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Endogenous and exogenous factors in
the emergence of novel phonological
patterns

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Conflicting directionality and grammaticalization can generate lexical accents

Language interference may cause new phonological patterns to emerge, esp. when radical morphological changes take place

COLORED TURBIDITY provides new insights in the representation of lexically-encoded stress

1. Introduction

TOPIC: Emergence of novel phonological patterns

- exceptional/deviant patterns from predictable ones
- predictable patterns from exceptional/deviant ones

CASE STUDIES:

- lexical accent genesis and loss
- development of a vowel harmony-like process in Asia Minor varieties of Greek

Q: Under which conditions do such novel patterns emerge?

A1: Combined effects of language-specific grammatical and structural properties (*endogenous factors*)

In Pontic Greek, lexical accents developed from a weight insensitive unbounded stress system (Kabak & Revithiadou to appear).

Sources for lexical accent genesis in such edgemost systems are: (a) the *conflicting directionality* of prominence at the word and above the word level, which determines the location of prominence in complex morphological structures such as compounds and compound-like constructions, and (b) *grammaticalization*, which causes independent lexical items within such constructions to become bound elements.

☞ Such fossilized instances of the default are imprinted as part of the underlying representation of a morpheme, i.e. root or affix, in the form of lexical accents.

A2: Language interference (*exogenous factors*)

In a handful of Asia Minor Greek dialects, certain morphosyntactic changes (e.g. the change from fusion to agglutination), caused by Turkish interference, led to the development of:

- a rightmost default stress at the expense of the Greek-origin lexical accent system
- a vowel harmony-like process

PHONOLOGICAL REPRESENTATION: To account for the emergence and loss of lexical accents, a two-dimensional autosegmental theory is proposed, namely, COLORED TURBIDITY (Revithiadou 2007), which builds on Goldrick's (1998, 2000) *Turbidity Theory* and Van Oostendorp's (2006, 2007) *Containment Theory*.

This approach distinguishes between the *morphological affiliation of an autosegmental feature* and its *locus of pronunciation* (Revithiadou 2007). The soundness of this theory is tested not only in capturing the diachronic changes at issue, but also with respect to its ability to make certain predictions with respect to the rise and decline of 'deviant' patterns without resorting to additional machinery.

Organization of the talk:

2. The emergence of lexical accents from edgemost stress
3. The emergence of edgemost stress from lexical accents
4. The development of vowel harmony (or something like harmony)
5. Conclusions

2. The emergence of lexical accents from edgemost stress¹

This section outlines one of the (many) possible developmental paths that lead to the emergence of lexically-encoded accent and discusses the specific phonological and morphosyntactic conditions that underlie this development.

2.1. Background information

☒ Starting point: Quantity insensitive edgemost stress systems; preferred because they allow us to set aside weight as a parameter that controls stress assignment.

☒ Interesting twist: Different prominence relations emerge from complex constructions such as compounds and compound-like formations (e.g. complex predicates). These constructions may lay the breeding ground for the rise of non-edgemost realizations of stress in cases of conflicting orientation of stress between the word and above the word level and, concomitantly, may lead to idiosyncratic realizations of stress.

☒ Sources: (a) Bailey's (1995) *Stress Systems Database*, (b) Gordon's (2002) typology of quantity insensitive stress² and (c) our own research. In total, 34 Leftmost and 18 Rightmost systems consisted the focal point of our investigation.

☒ Important observations:

	PROMINENCE	MORPHOLOGY	IDIOSYNCRATIC STRESS
Pontic	L(default), R(compound/phrasal stress)	Fusional	yes
Turkish	R(default), L(compound/phrasal stress)	Agglutinative	yes
Hungarian	L(default), L(compound/phrasal stress)	Agglutinative	no

Table 1. Pontic, Turkish, and Hungarian compared

- (1) *word-level stress*
- a. tani-dık-lar-ım **Turkish** (Kabak & Revithiadou to appear)
 know-DER-PL-1SG
 ‘my acquaintances’
- b. kará # deníz karádeniz
 black sea
 ‘The Black Sea’

¹ The research presented in this section is conducted in collaboration with Barış Kabak. See Kabak & Revithiadou (to appear) for a detailed account of many of the issues addressed here.

² The *Stress Systems Database* is posted on the following webpage: <http://www.cf.ac.uk/psych/ssd/>. The Gordon's (2002) typology can be found in the following webpage: <http://www.linguistics.ucsb.edu/faculty/gordon/stresstypology.pdf>.

c.	émorf-esa beautiful- NOM.SG.FEM 'beautiful'	Pontic	(Papadopoulos 1955: 136)
d.	/é ^m bru # písu/ front back 'back and forth'	e ^m bropís(u)	(Papadopoulos 1955: 147)
e.	ámerika-i-ak-at America-DER-PL-ACC 'Americans'	Hungarian	(Vogel 1989: 337)
f.	csó:nak # vérseny boat competition 'boat race'	csó:nakverseny	(Vogel 1989: 337)

- Only systems with conflicting directionality show instances of lexically-encoded accents. Unlike Hungarian, Pontic and Turkish both have instances of idiosyncratic stress.
- Pre-accenting suffixes (2) are much more commonly attested in Turkish than in Pontic. Pre-accentuation is primarily restricted to derivational morphemes in Pontic and represents a fairly recent stage of development.

(2)	a.	/kitap- [^] IE/ ³ book-INSTR	kitápla	Turkish	
	b.	/kako- [^] psin/ badly cooked-NOM.SG	kakópsin	Pontic	(Papadopoulos 1958: 381)

- Pontic and Turkish differ with respect to the quantity and the segmental shape of accented morphemes. Accented suffixes (3a) are common in Pontic whereas the few found in Turkish are *always* disyllabic (3b):

(3)	a.	<i>anixto-máts</i> clever-NOM.SG	Pontic	(Papadopoulos 1955: 150)
	b.	<i>gel-érek</i> come-ADV 'by coming'	Turkish	(Kabak & Revithiadou to appear)

- ☞ Basic research questions:
- (a) Which edgemoost stress systems are more likely to develop lexical accents, and under which conditions?
 - (b) How can we account for the bias for specific accent patterns in certain languages?
 - (c) How can the change from predictable to lexically-encoded stress be insightfully implemented in phonological representations?

2.2. A working hypothesis

- ☒ Two stages in the development of lexical accents from edgemoost stress

³ The superscript circumflex [^] is used as a notational convention to indicate that the accent is placed on a syllable outside the sponsoring morpheme. It precedes pre-accenting morphemes, e.g., /-[^]σ/.

