

THEORETICAL IMPLICATIONS OF FRENCH NUCLEAR DIPHTHONGISATION*

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Abstract

This article examines morphophonemic alternation between the high vowels /i y u/ and their glide counterparts /j ɥ w/. By their very nature glides lend themselves to two possible analyses: the glide can appear either as a semi-consonant associated with onset position, or as a semi-vowel associated with a syllabic nucleus (as part of a diphthong).

Since the formation of nuclear diphthongs is no longer an active process in French, recent phonological treatments prefer the first of the proposed analyses.

The active nuclear diphthongization hypothesis in Modern French has significant implications for phonological theory, yet empirical data from Verlan, from Spanish, and from non-standard varieties of French, strongly support such a hypothesis. Even though Phonological Government (PG) provides great insights into morphophonemic alternation, it nonetheless lacks the ability to explain adequately various aspects of medial glide formation in French.

The dual nature of glides (semi-consonant and/or semi-vowel) is a recurring topic in French phonology. The studies are however, most often centered on word-initial glides and their role in phonological processes such as elision, liaison and consonant-linking. Examinations of word-initial glides and the sandhi effects they produce in French (Kaye and Lowenstamm 1984; Dell 1973; Encrevé 1988) allow us an opportunity to observe instances of each glide: semi-consonant or semi-vowel, and to diagnose the "true" nature of that glide. This paper examines rather the role

*This article is drawn from my Masters *mémoire* (Kelly 2003). I would like to thank François Poiré for his generous support and superb direction throughout. This article has also benefitted immeasurably of the time, patience and copious invaluable comments from the Theoretical and Applied Linguistics Lab (TALL) group at the University of Western Ontario — my thanks to professors and students alike. I am likewise indebted to Emanuel Nikiéma of the University of Toronto for taking time to meet with me personally and discuss my research, and finally, to Monique Charette at the School of Oriental and African Studies for her many e-mails and articles. Thanks also to the editors of this special issue and to the anonymous reviewer for their helpful suggestions.

of glides occurring in the less-studied word-medial position, more specifically, in French verbal morphology and in phonological processes such as epenthesis and gemination.

Specifically, we consider the implications of word-medial glides in French verbal morphology for phonological theory in general and for Phonological Government (PG) in particular. In section 1, we examine three distinct contexts for glide formation in verbal morphology and argue for this three-way classification over the more conventional distinction: derived versus underlying glides. In section 2, the focus is on the particular gliding context of morphophonemic alternation and its significance given observations of phonological variation and finally the difficulty of accounting for the varying behaviour of glides within syllable theory. In section 3, we examine the implications of morphophonemic alternation for PG in view of empirical data (both from French and other Romance varieties) that appear to support the hypothesis of Nuclear Diphthongisation. In section 4, we examine dialectal variation in French verbal morphology and the implications for theoretical accounts regardless of the framework. In section 5, we conclude that there is no compelling empirical reason to rule out the possibility of active nuclear diphthongisation.

1. WORD-MEDIAL GLIDE FORMATION IN FRENCH

French exhibits a three-glide inventory of /j ɥ w/, corresponding articulatorily to the high vowel series /i y u/. While acoustically glides are comparable to the vowels to which they correspond, in their distribution they are more like consonants in that they never form the nucleus of a syllable but rather occur in edge positions. Having closely examined the origins and behaviour of glides in the context of French verbal morphology, we propose the following three categories (1):

(1) a. lexicalised ("true diphthongs"):¹

<i>ployer</i>	'to bend'	1SG: <i>plɔie</i>	[plwɑ]
		1PL: <i>plɔi + ons</i>	[plwɑ.jɔ̃]
<i>fuir</i>	'to flee'	1SG: <i>fuis</i>	[fɥi]
		1PL: <i>fui + ons</i>	[fɥi.jɔ̃]

b. morphophonemic "alternating": V → GV

<i>lier</i>	'to tie'	1SG: <i>lie</i>	[li]	
		i → j	1PL: <i>li + ons</i>	[ljɔ̃]
<i>suer</i>	'to sweat'	1SG: <i>su</i>	[sy]	
		y → ɥ	1PL: <i>su + ons</i>	[sɥɔ̃] ²
<i>jouer</i>	'to play'	1SG: <i>joue</i>	[ʒu]	
		u → w	1PL: <i>jou + ons</i>	[ʒwɔ̃]

¹The following abbreviations have been used in this article:

1, 2, 3	first, second, third person	L	liquid
C	consonant	PL	plural
G	glide	SG	singular
GV	glide + vowel nucleus	V	vowel

c. morphophonemic epenthesis: V → VGV

<i>plier</i>	'to fold'		1SG: <i>plie</i>	[pli]
		i → ij	1PL: <i>pli + ons</i>	[pli.jɔ̃]
<i>affluer</i>	'to flow'		1SG: <i>afflue</i>	[afly]
		y → yɥ	1PL: <i>afflu + ons</i>	[afly.ɥɔ̃]
<i>trouer</i>	'to make a hole'		1SG: <i>troue</i>	[tru]
		u → uw	1PL: <i>trou + ons</i>	[tru.wɔ̃]

