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LEXICAL CONSERVATISM IN FRENCH ADJECTIVAL LIAISON

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1. Introduction

The object of this study is the phonological mechanisms that signal lexical relations. To indicate that a form is closely related to another, in semantic content or morphosyntactic function, speakers employ similarities of phonological shape. For instance, a nonce word like *aspiratory* [æspiraːtori] will be interpreted as related to *aspirate*, not to *aspire*; and, conversely, [əspairətori] will convey a lexical connection to *aspire*, not *aspirate*. Phonological similarity to a known form is used to guide the interpretation of an unfamiliar one.

There is now growing consensus on the nature of the phonological mechanisms that have this signaling function. First, a number of phonologists have argued that it is the similarity between surface forms that is being manipulated (Benua 1995; Burzio 1994; Flemming 1995; Kenstowicz 1996; McCarthy & Prince 1995; Steriade 1996, forthcoming). Second, the relevant surface identity conditions are ranked and violable preferences in the OT sense (cf. Prince & Smolensky 1993 and subsequent literature). Thus, it is preferable for the stem of the *-atory* adjective based on *aspirate* to be identical to a surface realization of *aspirate*, but this preference may be overridden by conflicting considerations.

The standard facts of French adjectival liaison (Tranel 1981) pose a challenge to our understanding of the process of signaling lexical relations through phonological similarity. The preposed adjectives in (1) are masculine, like their head nouns, but they look strictly like citation feminine forms.

- (1) a. *nouvel an* [nuvel ā] "new year"
masc. citation [nuvo]; fem. [nuvel]

- (1) b. *bon endroit* [bɔ̃n ɑ̃dʁwa] "right place"
 masc. citation [bɔ̃]; fem. [bɔ̃n]
 c. *petit enfant* [pətit ɑ̃fɑ̃] "little child"
 masc. citation [pəti]; fem. [pətit]

In this paper, I will argue that the adjectives in (1a,c) are syntactically masculine, not feminine or gender neutral. I will suggest that their failure to resemble masculine citation forms and their misleading similarity to the feminines stems from a conflict between conditions of phonological well-formedness and conditions of lexical conservatism. Lexical conservatism is the new proposal here. It is a class of grammatical conditions taking the form in (2) and promoting the use of pre-existing familiar expressions or parts or properties of such expressions. They penalize the use of unprecedented, linguistically innovative expressions.

- (2) Property P of a novel form of morpheme μ has a precedent in property P of a listed form of μ .

Although lexical conservatism has effects throughout the grammar, the variety of lexical conservatism to be investigated here involves only avoidance of phonological innovation.

2. *Lexical conservatism in English Level 2 phonology*

The effect of lexical conservatism conditions and the formalism they require can be initially justified with data from English Level 2 phonology. This data will allow us to place the liaison facts in (1a,c) in a broader context.

There exists a class of English affixes which can give rise, variously, to Level 1 and Level 2 formations (Aronoff 1976). Level 2 forms are defined by the invariance of stresses in the stem relative to the pronunciation of the stem in isolation. For instance, *invalidism* is recognized as a Level 2 form because its stem is identical, stresswise, to that of *invalid*. The accentual resemblance between base and derivative is obtained in this case at the cost of metrical deviance: *invalidism* contains a string of 4 stressless syllables, more than is normally tolerated in English.

The same suffix *-ism* can generate accentually modified Level 1 forms, as in *bureaucratism*. The stress of this form differs from that of its base, *bureaucrat*. Thus *-ism* can apparently generate both Level 1 and Level 2 formations. Similarly *-able* generates mostly Level 2 forms, as in *administrable* (on *administer* not **administrable*), *parodiable* (on *parody*, **parodiable*), but occa-

sionally it does generate apparent Level 1 forms like *démonstrable*, with shifted stress relative to the *démonstrate* or *remédiable*, which differs similarly from *remedy*.

The ability of certain affixes to generate either Level 1 or Level 2 formations is, in fact, just a reflex of lexical conservatism. The analysis I suggest goes as follows: To optimally satisfy conditions of metrical well-formedness, it is sometimes necessary for the stress of the affixed word to be modified relative to the stress of its base. For instance, *bureaucratism* is better stressed than the alternatives *bureaucratism* or *bureaucratism* because it avoids stress clash. Similarly, *démonstrable* is better stressed than *démonstrable* because it reduces the length of the string separating the last stress from the right edge of the word, the length of the lapsed string. The considerations of Lapse and Clash avoidance, then, motivate these stress changes. However, stress changes occur with suffixes like *-ism* and *-able* only if the accentual pattern desired for the derivative has a counterpart in some other listed allomorph of the stem. It must not be an unprecedented stress profile within the relevant lexical paradigm. This is where lexical conservatism comes in. For instance, *démonstrable* differs from *démonstrate*, but displays the stress profile already present in *démonstrative*; *bureaucratism* displays the stress familiar from the form *bureaucracy*. When the base word has only one stress option, neither *-ism* nor *-able* will induce stress changes. Thus, the noun *invalid* has only one form: No variant such as *inválid*- exists independently in this lexical entry.¹ For this reason, it is not possible to improve the stress of *invalidism* by shifting stress (**inválidism*). Similarly, among the forms that can undergo *-able* affixation, *administer*, unlike *démonstrate*, has only one stress option: There is no independently established form such as **administrative* to license a shift in stress in the *-able* form.

Our conclusion, therefore, is that the Level 2 forms — those where stress remains in the position of the base word — are based on impoverished paradigms in which only one accentual profile is independently attested. On the other hand, the Level 1 forms, with shifted stress, are based on accentually richer paradigms that provide a model for the stress profile desired in the derivative. The level difference is entirely predictable from the paradigmatic structure. The correlation between the possibility of stress changes and paradigm structure is more general within the class of English learned suffixes and in English phonology in general (Steriade 1998).

Let us next note an interesting property of the Level 1 formations. They are so-called "split base" formations in that they have not one, but two or more

¹ The verb *invalidate* is semantically unrelated.

bases. This means that the properties of the derivative are determined by consulting several forms from a given paradigm. For instance, the semantics of *automatism* are closely related to those of *automatique*, but the stress of this word comes from *automaton*. Similarly, the *-able* forms require a transitive verb as their base; hence, they are based, in a morphosyntactic sense, on verbs like *démonstrate* or *remedy*. But the stress comes from non-verbal *démonstrative*, *remédial*. In other words, these forms are split base formations. Their phonological, syntactic, and semantic properties are computed by consulting the entire paradigm of the stem, not a unique base form.²

We can summarize the discussion thus far as follows. Certain phonological preferences induce changes in the phonology of the stem relative to the shape of the morphosyntactic or semantic base word. Such changes take place only if the resulting stress pattern is already attested in some pre-existing form of the stem. This condition — the requirement that a lexical precedent exist for the phonological properties adopted in the derivative — is an instance of lexical conservatism, as anticipated in (2). Lexical conservatism in conjunction with phonological dispreferences (such as Lapse and Clash) yields split base effects.

3. Formalizing lexical conservatism and split base effects

A number of questions arise concerning the nature of lexical conservatism and the formal conditions that enforce it. The fundamental question is: What counts as a listed form? Also, what is the form of lexical conservatism conditions? What is the range of phonological properties for which conservatism may be required through such conditions? How do lexical conservatism conditions relate to the more familiar correspondence conditions with which recent work has concerned itself? I outline answers to these questions as suggested by the English Level 2 data and then turn to French liaison facts to demonstrate that the same analytical moves provide an interesting analysis of that case as well.

Let us begin by assuming that lexical conservatism (Lex P) constraints take the form given in (3).

- (3) Let $T(\mu)$ be the allomorph of μ appearing in a form under evaluation. Let $L(\mu)$ be a listed allomorph of μ . Let P be a phonological property. $T(\mu)$ is characterized by P only if some $L(\mu)$ is characterized by P.