▪ **Stage I (accent genesis):** Two conditions must be at play:

1. *Directionality of prominence* at the word and above the word level (i.e. compounds and compound-like constructions):
 - i. Word-level stress which determines the default
 - ii. Above word-level stress (e.g., compound/phrase-level stress) which determines the directionality of resolution in competing prominences
2. *Grammaticalization* (in the form of re-analysis, prosodic erosion, semantic bleaching and so on), which causes independent lexical items within such constructions to become bound elements and hence change their stress status.

☒ **Predicted results:**

	COMPOUNDING	SUFFIXATION (gram/tion)	Predictions
(4) LL systems	a. $\acute{V}_1V_2\#\acute{V}_3V_4$ → $\acute{V}_1V_2\#V_3V_4$	b. $\acute{V}_1V_2+V_3V_4$	no accents; default only
(5) LR systems	a. $\acute{V}_1V_2\#\acute{V}_3V_4$ → $v_1V_2\#\acute{V}_3V_4$	b. $v_1V_2+\acute{V}_3V_4$	accented bound morpheme (e.g., + V_3V_4); no pre-accenting morpheme

Table 2. Predictions for the emergence of lexical accents in Leftmost systems

	COMPOUNDING	SUFFIXATION (gram/tion)	Predictions
(6) RL systems	a. $v_1\acute{V}_2\#\acute{V}_3\acute{V}_4$ → $v_1\acute{V}_2\#V_3V_4$	b. $v_1\acute{V}_2+V_3V_4$	pre-accenting bound morpheme (e.g., + V_3V_4); no accented morpheme
(7) RR systems	a. $v_1\acute{V}_2\#\acute{V}_3\acute{V}_4$ → $v_1V_2\#\acute{V}_3\acute{V}_4$	b. $v_1V_2+V_3\acute{V}_4$	no accents; default only

Table 3. Predictions for the emergence of lexical accents in Rightmost systems

▪ **Stage II (accent proliferation):**

Further morphophonological reduction in the form of segmental fusion and deletion processes (VD/F) may blur morphological boundaries, or even delete them, causing re-analysis.

☒ **Result:** Accent proliferation by means of accent migration

- (8) *accent migration*
 - a. *phonological migration:* The accent is sponsored by the original morpheme but it is realized on the vocalic peak of another morpheme.
 - b. *morphological migration:* The accent changes morphological affiliation because its original vocalic peak, to which it remains faithful, also changes morphological affiliation.

(12) **Stage II** (fusion; accent is transferred to the new morpheme → accented suffix)

$$V_{1i} + \overset{*j}{V}_{2,3j} V_{4j} \quad \text{morphological migration}$$

☒ **Outcome of the survey:**

▪ **LR:** From the 6 languages examined, only 1, namely Kalkatungu, lacks lexically-encoded stress. However, this language is poorly described and it may well be the case that deviant stress patterns do exist but are not discussed in the grammar we consulted.

☞ Pontic Greek and Bulgarian⁴ also have **accented** and **pre-accenting** morphemes. The latter are expected only under Stage II. We'll focus on PG and show that indeed both stages of the proposed developmental path took place.

▪ **RL:** The cross-linguistic survey of 7 systems of this type confirmed all predictions.

☞ Turkish, Basque, Lezgian, and Moghol confirm that pre-accentuation results from phonological weakening of independent items in compound-like constructions. Moreover, accented morphemes are disyllabic suffix complexes which resulted from a set of processes including the fusion and morphological re-analysis of suffix clusters.

(13) *copula verb constructions in Turkish* (Kabak & Revithiadou to appear)

- | | | | |
|----|---------------------------------------|-----------|------------------|
| a. | nazík # i-dí-n
kind # COP-PAST-2SG | nazíktin | 'You were nice.' |
| b. | hastá # i-mış
ill # COP-EVID | hastáymış | 'He/she is ill.' |

(14) *aspectual/temporal markers Turkish* (Kabak & Revithiadou to appear)

- | | | | | |
|----|--|---|----------------------|-----------|
| a. | al-á # yoru-r
take-CVM AUX-AOR
'He/She/It is taking.' | > | al-iyor
take-PROG | K611 |
| b. | -E + ^-rEk
CVM COMPR
gel-érek
come-ADV
'by coming' | > | -ÉrEk | B236, K74 |

2.3. A case study: Pontic Greek⁵

Pontic is a dialect once spoken by the Greeks of the Black Sea. Nowadays it is spoken in villages of Macedonia and Thrace by the second and third generation of Pontian Greeks. All forms appearing on the text have been checked with (first generation) native speakers of Pontic who live in the prefecture of Pieria (Central Macedonia).

⁴ Both languages have also inherited accents from Indo-European.

⁵ Our sources for Pontic are: Papadopoulos (P) (1955, 1958, 1961); Oikonomidis (O) (1958); Tombaidis (T) (1996); Drettas (D), (1997); Tsopouridis (Ts) (2002).

2.3.1. Stage I: Accent genesis



Stage I: Directionality of Prominence

Word stress rule: Leftmost; Compound stress rule: Rightmost

(15) *word stress rule: leftmost*

- | | | | |
|----|-------------|------------------------|---------|
| a. | ðéskal-onos | ‘teacher-GEN.SG’ | D119 |
| b. | émorf-esa | ‘beautiful-NOM.SG.FEM’ | P55: 32 |
| c. | éɣraf-ame | ‘write-1PL.PAST’ | P55:32 |

(16) *compound stress rule: rightmost*

- | | | | |
|----|---------------------------|--------------------------|----------|
| a. | é ^m bru # písu | e ^m bropís(u) | P55: 147 |
| | front back | | |
| | ‘back and forth’ | | |
| b. | aðá # é ^m bru | aðáé ^m br(u) | P55: 111 |
| | here in front | | |
| | ‘here in front’ | | |



Stage I: Grammaticalization of second compound member

V₃ of the suffix *j* sponsors an accent, which is realized on V₃

→ **local accents**; accented morpheme

▪ Output of edgemostr rules (Leftmost Default / Rightmost Compound):