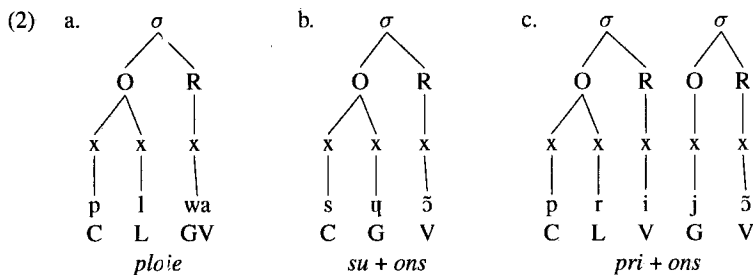
According to Kaye and Lowenstamm the "true diphthongs" observed in (1a) are distinct from the "derived" glides in (1b and 1c). We note that the diphthongs /qi/ and /wa/ are found in the stem of the verbs *fuir* and *ployer* respectively and do not vary through verbal derivation. These "true diphthongs" including their glide component are in fact constituents of the syllable nucleus. The glides implicated result from diachronic phonological processes no longer active in the language and are not the result of active phonological processes triggered during verbal derivation as in (1b and 1c).³ This type of diphthong (rising GV as in *fuir* /qi/) no longer participates in active processes and is no longer productive in the inventory of Modern French and can no longer be formed through active derivation. Since these glides are not "derived", but are present in the lexical representations, they are described as "lexicalised". Kaye and Lowenstamm maintain that all other glides, including those formed by active processes, remain inadmissible to the nuclear position thereby denying active nuclear diphthongisation. While the glides in (1b) and (1c) are both actively "derived", a distinction must be made between these two instances to account better for the different processes operating upon them and their differing output. In (1b) we observe the transformation of the high vowel /y/ to the glide /ɥ/ to resolve an instance of hiatus.⁴ In (1c), however, while the inflectional suffix is identical to that of (1b), the process by which the high vowel series is transformed to its corresponding glide is unavailable, instead the hiatus resulting from the morphological process is resolved through epenthesis: the appearance of a transitional sound that occurs between two vowels to prevent hiatus.⁵ In each of these active processes (1b and 1c), the analysis according to PG is that the glide must be a constituent of the syllable onset: (1b) results in syneresis as in (2b), and (1c) leads to dieresis as in (2c). In (1a) on the other hand, PG holds that the lexicalised glide occupies a position in the syllable nucleus as part of a "true" diphthong (2a):

²This is but one attested possibility; others are discussed further in section 4.

³See Carton (1974) for a more detailed account.

⁴According to Warnant (1987) and Martinet and Walter (1973), both epenthesis and hiatus are attested in this environment.

⁵According to Gougenheim (1932) and Fouché (1959) glide formation is blocked when following a CL cluster; therefore the "morphophonemic" strategy to resolve an instance of hiatus is unavailable in this environment.



These observations are the basis for two very important tenets of PG according to Kaye and Lowenstamm:

1. resyllabification results from the transformation of nuclear material into non-nuclear material which results in syneresis or dieresis; and
2. French syllabic constituents are maximally binary.

According to Kaye and Lowenstamm, derived glides in French are associated with syllable onsets only and are *not* nuclear constituents, a claim which is supported by the observation that these glides are blocked by a complex syllable onset preceding the hiatus context. Nonetheless, active nuclear diphthongisation is supported by empirical data (the word game *Verlan*, non-standard varieties of French and other Romance varieties), which we will discuss further in section 3.1. By denying active nuclear diphthongisation in Modern French phonology, and supported by the CL cluster observations, these authors propose a maximally binary syllable onset that, when filled, blocks syneresis and requires dieresis as in (2c).

The morphophonemic gliding in French remains a complex phenomenon, however, that presents us with facts difficult to account for in any theoretical model. It is this range of difficulty in accounting for this phenomenon that motivates our categorisation in (1). First, we are concerned only with the accounts of active glide production in French (1b in comparison to 1c) and second with the factors that determine the availability of syneresis (1b) versus dieresis (1c) in resolving hiatus in French phonology (i.e. the syllabic constituencies available to derived glides). The focus here is on a possible re-analysis of morphophonemic alternation (2b) based on empirical data that support active nuclear diphthongisation in at least one variety of French.

This analysis will show that while the treatment of syllabicity in PG accounts for much that previously went unexplained, there remains a great deal of data surrounding morphophonemic alternation and glide status in general which require further analysis. For example, PG assumes that syllabic constituents are *supposed* to be left-headed (Charette 1991), yet the lexicalised glide is an argument for exceptional glide-initial nuclei (examined further in section 3).

The following section discusses previous theoretical accounts of morphophonemic alternations and the implications of nuclear diphthongisation for these accounts.

2. IMPLICATIONS OF MORPHOPHONEMIC ALTERNATING GLIDES

Observations surrounding the behaviour of glides in these contexts forced a re-examination of the conventions of the SPE framework (Chomsky and Halle 1968). A strictly linear approach cannot motivate the appearance of a semi-consonant versus a semi-vowel. Based on these and other observations concerning tonal languages, Kaye and Lowenstamm (1984) advocate a theory that incorporates the role of syllable structure into phonological processes. This Principles and Parameters based framework views syllable structure as a parameter of a given language while emphasizing the significance of the position of a given segment inside syllable structure rather than focusing solely on the feature matrices internal to each segment. Focusing on the particular cases of glides in French and syllabic liquids and nasals in English, Kaye and Lowenstamm propose that these segments be reclassified to better reflect their dual roles; no longer [-syllabic] as proposed by Chomsky and Halle (1969) but [+cons, +voc] thus allowing these segments access to both nuclear and non-nuclear positions within the syllable.