² The existence of the split base effect has been independently discovered by Burzio (1997).

An instance of LexP is the condition in (4):

- (4) Lex [\pm stress]:
Let $\sigma(T)$ be a syllable in the target form $T(\mu)$ of morpheme μ . There is a listed allomorph of μ , $L(\mu)$, such that for any $\sigma(T)$, $\sigma(T)$ has a correspondent $\sigma(L)$ in $L(\mu)$ and $\sigma(T)$ is [α stressed] only if $\sigma(L)$ is [α stressed].

Lex [\pm stress] evaluates candidates by searching the lexicon for any listed allomorph of the relevant morpheme that possesses accentually identical syllables corresponding to the syllables of a given candidate. In this way, it verifies that the stress profile adopted by the candidate has a listed precedent. Sample evaluations appear in Tableaux 1 and 2 below.

| | Lex [\pm stress] |
|------------------------|---------------------------|
| i. <i>remédi-able</i> | ✓ (cf. <i>remédi-al</i>) |
| ii. <i>remédi-able</i> | ✓ (cf. <i>remedy</i>) |

Tableau 1: Lex [\pm stress] evaluations involving the listed allomorphs *remedy*, *remédi-(al)*

| | Lex [\pm stress] |
|--------------------------|-------------------------|
| i. <i>párodi-able</i> | ✓ (cf. <i>párody</i>) |
| ii. * <i>paródi-able</i> | *No matching $L(\mu)$! |

Tableau 2: Lex [\pm stress] evaluations include the listed allomorph *párody*, not **paródial*

Given Lex [\pm stress] in (4), it is possible to derive some of the data noted earlier by assuming that a specific variety of Lapse avoidance. *Lapse $\sigma\sigma\sigma$ — the condition penalizing final strings of three stressless syllables — is outranked by Lex [\pm stress]. Under this ranking, *Lapse $\sigma\sigma\sigma$ can be satisfied only in paradigms that are rich enough to offer a listed allomorph with the appropriate stress profile, as in Tableaux 3 and 4.

| | Lex [\pm stress] | *Lapse $\sigma\sigma\sigma$ |
|------------------------|---------------------|-----------------------------|
| i. <i>remédi-able</i> | | |
| ii. <i>remédi-able</i> | | *! |

Tableau 3: Listed allomorphs include *remedy* and *remédi-(al)*

| | Lex [\pm stress] | *Lapse $\sigma\sigma$ |
|-----------------|---------------------|-----------------------|
| i. párodi-able | | |
| ii. paródi-able | *! | |

Tableau 4: *Listed allomorphs include párody, not *paródial*

We consider now a different question: What is the range of properties for which lexical conservatism may be mandated? Are these strictly local properties, such as individual features or the feature composition of selected segments, or global properties, such as the overall structure and feature composition of a larger selected substring? This is a fundamental question for all theories of correspondence whether or not lexical conservatism plays a role in them. A key element in the analysis of French liaison will be that the global structure and composition of lexical landmarks such as the stressed syllable or the word margins play a fundamental role in correspondence, exactly as they do in lexical access (cf. Cutler 1989, Marslen-Wilson 1989).

The English data also sheds some light on this. In the course of verifying the analysis sketched above against a larger corpus of affixed forms I came across *-able* forms like *intuitable*, *contributable*, *domesticable*, which appear exceptional. Given paradigms such as {*intúit*, *intúition*}, {*contribúte*, *côntribútion*}, and {*domésticâte*, *dòmesticity*}, our analysis predicts **intuitable*, **côntribútable*, **dòmesticable* or **intu[í]able*, **côn-tribú[s]able*, **dòmestí[s]able*, with stress contour and segmentals taken from the nominal allomorph. The ungrammaticality of **intu[í]able* etc. suggests that the last stem-consonant must come from the form perceived as the morphosyntactic or semantic base of the derivative. Since the *-able* form requires a verb as its morphosyntactic base, the final consonant in the *-able* stem must be identical to the final consonant of the verbal stem.³ This requirement excludes **intu[í]able*. The corresponding condition appears in (5) and is followed by a sample evaluation.

(5) Lex (C), lexcat):

If $T(\mu)$ and some listed allomorph of μ , $L(\mu)$, have the same lexical category, then if there is a final consonant C in $T(\mu)$, C has a correspondent C' in $L(\mu)$ and is featurally identical to C'.

| | Lex (C), lexcat) |
|---------------------------------|------------------------------|
| i. $\sqrt{\text{intu[ít]able}}$ | $\sqrt{\text{cf. [intúít]}}$ |
| ii. intú[rt]able | $\sqrt{\text{cf. [intúít]}}$ |
| iii. intu[í]able | *No matching $L(\mu)$! |

Tableau 5: *Listed allomorphs include [mtúít] (Vb.), [mtuífən] (N)*

The assumption behind conditions like (5) is that the presence in the target form of certain syntactic or semantic features is signaled through phonological similarity to some form of the same morpheme which is known to possess the required semantic or syntactic features. The general form of such conditions (which I refer to as Lex PM) is given below in (6).

(6) Lex PM:

Let $T(\mu)$ be the allomorph of μ in a form under evaluation. Let M be a morphosyntactic feature required in $T(\mu)$. Let $L(\mu)$ be a listed allomorph of μ . Let P be a phonological property. If $L(\mu)$ is characterized by P and M, then $T(\mu)$ is characterized by P.

We must now explain why is it impossible to say **dòmés[ítk]able* and **intu[ít]able*, i.e. to use an adjectival with stress from the non-verbal allomorph and consonantism from the verb. The reason is that the entire contents of the stressed syllable must find a lexical precedent in some listed allomorph. What is disallowed is a stressed syllable whose accentual category is based on one allomorph and whose segmentals come from a distinct one. (Stressless syllables are free from this requirement: The stress category of the presuffixal syllable in *buréauc[ræt]ism* is based on *buréauc[rəs]y*, but its consonantism comes from *búreauc[ræt]*.) The upshot, therefore, is that we must admit global correspondence conditions of the form in (7). Lex σ below supersedes Lex [\pm stress], as made clear in Tableau 6.

³ Recall also the form *buréaucratism*, with [t] from *bureaucrat* but stress from *bureaucracy*. We do not say *buréaucra[s]ism* presumably because the *-ism* form normally selects a noun denoting the qualities of individuals, not abstract or collective nouns like *bureaucracy*. So *bureaucrat* is the semantic base of *buréaucratism* and in virtue of this, the last consonant of *bureaucrat* must be found in the stem of the corresponding *-ism* form.

