in Table 1. In agreement with Casali (1996), I assume that *lex* designates a free root belonging to a lexical category, that is, Noun, Verb, Adjective, etc., excluding all other non-lexical categories (represented here as *fnc*) such pronouns, determiners, etc. With regard to word-internal contexts, I treat all roots as lexical and all affixes as non-lexical or *fnc*.

(4)   **Table 1: Prosodic forms for [Fnc + Lex] sequences**

(a) Prosodic word   (b) free   (c) affixal   (d) internal
                              Clitic status
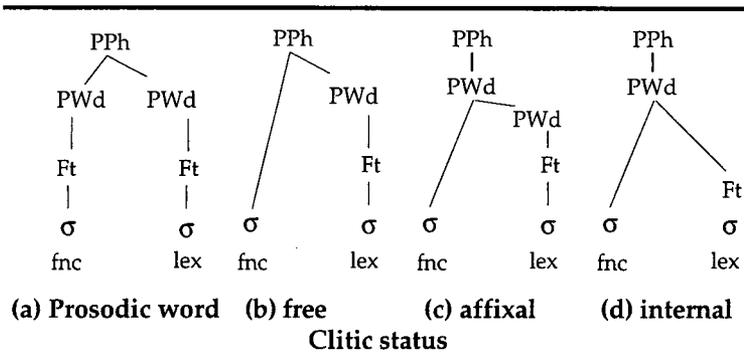
In order to account for these possibilities in an OT approach, I assume Selkirk's decomposition of the Strict Layer Hypothesis in (5), into four more primitive constraints, each with an independent status in the grammar, as I show in (6). In her view, the Strict Layer Hypothesis should be considered as a family of constraints, and not as a monolithic, inviolable device in which each non-terminal constituent of the prosodic hierarchy is exclusively composed of one or more constituents of the immediate lower category.

(5)   The Strict Layer Hypothesis   (Selkirk 1984):
           The categories of the Prosodic Hierarchy may be ranked in a
           sequence $C_1, C_2, \ldots C_n$, such that
    a.   all segmental material is directly dominated by the category C_n,
           and
    b.   for all categories C_i, $i \neq n$, C_1 directly dominates all and only
           constituents of the category C_{i+1}.

(6)   Constraints on Prosodic Domination   (Selkirk 1996):[6]

       (Decomposition of the Strict Layer Hypothesis, where C = some prosodic constituent)

   a.   Layeredness:

       No C^i dominates a C^j, $j > i$.

       e.g., No foot dominates a PWd.

   b.   Headedness:

       Any C^i must dominate a C^{i-1}.

       e.g., a PWd must dominate a Ft.

   c.   Exhaustivity (ExhC):

       No C^i immediately dominates a constituent C^j, $j < i-1$.

       e.g., No PWd immediately dominates a σ.

   d.   Nonrecursivity (*RecC):

       No C^i dominates C^j, $j = i$.

       e.g., No PWd dominates a PWd.

In (7), I show the prosodic Hierarchy adopted in this study. Along the lines of Zec (1988),[7] Inkelas (1989), Pepperkamp (1995, 1997), van der Leeuw (1997), and Selkirk (1996), I argue that the postulation of a further domain between the Prosodic Word and the Phonological Phrase, i.e., the Clitic Group, is unnecessary to determine the prosodization of non-lexical words (contra Nespor & Vogel 1986, Hayes 1989, Hannahs 1995, among others). In van der Leeuw's (1997) view, such an intermediate level is conceptually unacceptable since non-lexical words do not constitute a natural class or category; besides, the mapping rules of morphosyntactic con-

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6   In Selkirk's (1996) view, the constraints Layeredness and Headedness are universally inviolable and therefore must occupy an undominated position in the constraint ranking of all languages. This seems to contradict one major premise of OT, namely violability. In order to differentiate violable constraints from inviolable ones (which optimally speaking should not exist) and create a more constrained theory, Kawasaki (in preparation) proposes that inviolable constraints should be encoded into GEN, limiting, thus, the production of candidates for evaluation. In other words, GEN should only produce structures that do not violate the 'principles' Headedness and Layeredness, both of which deserve a different status in the grammar. In this analysis, I will not include candidates that violate these two 'undominated' constraints.

