

Quasi-opacity and headed spans in Silly and Megisti Greek

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Abstract: A number of Greek dialects developed a phonological process very similar to *vowel harmony* due to a long period of contact with Turkish. In this paper, we focus on Silly (Asia Minor Greek) and Megisti (Southern Greek), hitherto unknown in the literature, in order to study the interaction between vowel harmony and epenthesis. This interaction poses a puzzle for surface-based accounts of phonology since it looks opaque. We propose that no extra theoretical devices – such as *Comparative Markedness*, *Output-Output Correspondence* or *Sympathy* – are needed to account for these phenomena, once we accept appropriate theories of phonological representations and extend the notion of CONTAINMENT (Prince and Smolensky 1993) to the phonology-morphology interaction.

1. Introduction

One of the central issues of discussion within Optimality Theory (Prince and Smolensky 1993) over the past few years has been the proper description of *opacity* (Kiparsky 1971, 1973, a.o.). Various theoretical devices have been proposed over the years, but none of them has met general acceptance. In this paper, we argue that certain ‘opaque’ phenomena are no longer opaque in the computational sense, given certain plausible assumptions on phonological structure and the phonology-morphology interface. We demonstrate this point on the basis of a new set of data from Megisti and Silly Greek. These dialects developed a pattern of *vowel harmony* (henceforth VH), presumably under the influence of extensive language contact with Turkish (Revithiadou et al. in press). In Megisti Greek, *vowel epenthesis* and VH seem to be in a ‘counterfeeding’ relationship.

More specifically, we propose that, under a theory of the representation of vowel harmony in terms of *headed spans* (i.e. foot-like structures) and a theory of phonology-morphology interaction that makes use of *Consistency of Exponence* (McCarthy and Prince 1993ab) and thus takes the morphological affiliation of segments to be inalterable, there is no opacity. Together, these two assumptions already give us enough computational power to analyze the phenomena under investigation without invoking extra representations or invoking any unmotivated assumptions.

The remaining of this paper is organized as follows: Section 1 offers an overview of the two patterns of VH found in Silly and Megisti. Section 3 presents the basic properties of interaction of VH and epenthesis in both dialects and addresses the problems that monostratal, non-derivational theories encounter when dealing with the opaque behavior of epenthetic vowels in systems like Megisti Greek. Section 4 proposes an interface analysis that exploits the well-established principle of *containment* (Prince and Smolensky 1993) and builds on recent theoretical constructs that rely on headed spans. The proposed analysis extends to other phenomena that underline the inability of epenthetic elements to affect or be affected by the application of other phonological rules and, more importantly, makes some interesting and verifiable predictions regarding the behavior of high vowels in languages in which such segments act as harmony triggers as well as epenthetic vowels. Section 5 concludes this paper.

2. Vowel harmony in Greek

2.1. VH domains

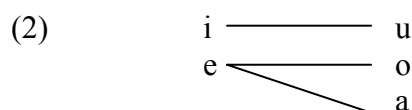
The Asia Minor dialects of Greek (henceforth AMG) as well as a few dialects of the southern zone display two vowel spreading processes that look superficially like the VH which is familiar from Turkish. Revithiadou et al. (in press) have shown that the two types of VH are dramatically different primarily because VH in Greek is domain-specific and dependent on stress. As mentioned in the introduction, our focus here is on the interaction of VH with epenthesis as this is attested in Silly and Megisti Greek. But before delving into this issue, we need to first briefly review the basic properties of VH in the dialects under investigation.

2.1.1 Final domain VH

A disyllabic harmonic domain is constructed either at the beginning or at the end of the word. As we will see in a while, these domains are subject to different restrictions. Let us start with the following examples from Megisti Greek:¹

(1)	<i>Megisti</i>		
a.	ájir-a	águra	‘anchor’ P102 ²
	sic-á	sutsá	‘fig tree’ P108
	/fím-a/	fúma	‘fame’ P102
	zíl-j-a	zúlja	‘jealousy’ P102
b.	zervá	zavrjá	‘left’ P102
	/kagrén-a/	kagrána	‘gangrene’ P105
c.	kin-ó	kunó	‘move’ P102
d.	kalójer-os	kalójoros	‘monk’ P99
e.	vraçól-i	vraséli	‘bracelet’ P102
	anófli	anéfli	‘intel’ P102

As obvious from the above examples, the final vowel requires the preceding vowel to agree with it in backness (and roundness). For instance, in *águra* (1a), the backness of the final vowel is transferred to the input vowel /i/ turning it into an /u/ in the output. The diagram in (2) portrays the attested vowel alternations:



Interestingly, examples such as *vraséli* (StGr *vraçóli*) and *anéfli* (StGr *anófli*) in (1e) show that high vowels initiate VH. The directionality of the harmonic process is right-to-left.