While syllable theory does much to advance theoretical analyses of French glides, there remains much still to be accounted for. In particular, the behaviour of word-medial glides in French is much less transparent than that of their word-initial counterparts; determining their 'true' nature or quite simply determining their position in the syllable can be difficult. How do we constrain the description of a segment that, by its dual nature and classification [+cons, +voc], is permitted access to all syllabic constituencies? What, if any, diagnostics are available to determine the nature and position of these glides?

Syllabicity, clearly a key factor in sandhi effects, is likewise implicated in active word-medial glide formation. Epenthetic gliding (1c) is perhaps a less contentious instance, the usual treatment being to associate the glide with the following empty onset to maintain CV structure, an analysis we can confirm using certain imperfect verbal derivations as a diagnostic (see *priions*, *fuyions* in Table 1). The apparently contradictory data in Table 1 demonstrate the various processes described above operating within verbal paradigms. While we *may* be able to diagnose certain of the epenthetic glides for their status and syllable constituency, the case is much more difficult concerning the glides that result from morphophonemic alternation. We note that the entire high vowel series /i y u/ is implicated in the process of morphophonemic alternation, and there are likewise epenthetic segments corresponding to the entire high vowel series /i y u/ (Table 1).

Column a. of Table 1 demonstrates first person present forms which can be considered the stem forms, given that the inflectional suffix is a phonetically null zero morpheme. In column b. we observe either epenthesis or morphophonemic alternation between the vowel and the glide except in the verb *cueillir* 'to pick', where the stem form contains a glide which must have the status of semi-consonant therefore preventing a hiatus. Note that in column c., instances of epenthetic glides

TABLE 1
Data from French verb morphology

		a. 1SG, present	b. 1PL, present	c. 1PL, imperfect
Morphophonemic	scier	sci + e = scie si + \emptyset = si CV + \emptyset = CV	i → j sci + ons = sci ^h ons si + δ = sj δ CV + V = CGV	j sci + ions = sciions si + j δ = sij δ CV + GV = CV.GV
	suer	su + \emptyset = sue sy + \emptyset = sy CV + \emptyset = CV	y → η su + ons = su ^h ons sy + δ = s η δ CV + V = CGV	j su + ions = suions sy + j δ = syj δ CV + GV = CV.GV
	jouer	jou + e = joue ʒu + \emptyset = ʒu CV + \emptyset = CV	u → w jou + ons = jou ^h ons ʒu + δ = $\text{ʒw}\delta$ CV + V = CGV	j jou + ions = jouions ʒu + j δ = $\text{ʒuj}\delta$ CV + GV = CV.GV
Epenthetic	prier	pri + e = prie p ʁi + \emptyset = p ʁi CCV + \emptyset = CCV	j pri + ons = pri ^h ons p ʁi + δ = p $\text{ʁij}\delta$ CCV + V = CCV.GV	jj pri + ions = priions p ʁi + j δ = p $\text{ʁijj}\delta$ CCV + GV = CCV.GV
	fuir	fui + is = fuis f ʁi + \emptyset = f ʁi CGV + V = CGV	j fui + ons = fuy ^h ons f ʁi + δ = f $\text{ʁij}\delta$ CGV + V = CGV.GV	jj fui + ions = fuyions f ʁi + j δ = f $\text{ʁijj}\delta$ CGV + VV = CGV.GV
	ployer	ploi + e = ploie plwa + \emptyset = plwa CCGV + \emptyset = CCGV	j ploi + δ = ploy ^h ons plwa + δ = plwaj δ CCGV + V = CCGV.GV	jj ploi + ions = ployions plwa + j δ = plwajj δ CCGV + GV = CCGV.GV
Stem	cueillir	cueill + is = cueillis k æj + \emptyset = k æj CVG + \emptyset = CVG	\emptyset cueill + ons = cueill ^h ons k æj + δ = k $\text{øj}\delta$ CVG + V = CV.GV	\emptyset cueill + ions = cueillions k æj + j δ = k $\text{øjj}\delta$ CVG + GV = CVG.GV

Source: *Dictionnaire de la prononciation française dans sa norme actuelle* (Warnant 1987).

in column b. (the /j/ in *fuir*, *prier*, *ployer*), appear to geminate in the imperfect.⁶ What is unclear is whether the second glide, the initial glide of the inflection -jō should be attributed to an onset or a nuclear position. If the /j/ of the imperfect morpheme -jō were a semi-consonant, i.e. in onset position, we would expect that the epenthesis-triggering environment (hiatus) would not occur, as is the case of the morphophonemic examples *scier*, *suer*, and *jouer*. Clearly for the “epenthetic” forms (*prions*, *fuyons*, and *ployons*), this does *not* appear to be the case, since epenthesis does occur, strongly suggesting that the imperfect morpheme must be vowel initial. Given this analysis, the glide can only be attributed to the nucleus, i.e. part of a diphthong with the vowel /ɔ/ (lexicalised as such after a very complex evolution from forms of the Latin verb *habere* to the French verb *avoir* ‘to have’ from which the imperfect morpheme is derived; cf. Joly 1998), thus accounting for the need for epenthesis.