7   Zec (1988) argues that the Clitic Group is simply the Prosodic Word in its postlexical form. Instead of the assignment of two distinct prosodic domains, we should refer to the lexical/post-lexical distinction and maintain that the Prosodic Word is only available lexically; post-lexically, however, it automatically combines with the elements that commonly trigger the formation of the Clitic Group, i.e., clitics and affixes.

stituents into prosodic structure should make no reference to functional categories (Selkirk 1996).

(7)   The Prosodic Hierarchy   (Selkirk 1978)

PPh	Phonological Phrase
(PWd) PWd	Prosodic Word
(Ft) Ft	Foot
(σ) σ	Syllable
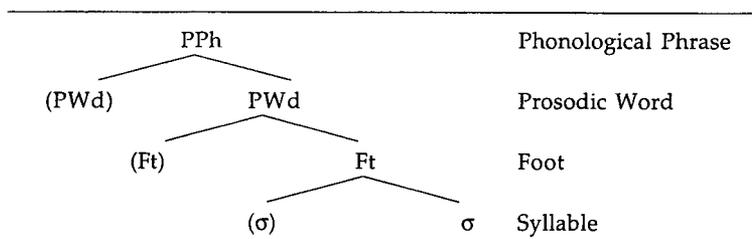
In agreement with Pepperkamp (1995), I believe that there must be a lexical and a post-lexical distinction for the Prosodic Word domain. Under her view, Prosodic Words are built at the lexical level. Post-lexical prefixation induces the construction of a new Prosodic Word, which includes the prefix plus the root, as I show in (8). Syllabification thus applies in two steps: 'at the lexical level, prefixes form independent syllabification domains, in accordance with the requirement that syllables be nested within prosodic words. Postlexically, however, resyllabification applies across prosodic words' (Pepperkamp 1997: 105); this accounts for the post-lexical Prosodic Words that prefixes form concomitantly with their bases in French. As it is evident, Pepperkamp argues against an output-output version of OT, and favors a version in which at least a lexical and a post-lexical level are recognized. Her main argument for such a view is grounded on resyllabification processes across Romance languages,[8] which lead to a 'readjustment' of Prosodic Word boundaries when resyllabification applies. Consequently, post-lexical Prosodic Word boundaries no longer coincide with morphological word boundaries, an alignment type of violation. To confirm her claim, Pepperkamp provides an example from Italian in which two morphological words (represented here by MWd) *bar* 'bar' and *aperto* 'open' form two Prosodic Words at the lexical level. When resyllabification applies (for compounding), the two words become a single morphological word, and a readjustment of the lexical Prosodic Words is required, as shown below:

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[8]   Pepperkamp (1997) rejects post-lexical extraprosodicity and ambisyllabicity as alternatives to resyllabification across Prosodic Words. For a more detailed analysis of the resyllabification phenomenon across Romance languages, see Chapter 2 of her dissertation.

- Lexical: (bar)$_{PWd/MWd}$ (aperto)$_{PWd/MWd}$ 'bar' & 'open'
- Post-lexical: ((ba)$_{PWd}$ (raperto)$_{PWd}$)$_{PWd/MWd}$ 'open bar'

The same analysis holds for compounding in French. The lexical and post-lexical Prosodic Word levels are insinuated in the work of Charette (1991). In her analysis for compounds, 'each term is a word which is joined to another word on a second cycle to form a complex noun' (p.151). For instance, consider the two independent morphological words *porte* [pɔrt] 'carry (3rd person singular)' and *assiette* [asjɛt] 'plate', which form two independent Prosodic Words at the lexical level. When these two words are combined to form the compound structure *porte-assiette* [pɔrtasjɛt] 'table mat', resyllabification requires a readjustment of the Prosodic Word boundaries. The result consists of two Prosodic Words that no longer coincide with their original morphological words:

- Lexical   ([pɔrt])$_{PWd/MWd}$ ([asjɛt])$_{PWd/MWd}$ 'carry (3p.)' & 'plate'
- Post-lexical   ((([pɔr])$_{PWd}$ ([tasjɛt])$_{PWd}$)$_{PWd/MWd}$ 'table mat'

Based on Pepperkamp's arguments for a lexical and post-lexical Prosodic Word distinction, I argue that Gliding in French applies exclusively within the lexical Prosodic Word, shown in (8). As I will show in the following sections, this configuration illustrates why Gliding is not possible between prefix plus root sequences, and between the two members of a compound. For the latter cases, the resulting prosodic constituents in which the target high vowel is present does not conform to the span range of the lexical Prosodic Word, the domain required for the application of the Gliding process.