The situation is analogous in Silly. A final vowel spreads together its backness and roundness features to the preceding one. This is demonstrated by examples such as *òksunu* in

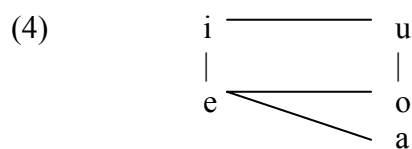
¹ The examples are organized as follows: in the left column, the underlying representation of the Standard Greek form is given. In the next column, the dialectal forms are provided together with glosses and information about the dialect and the particular source they are drawn from. When different from the standard language, the underlying representation of the dialectal form is provided within slashes /.../.

² The following written sources have been used in this paper: Kostakis (1968) for Silly; Pantelis (2002) for Megisti; Dawkins (1916), Mauroxalyvidis and Kesisoglou (1960) for Axo; Andriotis (1948) for Farasa; Andriotis (1961) for Livisi; Dawkins (1916), Kesisoglou (1951) for Ulaghatsh.

(3b). An independent process of mid vowel raising³ obscures the effects of VH. As a result, the word *óksino* is rendered as *óksunu* in Silly.

(3)	<i>Silly</i>		
a.	/ómixl-a/	ómurxa	‘mist’ Ko61
b.	ónoma	ónama	‘name’ Ko33
	pandeleímon-as	pandeleímanas	‘merciful’ Ko151
c.	ðeksiá	loksá	‘right side’ Ko31
d.	óksin-o	óksunu	‘acid’ Ko31
	áxir-o	áfuru	‘straw’ Ko33
e.	ánem-os	ánumus	‘wind’ Ko31
f.	á(n)θrop-os	ártupus	‘man’ Ko33
g.	θεύ	soγύ	‘god-GEN.SG’ Ko 31

The relations among vowels are depicted in (4). It should be noted that the high front vowel /i/ never triggers harmony as suggested by examples such as *lakáni* (</lekán-i/) ‘basin’ Ko30. Words ending in underlying /u/ and /e/ are scarce, therefore, we cannot draw any definitive conclusions regarding their behavior with respect to harmony. However, from examples such as *éfayi* (</éfaye/) ‘eat-3SG.PAST’ Ko30, *kimískami* (</kimískame/) ‘sleep-1PL.PAST’, Ko116 we can infer that they do not participate, as triggers at least, in harmony processes.



2.1.2 Initial domain VH

Next to the final harmonic domain, an initial domain of VH is in parallel active in both systems:

(5)	<i>Megisti</i>		
a.	eryáti-s	aryátis	‘worker’ P101
	éksafna	áksafna	‘suddenly’ P101
b.	zavolj-á	zavaljá	‘naughtiness’ 102
c.	velón-i	volóni	‘needle’ P102
	óreks-i	óroksi	‘appetite’ P102
d.	pirostj-á	porostjá	‘fireside’ 102
e.	cenúrj-o	tsunúrjo	‘new’ P105
f.	liturj-á	laturjá	‘liturgy’ P105

(6)	<i>Silly</i>		
a.	lekán-i	lakáni	‘basin’ Ko30
	meyalón-a	mayalóna	‘first toe’ Ko30

³ In Silly, unstressed mid vowels raise. Some illustrative examples are given in (i):

(i)	a.	éklep-s-e	éklipsi	‘steal-3SG.PAST’ Sil, Ko30
	b.	xeliðón-i	xiliróni	‘swallow’ Sil, Ko30
	c.	évrek-s-e	évriksi	‘rain-3SG.PAST’ Sil, Ko31
	d.	á(n)θrop-os	ártupus	‘man’ Sil, Ko33

b.	monastír-i	manastíri	‘monastery’ Ko65
c.	kamiláfki-i	kamaláfki	‘orthodox priest’s hat’ Ko31
d.	xelón-a	folóna	‘turtle’ Ko31
	velón-i	volóni	‘needle’ Ko31
e.	pondik-ós	puntzukós	‘mouse’ Ko33
f.	pliyúr-i	pulyúri	‘groats’ Ko187

In this word initial domain, it is vowel-copying rather than just spreading of features that takes place. This process is clearly sonority-driven since the most sonorous vowel replaces the least sonorous one, regardless of whether it precedes or follows. Compare *aryátis* in (5a) with *zavaljá* in (5b) and *velóni* with *óreksi* in (5c), and so on.