How then do we account for the *apparently* contradictory behaviour of one morpheme? We do not wish to propose here two separate imperfect morphemes (one that is semi-vowel-initial versus one that is semi-consonant-initial). We might instead explain the difference in form by looking to the lexicalised forms of the imperfect paradigm: are these glides resulting in a hiatus context (epenthesis) or are they perhaps lexicalised forms that only surface in the imperfect paradigm? Given that the stem forms of the imperfect are taken from the 3rd person plural forms of the present tense paradigm, we might account for the *apparent* gemination of yod as the presence of the “new” yod-final stem /pɛɪj/⁷, for example, to which we add the imperfect morpheme -jō, thus rendering the form [pɛɪjjō]. Though we might account for the appearance of a second yod in this way, we are still faced with a contentious issue of syllabification.

If, in fact, we have a semi-vowel-initial morpheme, how do we reconcile the apparent geminate forms within the conventional analysis of syllable structure in French (*prier*, *fuir*, and *ployer*)? In most approaches to syllabification, geminates always straddle two syllables; yet, by assuming a semi-vowel-initial morpheme, the resulting structures, [CLV.GGV] or [CLVG.GV], are hardly optimal.⁸ If, in fact we have a semi-consonant initial morpheme, the apparent geminate forms are much more easily accounted for but then we are unable to explain the absence of gemination in the verbs *scier*, *suer*, and *jouer*. What is needed is a more rigorous analysis of the role of glides and their dual nature in processes of hiatus resolution so that we

⁶In *cueillir*, however, this is *not* epenthesis as the glide is lexicalised as part of the [CVG] root form.

⁷From the 3rd person [pɛɪjō] minus the morpheme -ō.

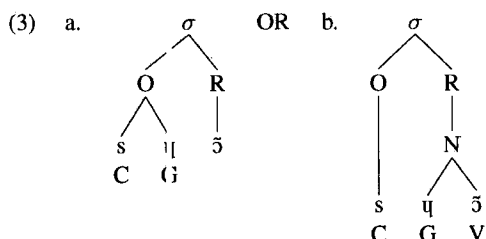
⁸The first structure with second syllable composition semi-consonant followed by a semi-vowel + vowel nucleus contradicts that which is given in Table 1: the verb *prier* in column c., the imperfect *prions* ‘we were praying’, [pɛɪjjō] or [CLVG.GV], but this typical description of the syllable structure is equally problematic in this case. The structures given in Table 1 represent the more common representations given in the descriptive literature, where the structure is assumed to be a geminate.

might better account for these contrasting examples in the syllabification of French (Poiré et al. 2005).

In the following sections we examine the conventional accounts that have dealt with this issue of determining syllabic constituency of medial glides.

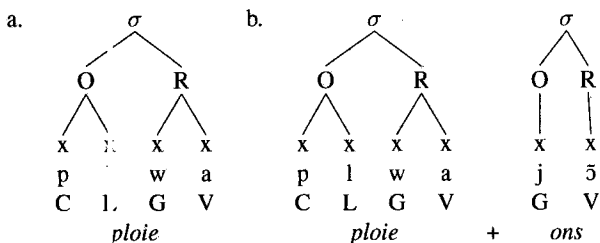
2.1. Descriptive Accounts: Is this nuclear diphthongisation or not?

How do we account for the alternating phenomenon in syllable theory? By their nature glides lend themselves to two possible analyses (Noske 1982), as illustrated in (3).



The formation of nuclear diphthongs is widely considered no longer active in French and as such recent formal treatments assume that semi-consonants deriving from active processes associate with onsets as in (3a), unlike the semi-vowels associating with nuclei shown in (3b). Only “true diphthongs”, those resulting from processes active in the evolution of French from Latin but no longer active in Modern French, are supposed to be assigned to the nucleus, as in (4) (Walker 2001; Tranel 1987; following Kaye and Lowenstamm 1984).

(4) Lexicalised “true diphthongs”:



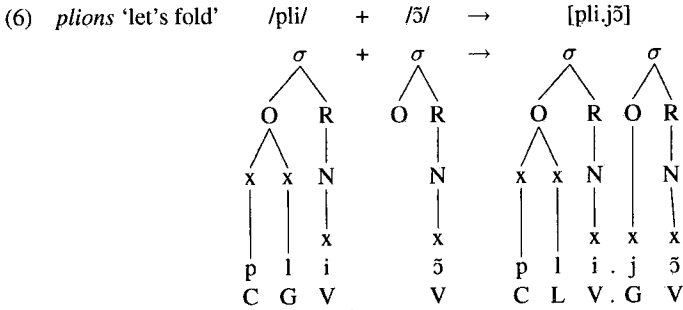
But can we rule out synchronic nuclear diphthongisation? In the following section we will examine the treatment of glides in PG as developed by Kaye and Lowenstamm (1984, 1985, 1990) and later expanded on by Charette (1991).