(8)   The domain of Gliding in French: the lexical Prosodic Word

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        PWd                    Post-lexical PWd
       ╱  ╲
      ╱    PWd                 Lexical PWd
     ╱     │
    ╱      Ft
   ╱       │
  σ        σ
 pref     lex
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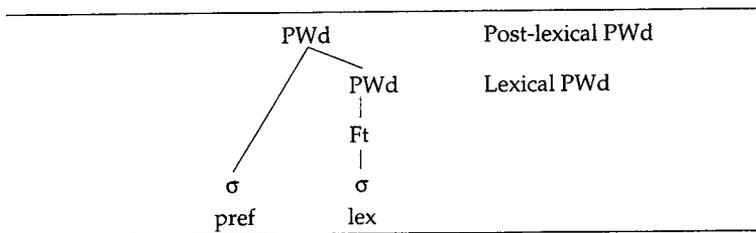
In the following sections, I show how the prosodization of suffixes, prefixes and compounding stems are obtained in order to determine the prosodic domain in which Gliding occurs in French.

2.1.1. The prosodization of suffixes

I initially provide an analysis for the prosodization of root plus suffix sequences in French. In order to account for affixation, another family of constraints is necessary besides the Family of Constraints on Prosodic Domination, illustrated in (6). The Constraints on Alignment of Edges of constituents, formalized by McCarthy & Prince (1993a, b), capture the match between phonological and morphological constituents; more specifically, they express how the designated edge of a prosodic or morphological constituent coincides with the designated edge of some other prosodic or morphological constituent.

The first relevant alignment constraint is the one that assigns the status of Prosodic Word to every stem or Morphological Word:[9] the AlignStem/PWd, illustrated in (9). According to this well-attested constraint, the left and right edge of every stem must be aligned with the left and right edge of a Prosodic Word. In other words, every stem must form a Prosodic Word. Assuming that this pair of constraints is equally ranked in the grammar of French, I will simply group them into one single constraint. Notice that it is this constraint, more specifically the left-alignment of the Stem with the prosodic Word (9a) that forces the recursive Prosodic Word structure for prefixation illustrated in (8).[10]

(9)   The Stem Alignment Constraint   (McCarthy & Prince 1993a, b)
            <AlignStem/PWd>
            a.   Align (Stem, L; PWd, L)
            b.   Align (Stem, R; PWd, R)

Based on stress assignment, I assume that suffixes form a Prosodic Word together with the root, the domain to which word stress is assigned in French, as proposed by Charette (1991). According to the author, stress is assigned to 'the rightmost expressed vowel of a word', and all the other vowels have a lesser degree of accentuation, as Nagy (1995) claims is the pattern for Romance languages. Since word stress is assigned at the PWd

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[9]   I use the terms stem and Morphological Word as synonymous throughout this article. In this analysis, a stem is the morphosyntactic result of affixation (affix + root) and compounding (stem + stem).

[10] The same does not hold for suffixation. Unlike prefixes, suffixes prosodicize as internal to the lexical Prosodic Word, satisfying in this way the requirement that the stem be right and left aligned with a Prosodic Word. Prefixes, on the other hand, prosodicize externally to the lexical PWd and in order to satisfy the AlignStem/PWd constraint, they must be licensed by a recursive structure, the post-lexical Prosodic Word.

domain, I assume that suffixes prosodicize as internal to lexical Prosodic Words. According to the constraint in (10), suffixation in French is simply the alignment of the left edge of a suffix with the right edge of a root, both of which form a stem and consequently a Prosodic Word, by AlignStem/PWd.

(10)   The Suffix Alignment Constraint

                        (McCarthy & Prince 1993b, Bullock 1995)

         Align (Suffix, L; Root, R) <AlignSuf>

   In (11) and (12) I show data which capture the fact that stress (indicated by a pre-syllabic ') is stem-final in French. Notice in the derived stems in (11), that even with the addition of a suffix, stress shifts to the rightmost syllable of the stem, a case of stress-dependent suffixation, as Kager (1996) defines such cases of prosodically governed morphology. In (12), notice that prefixes behave differently in that they do not interfere in stress assignment; in Kager's (1996) terminology, prefixed words are characterized by 'stem stress' in French.