(17) a. *word_i and word_j combine into a compound construction*

$$V_{1i}V_{2i} \# V_{3j}V_{4j}$$


grammaticalization (word_i → suffix_j); fossilization of once predictable stress

b. *local accent genesis*

$$V_{1i}V_{2i} + \overset{*j}{V_{3j}}V_{4j}$$

(18) *-máts* < /(*o*)mátion/ ‘eye’ P55:150

- | | | |
|----|-----------------|------------|
| a. | /anixtó-mátis/ | anixtomáts |
| | open eye | |
| | ‘clever-NOM.SG’ | |
| b. | /xamiló-mátis/ | xamilomáts |
| | down eye | |
| | ‘shy-NOM.SG’ | |

(19) *-púl(i)* ‘small, diminutive’ < /púla/ ‘bird’ T32

- | | | | |
|----|--------------|-------------------------|------------------------------|
| a. | /próto-púli/ | protópúl(i) | ‘first swarm of bees-NOM.SG’ |
| b. | /xalkó-púli/ | xalkópúl(i) | ‘small bronze thing-NOM.SG’ |
| c. | /kutó-púli/ | kutópúl(i) ⁶ | ‘small box-NOM.SG’ |

(20) *-é^mbru* < /é^mbru/ ‘in front of’ P55: 111

- | | | | |
|----|--------------------------|-------------------------|-------------|
| a. | /aðá-é ^m bru/ | aðáé ^m br(u) | ‘over here’ |
|----|--------------------------|-------------------------|-------------|

⁶ Unstressed high vowels delete, esp. in word final positions, e.g. /ðeskálu/ ðeskał ‘teacher-GEN.SG’, /esixóresa/ esxóresa ‘I forgive-1SG.PAST’, /kóftune/ kóftne ‘cut-3PL.PRES’ (P55:72).

b. /atú-é^mbru/ atué^mbr(u) ‘over here’



Accent genesis

Accented suffixes in Pontic have evolved from compound constructions after loss of the root status of the second compound member and fossilization of its (once predictable by rule) stress. Thus, the result is a **local accent**.

A two-dimensional representational model, called *Colored Turbidity*, is proposed here which

- a. encodes morphological affiliation
- b. draws a distinction between lexical association and the locus of pronunciation of an accent.

It is inspired by Goldrick’s (1998, 2000) *Turbidity Theory*, and Van Oostendorp’s (2006, 2007) *Containment Theory*. An elaborate presentation of COLORED TURBIDITY is provided in Revithiadou (2007).

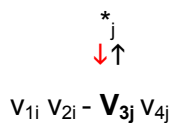
▪ **Turbidity Theory (TT)** (Goldrick 1998, 2000): Two relations hold between a vowel and, in general, any autosegmental feature sponsored by it:

- (21)
- a. *projection* (up-arrow ↗): an abstract, structural relationship holding between the vowel and the autosegmental unit.
 - b. *pronunciation* (down-arrow ↘): an output relation that holds between the autosegmental unit and the vowel and describes the output realization of structure.

▪ **Colored-Containment Theory (CC)** (Van Oostendorp 2006, 2007): The different morphological affiliation of phonological elements is visualized in terms of ‘colors’ (indicated through indexation in the text). CC allows the morphological affiliation of phonological elements to be ‘visible’ in the surface structure.

The unmarked case is for projection and pronunciation to match.⁷ Such a transparent relation between the vocalic peak and the accent exists in accented morphemes. In (22), the accent is projected by V₃ and pronounced on the same vowel:

(22) *non-turbid relation between affiliation of accent and its locus of pronunciation*



☒ **Result: local accent / accented morpheme**

2.3.2. Stage II: Accent proliferation



Stage II: Further morphophonological reduction (VD/F)

V₃ of suffix *j* may be forced to ‘fuse’ with the preceding vowel with which it ends up sharing some of its features as well as its accent → **phonological migration**

⁷ This is achieved by high ranking the constraint RECIPROCITY (If Y projects to X, then X must pronounce Y, Goldrick 2000: 3).

Several forces (i.e. structural harmony constraints) may operate in a language system and cause projection and pronunciation to drift apart and hence turbid relations to emerge. In Pontic, hiatus resolution via vowel fusion(/deletion) triggered such a change:

- (23) *local accent*
- $$V_{1i}V_{2i} + \overset{*j}{\downarrow\uparrow} V_{3j}V_{4j}$$
- (24) *non-local accent genesis*
- $$\overset{\mu_i}{\uparrow\downarrow} V_{1i}V_{2i} + \overset{\mu_j}{\uparrow} V_{3j}V_{4j}$$

Due to further grammaticalization, the sponsoring vowel may get lost or just lose its original morphological affiliation, but the accent may remain faithful to its original ‘color’.

- (25)
- $$V_{1i} \overset{*j}{\leftarrow} V_{2-3i} + V_{4j}$$
- (26) a. aðǽ^mbr(u)/aðǎ^mbr(u) ‘here in front’
 b. atú^mbr(u) ‘over there’
- (27) -[^]psin < /-épsin/ ‘baked/cooked thing’
 a. /kalo-[^]psin/ kalópsin (< kaloépsin) ‘easily-cooked-NOM.SG’ P58: 394
 b. /kako-[^]psin/ kakópsin (< kakoépsin) ‘badly-cooked-NOM.SG’ P58: 381

☒ **Result: non-local accent / pre-accenting morpheme**

☞ **Accent proliferation:** The accent is still sponsored by morpheme *j* – only now it lacks a sponsoring vowel and thus floats; however, it is pronounced on morpheme *i*. Thus, the result is a **non-local** accent and hence **pre-accentuation**

2.4. Interim summary

<p>Stage I: <i>lexical accent genesis</i></p> <p>Stage II: <i>proliferation of lexical accents</i></p>	<p>Leftmost Default</p> <p>↓</p> <p>accented (LR systems)</p> <p>↓</p> <p>pre-accenting</p>	<p>Rightmost Default</p> <p>↓</p> <p>pre-accenting (RL systems)</p> <p>↓</p> <p>accented</p>
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Table 4. Lexical accent genesis and proliferation

- ✓ In LR systems, conflicting directionality and grammaticalization originally give rise to local accents while in RL systems they have the opposite effect, i.e. they yield non-local ones (in the form of pre-accentuation).
- ✓ Further phonological processes and morphological re-analysis proliferate the existing accentual inventory for both types of stress systems: LR systems develop non-local

accents from local ones, whereas RL systems develop local accents from non-local ones. Consequently, what appears to be pre-accenting, for instance, in both systems, is the end-result of a different developmental path.