3. IMPLICATIONS OF NUCLEAR DIPHTHONGISATION FOR PHONOLOGICAL GOVERNMENT

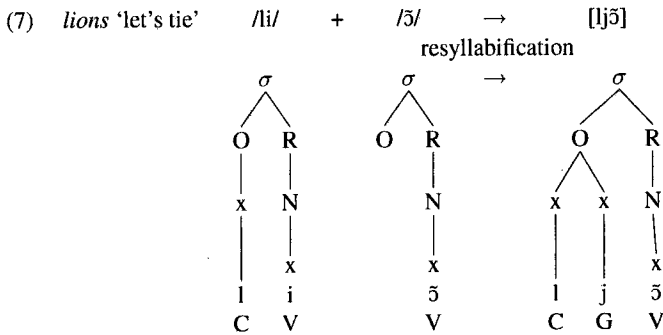
Nuclear diphthongs are assumed to be disfavoured in French following Gougenheim’s (1935) and Fouché’s (1959) observations that glide formation is generally blocked following CL clusters (Hannahs 1992:15–16, cf. note 2; Walker 2001) as in (5).

- (5) a. *chouette* ‘fantastic’ [ʃwet] vs. *brouette* ‘wheelbarrow’ [bru.ɛt]
 b. *duel* ‘duel’ [dœl] vs. *cruel* ‘cruel’ [cry.ɛl]

Following this observation, the descriptive literature (Léon 1978; Tranel 1987; Walker 2001) treats glides as semi-consonants which naturally associate with the onset position. Kaye and Lowenstamm (1984) postulate that onsets (and all other syllabic constituencies) are maximally binary branching in French and claim that a preceding CL cluster prevents the glide from taking up a position in the onset, thereby blocking the glide formation altogether, as we see in (6).⁹



They then propose that the “alternating” phenomenon is triggered by a process of resyllabification when the onset is not already maximised by a CL cluster (7).¹⁰



According to this account the high vowel /i/ in *lions* is realised as its corresponding glide /j/ because of contact with the vowel of the inflectional suffix /ɔ̃/, thus triggering resyllabification. The glide is then reassigned to the available empty skeletal position available under the first onset. It should be noted that any mora-based theories would have to account for the loss of a mora. To avoid the creation of nuclear

⁹ Apparent counter-examples, as in *trois* ‘three’ [trwa] and *emploi* ‘job’ [œ.plwa], contain “true” lexicalised diphthongs, and do not result from active processes.

¹⁰ Resyllabification is a highly controversial process. Charette (1998) and Haworth (1994) both advocate its elimination from PG theory as it conflicts with the stipulation that syllable structure is lexicalised and must be preserved in all derivational processes.

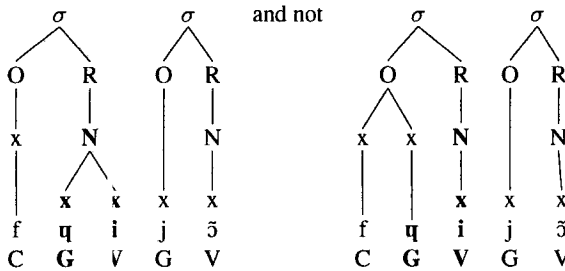
diphthongs in the process, resyllabification is governed by the constraint noted in (8) (Kaye and Lowenstamm 1984:146).

(8) Contrainte d'intégrité nucléaire (CIN):¹¹

- a. La resyllabification du noyau doit impliquer le noyau tout entier.
- b. Il n'est pas possible de resyllabifier du matériel segmental dans un noyau non nul.

The process of resyllabification governed by CIN provides a very insightful account of the "alternating" gliding phenomenon as in (7), while also accounting for instances of "true" diphthongs such as in *ployons* 'let's bend' or *fuyons* 'let's flee', as in (9).

(9) *fuyons* 'let's flee'



However, under FG, the syllabic constituents are *posited* to be left-headed (Charette 1991). Given the constraint in (8) and the principle of left-headedness in syllabic constituencies, the lexicalised glide is an argument for exceptional glide-initial nuclei and, by corollary, an argument for flexible nuclear headedness to account for these glide-initial nuclei, and to avoid attributing to glides the status of nuclear head (an undesirable result given the universally unacceptable syllables */tjɾ/, */tɥɾ/ and */twɾ/). All other glides, including those formed by active processes, remain inadmissible to the nuclear position thereby denying active nuclear diphthongisation.

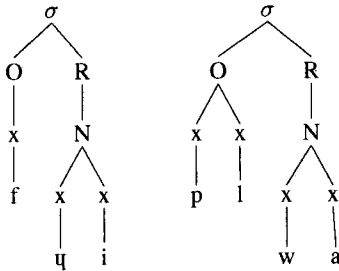
Kaye, Lowenstamm and Vergnaud (1990) later adopt the representation of a "light" diphthong in their representations of "true" diphthongs so that "true" diphthongs are associated with a single skeletal position (10).

¹¹Nuclear Integrity Constraint:

- a. The resyllabification of nuclear material must involve the nucleus in its entirety.
- b. It is impossible to resyllabify segmental material to a non-null nucleus.