(7) Lex σ :

For any stressed syllable σ in the target form $T(\mu)$, there is a correspondent σ' in some listed allomorph, $L(\mu)$, such that σ' is stressed and σ and σ' are segmentally identical.

| | Lex σ |
|-------------------------------|--------------------------------|
| i. intu[ít]able | * No matching $L(\mu)$! |
| ii. \checkmark intu[ít]able | \checkmark (cf. [intúit]) |
| iii. \checkmark intu[í]able | \checkmark (cf. [intuíf-ən]) |

Tableau 6: *Listed allomorphs [intúit] and [intuíf-ən]*

Since candidate (iii) in Tableau 6, *intu[í]able*, violates Lex (C), *lexcat*, candidate (ii), *intu[ít]able*, will win under the ranking in (8):

- (8) Lex σ Lex (C), *lexcat*
- ↘ ↗
- *Lapse $\sigma\sigma\sigma$

One last comment on English before we turn to the French liaison data. What counts as a listed form? Normally, the answer to this question starts from the *a priori* assumption that lexical representations are necessarily sparse: A listed form is one stripped of predictable information. The facts examined here point in a different direction. Consider *remédiable*, the *-able* form whose stress we have argued is based on that of the adjective *remédial*. The form *remédial* has the effect of licensing the stress shift in *remédiable* because it is a listed form: It is known (to those who use *remédiable*) to be in actual linguistic use and it is known to possess this particular stress pattern. A potential form would not have the same licensing ability. Thus, **paródial* is a potential *-al* adjective based on *parody* and, if it did exist, it would have this stress. But it does not, in fact, exist. The paradigmatic difference between *remedy-remédial* and *párody-*paródial* reflects an accidental gap in the English lexicon. Speakers' knowledge of this lexical gap explains the difference between *remédiable* and **paródiabale*. Note next that while the bare existence of the *-al* adjective associated with some verbal or nominal paradigm is unpredictable, the stress pattern of the *-al* adjective is fully predictable: Existing *-al* adjectives invariably follow the rules set forth in Hayes (1980) and Liberman & Prince (1977) for weak retractors. And notice finally that it is the predictable stress of *remédial* that permits the stress shift in the *-able* form. By this reasoning we arrive at the conclusion that the properties allowing a listed form to satisfy Lex P conditions

may very well be predictable properties. They are predictable, but known. I suggest then that, for purposes of Lex P satisfaction, a listed form is a form sufficiently familiar to the speaker as to inspire the confidence that it is in actual, against potential, linguistic use. *Happiness* is, in this sense, a listed form no matter how predictable its properties; a nonce form like *randomness*, on the other hand, is not. Clearly, intuitions of noncehood do exist as distinct from intuitions of grammaticality. We suggest here that the difference between nonce and familiar forms is the relevant one in the analysis of split base effects.

The discussion thus far has suggested the need for conditions of lexical conservatism of the form in (3). I have argued that these conditions may mandate global, as opposed to piece-meal, identity to some substrig within a listed allomorph. I have also suggested that listedness is in part a function of the speaker's familiarity with the form, not a function of the predictability of the form's properties. The general picture emerging here is that of an expanded lexicon that includes all actual words generated by the word formation rules, no matter how predictable their properties. This is the view proposed by Halle in his 1973 article "Prolegomena to a Theory of Word Formation". This does not exclude the existence of a more abstract and sparse lexicon functioning in parallel, again as Halle envisioned it, but it does suggest that the contents of the richer, familiarity-based lexicon play a critical role in the formation of novel expressions. We now turn to French to explore the interplay of the same ideas in the domain of adjectival liaison.

4. *French liaison analyzed*

Recall the central facts concerning French adjectival liaison illustrated earlier in (1a,c). The interesting question that arises in relation to these facts is why a masculine adjective must look like a feminine when it incurs the risk of hiatus in prenominal position. Part of this question has been addressed in Perlmutter (1996) and Tranel (1981, 1999), who point out that the feminine consonant is used in the masculine liaison form to avoid hiatus. If that C were not used, the argument goes, we would have abutting vowels in forms like **nouveau ami* [nuvo ami] "new friend".

But invoking hiatus yields only part of the answer. Hiatus could also be avoided through vowel loss, e.g. hypothetical **[nuv ami]* or **[nuvo mi]*, or through consonant insertion, as in **[nuvo-t-ami]*. Given this choice of options, why use the feminine form?

The answer is lexical conservatism. To know an adjective is, in most cases, to know its citation or phrase final forms, both feminine and masculine. Most adjectives are postnominal in French and thus occur at the end of an ac-

centual phrase (AP). The prenominal, AP-medial form and especially the form occurring in potential AP-internal hiatus is considerably less common. If listedness stands for a certain degree of familiarity, then the AP final forms of the masculine and the feminine are listed forms for the bulk of French adjectives. The liaison form — which requires the less common prenominal position and a less common class of V initial head nouns — is not necessarily listed; it is not necessarily familiar. It may be listed for certain determiners, such as the possessive or demonstrative pronouns, but not in general. We can now explain why the feminine C is used to avoid hiatus in preference to other means like V deletion or C insertion. Namely, the use of the feminine is the only lexically conservative solution to hiatus — the only option that resolves hiatus without resorting to the creation of a phonologically novel form.

Perlmutter (1996) has made a proposal that inspired ours, but is distinct from it. His Lexical Sourcing principle states that the candidates to be considered are always lexically listed forms. Lexical Sourcing is an element of grammatical architecture, not a violable constraint, unlike the violable LexP conditions proposed here. Lexical Sourcing yields roughly the correct results for French (although we will see below that it also fails in certain cases), but its general drawback is that it predicts that all phonology will be lexically conservative. Consider the main stress shift in *-able* forms like *ànalýzeable* and *prògrámmable*. Note that no listed allomorph of *ànalýze* or *prògrám* has this pattern of main stress. The relevant generalization here is that the suffix *-able* is lexically conservative only with respect to the distribution of stressed and stressless syllables; *-able* induces innovative effects with respect to main stress location. Lexical Sourcing does not allow this distinction to be drawn and since no listed form like *ànalýze* exists, it cannot consider this as a candidate for stem realization. We depart, therefore, from Perlmutter's proposals in two respects. First, we attribute the effect of Lexical Sourcing to a family of violable constraints, LexP. Secondly, we argue for a distinct set of conditions, LexPM, which directly encode semantic and morphosyntactic similarity via phonological similarity, as in (6) above. The constraint Lex C] in (9) below limits the solutions to hiatus to those that are conservative with respect to the choice of final C. Neither C insertion (**nuvo-t-ami*) nor V deletion (**nuv ami*, **nuvo ni*) will be conservative solutions in this respect, as made clear in Tableau 7.

(9) Lex C]

There is a listed allomorph of μ L(μ) such that if there is an absolute final C in the T(μ), C has an absolute final, featurally identical correspondent C' in L(μ).

| | Lex C] | *Hiatus |
|------------------------|--------|---------|
| i. [nuvo] <i>ami</i> | | *! |
| ii. [nuvel] <i>ami</i> | | |
| iii. [nuv] <i>ami</i> | *! | |
| iv. [nuvot] <i>ami</i> | *! | |

Tableau 7: *Listed allomorphs* [nuvo], [nuvel]

Tableau 8 establishes the ranking Lex C] >> *Hiatus. In an impoverished paradigm like that of *joli* "handsome/cute", which lacks a C-final allomorph, this ranking correctly predicts hiatus.

| | Lex C] | *Hiatus |
|---------------------------|----------------------------|---------|
| i. [joli] <i>enfant</i> | | * |
| ii. [jolit] <i>enfant</i> | *! No matching L(μ)! | |
| iii. [jol] <i>enfant</i> | *! No matching L(μ)! | |

Tableau 8: *Listed allomorphs*: joli

The actual choice of hiatus-blocking C is a more complex issue, as noted in Morin (1992) and Tranel (1999). There are feminine consonants like the [j] of *franche* [fʁã] "sincere" (masculine *franc* [fʁɑ]) which never appear in liaison: *franc* [fʁã] *entretien* "sincere discussion" **franche entretien*. And there are other consonants that undergo changes in liaison relative to the feminine, such as the voicing of [s]. Thus, the adjective *gros* "big" [gʁo] (masc.), [gʁos] (fem.) is realized as *grosse* [gʁos] *image* "big image" (a feminine NP), but as *gro[z]* *arbre* "big tree" (masculine NP). The overall generalization is that a limited set of feminine consonants {l, r, n, z, t} are accepted in the adjectival liaison and that consonants not belonging to this set are either eliminated or modified as to voicing to gain acceptance in the set. So the voicing in *gro[z]* *arbre* "big tree" is meant to generate [z], a known liaison consonant. Voicing will not affect other cases (**vi[v]* *enthousiasme* "lively enthusiasm", for *vif* *enthousiasme* or **parfai[d]* *amour* "perfect love" for *parfai[t]* *amour*). That is because voicing consonants other than [s] will not induce them to belong to this set. Similarly, devoicing of [d] applies occasionally, especially after a nasal vowel (*gran[t]* *ami* "great friend", *secon[t]* *événement* "second event"), but no general devoicing process is attested in liaison: **joyeu[s]* *aparté* "merry aside", for *joyeu[z]* *aparté*. (cf. citation forms masculine [ʒwajø] and feminine [ʒwajøz] "merry"). This too follows from the existence of a limited set of

acceptable liaison Cs which includes {z,t}, but not {s,d}. Devoicing [d] will yield a member of the liaison set; devoicing [z] will not.

