The phonology and phonetics of glides in North-Western Greek dialects

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1. Introduction

Apart from reports on high vowel deletion and mid vowel raising in Northern Greek dialects (Chatzidakis 1905, Papadopoulos 1927, Newton 1972, Browning 1991, Kondosopoulos 2000, Trudgill 2003) there is hardly any description of the phonetic quality of vowels[29]—and even less so of glides—surfacing in these dialects. Standard Modern Greek (SMG) has been reported to have only one glide, [j], in its inventory[30] (Mirambel 1959, Householder 1964, Newton 1972, Joseph & Philippaki-Warburton 1987), while in Northern Greek, in addition to the high front glide, there have been anecdotal, impressionistic reports about the existence of a high back glide, [w] (Phavis 1951, Newton 1972).

Crosslinguistically, segments labeled as *glides* have variable phonological and phonetic patterning, in that they display both consonantal and vocalic characteristics, sometimes becoming part of consonant clusters, while at other times forming diphthongs with vowels (see Nevins & Chitoran 2008 and references therein). The most common glides across languages are [j] and [w], which are thought to be closely related to [i] and [u] respectively.

Turning to the Greek phonological literature, there is no consensus on the phonological status of glides in SMG. Some scholars claim that [j] is an allophone of /i/ (Newton 1961, Kazazis 1968, Warburton 1976, Malavakis 1984, Nikolopoulos 1985), others argue for the existence of two separate phonemes /i/ and /j/ (Mirambel 1959, Koutsoudas 1962, Householder *et al*. 1964, Setatos 1974, Nyman 1981), while a third proposal puts forth the idea of an underlying archi-phoneme /I/ which is underspecified for the feature [consonantal] and which relies on the 'Maximal syllabification principle' to account for the surface realization of the segment sometimes as a vowel and sometimes as a glide (Deligiorgi 1987, Malikouti-Drachman & Drachman 1990). Clarifying the phonological status of the [j] glide in SMG is beyond the purposes of our study, but we will add another piece to this puzzle by describing a different type of glide in North-Western Greek (NWG), not attested in SMG, which has a different behaviour (section 2.1).

So far, no phonetic investigation of the dialectal glides has taken place to our knowledge, which is an essential step before any further analysis is undertaken. This is one of the aims of this paper, together with their phonological investigation as well as a comparison between NWG and SMG, which will hopefully promote discussion on Greek glides in general. To sum up, our aims in this paper are (a) to distinguish among different types of NWG glides and establish the phonetic environments where they appear; (b) determine whether this phenomenon in NWG is categorical or variable; (c) tentatively seek the reasons behind its different realizations.

[29] See, however, Trudgill (2009) for a recent analysis of the vowel system of the greek dialect spoken in Sfakia.

[30] This description has been questioned in phonetic studies (Malavakis 1984; Arvaniti 1999, 2007; Nicolaidis 2003) which show that what is phonologically described as /j/ is realized phonetically as a voiced fricative [ʝ].

2. Phonetic description of glides in NWG

The phonetic characteristics of Northern Greek glides, as already mentioned, have by and large received no attention till now. The only notable exception is a brief *impressionistic* description found in Newton (1972) who reports of a high front glide [j] and a high back glide [w]: "All dialects have the high front glide [j] … and many have a high back glide [w]." (1972: 11). However, Newton hasn't got much to say about glides in specific dialects or the phonetic environments they occur in besides a remark of Phavis (1951) who observes glide formation before stressed mid vowels reporting: "…a pronunciation [wó] for [ó] in Kozani and other parts of Macedonia." (Newton 1972: 29).

The current work offers a first analysis of these glides. The material we base our analysis on comes from a corpus of spontaneous and semi-spontaneous speech recordings of 12 speakers from the area of Western Macedonia (Kozani) and Epirus (Ioannina and Arta). The speakers were all in the 50-60 year old range and they reported, through conversation, on everyday matters, childhood memories, war memories etc. for about 60 minutes with the interviewer, with minimal interruption. For this paper, 5-6 minutes from 4 speakers were analyzed, in which we counted 125 tokens containing glides.

The next section supplies the results of this investigation. Starting from general observations about NWG glides, we then move on to their acoustic analysis (§2.1.1). §2.1.2 deals with the distributional properties of glides introducing us to the topic of the next section (§3), namely, a discussion on their phonological status.

2.1. The results

Our first finding is in accordance with previous impressionistic reports that NWG dialects present two glides, namely the palatal [j] and the labio-velar [w]. The second finding is more surprising; in particular, we offer evidence suggesting that NWG distinguishes between two types of glides: the first type of glides is common between NWG and SMG, appearing in exactly the same positions in both dialects (henceforth COMMON); the second type on the other hand is idiosyncratic to NWG and does not appear in comparable positions in SMG (termed here NWG-ONLY). In (1) we give examples of words containing the COMMON type of glides and in (2) the NWG-ONLY glides and compare them to their corresponding SMG words.