(10) "Light" diphthongs:

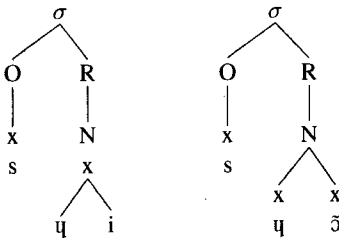
- a. [fi] b. [plwa]



This reformulated representation eliminates the issue of headedness for "true" diphthongs, while excluding extension of the representation to active nuclear diphthongisation.¹² In an active process we clearly begin with two syllable nuclei representing two skeletal positions. Were we to adopt an analysis based on active nuclear diphthongisation, the distinction "light" versus "heavy" diphthongs would figure prominently in any proposed account, since we would have to explain the loss of a skeletal position in the case of a "light" diphthong or the non-head left most position of the "heavy" diphthong as in (11).¹³

(11) Actively derived nuclear diphthongs:

- "light" [sqɔ̃] OR "heavy" [sqɔ̃]



¹²This representation also resolves a potential violation of the PG constraint on syllable constituencies being maximally binary. This constraint prohibits a branching nucleus inside of a branching rhyme. The imperfect form of the verb *ployer* 'to bend', before the reformulation of "true" diphthongs, would result in a violation of this constraint: *plwa* + *jɔ̃* = *plwajjɔ̃*, *ployions* 'we were bending'. The syllabification CCGVG.GV implies a ternary branching rhyme (branching nucleus plus coda). Charette (1991) states that this construction must be forbidden as the branching nucleus blocks c-command of the rhymal complement by the nuclear head.

¹³In an attempt to eliminate the process of resyllabification from PG, Haworth (1994) proposes that this phenomenon be treated as the spreading of the nuclear segment through P-licensing to the following onset position. The segment remains associated, though phonetically non-realised, with the nuclear position while also being associated and phonetically realised with the onset position thus surfacing as a glide.

The concept of a skeletal position is a very abstract one that is perhaps more appropriately described as a “perceived” length, rather than a measurable length. The distinction between “light” and “heavy” diphthongs is equally complicated which we leave for future research including instrumental analyses (Poiré, Gurski and Kelly 2005).

In the following sections, we examine empirical evidence from Verlan and other Romance varieties which support nuclear diphthongisation in Modern French. We also further examine the complexity of the morphophonemic alternation as evidenced by data from other dialects of French.

3.1. Empirical Evidence for Nuclear Diphthongisation

While the data supporting the claim that CL clusters block glide formation are compelling, they do not eliminate the possibility of nuclear diphthongisation especially in the light of the lexicalised counter-examples; *trois* ‘three’ [trwa], *emploie* ‘job’ [ãplwa], and *pluie* ‘rain’ [plɥi] show that this blocking is not motivated by any “impossibility” of pronouncing CLGV sequences. As we will see in the following sections, empirical evidence does suggest that CLGV sequences merit a closer analysis. Certainly it cannot be denied that these sequences play an important role in the non appearance of glide formation immediately afterwards. We would propose that rather than being the result of a syllable onset already filled which prevents a glide realisation because of the glides’ propensity for non-nuclear constituency, we are more likely dealing with a particularly complex sequence (CLGV) that, when parsed, often triggers simplification strategies of different kinds.¹⁴

The immediate consequence of such a proposition would be to explain the propensity of CL clusters to favour simpler segments in the following nuclei, while still allowing for nuclear diphthongisation in some cases. The theoretical consequences are however much more serious for PG.

In the following sections we look at some empirical evidence for active nuclear diphthongisation in Modern French. This data is gathered from a variety of sources, both intra- and interdialectal as well as cross-linguistic. Our goal at this point is not necessarily to account definitively for the morphophonemic alternations we have described, but rather to demonstrate that it is perhaps too simplistic to opt for an approach which excludes active nuclear diphthongisation as a possibility.

The data from Verlan which we present in the next section suggest that there is an association of glides with the nucleus on the part of native speakers of Standard French, and the possibility of nuclear diphthongisation cannot be ruled out.

In an examination of Romance varieties we will see that in fact nuclear diphthongisation is still an active process in Modern Spanish and this is precisely what we find occurs through verbal derivations of Spanish that look remarkably similar to those we have examined in French. In these processes we examine what appears

¹⁴For a detailed analysis of the internal phonetic nature of obstruent-liquid (OL) clusters, see Colantoni and Steele (2005).

to be a strong correlation with the shift of the primary stress from one syllable to another.

Finally, in examining dialectal variation of Continental French varieties (section 4), we observe that at least some varieties maintain active nuclear diphthongisation as a phonological process, though there is a move towards convergence with the Standard French tendency to eliminate such forms. These data show strong evidence for a re-formulated PG that might better take into account dialectal variation in French, a difficult challenge for any theoretical framework that is based on only one variety of a language.

3.1.1. Verlan

Using Verlan as a diagnostic tool, Bullock (2000:14) shows that “speakers consistently parse *all* non-initial GV sequences as nuclear” (2000:13; original emphasis). In (12), the mono-syllabic *bien* ‘well’ is inverted, following the rules of Verlan, at the level of syllable constituent thus demonstrating that speakers consider the glide to be a nuclear constituent (First Branch Metathesis or FBM, Lefkowitz and Weinberger, 1992).