We can now ask why {z, t, n, r, l} are members of the liaison set. That is, what defines this set? The answer is familiarity with other comparable instances of the liaison alternation. Certain cases of liaison are common and entrenched — this is the case with plural [z] (*beau*[z] *enfants* “beautiful children”) and the [t] in obligatorily prenominal determiners like *cel/cette* (*cel ami* “this friend”). Similarly, certain frequent and obligatorily prenominal determiners (*mon* “my”, *ton* “your”, *son* “his/hers”, *bon* “good” in the syncategorematic sense) establish the use of [n] as a liaison C: [mɔ̃n] *ami* “my friend”, [bɔ̃n] *ami* “good friend”. Other obligatorily prenominal determiners establish the use of liaison [r]: *premier homme* [pʁɛmjɛʁ ɔm] “first man”. In contrast, there is no precedent — in structures of obligatory liaison — for the use of consonants such as [ʃ], [j], [d], [s] as alternating hiatus buffers. This is due to the extreme rarity of these consonants in the final position of adjectives suited for (or restricted to) prenominal position or in the final position of any other lexical items occurring as the first term in contexts of obligatory liaison. It is for this reason that *fran*[ʃ] *entretien* “frank discussion” is disallowed. This expression is essentially a nonce formation and the speaker cannot justify the use of [ʃ] as a hiatus buffer in terms of known lexical precedents, i.e. in terms of other cases where the same alternation occurs between Ø (in citation) vs. C (in potential AP-internal hiatus). This idea can be faithfully formalized using the LexP format. For reasons of space, however, I will take here the analytical shortcut in (10).

(10) Liaison C

Let $T(\mu)$ be the form of μ under evaluation. Let $C(\mu)$ be a citation form of μ whose morphosyntactic features are identical to $T(\mu)$'s. If S is a consonantal segment in $T(\mu)$ and S has no correspondent in $C(\mu)$, then $S \in \{t, z, n, l, r\}$.

The ranking in (11) will characterize Morin's and Tranel's observations. For [s], a simple voicing modification can yield a known liaison C. On the other hand, for ʃ, voicing does not have this result since [ʒ], its voiced counterpart, is not in the set of acceptable liaison Cs. Illustrative tableaux follow.

(11) Liaison C >> *Hiatus >> Ident [voice]

| | Liaison C | *Hiatus | Ident voice |
|----------------|-----------|---------|-------------|
| i. gʁo aʁbʁ | | *! | |
| ii. ʁgʁoz aʁbʁ | | | * |
| iii. gʁos aʁbʁ | *! | | |

Tableau 9: Listed allomorphs [gʁo], [gʁos]

| | Liaison C | *Hiatus | Ident voice |
|--------------------|-----------|---------|-------------|
| i. fʁɑ̃ ɑ̃tʁətjɛ | *! | | |
| ii. ʁfʁɑ̃ɑ̃tʁətjɛ | | * | |
| iii. fʁɑ̃zɑ̃tʁətjɛ | *! | | * |

Tableau 10: Listed allomorphs [fʁɑ̃], [fʁɑ̃ʃ]

The phrase [fʁɑ̃ɑ̃tʁətjɛ] (cited by Delattre 1966) may indicate that [k] is a marginal member of the liaison set (perhaps based on the precedent provided by *La Marseillaise* in [sɑ̃k] *impur* “impure blood”) or, alternatively, that orthography-based liaison is an option for some speakers.

Thus far we have seen that Lex P constraints can characterize, in conjunction with other constraints, the basic facts of French liaison concerning the use of feminine Cs as hiatus buffers, as well as restrictions on the set of usable liaison segments.

Recall now that we had motivated a different class of constraints for English, those which use phonological identity to signal morphosyntactic or semantic identity. Recall, in particular, the constraint Lex (C), lexcat) in (5) which signals that the stem's lexical category via the identity of the stem's last C. The counterpart of this constraint is found in French. Here I draw again on Morin's and Tranel's earlier work, in which they note that adjectives ending in two consonants, one of which appears only in the feminine, employ the masculine citation form in liaison. Thus, *fort* “strong” (masculine citation [fɔʁ]) has the feminine *forte* [fɔʁt], but in the masculine liaison form, this [t] fails to surface. One says [fɔʁ] *accent* “strong accent”. So far, nothing in the system we have proposed insures that this will be so. But, in fact, this is exactly the effect of the French counterpart of the English Lex (C) lexcat) with the minor difference that the final C is used in French to signal gender, rather than lexical category, as expressed in (12).

(12) Lex (C), gender):

If T(μ) and some L(μ) have the same gender and if a final consonant C occurs in T(μ), then C has a correspondent C' in L(μ) and is featurally identical to C'.

The two constraints — English Lex (C), lexcat) and French Lex (C), gender) — could be reduced to a single one which mentions broad morphosyntactic identity, as seen below in (13). This possibility is not pursued here. We will continue to use in our discussion of French the restricted Lex (C), gender) n (12).

(13) Lex (C), ms):

If T(μ) and some L(μ) have the same morphosyntactic features and if a final consonant C occurs in T(μ), then C has a correspondent C' in L(μ) and is featurally identical to C'.

As indicated below in (14), Lex (C), gender) ranks below *Hiatus; it has no effect only when *Hiatus is moot, as illustrated in Tableau 12.

(14) *Hiatus >> Lex (C), gender)

| | *Hiatus | Lex (C) gender) |
|----------------------------|---------|-----------------|
| i. ☞ [pʁəm]jɛʒ] <i>ami</i> | | * |
| ii. [pʁəm]je] <i>ami</i> | *! | |

Tableau 11: Listed allomorphs pʁəm]je, pʁəm]jɛʒ

| | *Hiatus | Lex (C) gender) |
|--------------------------|---------|-----------------|
| i. ☞ [fɔʁ] <i>accent</i> | | |
| ii. [fɔʁt] <i>accent</i> | | *! |

Tableau 12: Listed allomorphs fɔʁ, fɔʁt

I would now like to analyze an aspect of liaison that is less commonly addressed. The vowels appearing in the accented syllable of feminine and masculine forms of French adjectives are frequently different. Some of the subtler differences are fully predictable from general French phonotactics and give rise to interesting idiolectal differences in the formation of the masculine liaison allomorph. It is this aspect of French liaison that provides the richest evidence

for the lexical conservatism analysis and the most striking parallels to the English data analyzed earlier. I will first review the range of differences between masculine and feminine vowels in citation and in liaison. The data, given below in (15a,e), comes from Fouché (1959), Prunet (1987), Tranel (1981, 1987), and my own survey of 5 speakers of Standard French.