Table 1 summarizes the basic properties of both harmonic processes:

DOMAINS	DIRECTIONALITY	SONORITY-DRIVEN	DESCRIPTION
...# FINAL	right-to-left	no	spreading of backness and roundness
#... INITIAL	bidirectional	yes	vowel-copying

Table 1. Final and initial domain VH compared.

2.2. Harmonic spans

The described harmonic domains cannot be constructed at the same time within the word. In fact, there is an intrinsic hierarchy between the two in the sense that final domain VH precedes initial domain VH. The key to determine this precedence relation is the behavior of stressed vowels. More specifically, a harmonic domain is formed at the end of the word, provided that, first, there is a harmony-triggering vowel, i.e. a vowel from the set {a, o, e, u} for Silly and {a, o, e, i, u} for Megisti, and, second, the target and the trigger are both unstressed:

(7)	a.	ájir-a	águra	‘anchor’ Meg, P102
		/ómixl-a/	ómurxa	‘mist’ Sil, Ko61
	b.	/zerv-á/	zavrjá	‘left’ Meg, P102
	c.	ónoma	ónama	‘name’ Sil, Ko33
		pandeleímon-as	pandeleímanas	‘merciful’ Sil, Ko151
	d.	kin-ó	kunó	‘move’ Meg, P102
		óksin-o	óksunu	‘acid’ Sil, Ko31
	e.	ánem-os	ánumus	‘wind’ Sil, Ko31

Otherwise, the harmonic domain is formed at the beginning of the word, as illustrated by the following examples:

(8)	a.	eryát-is	aryátis	‘worker’ Meg, P101
		lekán-i	lakáni	‘basin’ Sil, Ko30
		éksafna	áksafna	‘suddenly’ Meg, P101
		meyalón-a	mayalóna	‘first toe’ Sil, Ko30
	b.	zavolj-á	zavaljá	‘naughtiness’ Meg, 102
		monastír-i	manastíri	‘monastery’ Sil, Ko65
	c.	velón-i	volóni	‘needle’ Meg, P102
		óreks-i	óreksi	‘appetite’ Meg, P102

	xelón-a	folóna	‘turtle’ Sil, Ko31
d.	pirostj-á	porostjá	‘fireside’ Meg, 102
	pondik-ós	puntzukós	‘mouse’ Sil, Ko33
e.	cenúrj-o	tsunúrjo	‘new’ Meg, P105
f.	liturj-á	lurj-á	‘liturgy’ Meg, P105
	pliyúr-i	pulyúri	‘groats’ Sil, Ko187

In previous work on similar harmonic processes that take place in other AMG dialects, Revithiadou et al. (in press) have shown that VH in Greek is actually different from VH in Turkish. First, VH in Turkish is unbounded with a left-to-right directionality (e.g. *tas-lar-um* ‘pot-PL-GEN’, *gæl-ler-in* ‘lake-PL-GEN’), whereas in Greek it is confined to a disyllabic harmonic domain, which is constructed either at the last two or at the first two syllables of the word. Each domain complies to different conditions with respect to the directionality as well as the feature spreading mechanisms involved. Second, unlike Turkish VH, Greek VH shows sensitivity to stress.

In line with recent work by McCarthy (2004), as well as numerous other authors, we assume that harmony is a property of *spans*. These spans can be seen as binary feet,⁴ constructed at the right or left edge of the word, as shown in (9a) and (9b), respectively. Foot-sized spans are indicated by ‘S’.

(9)	a.	word-final	b.	word-initial
		S		S
		∧		∧
		ó n a m a		a r γ á t i s
	St.Gr	ó n o m a	St.Gr	e r γ á t i s

The span at the end of the word (9a) involves mainly spreading of the features [back] and [round]. In this sense, it is closer to Turkish VH. Within this span, stressed vowels are neither triggers nor undergoers unless harmony would fail to apply altogether. In contrast, the span at the beginning of the word is sonority-driven and involves copying of the most sonorous vowel to the less sonorous one. Within this domain, stressed vowels can be both triggers and undergoers.