(1) *Words with COMMON glides in NWG*

NWG	SMG	Gloss
piðʝá	peðjá	'children'
tsimbʝéndan	tsibʝótan	'was enamored'
ðʝo	ðʝo	'two'
çérʝa	çérʝa	'hands'

(2) *Words with NWG-ONLY glides and their correspondents in SMG*

NWG	SMG	Gloss
k**w**ókału	kókalo	'bone'
m**w**óʌis	mólis	'just before, as soon as'
p**w**ósa	pósa	'how many'
m**j**ésa	mésa	'inside'
ks**j**éru	kséro	'I know'
pat**j**éra	patéra	'the father'
funá**j**ʒ	fonázi	's/he shouts'

Note that the transcription of glides in (1) and (2) is different. We transcribe the glides in (1) as fricative palatals [ʝ], while in (2) as approximant palatals [j]. Contrary to what has been reported in Nevins & Chitoran (2008), phonetic studies of SMG note that the SMG palatal glide surfaces as a voiced palatal fricative (Malavakis 1984; Arvaniti 1999, 2007;

Nicolaidis 2003) and our data show the same realization for COMMON glides as well (see Figure 1 in section 2.1.1 below). On the other hand, NWG-ONLY glides do not show any trace of frication (see Figure 2). We discuss these differences in section 2.1.1

We found far more NWG-ONLY glides than COMMON ones in our data; 111 and 14 tokens respectively. Before discussing the differences between the two types of glides in terms of distribution, we present their acoustic realization in NWG.

2.1.1. Acoustics of NWG glides

As is well-known, the acoustic structure of glides, or semi-vowels, corresponds to that of vowels. For instance, Ladefoged & Maddieson (1996: 323) point out that "…within each language the semi-vowels differ from the corresponding vowels in that they are produced with narrower constrictions…", hence, the formant structure of [j] and [w] roughly corresponds to that of [i] and [u] respectively. In addition, the narrower constriction of /j/ in turn often leads to palatalization and/or affrication of a preceding consonant (Hall & Hamann 2006; Hall et al. 2006) – which is the predominant realization in COMMON cases – as was reported in 2.1 above (see (1)). Figure 1 gives a representative example of a word containing a COMMON type glide in the word *tsibjjendan* 'got enamored' realized [tsimbj̟endan] in NWG. The frication of the glide is evident after the voiced stop [b].

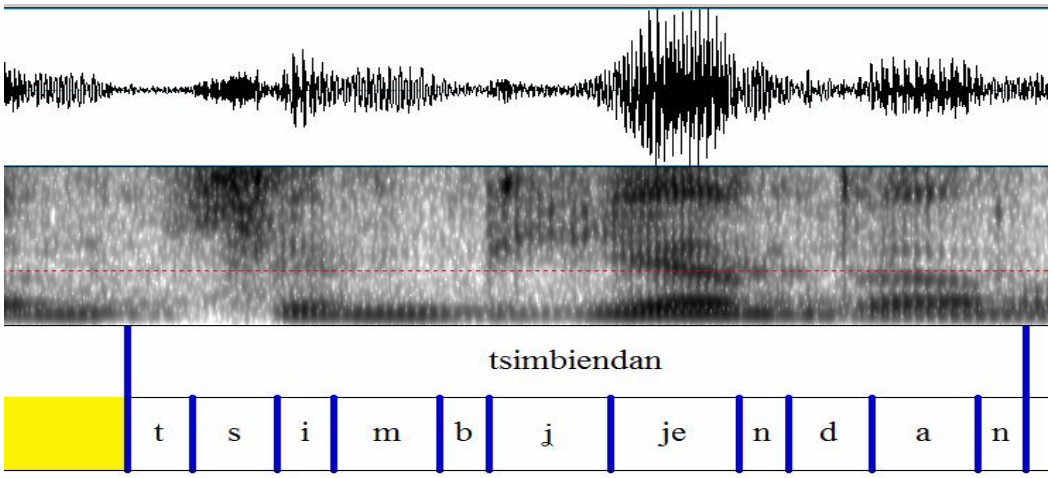


Fig. 1: *The NWG word [tsimbj̟endan] tsimbjotan 'got enamored' shows the fricative portion of the glide immediately after [b].*

Figure 2 shows an example of an NWG-ONLY glide in the word *enas* 'one' realized [jenas] in NWG. There is clearly no frication in the glide realization here and this difference is consistent between COMMON glides and NWG-ONLY ones, as is also shown in Figures 3, 4 and 6 below.