(15) a. [+high]/[-high] alternations in oral vowels

| Masculine | Feminine | Masc. liaison |
|----------------------------|-------------------------------|------------------------------------|
| <i>fou</i> [fu] “crazy” | <i>folle</i> [fɔl] “crazy” | [fɔl] <i>épis</i> “crazy stalk” |
| <i>mou</i> [mu] “soft” | <i>molle</i> [mɔl] “soft” | [mɔl] <i>épis</i> “soft stalk” |

b. [+round]/[-round] and [tense]/[lax] alternations

| Masculine | Feminine | Masc. liaison |
|--------------------------------|----------------------------------|------------------------------------|
| <i>nouveau</i> [nuvo] “new” | <i>nouvelle</i> [nuvɛl] “new” | [nuvɛl] <i>ami</i> “new friend” |
| <i>vieux</i> [vjø] “old” | <i>vieille</i> [vjɛj] “old” | [vjɛj] <i>ami</i> “old friend” |

c. [+nasal]/[-nasal] alternations

| Masculine | Feminine | Masc. liaison |
|------------------------------------|-------------------------------------|--|
| <i>prochain</i> [pʁɔʃɛ̃] “next” | <i>prochaine</i> [pʁɔʃɛn] “next” | [pʁɔʃɛn] ~ [pʁɔʃɛ̃n] <i>arrêt</i> “next stop” |
| <i>soudain</i> [sudɛ̃] “sudden” | <i>soudaine</i> [suden] “sudden” | [suden] ~ [sudɛ̃n] <i>effet</i> “sudden effect” |
| <i>serain</i> [sɛʁɛ̃] “serene” | <i>seraine</i> [sɛʁɛn] “serene” | [sɛʁɛn] ~ [sɛʁɛ̃n] <i>esprit</i> “serene spirit” |

d. [+high]/[-high] and [tense]/[lax] alternations in nasal rimes

| Masculine | Feminine | Masc. liaison |
|-----------------------------------|-------------------------------------|--|
| <i>commun</i> [kɔmɔ̃] “common” | <i>commune</i> [kɔmỹn] “common” | ??[kɔmỹn] ~ [kɔmɔ̃n] <i>accord</i> “mutual agreement” |
| <i>divin</i> [divɛ̃] “divine” | <i>divine</i> [divin] “divine” | [divin] ~ [divɛ̃n] <i>archer</i> “divine archer” |

(15) e. [tense]/[lax] alternations in oral rimes

| Masculine | Feminine | Masc. liaison |
|--|---------------------------------------|---|
| <i>premier</i> [pʁəmje] “first” | <i>première</i> [pʁəmjeʁ] “first” | [pʁəmjeʁ] ~ [pʁəmjeʁ] <i>ami</i> “first friend” |
| <i>parfait</i> [pʁæfe] ⁴ “perfect” | <i>parfaite</i> [pʁæfet] “perfect” | [pʁæfet]~[pʁæfet] <i>amour</i> “perfect love” |
| <i>sot</i> [so] “silly/stupid” | <i>sotte</i> [sɔt] “silly/stupid” | [sɔt]~[sɔt] <i>avocat</i> “silly lawyer” |

The vocalic alternations in (15a) and (15b) (*fou/folle, nouveau/nouvelle*) are of limited generality. One cannot formulate general principles predicting them. All others, however, are predictable, in virtue of the principles in (16a,c).

(16) Phonological basis for masculine/feminine vowel alternations:

- a. Nasals are disallowed in the same rime as nasal vowels: [suden], [sudɛ̃], *[sudɛ̃n] i.e. the alternations in (15c).
- b. High nasalized vowels are disallowed: [divin], [divɛ̃], *[divi] cf. high/mid alternations in (15d)
- c. Word final lax [ɔ] is disallowed: cf. [so] *[sɔ].
Tense [o] is disallowed in most closed syllables: [sɔt], *[sɔt].
Tense [e] disallowed in all closed syllables: [fjeʁ], *[fjeʁ].
cf. tense/lax alternations in (15e)

With these data as background, we next consider certain generalizations about the range of vowel qualities that the liaison masculine can adopt. These will reveal further parallels between the English affixal data and French liaison.

We observe in (15) two ways of forming the liaison masculine. One option is to use the citation feminine form as the masculine anti-hiatus allomorph, as in [pʁɔʃɛ̃] *arrêt* “next stop”, with [pʁɔʃɛ̃] strictly identical to the feminine. The second alternative is to combine in the liaison rime, the feminine consonant with the masculine vowel, that is, the last full vowel of the citation masculine, as in [pʁɔʃɛ̃n] *arrêt*, with [n] from the feminine [pʁɔʃɛ̃] and [ɛ̃] from the citation masculine [pʁɔʃɛ̃]. All variants recorded above represent instances of these two options. The interest of solutions like [pʁɔʃɛ̃n] *arrêt* is that these are split base expressions. The phonological composition of the liaison form is

Many speakers still have final [ɛ] here, but increasingly this is becoming [e].

based simultaneously on the citation feminine and the citation masculine form. The masculine vowel in forms like [pʁɔʃɛ̃n] *arrêt* is employed to signal the gender of the adjective. This is done, via a LexPM condition of the sort examined earlier, by selecting a phonological property — the nuclear quality of accented V — which must be identical to the accented nucleus of a listed form of the appropriate gender. The listed form is, in this case, the citation masculine. The relevant LexPM condition appears below in (17), accompanied by sample evaluations in Tableaux 13 and 14.

(17) Lex (V, gender):

If T(μ) and some L(μ) have the same gender features, then the accented V in T(μ) has a correspondent V' in L(μ) and is identical featurally and stresswise to V'.

| | Lex V gender |
|-------------------------|--------------|
| i. pʁəmje <i>ami</i> | √ |
| ii. pʁəmjeʁ <i>ami</i> | * |
| iii. pʁəmjeʁ <i>ami</i> | √ |

Tableau 13: *Listed allomorphs* [pʁəmje] (masc.) [pʁəmjeʁ]

| | Lex V gender |
|---------------------------|--------------|
| i. pʁɔʃɛ̃ <i>arrêt</i> | √ |
| ii. pʁɔʃɛ̃n <i>arrêt</i> | * |
| iii. pʁɔʃɛ̃n <i>arrêt</i> | √ |

Tableau 14: *Listed allomorphs* [pʁɔʃɛ̃] (masc.) [pʁɔʃɛ̃n]

Candidates (i) in the preceding tableaux — [pʁəmje] *ami* “first friend” and [pʁɔʃɛ̃] *arrêt* “next stop” — will be excluded because they violate Hiatus. Therefore, candidates (iii) — [pʁəmjeʁ] *ami* and [pʁɔʃɛ̃n] *arrêt* — emerge as optimal in systems where Lex(V, gender) is undominated and *Hiatus >> Lex(C, gender).

What about phrases like [pʁɔʃɛ̃n] *arrêt* “next stop”? These are so patently deficient at signaling grammatical gender that we must identify the considerations that outrank the expression of gender agreement, i.e. Lex (V, gender), in order to understand their raison d'être. This consideration is a constraint similar to the English Lex σ' in that both target global identity for some constituent larger than one segment. The French constraint may be viewed as requiring the liaison VC sequence to be strictly identical to some listed word's rime.

Alternatively, the French constraint may simply require global identity between the liaison form and some listed allomorph of the relevant adjective. We adopt this second version. Therefore, if the feminine C is employed in liaison to block hiatus, the vowel preceding it, along with all other segments, must be identical to that of the feminine to ensure global identity between the liaison form and some listed allomorph. These ideas are expressed in (18) with sample evaluations in Tableaux 15 and 16.