The differences, however, between the two harmonic spans are of no central concern in this paper. The interested reader is referred to Revithiadou et al. (in press) for an extended discussion and analysis of both types of VH. Here our focus is on the way VH interacts with epenthesis. Therefore, of crucial importance is the fact that these harmonic spans are *headed* and *binary*. This issue is undertaken in the following section.

3. VH and epenthesis

In Silly and Megisti there is an epenthetic vowel, namely /i/, which breaks up onset clusters in the former language and coda-onset clusters the latter:

(10)	<i>epenthesis in Silly</i>		
a.	xliaró	xliaró	‘lukewarm’ K37
	splína	spilína	‘spleen’ K37

⁴ See Piggott (1996, 1997, 2000) for a similar proposal, according to which feet constitute domains for nasal VH.

	fríði	fíriri	‘eye-brow’ K37
	tréno	tiréno	‘train’ K37
	krío	kirió	‘cold’ K36
	ðákri	rákiri	‘tear’ K36
	vriázo	viriázu	‘shout-1SG.PRES’ K36
b.	áspro	áspuru	‘white’ K36
	própersi	purópersi	‘the year before last year’ K37
	kástro	kásturu	‘castle’ K36
	gastróno	kasturónu	‘make pregnant-1SG.PRES’ K167

(11) *epenthesis in Megisti*

a.	pátmos	pátinos	‘Patmos island’ P104
b.	patmiótis	patinjótis	‘inhabitant of Patmos’ P104
c.	atmós	atimós	‘steam’ P104
d.	vaθmós	vaθimós	‘grade’ P104
e.	ðen zvíni	enizvíni	‘NEG-erase-3SG.PRES’ P104
f.	ðen stróno	enistróno	‘NEG-lay out-1SG.PRES’ P104

Interestingly, the interaction between vowel harmony and epenthesis is different in the two dialects. In Silly, epenthesis *feeds* VH in the sense that the epenthetic vowel is subject to rounding harmony. The example *áspuru* in (10b) is telling in this respect. In derivational terms, first, epenthesis applies to recuperate the illicit consonant cluster. Then, raising changes the unstressed mid vowel /o/ into an /u/ and VH completes the derivation by spreading the [back] and [round] features and coloring the newly added vowel accordingly:

(12) *transparent interaction of VH and epenthesis*

Input:	/aspro/
1. Epenthesis:	áspIro
2. Mid-V raising and VH:	áspuru
Output:	[áspuru]

In Megisti, on the other hand, epenthesis and VH are in a *counterfeeding* relationship. The epenthetic vowel is never harmonic (except by accident, e.g. *enizvíni* (11e)). The word *atimós* (11c) helps us illustrate this point in (13).

(13) *opaque interaction of VH and epenthesis*

Input:	/atmós/
1. VH:	d.n.a
2. Epenthesis:	atImós
Output:	[atimós]

Such opaque interactions between phonological rules of pose a problem for non-derivational theories of phonology. Most of the well-known ‘opacity killers’ of Optimality Theory (Prince and Smolensky 1993), such as Sympathy (McCarthy 1999) or Comparative Markedness (McCarthy 2003) can technically solve the problem, but none has met with general satisfaction. By way of an example, we provide a Sympathy tableau for the Megisti forms in (11a). This tableau is also compared to the regular example *kinó* in (1c):

(14)

/patnos/	☞-IDENT(round)	*CLUSTER	HARMONY	★DEP-V
☞ a. atmós		*!		
☞ b. atimós			*	*
c. atumós	*!			*
d. atimés	*!		*	*

(15)

/kino/	☞-IDENT(round)	*CLUSTER	HARMONY	★DEP-V
☞ a. kunó				
b. kinó	*!		*	
c. kiné	*!		*	

Next to various formal and technical problems related to Sympathy Theory in general, this approach does not seem particularly insightful for the VH facts discussed here. For instance, it does not explain the relation between epenthesis and blocking of harmony in a principled way nor it precludes unattested types of interaction between the two processes, e.g. epenthetic vowels acting as harmony triggers.

4. Containment and the phonology-morphology interaction

We assume that the phonology-morphology interface is subject to the following general condition:

(16) *Mirroring*: phonological structure should mirror morphological structure.