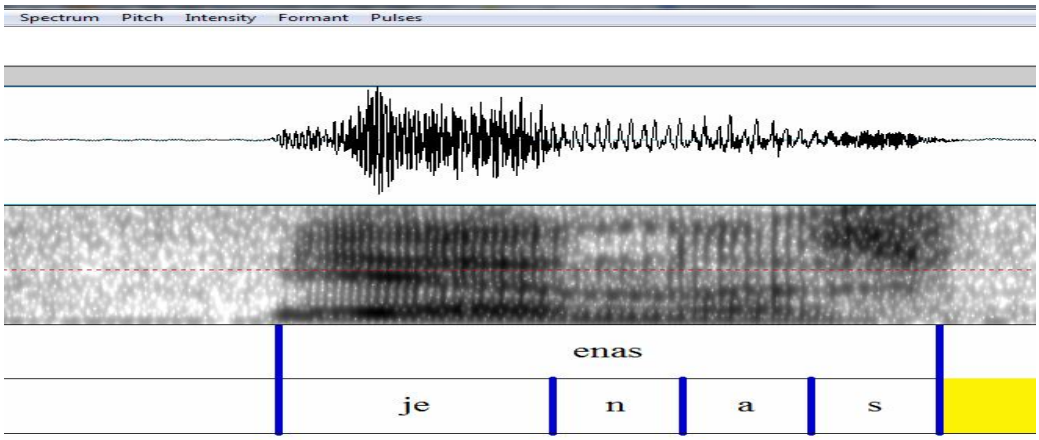
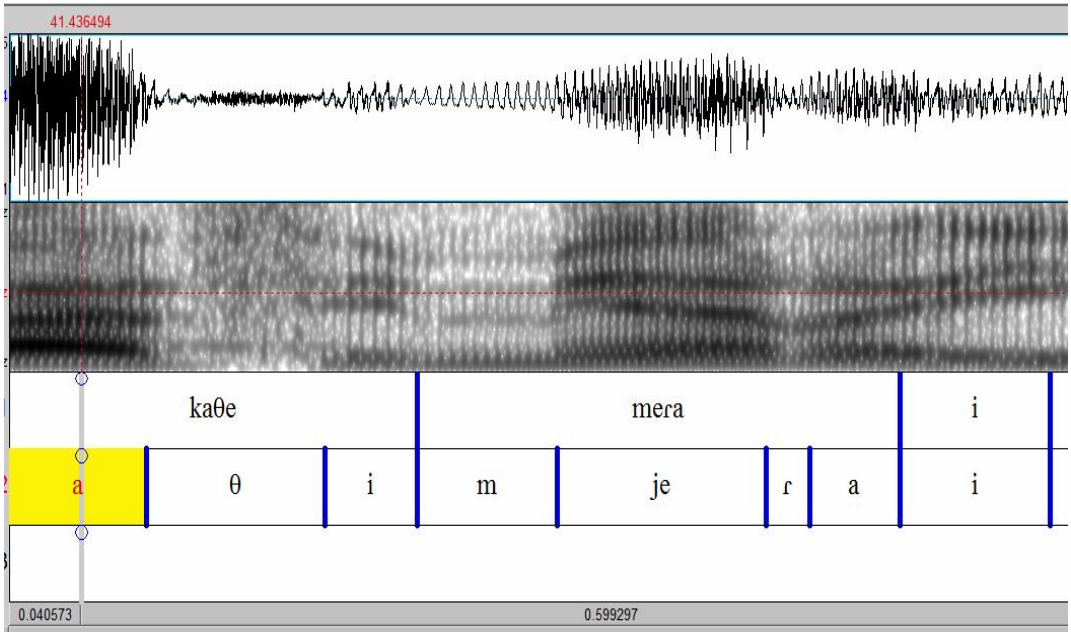


Fig. 2: *The NWG word [jenas] enas 'one' shows that there is no frication in* NWG-ONLY *glides in word-initial environments.*

Arguably, the frication part could be missing from the token of Figure 2 because the glide is not postconsonantal. However, our data show that there is no frication in NWG-ONLY glides in any environment, as is clearly evident in Figure 3 which shows two representative tokens of post-consonantal NWG-ONLY glide: in the words *mera* 'day' realized [mjera] in NWG (top panel) and *patera* 'father' realized as [patjera] (bottom panel). À propos of the example [mjera] we should note another difference between NWG and SMG: it is very common for a [mj] cluster in SMG to be realized with an epenthetic [ɲ], that is, [mɲj]; that is not the case for NWG-ONLY glides, which as the example in Figure 3 shows has no such epenthetic segment.



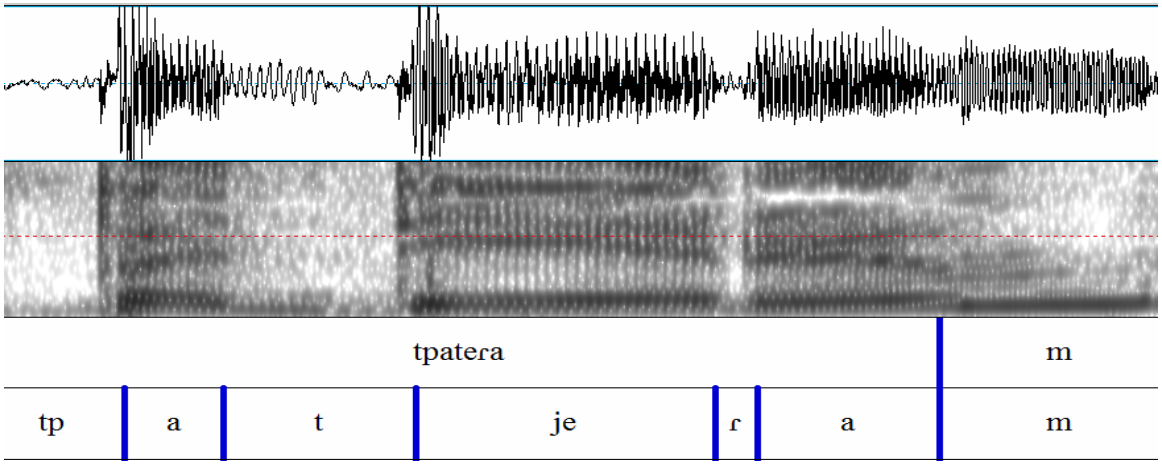


Fig. 3: *The NWG words [mjera] mera 'day' (top) and [patjera] patera 'father' (bottom) showcase realization of NWG-only glides in a postconsonantal/prevocalic environment. No frication is evident.*

This salient difference between the two types of glides can be aerodynamically attributed to the high velocity of the airflow produced at the release of a stop which is higher with greater constriction degrees of the following vocoid (Ohala 1983, Nevins & Chitoran 2008). In other words, the phonetic realization of our data suggest that NWG-ONLY glides do not show the frication part because they are more vowel-like (have smaller constriction)[31] than the COMMON glides which are more consonant like (greater constriction).