(18) Lex P-∇:

There is a $L(\mu)$ such that every segment in $T(\mu)$ has a featurally identical correspondent in $L(\mu)$ and every segment in $L(\mu)$ has a featurally identical correspondent in $T(\mu)$.

| | Lex P-∇ |
|---|---------|
| i. $p\check{r}\check{a}mje\text{ }ami$ | √ |
| ii. $p\check{r}\check{a}mj\check{e}\check{x}\text{ }ami$ | √ |
| iii. $p\check{r}\check{a}mj\check{e}\check{x}\text{ }ami$ | * |

Tableau 15: *Listed allomorphs* [$p\check{r}\check{a}mje$] [$p\check{r}\check{a}mj\check{e}\check{x}$]

| | Lex P-∇ |
|---|---------|
| i. $p\check{r}\check{a}\check{c}\check{f}\check{e}\text{ }arr\hat{e}t$ | √ |
| ii. $p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}\text{ }arr\hat{e}t$ | √ |
| iii. $p\check{r}\check{a}\check{c}\check{f}\check{e}\check{n}\text{ }arr\hat{e}t$ | * |

Tableau 16: *Listed allomorphs* [$p\check{r}\check{a}\check{c}\check{f}\check{e}$] [$p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}$]

Our account of the difference between normative liaison (e.g. $p\check{r}\check{a}mj\check{e}\check{x}\text{ }ami$ and $p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}\text{ }arr\hat{e}t$) and non-normative liaison (e.g. $p\check{r}\check{a}mj\check{e}\check{x}\text{ }ami$ and $p\check{r}\check{a}\check{c}\check{f}\check{e}\check{n}\text{ }arr\hat{e}t$) will rest on the observation that Lex P-∇ in (18) is violated by the candidates that emerge as optimal with respect to Lex (V, gender). Our global account of the variation reported in (15) will, therefore, rest on a ranking difference between Lex (V, gender) — a Lex PM condition — and Lex P-∇ — a Lex P condition. We illustrate this line of analysis with the following tableaux which show the effect of changing the ranking between these constraints while maintaining intact the ranking *Lex (C) >> Hiatus >> Lex (C), gender established earlier:

| | Lex (V' gender) | Lex P-∇ |
|---|-----------------|---------|
| i. $p\check{r}\check{a}\check{c}\check{f}\check{e}\check{n}\text{ }arr\hat{e}t$ | √ | * |
| ii. $p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}\text{ }arr\hat{e}t$ | *! | √ |

Tableau 17: *Non-normative liaison* — [$p\check{r}\check{a}\check{c}\check{f}\check{e}\check{n}$] $arr\hat{e}t$

| | Lex P-∇ | Lex (V' gender) |
|--|---------|-----------------|
| i. $p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}\text{ }arr\hat{e}t$ | √ | * |
| ii. $p\check{r}\check{a}\check{c}\check{f}\check{e}\check{n}\text{ }arr\hat{e}t$ | *! | √ |

Tableau 18: *Normative liaison* — [$p\check{r}\check{a}\check{c}\check{f}\text{e}\check{n}$] $arr\hat{e}t$

The same ranking variation predicts the difference between normative and non-normative pairs such as [$s\check{a}t$] ami vs. [$s\check{a}t$] ami , [$p\check{r}\check{a}mj\check{e}\check{x}$] ami vs. [$p\check{r}\check{a}mj\check{e}\check{x}$] ami , [$p\check{a}k\check{f}\check{e}t$] $amour$ vs. [$p\check{a}k\check{f}\check{e}t$] $amour$.

We consider now further implications of this approach. One prediction is that the masculine vowel quality will emerge in both normative and non-normative speech when higher constraints compel violations of Lex P-∇. Thus in $gr\check{o}[z]\text{ }arb\check{r}\check{e}$ “big tree”, the liaison C is a modified version of the feminine [s] in $gr\check{o}sse$ [$g\check{r}\check{a}\check{a}s$]. It is modified to a [z] by virtue of the rankings discussed earlier in (11). Because the [z] in $gr\check{o}[z]\text{ }arb\check{r}\check{e}$ is distinct from the feminine [s] of [$g\check{r}\check{a}\check{a}s$], the vowel preceding it is distinct as well: We get $gr\check{o}[z]\text{ }arb\check{r}\check{e}$, not * $[g\check{r}\check{a}\check{a}z]\text{ }arb\check{r}\check{e}$. Similarly, when the plural [z] makes liaison in a masculine NP, the vowel preceding it is the vowel of the citation masculine, not that of the feminine: [$s\check{e}gylj\check{e}z$] $amis$ “odd friends” not [$s\check{e}gylj\check{e}z$] $amis$ (cf. masc. [$s\check{e}gylj\check{e}$], fem. [$s\check{e}gylj\check{e}\check{x}$] “odd”). In this phrase, the liaison C is the plural [z], not the feminine [ʁ].⁵ Consequently, the feminine vowel may not surface and the vowel of the citation masculine $si\check{n}g\check{u}li[e]$ appears in liaison. This is true for all classes of speakers, regardless of whether they use in the singular the normative [$s\check{e}gylj\check{e}\check{x}$] ami or the non-normative [$s\check{e}gylj\check{e}\check{x}$] ami . Moreover, this is not the effect of purely phonological conditions. There is no phonotactic reason why a phrase like [$s\check{e}gylj\check{e}z$] $amis$ cannot be uttered with a lax [e], as [$s\check{e}gylj\check{e}z$] $amis$. Rather, the Listed Rime Generalization, documented below in (19), is a direct consequence of the fact that Lex (V', gender) is grammatically relevant for all speakers of French, normative or not. The difference between dialects involves ranking alone.

⁵ The conditions governing the occurrence of the plural [z] are only partly similar to those involved in singular liaison. This [z] is permitted only before a V-initial word, but it is not exclusively used as a hiatus blocker. A partial analysis appears below in Tableau 20.

- (19) The Listed Rime Generalization: The feminine V appears in masculine liaison only if the feminine C does.
- a. The feminine C appears in masculine liaison (normative speech only):
 [paʁfɛt] *amour* cf. feminine [paʁfɛt], masc. [paʁfɛ], [paʁfɛ]
 [sɛ̃gyljɛʁ] *ami* cf. feminine [sɛ̃gyljɛʁ], masc. [sɛ̃gyljɛ]
 [pʁɔʃɛn] *arrêt* cf. feminine [pʁɔʃɛn], masc. [pʁɔʃɛ]
- b. The feminine C does not appear in liaison (all idiolects):
 [gʁɔz] *arbre* cf. masc. [gʁɔ], fem. [gʁɔs]
 [sɛ̃gyljɛz] *amis* cf. masc. [sɛ̃gyljɛ], fem. [sɛ̃gyljɛʁ]
 [pʁɔʃɛz] *arrêts* cf. masc. [pʁɔʃɛ]

We illustrate the effect of Lex (V', gender) in normative dialects by providing the analysis for [gʁɔz] *arbre* and the plural [pʁɛmjɛz] *amis*.

- (20) Emergence of gender agreement vowel in normative speech:
 Liaison C, MarkPlural >> Lex P-∇ >> Lex (V', gender)

| | Liaison C | Lex P-∇ | Lex V', gender |
|--------------------------|-----------|---------|----------------|
| i. [gʁɔs] <i>arbre</i> | *! | | * |
| ii. [gʁɔz] <i>arbre</i> | | * | |
| iii. [gʁɔz] <i>arbre</i> | | * | *! |

Tableau 19: *Listed allomorphs* [gʁɔ], [gʁɔs]

| | MarkPlural | Lex P-∇ | Lex V', gender |
|----------------------------|------------|---------|----------------|
| i. [pʁɛmjɛz] <i>amis</i> | | * | *! |
| ii. [pʁɛmjɛz] <i>amis</i> | | * | |
| iii. [pʁɛmjɛʁ] <i>amis</i> | *! | | * |

Tableau 20: *Listed allomorphs* [pʁɛmjɛ], [pʁɛmjɛʁ]