- ✓ Local accents in LR and non-local accents in RL are 'primal' (Stage 1) in the sense that they depict fossilized edgemost stress.
- ✓ Non-local accents in LR and local ones in RL are 'derived' (Stage 2), that is, they arise from 'primal' lexical accents via further reduction processes and morphological re-analysis.
- ✓ A two-dimensional representational apparatus is proposed which provides us with a unified approach towards capturing the diachronic developments of local and non-local accents by separating morphological identity from phonological realization.

3. The emergence of edgemost stress from lexical accents

This section investigates the effects of language interference on reshaping 'deviant' phonological behavior and recasting it towards a more regular phonological pattern. More specifically, we examine a few Asia Minor Greek dialects, in which lexically-imprinted stress subsided under the influence of language contact with Turkish, which has a predictable (rightmost default) stress rule. We argue that this development was assisted by certain morphosyntactic changes which independently took place and transformed the original fusional system of noun morphology into an agglutinative-oriented one.

3.1. Background information

☒ Starting point: A group of Asia Minor Greek dialects (mainly the Cappadocian group), which are contact-induced systems (Greek-Turkish). The Greek dialects were subordinate compared to Turkish and most Greek speakers were bilingual in Greek and Turkish (Thomason & Kaufman 1988: 215)

- Greek: fusional language with lexically-encoded stress (PU, U) and default on the initial/APU
- Turkish: agglutinative system, with mainly rightmost default stress as well as instances of lexically-imprinted stress (see also Section 2)

☒ Sources: Dawkins (Da) (1916), Kesisoglou (1951)

☒ Background information:

- The degree of Turkish interference varies; some dialects appear to be more 'turkicized' (e.g. Ulaghatsh, Semenderé) than others (e.g. Delmeso, Misti, Aravan).⁸
- Fusional and agglutinative morphology co-exist in Cappadocian dialects with certain preferences for one or the other depending on the degree of 'turkicization' exhibited by each dialect (Janse 2004).

⁸ This discrepancy hinged on the extent of bilingualism and the existence or not of established Greek schooling in the village. Other Asia Minor dialects, such as Fárasa, Silli and Pontic, which were spoken in areas with established Greek schooling and less widespread bilingualism, displayed much less interference from Turkish.

3.2. From fusion to agglutination

☒ The most ‘turkified’ Cappadocian dialects (e.g. Ulaghatsh, Ghourzono, Ferték, Semenderé), next to the fusional declension, also developed an agglutinative one.

Ulaghatsh, Ferték: Nouns of Greek origin ending in *-os* split into two inflectional patterns depending on (a) position of stress, and (b) certain morphosyntactic features.

- Stress final nouns, $\sigma\sigma\acute{o}$, follow the agglutinative declension. (See Table 6.)
- Nouns stressed elsewhere (e.g. on the initial or the PU syllable) follow either the fusional or the agglutinative declension usually depending on (a) noun class (e.g. nouns ending in *-a* or in a consonant enter the agglutinative paradigm), and (b) within the same class, the feature $[\pm\text{human}]$ (Spyropoulos & Kakarikos 2007):
 - $[\text{+human}]$ nouns, such as *xerifos* ‘man’, *ɣjávolos* ‘devil’ Da102 follow a fusional declension
 - $[\text{-human}]$ nouns, such as *likos* ‘wolf’ Da102, follow the general agglutinative declension pattern:

SINGULAR		
NOM	xeríf-os	ɣjávól-os
GEN	xerif-jú	ɣjavól-(u), ɣjavol-jú
ACC	xeríf-o	ɣjávól-o
PLURAL		
NOM	xeríf-ja	ɣjavól-(i)
GEN	—	—
ACC	xeríf-ja	ɣjavol-jús

Table 5. Fusional declension in Ulaghatsh

SINGULAR			
NOM	níf _[base] - \emptyset^9 <i>nif</i>	líkos- \emptyset <i>likos</i>	néka- \emptyset <i>néka</i>
GEN	níf _[base] -jú _[gen] <i>nifju</i>	líkos-jú <i>likozju</i>	néka-jú <i>nekazju</i>
ACC	níf _[base] - \emptyset <i>nif</i>	líkos- \emptyset <i>likos</i>	néka- \emptyset <i>néka</i>
PLURAL			
NOM	níf _[base] -es _[+p] - \emptyset <i>nifes</i>	líkos-ja- \emptyset <i>likozja</i>	nék-es _[+p] - \emptyset <i>nékes</i>

⁹ The underlying form is /nif-i/. In these dialects, syllable structure permitting, unstressed high vowels in word-final position delete.

GEN	níf _[base] -es _[+p] -jú _[gen] <i>nifezju</i>	—	nék-es _[+p] -jú _[gen] <i>nékezju</i>
ACC	níf _[base] -es _[+p] -∅ <i>nifes</i>	líkos-ja-∅ <i>líkozja</i>	nék-es _[+p] -∅ <i>nékes</i>

Table 6. Agglutinative declension in Ulaghatsh and Ferték

GLOSSES: *nif* ‘bride’ Ul, Sem, Fer Da115, *líkos* ‘wolf’ Ul, Da102, *néka* ‘woman’ Fer, Da114

Q: Which factor(s) triggered the **re-analysis** of inflectional suffixes as part of the stem and, subsequently, caused the transition from fusion to agglutination?

A1. Syncretism of nominative-accusative: Cappadocian, under the influence of Turkish, exhibits *Differential Object Marking* with respect to specificity (Kornfilt 1997, a.o.).¹⁰ This is evidenced mainly in less turkified dialects, that is, dialects in which agglutination is more confined compared to the fusional paradigm (Spyropoulos & Tiliopoulou 2006: 367-370).

- (28) a. Ali bir kibab-ı aldı
Ali a book-ACC buy-3SG.PAST
‘Ali bought a certain book.’ (=A book is such that Ali bought it)
- b. Ali bir kitab aldı
Ali a book-NOM buy-3SG.PAST
‘Ali bought some book.’
- (29) a. έχω έναν αδελφό (Potamia, Da454, §4)
have-1.SG a brother-ACC.SG
‘I have a certain brother.’
- b. δέκε ένα λαγός (Delmesos, Da94)
hit-3.SG a hare-NOM.SG
‘He struck some hare.’