- | | | | | | | | |
|------|----|--------------|--------|--------|---|--------|-------------|
| (12) | a. | <i>bien</i> | ‘well’ | [bjɛ̃] | → | [jɛ̃b] | not *[ɛ̃bj] |
| | b. | <i>moi</i> | ‘me’ | [mwa] | → | [wam] | not *[amw] |
| | c. | <i>chien</i> | ‘dog’ | [ʃjɛ̃] | → | [jɛ̃ʃ] | not *[ɛ̃ʃj] |

If we apply the grammar rules of Verlan as described by Lefkowitz and Weinberger to our morphophonemic alternations (also mono-syllabic), we should expect the forms in (13).

- | | | | | | | | |
|------|----|---------------|---------------|--------|---|--------|-------------|
| (13) | a. | <i>suons</i> | ‘let’s sweat’ | [sqɔ̃] | → | [qɔ̃s] | not *[ɔ̃sq] |
| | b. | <i>scions</i> | ‘let’s saw’ | [sjɔ̃] | → | [jɔ̃s] | not *[ɔ̃sj] |
| | c. | <i>jouons</i> | ‘let’s play’ | [ʒwɔ̃] | → | [wɔ̃ʒ] | not *[ɔ̃ʒw] |

These forms, however, have yet to be verified with Verlan speakers and we expect, given that the forms in (12) involve “lexicalised” diphthongs, whereas in (13) they are active, we may find variation in the Verlan forms just as we find in the standard dialect,¹⁵ or that Verlan forms are derived exclusively from the bi-syllabic epenthetic verb inflections, as in *scions* [si.jɔ̃]. We may also find that the grammar of Verlan requires a more detailed description of syllabification, but we have perhaps a diagnostic tool, similar to the sandhi effects for initial glides, that permits us some insight into native French speakers’ representation of syllable structure for medial glides.

3.1.2. Other Romance Varieties

Nuclear diphthongisation, once a very active process in the evolution of French from Latin, is still available in the phonologies of other Romance languages. Diachronically active processes produced word-medial GV sequences that have since

¹⁵We will be discussing dialectal and individual variation further in section 4.

been syllabified as nuclear diphthongs—the “true” diphthongs of French (according to Kaye and Lowenstamm 1984). So the possibility cannot be ruled out that nuclear diphthongisation continues to be active in some Romance varieties or is a recent innovation in others.

Right-headed nuclear diphthongs are attested in Spanish. A cross-linguistic analysis may help to account for the morphophonemic “alternation”. In spite of the differing status of stress accent in French and Spanish, the phenomena appear to be similar (14).

- (14) a. *frie* ‘s/he/it fries’ [fri.e]
 b. *frió* ‘s/he/it fried’ [frijo]

According to this account, in (14a), we observe that the primary stress accent on the vowel of the verb stem *fri* provides resistance to the transformation to glide in the present indicative, but when the stress shifts to the vowel of the inflectional morpheme *-ó* of the preterite (14b), the high vowel freely transforms into its corresponding glide. The CL cluster in the onset may or may not prevent reassignment to the onset but çoes not prevent glide formation, thus the glide is assigned to the nucleus.

Given what we observe in Spanish, stress might play a significant role in word-medial glide formation in French. Although stress is not distinctive in French, accentuated syllables are generally deemed “stronger” or less susceptible to deletion or variation. In its evolution from Latin, French preserved all the accentuated syllables of Latin, but all syllables following the accentuated syllables have since been lost through a series of diachronic phonological processes. As a result, French is a fixed stress language; stress accent always falls on the final syllable. If we re-examine the data from Table 1 reprised here in (15), we observe a pattern in French morphology similar to that which we observed in (14) for Spanish.

- (15) a. (*je*) *swe* ‘I sweat’ [sy] *suons* ‘let’s sweat’ [sy + ɔ̃] → [sq̃ɔ̃]
 b. (*je*) *saw* ‘I saw’ [si] *sciens* ‘let’s saw’ [si + ɔ̃] → [sjɔ̃]
 c. (*je*) *play* ‘I play’ [ʒu] *jouons* ‘let’s play’ [ʒu + ɔ̃] → [ʒwɔ̃]

In (15), the accent that would fall on the syllable nucleus in the present singular forms and is displaced to the vowel of the inflectional morpheme *-ɔ̃*, thus allowing the transformation of the high vowel of the root into its corresponding glide. What remains to be determined is whether this newly formed glide should be a semi-consonant assigned to the onset in French, or a semi-vowel assigned to the nucleus, as in Spanish (16):

- (16) *suons* ‘let’s sweat’ /sɥ/ + -ɔ̃ → /sq̃ɔ̃/

Typically tone-bearing segments are nuclear.

In section 4, we examine further dialectal variation in these verb paradigms to try to understand the full magnitude of the gliding phenomenon in French.

4. DIALECTAL AND INDIVIDUAL VARIATION IN FRENCH

How do we account for the fact that the form [sqɔ̃] presented in (16) is but one of two possible forms attested in the descriptive literature (Warnant 1987; Martinet and Walter 1973)?