We observe next that the appearance of tense vowels in the masculine liaison form, as in [gʁɔz] *arbre* "big tree", is strictly determined by correspondence to the masculine citation form. When the masculine citation contains, for any reason, a lax vowel, then that vowel will appear in liaison: e.g. [syʁvɛm] *effort* "supreme effort" (*[syʁvɛm] *effort*), cf. masc., fem. [syʁvɛm] "supreme". Similarly, for speakers whose masculine form for "perfect" is [paʁfɛ], the liaison form is [paʁfɛt] (as in [paʁfɛt] *amour* "perfect love", *[paʁfɛt] *amour*). This means that there is no general V-tensing process oc-

curing in liaison; rather, the tense vowels in [gʁɔz] *arbre*, [sɛ̃gyljɛz] *amis* or non-normative [sɛ̃gyljɛʁ] *ami* are the effect of correspondence to the masculine. Speakers, in such cases, mark the true gender of the adjective through phonological similarity to a related listed form, the citation masculine. Likewise, the appearance of nasalized vowels in liaison, as in non-normative [pʁɔʃɛ̃n] *arrêt* "next stop", is strictly determined by the presence of a nasal vowel in the citation masculine, [pʁɔʃɛ̃]. Where the citation masculine contains oral vowels, as in [syʁvɛm], the liaison vowel is uniformly oral for all dialects: [syʁvɛm] *effort*, *[syʁvɛ̃m] *effort*. These observations confirm our view that the vowel quality of the liaison rime is used to mark the true syntactic gender of the adjective. The vowel is oral when the citation masculine ends in an oral vowel ([syʁvɛm] *effort*), lax if the citation masculine ends in a lax vowel ([paʁfɛt] *amour* "perfect love"), nasal (in non-normative speech) if the citation masculine ends in a nasal vowel (non-normative [pʁɔʃɛ̃n] *arrêt* "next stop") and tense if the citation masculine ends in a tense vowel (non-normative [pʁɛmjɛʁ] *amour* "first love"). This justifies the adoption of Lex (V', gender) for French and that of LexPM conditions in general.

5. Extensions

French non-normative liaison phrases like [paʁfɛt] *amour* "perfect love" are split base expressions and in this they resemble the English derivatives analyzed in the first section of this study. In the French case, one of the two bases is the gender appropriate allomorph — here the citation masculine [paʁfɛ] — which lends its accented vowel quality to the liaison allomorph and, in this way, signals the gender of the adjective. The other base is the feminine — [paʁfɛt] — which lends its C in order to provide a lexically conservative means of blocking hiatus. The ranking in Tableau 17 — *Hiatus, Lex (V, gender) >> Lex P-∇, Lex C) gender — guarantees this mix of properties.

There are, however, limits to this mix-and-match effect. It is not possible in any variety of French to say [nuvɔl] *ami* "new friend" (based on masculine [nuvɔ] and feminine [nuvɛl]) or [ful] *espoir* "mad hope" (masculine [fu], feminine [fɔl]). In both these cases, the proper way is to use the feminine: [nuvɛl] *ami*, [fɔl] *espoir*. Similarly [vjɛj] *ami* "old friend", *[vjɔj] *ami*, with [ø] from the masculine citation [vjø].

Why is it that split base expressions like [paʁfɛt] *amour* "perfect love", [pʁɔʃɛ̃n] *arrêt* "next stop" are acceptable to many speakers, while *[nuvɔl] *ami* "new friend", *[ful] *espoir* "mad hope", *[vjɔj] *ami* "old friend", are acceptable to none? The relevant difference is one of predictability. The tenseness of the accented vowel in [paʁfɛ]/[paʁfɛt] is predictable from the generalization in

(16c). The feminine vowel in [parʃet] must be lax because it occurs in a closed syllable. Similarly, the oral/nasal quality of the vowel in [pʁɔʃɛn]/[pʁɔʃɛ̃] is predictable from the generalization in (16a). The French rime cannot contain a nasal vowel and a nasal consonant. If the nasal consonant is present, the vowel must be oral. In contrast, the ε/o , \circ/u , ε/\emptyset alternations characterizing masculine/feminine pairs like [nuvel]/[nuvo], [fu]/[fɔl], [vjɔ]/[vje] are unsupported by any general principles of French phonology. We conjecture further that, all else being equal, predictable properties are less salient than unpredictable ones and, therefore, that the unpredictable ε/o , \circ/u and ε/Λ differences are more noticeable than the predictable ε/ε , \circ/o , ε/en differences.⁶ The more noticeable the difference between a liaison rime and an actual listed rime, the more highly ranked the Lex P constraint penalizing it. In this case, we propose that the relevant Lex P constraint, Lex P- ∇ , admits of multiple degrees of strictness, standing in fixed ranking relative to each other. Its strictest version recognizes as equivalent only identical pairs of accented rimes. Thus Lex P- ∇_{strict} will penalize candidates such as [sɔt] *ami* "foolish friend", [pʁɔʃɛ̃n] *arrêt* "next stop" because the final VC sequence of these adjectives fails to be strictly identical to that of any citation form. *A fortiori*, this constraint will also penalize *[nuvol] *ami* "new friend" etc., whose perceived difference relative to listed forms is even greater.

A looser version of Lex P- ∇_{strict} , Lex P- ∇_{loose} , will accept as equivalent those pairs of rimes whose elements are differentiated by a property with predictable distribution. Thus, Lex P- ∇_{loose} will accept [sɔt] *ami* (because listed [sɔt] is predictably different from [sot]) and [pʁɔʃɛ̃n] *arrêt* (because listed [pʁɔʃɛn] is likewise predictably different from [pʁɔʃɛ̃n]). However, Lex P- ∇_{loose} will continue to penalize *[nuvol] *ami*, *[ful] *espoir*, *[vjɔ] *ami* because *[nuvol] differs unpredictably, hence more saliently, from both [nuvo] and [nuvel] and similarly for the relation between *[ful], *[vjɔ] and their corresponding citation forms. Being a more modest goal, loose similarity is always more highly ranked than strict similarity, hence the fixed ranking in (21a) below. A full account of non-normative liaison is now possible. As Tableaux 21 and 22 show, the difference between acceptable [pʁɔʃɛ̃n] *arrêt* "next stop" and unacceptable [nuvol] *ami* "new friend" is captured by the highest ranked

⁶ For evidence supporting this assumption, see Kawasaki (1986) and Ohala (1981). Kawasaki (1986: 86-87) summarizes the moral of her findings regarding distinctive and non-distinctive denasalization as follows: "Whatever a listener expects to hear [...] may be taken for granted and factored out of the phonetic percept constructed for a word." The assumption made here is that we need to distinguish degrees of perceptual salience, which are in part attributable to predictability, rather than identifying categorically properties that factored in or out in the process of speech perception.

constraint, Lex P- ∇_{loose} . In the interest of space, Tableaux 21 and 22 consider only candidates that satisfy *Hiatus. We assume that *Hiatus outranks Lex (V', gender) in order to explain violations of the latter in [nuvel] *ami* etc.

- (21) a. Lex P- ∇_{loose} >> Lex P- ∇_{strict}
 b. Non-normative ranking:
 Lex P- ∇_{loose} >> Lex V' gender >> Lex P- ∇_{strict}

| | Lex P- ∇_{loose} | Lex V', gender | Lex P- ∇_{strict} |
|--|--------------------------------|----------------|---------------------------------|
| i. [pʁɔʃɛn] <i>arrêt</i> | | *! | |
| ii. ε [pʁɔʃɛ̃n] <i>arrêt</i> | | | * |

Tableau 21: *Listed allomorphs* [pʁɔʃɛ̃], [pʁɔʃɛn]

| | Lex P- ∇_{loose} | Lex V', gender | Lex P- ∇_{strict} |
|-------------------------------------|--------------------------------|----------------|---------------------------------|
| i. ε [nuvel] <i>ami</i> | | * | |
| ii. [nuvol] <i>ami</i> | *! | | |

Tableau 22: *Listed allomorphs* [nuvo], [nuvel]

For normative speech, we rank Lex P- ∇_{loose} >> Lex P- ∇_{strict} >> Lex (V' gender). This will guarantee both [pʁɔʃɛn] *arrêt* "next stop" and [nuvel] *ami* "new friend".