(11)   Suffixation:

         Underived stems: Derived stems:

   a.   ['djabl]   'devil'   [djabɔ'lik]   'devilish'
   b.   ['parl]   '3sg. speaks'   [par'le]   'to speak '

(12)   Prefixation:

         Underived stems: Derived stems:

   a.   ['mɛ]   '3sg. puts'   [rə'mɛ]   '3sg. replaces'
   b.   ['prɔpr]   'clean'   [mal'prɔpr]   'dirty'

   Based on these facts, I adopt the AlignStem to Foot constraint (AlignStem/Ft) in (13), which captures the fact that stress is stem-final in French. In order to satisfy this constraint, stress is shifted to the rightmost syllable of the stem in suffixation. In prefixation, however, stress is preserved since prefixation does not affect the right edge of the stem, as I showed in (12). According to the constraint in (13), the right edge of every stem must coincide with the right edge of a Foot. The leftover syllables are then parsed by a higher constituent in the prosodic hierarchy, that is, the Prosodic Word.

(13)   The Stem-to-Foot Alignment Constraint

                        (Kenstowicz 1995, Garrett 1996):

         Align (Stem, R; Foot, R) <AlignStem/Ft>

   The Prosodic Word constraint (PWdCon) in (14), originally proposed by McCarthy & Prince (1993a), captures the fact that every Prosodic Word be

right and left aligned with a lexical word or free root. It is based on this constraint that I, in agreement with Selkirk (1996), reject the Clitic Group as a prosodic domain. In her view, prefixes are not X^0s and therefore should not be visible for the mapping rules of morphosyntactic constituents onto prosodic constituents (Selkirk 1984). The prosodization of prefixes, therefore, is driven by a secondary mechanism,[11] which requires all segmental material to be part of prosodic constituency.

(14)   The Prosodic Word Alignment Constraint <PWdCon>
                                             (Selkirk 1996, McCarthy & Prince 1993b)
          a.   Align (PWd, L; Lex, L)
          b.   Align (PWd, R; Lex, R)

In view of the facts and constraints discussed, I propose the constraint ranking in (15), in which constraints are organized in terms of hierarchy, going from highest ranked on the left, to lowest ranked on the right. Double arrow heads indicate that the constraints are crucially ranked and commas indicate that the ranking is indeterminate between the two constraints.

(15)   Preliminary constraint ranking (1):[12]
                [AlignSuf, Align Stem/PWd, AlignStem/Ft]
                                >>
                [PWdCon, ExhC, *RecC]

In Table 2, from which I exclude all irrelevant structures for expository reasons, I show the competing candidates and the optimal form of the input [root + suffix]. In this tableau analysis, I make use of slightly modified OT conventions: a thick vertical line in the tableau indicates that the constraints are ranked with respect to each other. A thin line indicates that the ranking is indeterminate. The hand on the leftmost column of the tableau indicates the winner candidate, that is, the one with the fewest violations of highly ranked constraints. Each constraint violation is indicated by an asterisk. An exclamation mark after an asterisk marks a fatal violation, the point where a given candidate loses out to at least one other candidate.

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[11] In the OT approach that I use here, prefixes must be licensed by a prosodic constituent (in the case of French, by the Prosodic Word) by the constraint PARSE, which requires that all segmental material be licensed by a prosodic constituent in the prosodic hierarchy, illustrated in (7).

[12] For expository reasons, I will build the hierarchy and add the constraints as they become relevant to the analysis. For the final version of the constraint ranking, see (19), which completes the two preliminary versions of the hierarchy (15 and 17), without prejudice to the results previously obtained.

After a candidate is out of contention, the cells for the lower ranked constraints are shaded to emphasize the irrelevance of these constraints for the selection of the output candidate.

Table 2: The prosodization of suffixes

[Root suf]	Align Suf	Align Stem/PWd	Align Stem/Ft	PWdCon	ExhC	*RecC
a. ☞ PWd / Ft / ʒwabl				*		
b. PWd / PWd / Ft / σ / ʒu abl			*!	*	*	*
c. PWd / Ft / σ / ʒu abl			*!	*	*	
d. PPh / PWd / Ft Ft / ʒu abl		*!		**	*	

According to the ranking in (15), candidate (a) is the optimal candidate: it does not violate the highly ranked constraints that the other three candidates violate, and it is the one in which stress is shifted rightwards in order to satisfy the highly ranked AlignStem/Ft. In candidate (a), the suffix is prosodicized as internal to the Prosodic Word, and all phonological processes sensitive to this domain will apply if the phonological environment is adequate, as shown in (1) and (2). The structure represented by candidate (b) is slightly similar to the one I argue holds for prefixation in French. Notice, however, that candidate (b) violates the undominated AlignStem/Ft constraint because the original stress of the root [u] is preserved in the output form. Candidate (c) also illustrates the Foot left-aligned with the stem, thus violating the highly ranked

AlignStem/Ft, and therefore is ruled out as the optimal candidate. Notice
that the distinction between candidate (c) and the two first candidates lies
in the recursive structure in (b), and the rightward shift of the stem stress
in (a). Candidate (d), on the other hand, shows the suffix bearing the status
of a Prosodic Word. Such a configuration loses out because it violates the
undominated AlignStem/PWd constraint.