Many well-known constraints in the OT literature seem to be implementations of this general idea such as ALIGNMENT (McCarthy and Prince 1993), HEAD-FAITHFULNESS (Revithiadou 1999), FAITH(root) >> FAITH(affix) (McCarthy and Prince 1995), and so on. In particular, we propose to take seriously the principle of *Consistency of Exponence* (Prince and Smolensky 1993), stated in (17):

(17) Gen cannot alter the morphological affiliation of segments.

This principle has always been assumed in the OT literature (see, however, Walker and Feng (2004) for an – unsuccessful – attack). Its implication is that every segment has to bear its morphological affiliation on its sleeves. Epenthetic material, however, does not bear a morphological affiliation because it simply is morpheme-free. We thus get structures such as the following:

(18) $a_{\alpha} t_{\alpha} i_{\emptyset} m_{\alpha} o_{\alpha} s_{\alpha}$

In (18), each segment is morphologically affiliated to word α , with the exception of the epenthetic vowel /i/ the presence of which is driven by purely phonological factors. It is inserted to repair impermissible consonant sequences and it is colorless since it is not an intrinsic part of the word α .

Furthermore, we propose the constraint in (19), which is assumed to be a reflection of mirroring in the sense that it requires phonological structure to be isomorphic to morphological structure in some respect.

- (19) **STRONG CONTAINMENT (SC):** All segments in a harmonic span (HS) should be in the morphological domain of the head of the HS.

Megisti is subject to SC. A potentially harmonic form such as *átumos* (from /átmos/ (11a)), would have the following domain structure:

- (20)
- $$\begin{array}{c}
 \text{S} \\
 \swarrow \quad \searrow \\
 \text{a}_\alpha \text{ t}_\alpha \text{ u}_\emptyset \text{ m}_\alpha \text{ o}_\alpha \text{ s}_\alpha
 \end{array}$$
- where α is the morphological word, i.e. *atmós*

The epenthetic vowel is outside of the α domain and hence is forbidden by (19). Ranking SC above the HARMONY constraint results in the desired outcome.

- (21)

/patnos/	STRONGCONTAINMENT	*CLUSTER	HARMONY
a. pátnos		*!	
☞ b. pátinós			*
c. pátnunos	*!		

We would expect dependence on morphological domains to show up in other aspects of grammar as well. And indeed, in this respect, VH in Megisti looks surprisingly like stress in Dakota (Alderete 1999). In Dakota, stress is on the second syllable of the word (22a), except when this syllable contains an epenthetic vowel; in this case stress is initial (22b).

- (22) *Dakota stress* (Alderete 1999)

- a. chi-kté ‘I kill you’
 ma-yá-kte ‘you kill me’
 wichá-ya-kte ‘you kill them’
- b. céka ‘stagger’ (</cek/)
 khúsa ‘lazy’ (</khus/)
 cápa ‘trot’ (</cap/)

In other words, epenthetic vowels cannot be part of a foot in Dakota just as they cannot be part of a headed span in Megisti Greek.

Silly Greek is obviously not subject to SC, since epenthetic vowels can be harmonic. Consider a form such as (10b), repeated here as (23):

- (23)
- $$\begin{array}{c}
 \text{S} \\
 \swarrow \quad \searrow \\
 \acute{\text{a}}_\alpha \text{ s}_\alpha \text{ p}_\alpha \text{ u}_\emptyset \text{ r}_\alpha \text{ u}_\alpha
 \end{array}$$

The epenthetic vowel does not share the same morphological domain with the head of the HS. It is still included, however, because the need to build a harmonic foot is greater in this dialect.

(24)

/aspro/	*CLUSTER	HARMONY	STRONGCONTAINMENT
a. áspru	*!		
b. áspiru		*!	
☞ c. áspuru			*

Given these assumptions then, a purely monostratal theory can easily account for these facts, and no reference to extra levels of representation is necessary. However, we still want to derive one important generalization:

(25) Epenthetic vowels can never be the source of harmony/spreading.