One further difference in the realization of the two types of glide is regulated by stress: NWG-ONLY glides appear only in stressed syllables, while there is no such restriction for COMMON glides. Figure 4 gives an excellent example of the role of stress in NWG-glides. The speaker self-corrects, changing the position of stress in the word *katevenan* 'they went down'. First he pronounces it [kati'vjen(an)] with penultimate stress and the second time [ka'tjevinan] with antepenultimate stress. This change in stress position brings about the change in the position of glide insertion, as well.

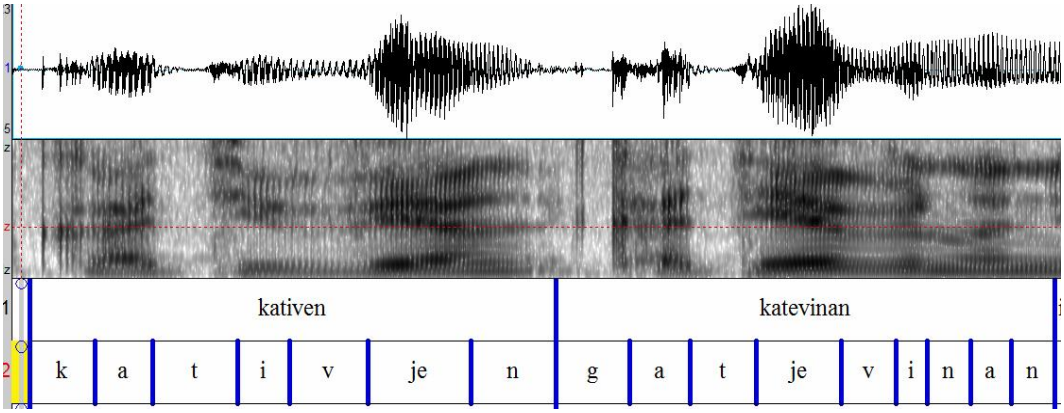


Fig. 4: *The role of stress in NWG gliding. On the left, the word katevenan 'they went down' is realized [kativjen(an)] with stress and [je] in penultimate position; on the right it is realized [katjevinan] with stress and [je] in antepenultimate position.*

[31] This opens up the possibility that NWG glides function as diphthongs. A similar process appears in Romance. In the Romance languages, the original Latin short vowels /e/ and /o/ have generally become diphthongs, [je] and [wo], when stressed, e.g. Latin *petra* 'stone' and *focu* 'fire' evolved in Spanish as [pjédra] and [fwégo] respectively (Chitoran and Hualde 2007: 46). Perhaps the fact that NWG dialects also have this phenomenon, but SMG does not, has to do with the contact of N. Greece with such languages through the Balkans. Nonetheless, the fact that this process exists in Romance does not explain why it exists, or why it started in the first place. Since we became aware of this possibility at the final stages of writing this paper, we will explore this alternative in future work.

Figure 5 gives an example of an NWG-ONLY [w] glide in the word [fwotu] 'Fotu's (name)'. Formant movements are shown to highlight the similarity between the height of F2 at the beginnining of [wo] in the first syllable and at the steady state of [u] in the second syllable. Note how F2 rises for the position of [o] near the middle of the [wo] syllable.

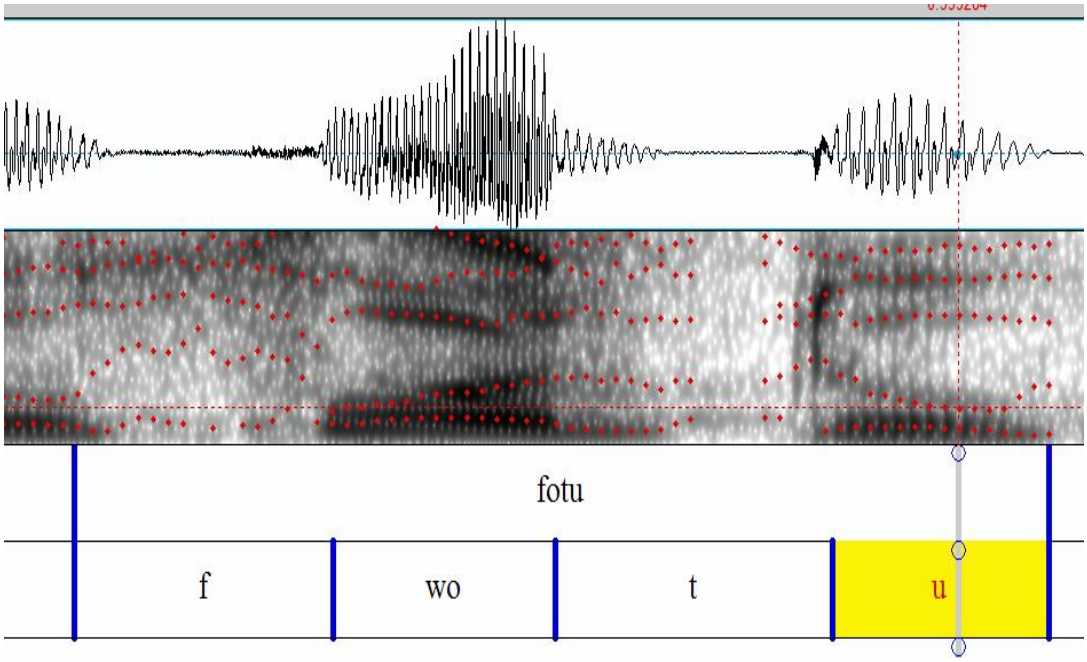


Fig. 5: *Example of [wo] in the word [fwotu] 'Fotu's (name)'.*

Since the glides [j] and [w] have similar formant values to [i] and [u], we expect the formants in sequences [je] and [wo] to show movement from the high vowel values to those of the mid. We measured formant movements of 10 words each for the [je] and [wo] from the NWG-ONLY category. Figure 6 shows the average measurements of F1 (bottom) and F2 (top) taken ¼ into the vowel [e] then at the ½ and ¾ points over the 10 tokens measured of words with [je]. Movement of F1 and F2 from the values typical for [i] to the values typical for [e] is evident which we interpret as the presence of an onglide to the vowel.