A2. The influx of Turkish loans (with final stress) and the pressure for assimilation:

- (30) a. NOM.SG GEN.SG
qarəndzǎ qarəndzayjú ‘ant’ Da110
- b. qarǎ qarǎyjú ‘crow’ Da110

A3. Certain phonological changes: The deletion of unstressed high vowels /i, u/ in word final positions:¹¹

- (31) a. /korítji/ korítʃ ‘girl’
b. /níf-i/ níʃ ‘bride’

led to (i) the loss of inflection and, consequently, the increase of suffixless bases, and (ii) the proliferation of finally stressed words: σσó. This was further enhanced by the overall shape of the fusional paradigm (see (35a).) For instance, the genitive singular suffix -jú is accented and attracts stress from the root, resulting in a word with stress on the final syllable.

¹⁰ Specific objects are marked by the accusative marker -(y)l, whereas non-specific objects appear in the nominative/absolute form which carries no overt case morphology.

¹¹ Cf. *spít* ‘house’, *spítit* ‘his house’ Da358 (due to *tt#).

☒ **Results:**

(a) nom=acc → re-analysis of –os as part of the stem

(32) **lik**_[base]-**os**_[infl] → **likos**_[base]

→ -∅ is defined as the general default (marking the absolute) (Spyropoulos & Kakarikos 2007)

(33) **likos**-∅

→ re-analysis of plural; the grammatical categories of number and case are marked separately (Spyropoulos & Kakarikos 2007)

(34) **likos**-**ja**_[pl]-∅

(b) Emergence of the agglutinative sub-system; restricted use of the fusional paradigm

(c) Each morphological sub-system is associated with a particular stress pattern:

(35) Turkish and Greek stress patterns compared

TURKISH/AGGLUTINATIVE	STRESS PATTERNS	GREEK/FUSIONAL
default	a. σσσ	lexically-encoded
lexically-encoded ¹²	b. σσσ	lexically-encoded
lexically-encoded ¹³	c. σσσ	default

▪ **Fusional:** (a) initial and PU stress; initial is the default; PU due to lexical accents (No U-stressed words!), (b) there is stress mobility within the paradigm, (c) in case of conflicting accents, the rightmost one is stressed; otherwise, default stress is assigned on the leftmost syllable → **proliferation of σσσ pattern**

• **Cophonology-1 (CoP1):** “Assign stress to the rightmost accent (36a); otherwise stress the leftmost syllable (36b).”

C-ranking: FAITH(acc), RIGHTMOST(acc) » LEFTMOST-σ

(36) a. /xeríf-jú/ → *xerífjú* proliferation of σσσ pattern
 b. /ɣjavol-os/ → *ɣjávolos*

▪ **Agglutinative:** (a) mainly U stress, (b) initial/APU and PU stress is due to underlying accents, (c) in case of multiple underlying accents, e.g. /líkos-jú/, the leftmost accent surfaces with stress, *líkozju* (38b).

• **Cophonology-2 (CoP2):** “Assign stress to the leftmost accent (38b); otherwise, stress the final syllable (38a).” → **This is the Turkish stress rule**¹⁴

C-ranking: FAITH(acc), LEFTMOST (acc) » RIGHTMOST-σ

¹² This pattern exists in loans and places names, e.g. *Ánkara* ‘Ankara’, *ácabá* ‘one wonders’, etc. (Kabak & Vogel 2001: 316).

¹³ Lexically-encoded patterns of this sort are also attested in Turkish, e.g. *Avrúpa* ‘Europe’, etc.

¹⁴ For recent accounts of Turkish stress see Inkelas (1999/2004), Kabak & Vogel (2001), Inkelas & Orgun (1998, 2003), among others.

(37) *Turkish*

- a. final default
 /kitap/ kitap ‘book’
 /kitap-lar/ kitaplár ‘book-PL’
- b. leftmost accent
 /yap-ı-ver-ince/ yapıverince (Inkelas & Orgun 2003:142)
 do-ADV-AUX-ADV
 ‘having suddenly done, as soon as s/he did (that)’
- c. /Ánkara-li-laş-ıyor/ Ánkara-li-laş-ıyor (Inkelas 1999/2004:160)
 Ankara-DER-VERB-PROGR
 ‘becoming ones from Ankara’

(38) *Ulaghatsh - Ferték*

- a. final default
 /qarəndʒa/ qarəndʒá ‘ant’ Da110
 /qarəndʒa-γju/ qarəndʒaγjú ‘ant-GEN’
 /adelfo/ adelfó ‘brother’ Da106
 /adelfo-γju/ adelfoγjú ‘brother-GEN’
- b. leftmost accent
 /líkos-jú/ líkozju ‘wolf-GEN’ Da102

Conclusion:

- ✓ Two accentual systems (*cophonologies*), each one associated with a particular morphology: agglutination – CoP2; fusion – CoP1

(39) *Ulaghatsh agglutinative and fusional stress compared*

<i>ULAGHATSH AGGLUTINATIVE</i>	<i>SURFACE STRESS PATTERNS</i>	<i>ULAGHATSH FUSIONAL</i>
default	a. σσσ	d.n.e.
lexically-encoded	b. σσ́σ	lexically-encoded
lexically-encoded	c. σσσ́	default

(40)

<i>ULAGHATSH AGGLUTINATIVE URS</i>	<i>SURFACE STRESS PATTERNS</i>	<i>ULAGHATSH FUSIONAL URS</i>
a. /σσσ/	a. σσσ	d.n.e.
b'. /σσ́σ/	b. σσ́σ	b''. /σσ́-σ/
c'. /σσσ́/	c. σσσ́	c''. /σσ-σ́/

3.3. The emergence of edgemost stress from lexical accents

☒ Cappadocian is a contact-induced system:

- Thomason & Kaufman (1988), Thomason (2001): ‘heavy borrowing’
- Winford (2003a, b): not only borrowing but mainly a case of ‘imposition’, according to which the *source-language* (SL), i.e. Turkish, is dominant and material and structures are transferred from it into the *recipient language* (RL), i.e. Greek, to which the speaker is less proficient.

That is, next to the Greek-dominant bilinguals, who import changes from Turkish (SL) into Greek (RL) through borrowing (=RL agentivity), Turkish-dominant bilinguals played a major role in introducing grammatical structures from Turkish to Greek through imposition (=SL agentivity).