In principle, this could follow for Silly from the fact that, first, epenthetic vowels are high vowels and, second, underlying high vowels are not the source of harmony. But we are a little more ambitious, since (25) seems to be a much more general constraint on VH and other types of vowel assimilation. For instance, it holds for the famous case of Icelandic *u*-umlaut as well (Anderson 1969, Kenstowicz 1994:80, where the examples are taken from):

- (26) a. barn ‘child-NOM.SG.’ börn-um ‘child-DAT.PL’
 kalla ‘call-1SG’ köll-um ‘call-1PL’
 b. dag ‘day-ACC.SG’ dag-ur ‘day-NOM.SG.’ (< /dag/+r/)

Many suffixes in Icelandic containing the vowel /u/ such as the dative plural mutate the vowel /a/ of the preceding syllable. Epenthetic vowels, however, such as the one found in the nominative singular suffix *-ur*, for instance, do not umlaut the preceding vowel of the root.

We conclude, therefore, from the above, that the effect is more general, and it follows from the theory of headed spans. In McCarthy’s (2004) view, these structures are built as the result of a faithfulness requirement:

- (27) FTHHDSpan(α F): If an input segment s_i is [α F] and it has an output correspondent s_o , then s_o is the head of an [α F] span.

This constraint replaces the constraint IDENTITY in *Headed Span* theory, and, moreover, it predicts that epenthetic vowels, which, as already mentioned, are not part of the input, will have no reason ever to head a harmonic span of their own. The apparent ‘opacity’ of Icelandic and the generalization in (25), therefore, follow from this constraint without any further assumptions.

A related prediction of equal significance is that in a Greek dialect, in which high vowels can be the source of harmony, as in Megisti, for instance, and in which epenthetic vowels do participate in harmony in principle, as in Silly, epenthetic high vowels should still not be able to be the source of harmony. Interestingly, this prediction is confirmed by Aravan, an AMG dialect in which high vowels trigger harmony but epenthetic vowels are targets without ever initiating the process. The examples in (28) and (29) are illustrative:

- (28) *Aravan VH* (Fosteris and Kesisoglou 1960: 2-3)
- | | | | |
|----|---------|---------|-----------------|
| a. | ánemos | ánomos | ‘wind’ |
| b. | jéros | jóros | ‘old man’ |
| c. | forás | farás | ‘wear-2SG.PRES’ |
| d. | katófli | katéfli | ‘doorway’ |
| e. | skjáði | skeði | ‘shadow’ |
- (29) *Aravan epenthesis* (Fosteris and Kesisoglou 1960: 3)
- | | | | |
|----|-----------|-----------|-----------------|
| a. | γῤῥῖά | γῤῥῖά | ‘old woman’ |
| b. | xῤῥῖάζome | xῤῥῖάζome | ‘need-1SG.PRES’ |
| c. | /krjás/ | kirjás | ‘meat’ |

Examples such as (28d-e) demonstrate that high vowels spread their features to the preceding vowels causing them to agree in frontness and unroundedness. Examples such as the ones in (29) confirm the failure of epenthetic vowels to participate in final and/or initial domain VH. This is further substantiated by clitic constructions. For instance, a string such as *patéras m* ‘father 1SG.POSS’ is realized as *patérasim* and not as **patéresim*. [Cf. /pῤῥῖpῖen ta/ *pirpῖan da* ‘lead-3SG.PAST-them’ (Dawkins 1916: 332) where VH applies within the verb-clitic construction.]

A second confirmation of this prediction comes from informal registers of Turkish loanwords (Clements and Sezer 1982: 247), where epenthetic vowels are colored by neighboring segments without ever being the triggers of harmony:

- (30)
- | | <i>formal form</i> | <i>colloquial form</i> | |
|----|--------------------|------------------------|-------------|
| a. | pranga | pῤῥanga | ‘fettors’ |
| b. | prens | pῤῥens (*pῤῥans) | ‘prince’ |
| c. | prova | purova | ‘test’ |
| d. | spiker | sῤῥiker | ‘announcer’ |

Thus, in this variety of Turkish, high vowels do participate, but only as targets of VH, not as its source. This conforms to (25), and hence it follows from our explanation in terms of headed spans and morphological mirroring.

5. Conclusions

Vowel Harmony in Asia Minor Greek as well as in a strip of Southern Greek dialects gives evidence for a headed span analysis, enriched with strict binarity and alignment to some edge of the word. The apparent opaque interaction of this process with vowel epenthesis does not need to be described with some mechanism invoking abstract alternate representations, such as Sympathy Theory. Instead, it can be fully described using the theoretical instruments we already have, such as *Headed Spans* and *Consistency of Exponence*. A welcome result of the proposed analysis is that it derives an accurate cross-linguistic generalization regarding the inability of epenthetic vowels to act as triggers of VH.