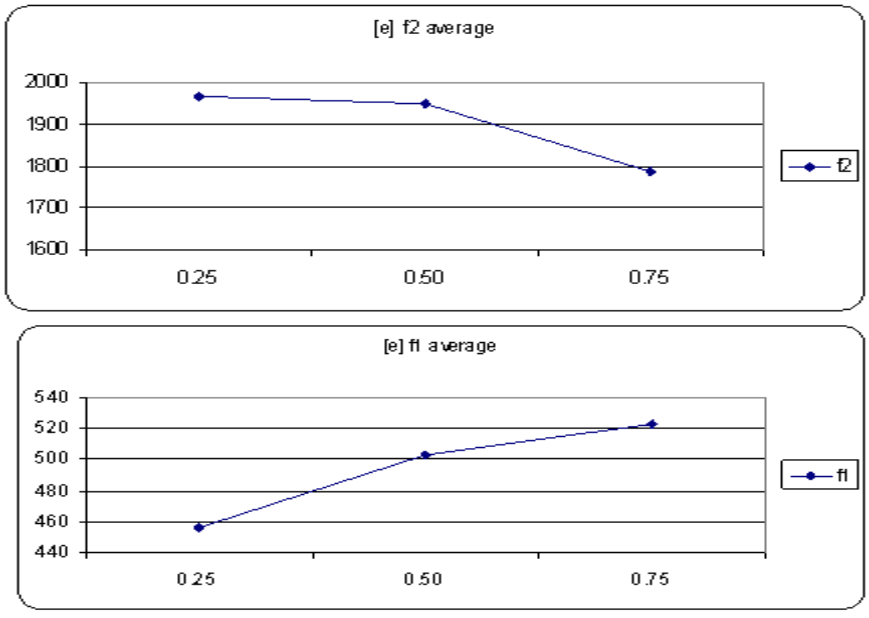


Fig. 6: *Movement of F1 (bottom) and F2 (top) from the values typical for [i] to the values typical for [e] in [je] sequences (average from 10 tokens)*.

Figure 7 shows measurements for [o] taken ¼ into the vowel, then at the ½ and ¾ points over the 10 tokens measured of words with [wo]. Movement of F1 and F2 from the values typical for [u] to the values typical for [o] is evident (averages over 10 tokens), which we interpret as the presence of an onglide to the vowel.

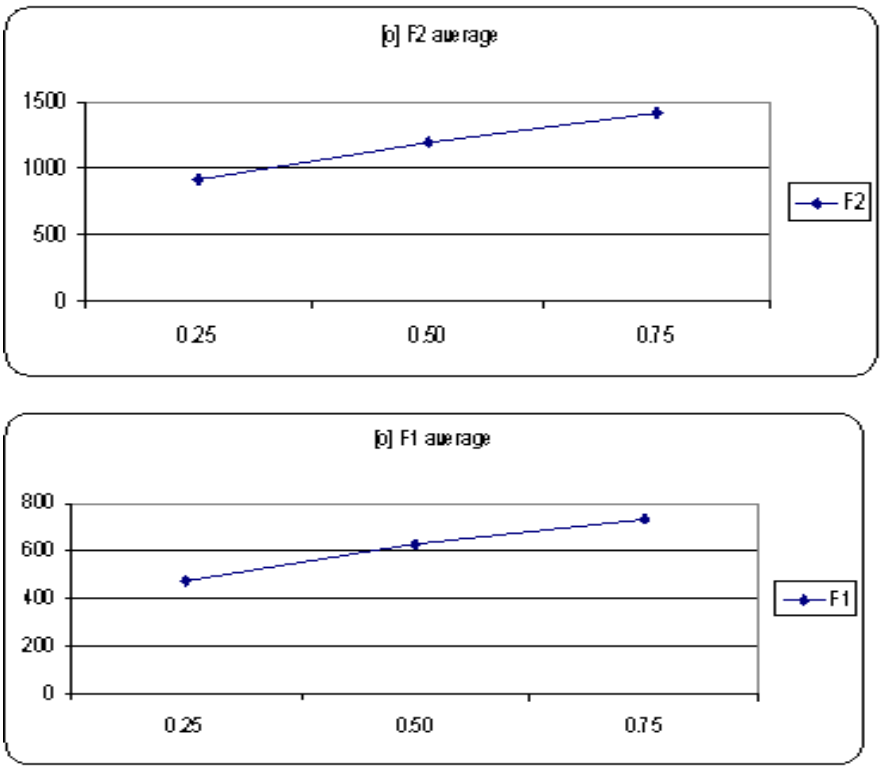


Fig. 7: *Movement of F1 (bottom) and F2 (top) from the values typical for [u] to the values typical for [o] in [wo] sequences (average from 10 tokens)*.

In sum, examination of the acoustic properties of glides in North Western Greek showed that there are two different types of glide in this variety which differ in their acoustic realization: the type which is similar to the SMG glides—and which we called COMMON—is characterized by frication, while the type of glide which is only attested in North Western Greek—the NWG-ONLY glides— is realized without any frication. The former glides are arguably realized with greater constriction and this suggests they are more consonant-like, while the latter with less constriction or more vowel-like. The next section examines the distribution of NWG-ONLY glides both with respect to the COMMON glides as well as with each other, i.e. a comparison between *j* and *w*, something we have not yet discussed.