Lexical conservatism also appears to play a role in phrasal syllabification as it relates to liaison consonants. This is the interpretation we suggest for a number of striking generalizations noted by Tranel (1990) regarding the realization of preposed adjectives when they occur before Right-Dislocated head nouns. Tranel (1990) notes that hiatus avoidance is enforced across the prosodic boundary induced by Right Dislocation, as in (22). (The symbol \$ in this example, and others to follow, refers to an AP boundary.)

- (22) *J'en ai un petit*, [t]-*éléphant*. [pti. \$ te.le.fã], *[pti. \$ e.le.fã]
 "I have a small one, a male elephant."

In general, the liaison C prefers to syllabify so as to terminate the AP in a form that is identical to the gender-appropriate one. Hence the syllabification differences below in (23a,b).

- (23) a. *J'en ai un petit, éléphant*. [pti.\$ te.le.fã], *[ptit. \$ e.le.fã]
 "I have a small one, a male elephant."

- (23) b. *J'en ai une petite, éléphant.* [ptit \$ e.le.fãt], *[pti. \$ te.le.fãt]
 "I have a small one, a female elephant."

We attribute this effect to the alignment constraint in (24):

- (24) Lex (]AP, gender):

The last form of the A-Phrase is identical to a gender-appropriate listed allomorph of the relevant morpheme.

Similarly, in dislocated phrases like *J'en ai un sot, éléphant.* "I have a silly one, a male elephant.", the final [t] is realized as the onset to the dislocated noun and the vowel is tense, as in the citation masculine. (I gather this is so even for normative speakers who might be inclined to say, without dislocation, [sɔt] *éléphant.*) This too follows from the constraint in (24). The function of Lex (]AP, gender) is — like that of all LexPM conditions — to manipulate similarity to known forms in facilitating the interpretation of unfamiliar, non-lexicalized expressions.

It is clear, however, from examples like (25a,b), that this condition will not always prevail:

- (25) a. *J'en ai un bel, éléphant.*
 "I have a beautiful one, a male elephant."
 [bel.\$ e.le.fã], *[be.\$ le.le.fã], *[bo.\$ e.le.fã], *[bo \$ le.le.fã]
- b. *J'en ai un vieil, éléphant.*
 "I have an old one, a male elephant."
 [vjej.\$e.le.fã], *[vje.\$je.le.fã], *[vjø.\$ e.le.fã], *[vjø.\$je.le.fã]

In these phrases, the constraint Lex (]AP, gender) is being violated: The forms [bel] and [vjej], which contain the right edge of the AP are not identical to a listed masculine form of either adjective. We note that the impossible *[bo \$ le.le.fã], which does satisfy Lex (]AP, gender), involves a violation of Lex P-∇_{loose}. The liaison VC sequence [ol] is not even loosely similar to anything found in the paradigm of [bo]/[bel]. Further, we will assume that the pronunciation of phrases like those in (25a,b) is, in part, the effect of ranking *Hiatus >> Lex (]AP, gender). This will exclude the option [bo] \$ *éléphant*. But this is still insufficient to fully predict the correct syllabification of the dislocated phrase because it does not differentiate the option *[be. \$ le.le.fã] from the correct [bel. \$ e.le.fã], as seen below in Tableau 23.

| | *Hiatus | LexP-∇ _{loose} | Lex]AP, gender |
|--------------------------------|---------|-------------------------|-----------------|
| i. [bɛl] \$ <i>éléphant</i> | | | * |
| ii. [bɛ] \$ l- <i>éléphant</i> | | | * |
| iii. [bo] \$ <i>éléphant</i> | *! | | |
| iv. [bo] \$ l- <i>éléphant</i> | | *! | |

Tableau 23: *Listed allomorphs* [bo], [bɛl]

To differentiate the top two candidates in Tableau 23, we suggest a further LexP constraint, given below in (26). This constraint requires that the right edge of the AP be identical to the right edge of some listed allomorph of its last morpheme. Note that the correct syllabification, [bɛl. \$ e.le.fã], aligns the right edge of the AP to [bɛl], identifiable as an existing allomorph of the relevant adjective. In contrast, [bɛ. \$ le.le.fã] ends the AP with a string that cannot be traced to any lexical entry.

- (26) Lex A-phrase:

For any μ , if μ is the last morpheme in an AP, then the right edge of the AP is identical to the right edge of some listed allomorph of μ , L(μ).

Regardless of its ranking, this constraint will succeed in differentiating *[be. \$ le.le.fã] from [bel. \$ e.le.fã].

6. *Implications and conclusions*

The analysis presented in this paper has broader implications for correspondence theory beyond the issue of lexical conservatism. It documents the need for global correspondence conditions, such as the English Lex σ and the French Lex P-∇. The edge-of-AP conditions motivated in the previous section fall into the same category. Once global correspondence conditions are adopted, it becomes necessary to recognize that they come in different degrees of strictness. It will perhaps be possible now to experiment with the idea that rankings among correspondence constraints of the same type (Lex P or Lex PM) are, to a large extent, fixed in the way in which the strict and loose versions of Lex P-∇ are predictably ranked in French.

The clearest conclusion of the present study is that entire paradigms of lexically related forms participate in computing the phonological properties of novel expressions. Some listed members participate by lending phonologically desirable properties to the novel expression. These members function as phonological bases. Thus, *remédial* is a phonological base for *remédiable*

because its contribution in the creation of the latter is to legitimize its optimal stress pattern. Similarly, the feminine [bel] "beautiful" is a phonological base in the formation of the masculine NP [bel elefã] "beautiful male elephant". Its use is to justify the use of the hiatus breaking [l]. Other listed members function to insure the presence in the novel expression of required morphosyntactic or semantic properties. Thus, the existence of the verb *rémedy* is a necessary condition for the formation of *remédiable*: No productive *-able* forms are based on paradigms lacking a verbal member. This establishes the fact that, in addition to its phonological base *remédial*, the adjective *remédiable* possesses a distinct morphosyntactic base. In the case of French masculine liaison, the morphosyntactic base, the masculine citation form, plays a direct role in computing the phonology of liaison phrases. It accounts for the vowel quality in non-normative cases like [sot] *ami* "silly male friend"; it explains the quality of the last C in cases like [fɔʁ] *accent* "strong accent"; and it dictates syllabification in dislocated phrases like masculine [pti.telefã] "small male elephant" versus feminine [pti.elefãt] "small female elephant". Thus, neither the feminine nor the masculine can be identified as the unique reference term in the formation of any of these expressions. We conclude that no unique expression functions as THE base in the formation of either words or phrases. The base is the paradigm.

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**OPTIONAL SCHWA DELETION
ON SYLLABLE ECONOMY IN FRENCH***

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0. Introduction

Optional Schwa Deletion (OSD), as it operates in French, refers to the variable interconsonantal schwa ~ zero alternation exemplified in (1).¹

- (1) *ce panneau* "this panel"
 a. [sœpano]
 b. [spano]

The traditional generative treatment of OSD (e.g. Dell 1973) relies on several schwa deletion processes with miscellaneous contextual restrictions. Two such rules are reproduced in simplified form in (2a,b). The rule in (2a) would account for the facts in (1a,b) above. (The symbol || in (2a) means "phrase-initial".)

- (2) a. $\text{ə} \rightarrow \emptyset / \parallel \text{C} \text{---}$ (optional)
 b. $\text{ə} \rightarrow \emptyset / \text{V} \# \text{C} \text{---}$ (optional)

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¹ As shown in (1a), French schwa is generally realized as [œ]. The term "schwa" (among others) is often used to distinguish this "fleeting" vowel from "stable" /œ/ (Tranel 1987a).