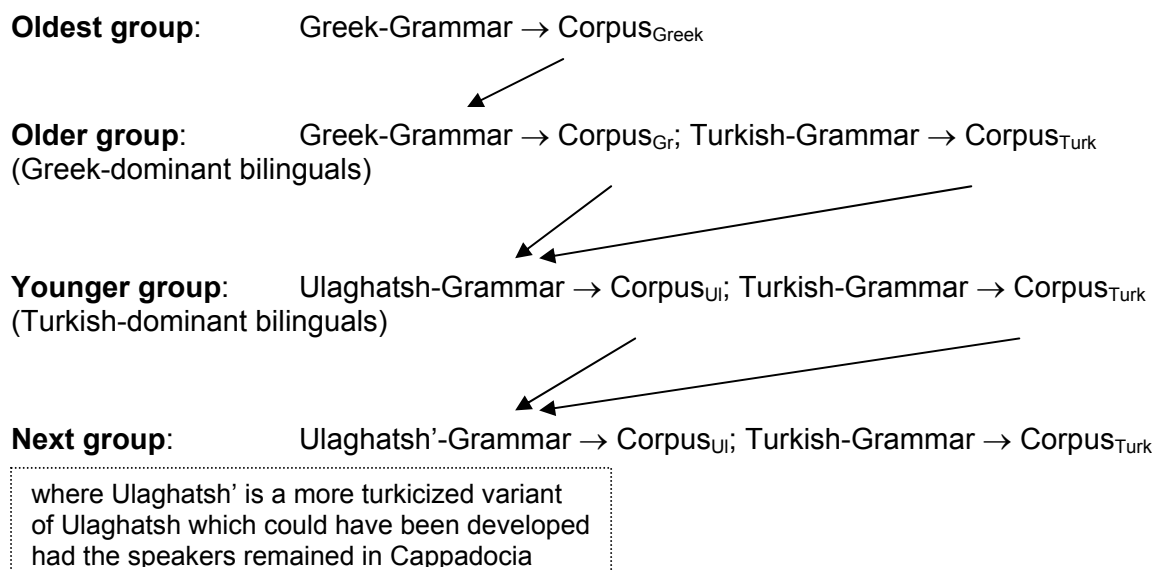
Dawkins (1910: 118): ‘... But in fact in all these villages the local dialect is in danger of being lost. It is attacked on two sides; by Turkish, and by the purified Greek taught in the schools.’

Dawkins (1910: 118): “To a Christian living where there are Turks, a knowledge of Turkish, for the men at all events, is a necessity, whilst Greek is not, and therefore tends to lose ground... from economic cause the Turkish element in these villages is increasing and the Greek is decreasing.”

Dawkins (1910: 120): “...the difference between the local speech and the Greek of the schools is so great that the schoolmaster's efforts rather go to substitute another language for the local dialect than gradually correct it, as happens in places where the divergence between the two is not so marked.”

This language contact schema is diagrammed in (41):

(41) Language contact in Ulaghatsh (à la Winford 2003a)



Q: How can this language contact schema be fruitfully implemented in order to shed light on the way the agglutinative stress pattern emerged and gradually superseded the fusional one?

☒ The combined effects of the factors mentioned above caused the σσσ pattern to be **reanalyzed** as the **default** and be associated with a Turkish-like morphology.

- U** σσσ
- Oldest group: fusional morphology and lexically-encoded stress, /σσ-σ/
 - Older & Younger groups: **ALWAYS** agglutinative morphology (suffix joins the root to form the base for agglutination) and default stress, i.e. loss of lexical accent contrast, /σσσ/

→ (internal) morphological structure and phonological representation both **change**

(42) a. *Greek/Fusional*
lexically-encoded stress
*
↓↑
σσ-σ → σσσ

b. *Turkish/Agglutinative*
accentless; default
σσσ → **σσσ**

☒ The σσσ pattern remains lexically-encoded in all groups, only the morphology changes in the **Older** and **Younger** groups:

PU
σσσ

- Oldest group: fusional morphology and lexically-encoded stress, e.g. /σσ-σ/
- Older & Younger groups: agglutinative and fusional morphology and lexically-encoded stress in both cases, e.g. /σσσ/ or /σσ-σ/.

(43) a. *Greek/Fusional*
lexically-encoded stress
*
↓↑
σσ-σ → σσσ

b. *Turkish/Agglutinative*
lexically-encoded stress
*
↓↑
σσσ → **σσσ**

☒ The σσσ displays a split; it is considered lexically-encoded or default stress depending on the type of morphology it is associated with:

Initial
σσσ

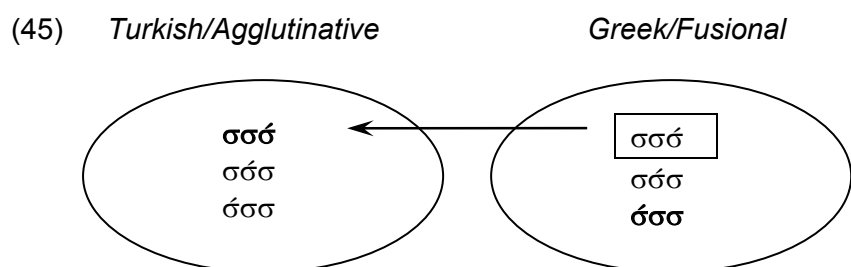
- Oldest group: fusional morphology and default stress, /σσ-σ/
- Older & Younger groups: agglutinative morphology and lexically-encoded stress, e.g. /σσσ/ or fusional morphology and default stress /σσ-σ/ (depending on morphosyntactic features of the base)

→ dual representation and hence unstable

(44) a. *Greek/Fusional*
accentless; default
/σσ-σ/ → σσσ

b. *Turkish/Agglutinative*
lexically-encoded stress
*
↓↑
σσσ → **σσσ**

→ The fusional default fossilizes and the morpheme is introduced in the agglutinative system with a lexically-imprinted accent.



Note: The default pattern of each language is given in boldface.

☒ **Predictions for Ulaghatsh'**

Prediction 1: Further decline of the fusional system

- ☞ More turkicized dialects: Ferték, Ghourzono and Semenderé preserved only fossilized instances of fusional morphology (Da106, §146).

Prediction 2: Decline and loss of ‘problematic’ (because of dual representation) $\acute{\sigma}\sigma$ pattern and shift to the default. In general, increase of $\sigma\sigma$ words and concomitant lexical accent death.

- ☞ There must be a stage in which the $\acute{\sigma}\sigma$ stress pattern fluctuates with the $\sigma\sigma$ one in the agglutinative system. This is confirmed by Dawkins (1910: 277, §62):

‘...whenever the agglutinative genitive is found, it is doubtful if the accent remains on the stem or passes to the ending. E.g. from Ghourzono *ɣjǎskalozju* or *ɣjaskalozju* (AR: ‘teacher-GEN’). Probably the ending has a secondary stress, *ɣjǎskalozju*.”