2.1.2. Distribution

Starting with a distribution comparison of the COMMON and NWG-ONLY glides, we observe that the former category only comprises one glide, i.e. [j], whereas the latter contains both [j] and [w], their distribution being regulated by the following vowel; the mid-front vowel is preceded by [j], while the mid-back one is preceded by [w], cross-linguistically a very common distribution. This distribution holds for the overwhelming

majority of cases[32]. In *prevocalic* environments [j] and [w] only appear before [i] and [o] respectively. Such a restriction does not hold for the COMMON glide which may be followed by any vowel.

More specifically, in the set of 111 NWG-ONLY tokens, both [j] and [w] emerge with approximately the same frequency: we found 46 [je] tokens (41%) and 45 [wo] tokens (40%). Less frequently, glides appeared postvocalically. In particular, we found 12 [aj] tokens (10.8%) only before palatals and 8 tokens (7%) of the type [oj], [uj] and [ej], while only 1 token of [ow]. Finally, NWG-ONLY glides arise much more often as onglides than offglides. In the latter case, they basically appear before palatal consonants only. No similar limitation seems to be pertinent to COMMON glides.

A second important difference relates to the role of stress. The COMMON glide may or may not be found within a stressed syllable, but the NWG-ONLY glide necessarily occurs within a stressed one (cf. (2) above).

Our data also reveal a third difference between the two types of glide concerning their obligatoriness: Words with NWG-ONLY glides display variable realizations, some with and some without the glide; for example, we found instances of the same speaker pronouncing *patera* 'father' both as [patera] and [patjera]. On the other hand, words containing COMMON glides are never realized without one.

Table 1 summarizes all the preceding remarks on the differences between COMMON and NWG-ONLY glides.

Table 1: *Distribution of COMMON and NWG-ONLY glides.*

	COMMON	NWG-ONLY
[j]	✓	✓
[w]	×	✓
Licensed by stress	×	✓
Obligatoriness	✓	× (optional)
Combination with any V	✓	Mainly [je] & [wo]
Onglide position: (j+V, w+V)	✓	✓
Offglide position: V+j	✓	Restricted (before palatals)
V+w		Very rare (1 token in 45)

Table 1 above seems to imply that the NWG-ONLY [j] and [w] pattern in the same way. Although it is true that they share the property of both appearing in stressed syllables, they are different in other respects. More specifically, [j] appears word-initially and word-medially with almost the same frequency, while [w] appears mostly word-medially—we found only 5 word-initial tokens. When prevocalic, [j] comes after any type of consonantal articulation (except velars), but [w] mostly follows labial and velar consonants. The basic observations are summarized in Table 2 below.

Table 2: *Differences in the distribution of NWG-ONLY [j] and [w] in NWG.*

		[j]	[w]
Word-initial		16	5
After	labials	9	16
	interdentals	5	1
	alveolars	6	4
	palatals	10	0

[32] There are some cases, approximately 18% of our nwg-only tokens, where [j] appears with other vowels, but crucially in all of these cases it is an off-glide, appearing *after* a vowel (mostly [a]) and before a palatal sibilant [ʃ] or [ʒ]. Due to the scarcity of offglides in our data, the following discussion mainly focuses on onglides.

velars	0	19

3. The phonology of glides

3.1. Brief overview of previous studies on Greek glides

Early accounts of glides viewed underlying vowels as the only source for surface glides (e.g. Kaye and Lowenstamm 1984, Steriade 1984, Levin 1985, Rosenthall 1994). In such approaches however, the difference in the consonantal vs. vocalic behaviour of glides was not clearly evident. To capture the duality of glides as consonants or vowels, Clements and Hume (1995) instead assigned particular constituenthood within the syllable or feature structure, so that glides could bear place features under the C- or V-place-nodes. Much more recently, Levi (2008) has attempted to capture differences in glide behaviour in a rather direct approach. In particular, she differentiates between underlying and derived glides. The former refer to 'real' phonemic glides that pattern with consonants, whereas the latter refer to underlying vowels that surface as glides, but pattern with vowels.

This distinction finds equivalents in SMG where a contrast between underlying and derived glides seems extant.

(3) *SMG phonologically*

Underlying:	/mjalo/	[mjaló]	'mind'				
Derived:	/mati/	[máti]	'eye'	*but*	/mati+a/	[mátja]	'eyes'

Specifically for Greek now, a number of proposals have been put forward to account for glides. The three main approaches are listed in (4) and outlined below (cf. Rytting 2005 for details).

(4) *Proposals about Greek glides*

i) Allophonic (e.g. Kazazis 1968, Warburton 1976)

ii) Phonemic (e.g. Setatos 1974, Nyman 1981)

iii) Underspecification (e.g. Deligiorgi 1987, Malikouti-Drachman & Drachman 1990)

The former follows the tradition (see Kaye & Lowenstamm 1984 above and others) which claims that glides necessarily come from underlying vowels. Thus, depending on the environment, a high vowel may surface as a vowel or as a corresponding glide, i.e. /i/ → [i] ~ [j]. This allophonic account however misses cases whereby a lexical contrast between vowels and glides arises. Consider for instance the word *άδεια*. For many speakers this is pronounced as [áðia] when it means 'permission' and as [áðja] when it means 'empty-PL.-NEUT.'. Minimal pairs of this kind motivate the phonemic account which maps /i/ to [i] and /j/ to [j]. The phonemic proposal is not without problems either, since it fails to capture the cases of derived glides that the allophonic approach so easily accounts for. Lastly, the underspecification account attempts to capture the vowel vs. glide contrast simultaneously with the allophonic relationship by claiming that there is a just a single phoneme /i/ without the need for /j/. The twist required here is that /i/ can either be specified as [-cons], in which case it is systematically interpreted as [i] phonetically or it can be left unspecified for [cons], in which case it can alternate between [i] or [j] depending on the syllabic position.