(17) syneresis: [sqɔ̃] versus dieresis: [sy. wɔ̃]¹⁶

Similarly, in a study of French glides, Durand and Lyche (1999) compare Standard French (SF) to Midi French (MF) and find not only striking differences between these two varieties but also a conservative/innovative split amongst the speakers of the Midi French variety. The Midi data in (18) show that in at least one variety of Continental French active nuclear diphthongisation is still available and that CL clusters do not block glide formation.

(18) MF conservative MF innovative¹⁷
câbliez 'you cabled' [ca. blje] [ca. blije]

How do we account for such dialect variation? While the monosyllabic forms (15) are widely attested in "standard" French, they are not reported in Canadian (Charette 1998), Belgian (Liddicoat 1994) and non-standard varieties (Bullock 2000), which prefer glide epenthesis or hiatus (19).

(19) SF Non-standard 1 Non-standard 2
suons 'we sweat' [sqɔ̃] [sy.wɔ̃][sy. ɥɔ̃] [sy. ɔ̃]

While the monosyllabic alternation is not to our knowledge attested in Canadian French, gliding phenomena in Canadian French merit further study since diphthongisation (albeit off-gliding diphthongs) is one of the most identifiable dialectal traits to distinguish Canadian French from other dialects (20).

(20) a. *fête* 'party' [fe't]
 b. *chose* 'thing' [ʃo'wz]

As we further examine the gliding phenomena in French verbal morphology, we continue to marvel at the complexity of it. Even if we are as yet unable to

¹⁶Native speakers of Canadian French tell me that they much prefer the form [sy. ɥɔ̃] to [sy. wɔ̃], saying the former is more "natural" than the latter. I have yet to find a source to confirm this finding, but it does seem to indicate a broadening of the inventory of epenthetic segments, a topic which requires further investigation (Kelly 2005; Kelly and Heap 2005). A third form, bi-syllabic without epenthesis is also attested (Martinet and Walter 1973:833, in this case citing the infinitive *suer* 'to sweat' [sy.e]). This variant is immaterial for the present analysis.

¹⁷The MF (Midi French) innovations show a tendency to converge with the patterns of SF which is not surprising given the interaction between the two varieties in the region (Pézenas, Hérault): "[...] ces deux types de français ne sont pas isolés l'un de l'autre mais interagissent chez nos locuteurs" (Durand and Lyche 1999:40). As demonstrated by Durand and Lyche (1999), the degree of variation in this variety is more complex than is represented here.

account for all of the data in all of the varieties of French within one theoretical framework, the data presented here demonstrate that this is an area that clearly requires much further analysis and perhaps a combination of theoretical frameworks to properly account for all of the variables.¹⁸ What *is* clear is that the role of medial gliding in French has not been sufficiently examined and that recently documented variation demonstrates a growing propensity towards gliding and an expanding number of contexts where the full three glide inventory is implicated.

5. CONCLUSION

While this article represents only a preliminary examination of medial gliding phenomena in French, we are certain that there is much that must still be studied in order to provide a satisfactory theoretical account. While nuclear diphthongisation is no longer a productive process in French, we cannot definitively exclude it from French phonology. Data from Verlan and Midi French suggest that at least some speakers are reanalysing word-medial glides as nuclear.

While the traditional descriptive literature reports the absence of ‘alternation’ in other non-standard varieties (Canadian and Belgian French, for example), there is growing evidence to suggest that medial glide formation may be growing more prevalent in French dialects. Until recently the inventory of epenthetic glides was limited to yod /j/. Neither /ɥ/ nor /w/ were attested in epenthetic roles (Tranel 1987; Walker 2001), but given the unsolicited acceptability judgments we have received from French Canadians (cf. note 15), an expanded role for glides in French phonology seems in order and may not be restricted to “continental” or “standard” varieties.

Clearly, the facts surrounding gliding in French (in particular its variability, both for the individual and in the various dialects), challenge our existing theoretical models to the greatest extent. We have shown that determining the status of glides (semi-vowel or semi-consonant) is a difficult task and much further analysis is necessary.

Positing that syllable onsets in French must be maximally binary and using the powerful observation that CL clusters block gliding immediately afterwards, Kaye and Lowenstamm propose that the glides that result from verb derivations must be semi-consonants which are therefore prevented from associating with an already filled syllable onset. However, as shown by the data in Table 1, the facts surrounding word-medial glide formation are complex and determining glide status is inconclusive. Unlike the sandhi effects of word-initial glide formation, we are unable to determine the role and/or quality of these segments.

While the notion of syllabicity adds greatly to phonological accounts, the the-

¹⁸Kelly and Heap (2005) propose an OT treatment and Poiré, Gurski and Kelly (2005) study in detail the distribution of glides in a prosodic account that includes instrumental analysis. Kelly (2005) examines the significance of sociolinguistic factors on gliding in Ontario French from the Windsor region.

oretical framework of Phonological Government remains incapable of adequately explaining all of the data implicated in word-medial gliding — be it morphophonemic alternation between the high vowels and their corresponding glides or the less controversial but still complex epenthetic gliding (as shown in Table 1).

We have clearly demonstrated that gliding phenomena merit a much more detailed account but this matter is not solely an issue for the PG framework, but for any phonological theory. The status of glides in French presents a particularly complex task which merits a much more detailed account no matter the framework.

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