References

- Alderete, J. 1999. Head dependence in stress-epenthesis interaction. In B. Hermans and M. van Oostendorp (eds.), *The Derivational Residue in Phonological Optimality Theory*, 29–50. Amsterdam: John Benjamins.
- Anderson, S. 1969. West Scandinavian vowel systems and the ordering of phonological rules. PhD diss., MIT, MA.
- Clements, N. and E. Sezer 1982. Vowel and consonant disharmony in Turkish. In H. van der Hulst and N. Smith (eds.) *The Structure of Phonological Representations*, 213–255. Dordrecht, Holland and Cinnaminson, USA: Foris Publications.
- Dawkins, R.M. 1916. *Modern Greek in Asia Minor: A Study of the Dialects of Silly, Cappadocia and Pharasa with Grammar, Texts, Translations and Glossary*. Cambridge: University Press.
- Fosteris, D. and I.I. Kesisoglou 1960. *Word Lists of Aravan*. Athens.
- Kiparsky, P. 1971. Historical linguistics. In Dingwal, W.O. (ed.), *A Survey of Linguistic Science*, 577–649. College Park, Maryland: University of Maryland.
- Kiparsky, P. 1973. Abstractness, opacity and global rules. In O. Fujimura (ed.), *Three Dimensions of Linguistic Theory*, 1–136. Tokyo: Taikusha.
- Kostakis, T.P. 1968. The dialect of Silly. Athens.
- McCarthy, J.J. 1999. Sympathy and Phonological Opacity. *Phonology* 16: 331–399. [Also available as ROA 252-0398.]
- McCarthy, J.J. 2003. Comparative Markedness. *Theoretical Linguistics* 29: 1–51.
- McCarthy, J.J. and A. Prince. 1993a. Generalized alignment. In 1993, Geert Booij and Jaap van Marle (eds.), *Yearbook of Morphology*, 79–153. Dordrecht: Kluwer.
- McCarthy, J.J. and A. Prince. 1993b. Prosodic morphology I: Constraint interaction and satisfaction. Report no. RuCCS-TR-3, Rutgers University Center for Cognitive Science, New Brunswick, NJ.
- McCarthy, J.J. and A. Prince. 1995. Faithfulness and reduplicative identity. In Jill N. Beckman, Laura Walsh Dickey, and Suzanne Urbanczyk (eds.), *Papers in Optimality Theory*, 249–384. University of Massachusetts, Amherst, MA: GLSA.
- McCarthy, J.J. 2004. Headed spans and autosegmental spreading. Unpublished manuscript, University of Massachusetts, Amherst.
- Pantelis, P. 2002. The history and the language of the people of the island of Megisti–Kastellorizo. Athens: Eleftheri Skepsis.
- Piggott, G.L. 1996. Implications of consonant nasalization for a theory of harmony. *Canadian Journal of Linguistics* 41: 141–174.
- Piggott, G.L. 1997. Licensing and alignment: a conspiracy in harmony. *Phonology* 14: 437–477.
- Piggott, G.L. 2000. Against featural alignment. *Journal of Linguistics* 36: 85–129.
- Prince, A. and P. Smolensky 1993. Optimality Theory: constraint interaction in Generative Grammar. Report no. RuCCS-TR-2, Rutgers University Center for Cognitive Science, New Brunswick, New Jersey.
- Revithiadou, A. 1999. Headmost accent wins: Head dominance and ideal prosodic form in lexical accent systems. PhD diss., HIL. The Hague: HAG.
- Revithiadou, A., M. van Oostendorp, K. Nikolou and M.–A. Tiliopoulou (in press). Vowel harmony in contact-induced systems: the case of Cappadocian and Silly. To appear in B. Joseph, A. Ralli and M. Janse (eds.), *Proceedings of the 2nd International Conference on Modern Greek Dialects and Linguistic Theory*. University of Patras. [Also available as ROA 731-0405.]
- Walker, R. and B. Feng. To appear. A ternary model of morphology-phonology Correspondence. To appear in B. Schmeiser, V. Chand, A. Kelleher and A. Rodriguez. Somerville (eds.), *WCCFL 23 Proceedings*. Somerville, MA: Cascadilla Press.