Despite any advantages each of these accounts has, it is quite clear that each fails to capture a number of facts related to the [i]-[j] alternations, a phenomenon that is usually attributed to socio-linguistic factors or the demotic-katharevousa distinction. Bearing in mind that our purpose here is to describe glides in NWG as adequately as possible – given our presently limited corpus of data – and to remark on their innovations when compared to those of the standard dialect, we currently refrain from reaching any theoretical conclusion on SMG glides and focus instead on certain aspects of the dialectic

glides. For this reason, we do not take a stand as to whether these glides are underlying or derived and will continue using the theory-neutral terms COMMON and NWG-ONLY.

3.2. The NWG-ONLY glides

Argumentation supporting the difference between COMMON and NWG-ONLY glides has been presented in §2.1.1 and §2.1.2. This now brings us to the question; if NWG-ONLY glides are distinct from the COMMON ones, then how can we theoretically analyze them? This is the topic of the next sub-sections.

3.2.1. NWG-ONLY glides function epenthetically

Recall that prevocalic NWG-ONLY glides appear either after another consonant (…CjV…) as in [mjéra] or word-initially (#je or #wo) as in [jétsi] 'so, this way' or [wótan] 'when'. Let us first consider the latter instance which seems more straightforward to account for, since it appears to be driven by the need to satisfy ONSET by means of onset epenthesis. At first sight, no similar justification seems to be available for the /…CV…/ → […CjV…] change, given that an onset is present already. However, we argue that the epenthesis of a glide in NWG, whether to offer a (new) onset or to form a complex onset is driven by the need to create smoother transitions from and to the syllable nucleus.

This idea is inspired by work by Uffmann (2007) who observes that glottal stops are usually epenthetic word- or foot-initially, whereas glides are usually epenthetic intervocalically. This differentiation on the nature of the epenthetic consonant relates to sonority considerations, since different epenthetic consonants may enhance or reduce the contrast of the preceding/following segment. Given that vowels are prominent segments, the best epenthetic segment in a V_V context is a glide due to its high sonority. Uffmann (2007: 458) thus proposes that "glides are inserted to minimise the contrast to the following or preceding vowel".

Glides in NWG presumably take on this role intervocalically, but, as we presently claim, also prevocalically in #_V, C_V and post-vocalically in V_C contexts[33]. To see why, consider Sonority Sequencing (Clements 1990), whereby sonority must sharply rise from the onset to the nucleus and then gradually lower towards the coda. For this reason, ideal singleton onsets are the ones of the lowest sonority such as the stops *p, t, k*. On the other hand, ideal singleton codas are the ones whose sonority is lower than a vowel, but still not too low. When we add complex margins to the equation, things get slightly modified. The generated strings will consist of [C_1C_2V] for a complex onset and [VC_2C_1] for a complex coda. Davis and Baertsch (2008) observe that the preferable sonority profile of C_1 and C_2 cross-linguistically is the same across the corresponding positions, namely low sonority for C_1 and high for C_2. This proves quite insightful, when we consider the NWG data. C_2 in complex margins is ideally filled by a high sonority segment, a role that is undoubtedly best fulfilled by an epenthetic glide. We can thus claim that the glide is inserted to achieve the preferable sonority profile, thus accounting for the C_V and V_C environments.

But this does not answer the question of why a glide should be epenthesized in the first place. In the #_V context a low sonority singleton onset would offer the ideal rising sonority slope towards the nucleus, whereas in the …C_V… context, glide insertion seems redundant, as there is already a good sonority profile available. The answer to both questions comes from a single proposal. In particular, we claim that in NWG more important than a simply good sonority profile is to have smooth transitions from an onset to the peak and from the peak to a coda, whenever possible. Uffmann's proposal about the minimisation of contrast offered by glides in relation to vowels now comes in handy. Epenthetic glides in C_2 position or as singleton onsets serve this function in the best way

[33] In the light of Uffmann's (2007) observations, such claim might seem surprising in the #_V context, but it is actually not, if one takes into consideration the lack of [ʔ] in Greek. As for the preference of using [j] over low-sonority consonants in singleton onset-position, an explanation is offered a bit later in the text.

possible and are thus preferred, even at the expense of a more complex syllable structure in the case of …C_V… or …V_C…

3.2.2. Some complexities

Naturally at this point, one may wonder: if NWG-ONLY glides are truly epenthetic, then why don't they appear in front of any vowel? Our answer will be that these glides behave epenthetically, but may only surface under assimilatory conditions. To unravel what this means, consider the context where each of the epenthetic glides emerges. In particular, we find [je] but not *[ji] and [wo] but not *[wu]. The prohibition against high glides and vowels presumably indicates that the high glide acts as a separate root node/segment – hence is epenthetic – that cannot co-occur with a high vowel due to an OCP restriction such as **[+high] [+high]*[34]. Treating the glide as a separate root node on the other hand fails to explain why it is [j] and not [w] that accompanies the front vowel [e] and vice versa for the back vowel [o]. Moreover, it provides no account as to why the central-back [a] is not preceded by the dialect-only [w]. These points however can be answered, if we assume that the NWG-ONLY glide is actually the product of assimilation to the following vowel in terms of the features [-low]&[α back]. Given that [a] is [+low], then it falls out that it will be not preceded by any glide. At the same time, the feature specification of the mid vowels [e] and [o] in terms of backness will regulate the corresponding glides. A similar interaction between glide epenthesis and assimilation is observed in Chamicuro (de Lacy 2006: 106, 129-130) where the inserted [w] glide takes on its specification by the [+back] or [dorsal] feature of the vowel /a/ that systematically precedes it.