- Emergence of two stresses; primary < lexical accent, secondary < default

Cf. Thracian Muslim Greek spoken by young students of Minority Schools who have Turkish as a native language (L1) and learn Greek as a second language (L2):

- (46) Early stages of L2 acquisition: primary stress on initial/APU or where the accent dictates; secondary stress on final syllable (Revithiadou & Tzakosta 2007)

	<u>$\acute{\sigma}\sigma$</u>		
a.	áloyòs	‘horse’	1MF-e-Em
b.	práɣmata	‘thing-PL’	1MF-st-Eb
c.	kítrinò	‘yellow’	2MF-d-Has
d.	fórtiyò	‘truck’	2MF-d-Has
e.	aftocínitá	‘car-PL’	1MF-st-Eb

	<u>(σ)σσ:</u>		
f.	pexníðjâ:	‘toy-PL’	2MF-e-Es
g.	jínékâ:	‘woman’	1MX-st-Ai
h.	kostúmjà:	‘costume-PL’	1MF-st-Eb

- ☞ Several Ulaghatsh bases shift their stress from the A(PU) to the U syllable:

(47)

		<u>Ulaghatsh</u>	
a.	krios	kirjós	‘cold’ Kes19
b.	kréas	kirjás	‘meat’ Da372
c.	xórja	xorjá	‘separately’ Kes19
d.	ekíno	ekinó	‘that one’ Da350
e.	kenúrjo	kenirjó	‘new’ Kes19

4. The development of vowel harmony (or something like harmony)

The Asia Minor dialects of Greek¹⁵ (with the exception of Pontic) display a vowel process which looks superficially like the vowel harmony that is familiar from Turkish.¹⁶ However, this

¹⁵ The following written sources are used: Kostakis (1968) for Silly; Dawkins (1916), Mauroxalyvidis & Kesisoglou (1960) for Axo; Andriotis (1948) for Farasa; Andriotis (1961) and the Oral Archives of the Center of Asia Minor Studies for Livisi.

process shows sensitivity to stress and morphological structure, and hence should not be identified as vowel harmony of the Turkic type.

Even though the Greek dialects discussed here do not really have a truly Turkic type of vowel harmony, we claim that this harmony-like process may have developed under the influence of language contact with Turkish and, more specifically, may be intimately related with the transition from a fusional morphological pattern to an agglutinative one.

(48) *Vowel harmony in Turkish*

	NOM.SG	GEN.SG	NOM.PL	GEN.PL	
a.	/iʃ/	/iʃin/	/iʃler/	/iʃlerin/	'name'
b.	/ev/	/evin/	/evler/	/evlerin/	'house'
c.	/kuz/	/kuzun/	/kuzlar/	/kuzların/	'girl'
d.	/jol/	/j olun/	/jollar/	/jolların/	'road'
e.	/gyl/	/gylyn/	/gyller/	/gyllerin/	'rose'
f.	/gæ/	/gælyn/	/gæller/	/gællerin/	'lake'
g.	/tas/	/tasun/	/taslar/	/tasların/	'pot'

Turkish **vowel harmony** is found in Greek verbal suffixes, e.g. /dízo/ (< Gr /*(d)ízo*/), which attach to Turkish roots:

(49) a.	/anladízo/	<	anlamák	'understand' Delmeso, Da67, §70
b.	/axdízo/	<	akmák	'flow' Delmeso, Da67, §70
c.	/aradízo/	<	aramák	'seek' Delmeso, Da67, §70
d.	/baturdízo/	<	baturmák	'sink myself' Delmeso, Da67, §70
e.	/istedízo/	<	istemék	'want' Delmeso, Da68, §70
f.	düjündízo	<	düjünmék	'consider' Ghourzono, Da67, §70

Words of Greek origin exhibit the following **harmony-like** process which takes place at the last two syllables of the word (=noun/adjective):

(50) *Asia Minor Greek 'harmony'*

	<u>Greek word</u>	<u>AMG word</u>	
a.	perðikóθir-a	perdikóθ <u>ara</u>	'window-PL' Far, An48:21
b.	pandeleímon-as	pandeleí <u>manas</u>	'merciful' Sil, Ko151
c.	petsét-a	pet <u>jata</u>	'napkin' Sil, K185
d.	ðáskal-os	ðásk <u>olos</u>	'teacher' Far, An48:20
e.	ánem-os	án <u>omos</u>	'unlawful' Axo, MK9; UI, K13,§3
f.	kóskin-o	kósk <u>unu</u> (/i-o/ ¹⁷)	'sieve' Sil, Ko31
g.	áçiro	ás <u>uru</u>	'straw' Liv, OACAMS IE'
g.	ípno-s	j <u>upnu</u> s	'sleep' Sil, Ko35
h.	xrist-ós	xr <u>ustos</u>	'Jesus' Liv, OACAMS IE'
	θim-ós	su <u>mos</u>	'anger' Sil, Ko35

☒ **Comments:**

- Examples (50a-c) demonstrate that the final vowel requires the preceding vowel to agree with it in backness/frontness.

¹⁶ The discussion in this section relies on many of the findings and ideas developed in previous work on vowel harmony in Asia Minor Greek: Revithiadou, Van Oostendorp, Nikolou & Tiliopoulou (2006); Van Oostendorp & Revithiadou (2005).

¹⁷ Unstressed /o/ raises to [u] in this dialect, e.g. /ómosma/ *ómusma* 'oath' Ko33.

- Examples (50f-g) evidence the same also for roundness.
- The process affects only initial/APU- or PU-stressed words. A stressed vowel is a trigger only in disyllabic words (50h).¹⁸
- Restrictions on distribution/Exceptions: The process does not affect all nouns; it has several lexical exceptions. Moreover, it is restricted to the nom/acc singular forms of the paradigm, e.g. **ðaskol-u* ‘teacher-GEN’. Finally, it is mostly associated with fusional morphology.

(51) AMG ‘harmony’ characteristics in a nutshell:

a. Sensitive to stress; attested only in $\sigma\sigma\sigma$ and $\acute{\sigma}\sigma\sigma$ words → stressed vowel is not a trigger
b. Sensitive to morphological category; attested in nouns/adjectives
c. It appears in nom/acc forms
d. Disyllabic domain; end of the word, between a suffix and a stem
e. It has lexical exceptions; it is associated with fusional morphology

Qs: Why is this VH-like process confined to the last two syllables of the word? Why is it sensitive to morphology?