2.1.2.   The prosodization of prefixes

For Prefixation, I adopt Bullock's (1995) analysis for French and
McCarthy & Prince's (1995) constraint for prefixation, formalized in (16).
According to AlignPref, the base for prefixation in French is the Prosodic
Word and the right edge of every prefix must correspond to the left edge of
a Prosodic Word. This constraint also accounts for the recursive structure
that I argue holds for prefixation: the AlignPref constraint demands that
prefixes be right-aligned with a base Prosodic Word; by the
AlignStem/PWd constraint, the stem formed by the prefix and the Prosodic
Word must together form a recursive Prosodic Word.

(16)   The Prefix Alignment Constraint
                                      (McCarthy and Prince 1995, Bullock 1995)
              Align (Prefix, R; PWd, L) <AlignPref>

In (17) I maintain the hierarchy proposed in (15), with the addition of
undominated AlignPref to account for prefixation. Also, a further adjust-
ment of PWdCon[13] positioned above the two lowest ranked constraints is
necessary so that I can explain why candidate (a) in Table 3 is the optimal
prosodic representation for [prefix + root] sequences in French.

(17)   Preliminary constraint ranking (2):
              [AlignPref, AlignSuf, Align Stem/PWd, AlignStem/Ft]
                                      >>
                                   [PwdCon]
                                      >>
                                [ExhC, *RecC]

---

13 Observe that the adjustment of PWdCon above ExhC and *RecC does not affect
    the results obtained in Table 2: candidate (a) minimally violates PWdCon be-
    cause all of its competing candidates are already out of contention.

Table 3: The prosodization of prefixes

[Pref Root]	Align Pref	Align Stem/PWd	Align Stem/Ft	PWdCon	ExhC	*RecC
a. PWd / PWd / Ft / σ .. / mi u				*	*	*
b. PWd / PWd PWd / Ft Ft / mi u				**!*		**
c. PPh / PWd PWd / Ft Ft / mi u				**!		
d. PWd / σ Ft / mi u	*!					

Candidate (a) is the optimal structure, since it violates the PWdCon only once and does not violate any other highly ranked constraint. Observe that the root [u] is dominated by the lexical Prosodic Word. The prefix [mi] is only included at the post-lexical level, together with the lexical Prosodic Word, which accounts for why we do not find Gliding between a prefix and the following root. Candidate (b) is the equivalent of Hannahs' (1995) proposal: each lexical or non-lexical word forms a Prosodic Word. By the Strict Layer Hypothesis, both PWds are immediately dominated by the Clitic Group, replaced here by PWd. This configuration, however, fatally violates PWdCon and is ruled out as the optimal form. Candidate (c) illustrates both Prosodic Words directly dominated by a Phonological Phrase. Such a representation, however, violates PWdCon twice and consequently is excluded as optimal. Candidate (d) shows the prefix as internal to the Prosodic Word, leading to a fatal violation of AlignPref.

2.1.3. The prosodization of compounds

For compounds, I adopt Charette's (1991) analysis for compounds in French, which is also in agreement with many other analyses for compounds across languages (cf. Inkelas 1989, McCarthy & Prince 1993a, b, Pepperkamp 1997, among others). In Charette's analysis, each compounding stem bears a Foot and consequently forms Prosodic Words, both recursively dominated by another Prosodic Word. This approach to compounds can be easily captured by the constraint Word Alignment (WdCon) in (18), proposed by McCarthy and Prince (1993ab). WdCon requires that every lexical word be both left and right aligned with a Prosodic Word, and ensures that both members of the compound bear the status of Prosodic Words.

(18)   The Word Alignment Constraint <WdCon>
                                (McCarthy and Prince 1993ab, Nagy 1995):
             a.   Align (Lex, L; PWd, L)
             b.   Align (Lex, R; PWd, R)

The same constraint ranking proposed so far and the addition of WdCon,[14] accounts for the prosodization of the two members of a compound as lexical Prosodic Words, recursively dominated by the post-lexical Prosodic Word. In (19) I show the final version of the constraint ranking responsible for the prosodization of the words involved in Gliding in French, followed by Table 4 in which I show how the prosodic configuration of a compounding [stem + stem] sequence is obtained.