The proposal about epenthetic glides is not unprecedented. For instance, in Brazilian Portuguese, Albano (1999) claims that "epenthetic [j] should be regarded as distinct from 'true' [j]" based on phonetic evidence that suggest the former glide is "probably the result of a gradient process that can, in this case, be attributed to gesture overlap". We have also provided phonetic evidence that indicates a distinction between COMMON and NWG-ONLY glides. While in many cases, phonetically distinct glides also contrast phonologically, cf. Sundanese (Levi 2008), such mapping is not always one-to-one. For instance, Levi explains that in Karuk and Pulaar two phonologically contrastive glides receive the same phonetic realization (a many-to-one phonology-phonetics mapping), whereas in Argentinian Spanish a single phonological glide exhibits different phonetic realisations depending on the environment (a one-to-many phonology-phonetics mapping).

For this reason, Levi (2008) suggests that an exploration of the phonological behaviour of glides, with respect to e.g. the syllable, is a more reliable means so as to classify them in different types[35]. While we currently lack sufficient data to be able to determine the constituent structure of the NWG-ONLY glides, there are numerous other observations which seem to phonologically distinguish them from the COMMON glides. Some relate to distributional properties mentioned already in (§2.1.2) and will not be repeated here. Additional ones are listed in (5) and briefly explained next. Note that (5) refers only to the phenomena in NWG. We do not make claims about SMG.

(5) *Phonological differences between COMMON and NWG-ONLY glides in the dialect*

<u>The glide</u>:	COMMON	NWG-ONLY

[34] The tendency against *[ji] and *[wu] in languages such as Ignaciano Moxo is alternatively attributed by Ohala and Kawasaki (1984: 122-3) to the fact that these sequences create minimal modulations in amplitude, periodicity and spectrum.

[35] However, even when researchers agree on the phonological status of glides, their position within the syllable is often debatable. For example, Yip (2003: 782) observes that: "…Harris (1983) for Spanish and Bao (2000) for Fuzhou locate them in the Rime; Pike and Pike (1947) for Mazateco and Bao (1990) for Mandarin locate them in the Onset; and Clements (1986) for Luganda and Duanmu (1990) for Mandarin consider them secondary articulations on the onset consonant".

Undergoes fortition to fricative after obstruents	✓	✗
May be preceded by epenthetic nasal	✓	✗
Is the product of assimilation to the following V	✗	✓

A phonological process that often applies to input glides is that of fortition to fricatives after obstruents, thus [pápja] becomes [pápça] 'duck', [ɾáfja] → [ɾáfça] 'shelves', [tétjos] → [tétços] 'such-NOM-MASC', etc (for a somewhat similar process, see Nevins and Chitoran 2008 on Cypriot Greek). No similar fortition is applicable to NWG-ONLY glides in words such as [patjéɾa] 'father' or [kaθjénas] 'everyone'. In a similar vein, an epenthetic nasal may develop before [m] and the COMMON glide [j], as in [mɲjá] 'one-FEM-SMG', but not if the glide is epenthetic, thus *[mɲjéɾa] 'day' or *[mɲjéxɾ] 'until'. Lastly, as explained before, the epenthetic NWG-ONLY glide is the product of assimilation to the features [-low] & [α back] of the following vowel, whereas the COMMON glide seems to be present as such in the underlying representation (see also §3.1 for discussion).

These differences therefore suggest that the distinction between COMMON and NWG-ONLY glides is not only phonetic, but also phonological. Notably, some of the phonological facts are corroborated by the phonetic findings. In particular, we showed in §2.1.1 that COMMON glides bear a frication part that renders them more consonant-like as opposed to the more vowel-like NWG-ONLY glides, which lack this feature. It thus seems no accident that only the former undergo fortition to fricatives – since they are consonant-like – in contrast to the latter ones.

4. Conclusion

In this paper, we have investigated the behaviour of glides in the North-Western variety of Greek. Several new findings have emerged. First, we established acoustically, for the first time to our knowledge, the existence of a high back glide [w] in addition to the high front glide [j]. Secondly, we have shown through phonetic evidence that there are two distinct types of glide in this variety, one that we termed COMMON and another that we termed NWG-ONLY. We showed that these two types differ in three respects: (a) their phonetic realization, in that the former type is realized mostly as a fricative while the latter as an approximant, (b) their distribution, in that the former can occur in any type of syllable, whereas the latter is only found within stressed syllables and (c) their obligatoriness, in that the former is obligatory while the latter is not. Finally, we offered a preliminary account of the phonological structure of the NWG-ONLY onglide and argued that its function is epenthetic but subject to assimilatory conditions as well as to the OCP. This explains why it is found before certain vowels only. We also compared its phonological behaviour with that of the COMMON glide and identified certain differences between them. These findings have thus led us to the claim that the two types of glides are distinct both in terms of their phonetics as well as their phonology.

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