(19)   Final constraint ranking:
             [AlignPref, AlignSuf, AlignStem/PWd, AlignStem/Ft]
                          >>
                       [WdCon]
                          >>
                       [PwdCon]
                          >>
                     [ExhC, *RecC]

---

[14] The prosodic configuration that I propose for suffixation in Table 2 violates WdCon once. However, all the competing candidates violate a higher ranked constraints, and the winner candidate remains the same. For prefixation, WdCon is irrelevant because the winning structure does not violate it.

Table 4: The prosodization of compounds

[Stem Stem]	Align Stem/PWd	Align Stem/Ft	WdCon	PWdCon	ExhC	*RecC
a. (PWd → PWd, PWd; Ft, Ft; sezi, arɛ)						*
b. (PWd → Ft, PWd; Ft; sezi, arɛ)			*!			*
c. (PWd → Ft, Ft; sezi, arɛ)			*!*			

Candidate (a) minimally violates the Nonrecursivity of a Constituent constraint because the two lexical Prosodic Words formed by the two members of the compound are recursively adjoined to a higher, post-lexical Prosodic Word. Since Nonrecursivity of C is ranked lower in the grammar of French, candidate (a) wins out among the competing candidates, and illustrates why Gliding does not apply between the two members of a compound, as I showed in (3b). Candidate (b) violates the highly ranked Word Alignment Constraint, since the right edge of the first member of the compound does not right-align with the right edge of a Prosodic Word. Finally, candidate (c) fatally violates the Word Alignment Constraint and loses out among the competing candidates.

In summary, Gliding does not apply between prefix plus root sequences and compounding stems because the prosodic status that these morphosyntactic elements assume in the phonology of French does not constitute the application domain for the Gliding phenomenon. Suffixes, however, syllabify internally to Prosodic Words and therefore constitute, with the preceding root, the domain for Gliding. Below I illustrate my proposal for the representation of the elements involved in suffixation, prefixation and compounding, which illustrates the prosodic domain in which the

Gliding phenomenon applies in European French, i.e., the lexical Prosodic Word:

(20)   a. Suffixation: b. Prefixation: c. Compounding:

PWd	PWd	PWd	Post-Lexical PWds
	PWd	PWd PWds	Lexical PWds
root suf	pref root	stem stem	
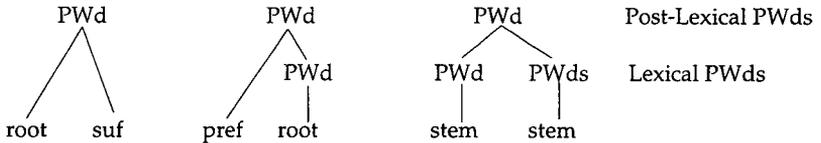
3. CONCLUSIONS

In this article, I have presented data that confirm the significance of the Prosodic Hierarchy in determining the application scope of domain-sensitive phonological processes. More specifically, I have provided further evidence to support Selkirk's (1996) view on the prosodization of non-lexical words in an Optimality Theoretic Framework, which presents the advantage of constraint violability, crucial to the domain analysis of Gliding in French.

As I have shown, Gliding is a domain-sensitive phenomenon that applies exclusively in monomorphemic words and in root plus suffix sequences. In other morphosyntactic contexts, however, the result is heterosyllabification of the two vowels involved in the process. In order to account for the asymmetry found in prefixes and suffixes, I have proposed that their idiosyncratic behavior with respect to the Gliding phenomenon reflects the way in which these non-lexical words prosodicize in French: while suffixes prosodicize within the domain of the lexical Prosodic Word, prefixes are licensed as unfooted syllables by a recursive (post-lexical) Prosodic Word, creating thus a prosodic domain where Gliding is inapplicable. The claim that Gliding applies exclusively within the domain range of the lexical Prosodic Word is thus able to explain why the phenomenon may occur in monomorphemic words and suffixation and not in prefixation or compounding. As a consequence of my adoption of the lexical and post-lexical distinction for the Prosodic Word, my analysis renders the Clitic Group unnecessary as a prosodic constituent in French: prefixes, as well as suffixes and other non-lexical words, are thus defined with respect to the category Prosodic Word only.

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