☒ Van Oostendorp (2005): VH in AMG does not have any of the characteristics of vowel harmony and, furthermore, cannot be efficiently treated as such under current theories of vowel harmony.

Hypothesis: Vowel harmony in AMG is not a ‘borrowed’ rule from Turkish but rather a novel phonological pattern that emerged when certain morphological pressures were exercised in the system.

☒ Sketching out the idea:

☞ The morphological structure of word in a fusional paradigm is as follows:

(52) $[[\text{Stem}] + \text{Theme-Inflection}]_{\text{word}}$

<i>ðaskal</i>	<i>o s</i>
<i>petjet</i>	<i>a</i>
<i>koskin</i>	<i>o</i>

☞ Spreading of [back] / [round] from inflection to the stem is a form of *conflation*; the inflection ‘merges’ (in the sense of sharing the same feature) with the stem. (See Postma, Hermans & Van Oostendorp 2006 for a somewhat similar account of A Umlaut in Old High German.)

(53) $[[\text{Stem}] + \text{Them-Inflection}]_{\text{word}}$

a.	<i>ðaskal os</i>	b.	<i>petjet a</i>	c.	<i>koskin o</i>
	↘		↘		↘
	[+rd]		[+bk]		[+rd]

¹⁸ Another process, which affects the first syllables of the word, takes place in $\sigma\sigma\sigma$ words.

Recall that, because of the nom/acc syncretism and other factors mentioned above, in many AMG systems the [Them-Inflection] complex underwent a process of fusion with the stem, e.g. *laγ-os*, and was eventually reanalyzed as a base, e.g. *laγos* (see ex. (32-34)). Spreading of the [back]/[round] feature, therefore, could be viewed as an instance of such a fusion: The inflection starts sharing some features with the base before merging completely with it.

☒ **Welcome results:** It explains

- why the process applies only to nouns and adjectives and is restricted to the nom/acc forms; these inflectional endings underwent syncretism and, subsequently, fused with the stem in order to form a base (see ex. 32-34)
- why the process has exceptions (incomplete actualization)
- why the process is bound to a binary domain

☞ Contra to previous assumptions (Revithiadou et al. 2006, Van Oostendorp 2005), this VH-like process is related to language interference not via borrowing of the VH-rule from Turkish, but rather as a reflection of certain morphological changes that were initiated due to language contact with Turkish.

5. Conclusions

▪ Development of unpredictable stress from a 'predictable' system

- ✓ The combined effects of the directionality of stress assignment and morphologization can lead to the genesis of lexically-encoded accents.
- ✓ Lexical accents can proliferate through the subsequent application of fusion and morphological re-analysis.
- ✓ The cross-linguistic inquiry into a substantial number of edgemost languages allowed us to make several typological observations.
 - In Leftmost languages, only the systems with conflicting directionality, that is LR, exhibit lexically-encoded accents.
 - The same conditions in Rightmost languages yield the mirror image of LR systems.
- ✓ We have provided a model which crucially relies on the discrepancy between phonological and morphological migration. We have shown that this distinction is crucial not only in understanding the split identity of non-local accents, but also in accounting for their emergence in the course of history.
- ✓ Furthermore, we have shown that the proposed model can encode the diachronic aspects of the development of lexical accents and, at the same time, be advantageous for their synchronic representation.

▪ Development of predictable stress from an 'unpredictable' system

- ✓ Language interference may trigger certain changes at different components of the grammar the effects of which are mirrored in phonology. We examined two phenomena, an accentual and a segmental one, which have been shown to be intimately linked with the transition from fusion to agglutination.
- ✓ Morphosyntactic changes may cause a radical shift in the mental representations of lexical items, as exhibited by Ulaghatsh; in this language, final stress was reanalyzed as the default in the agglutinative/Turkish-based system, whereas initial stress was

linked with two different representations depending on the specific co-grammar it was associated with.

- ✓ Patterns which assume such dual representations are unstable and tend to regularize towards the unmarked/favorite/statistically preferred choice of the language.

▪ Development of a vowel harmony-like process

- ✓ Vowel harmony in AMG is not a ‘borrowed’ rule from Turkish but rather a novel phonological pattern which is the phonological reflection of the morphological process of fusion between the Greek inflection and the root, a predecessor of agglutination.

References

- Andriotis, N.P. (1948). *Το γλωσσικό ιδίωμα των Φαράσων*. [The Dialect of Farasa.] 8 Collection de l'Institut Français d' Athènes. Μουσικό Λαογραφικό Αρχείο, Αρχείο Μικρασιατικής Λαογραφίας, τόμος 4: Καππαδοκία 2. Ίκαρος, Αθήνα.
- Andriotis, N.P. (1961). *Το ιδίωμα του Λιβισίου Λυκίας*. [The Idiom of Livisi of Lykia.] Αθήνα: Εκδόσεις Κέντρου Μικρασιατικών Σπουδών.
- Bailey, Todd Mark (1995). Nonmetrical constraints on stress. Ph.D. Dissertation, University of Minnesota, Minneapolis.
- Dawkins, Richard M. (1910). Modern Greek in Asia Minor. *The Journal of Hellenic Studies* 30: 109-132 & 267-291.
- Dawkins, Richard M. (1916). *Modern Greek in Asia Minor: A Study of the Dialects of Silly, Cappadocia and Pharasa with Grammar, Texts, Translations and Glossary*. Cambridge: Cambridge University Press.
- Drettas, Georges. (1997). *Aspects Pontiques*. Publié avec le concours du Centre National du Livre. Association de recherches pluridisciplinaires.
- Goldrick, Matthew A. (1998). Optimal opacity: Covert structure in phonology. Ms., John Hopkins University, Baltimore.
- Goldrick, Matthew A. (2000). Turbid output representations and the unity of opacity. In *NELS 30*, Masako Hirotoni, Andries Coetzee, Nancy Hall and Ji-Yung Kim (eds.), 231-245. Amherst, Massachusetts: GLSA, University of Massachusetts.
- Gordon, Matthew (2002). A factorial typology of quantity insensitive stress. *Natural Language and Linguistic Theory* 20: 491-552.
- Inkelas, Sharon (1994). Exceptional stress-attracting suffixes in Turkish: Representations vs. the grammar. Paper presented at the Workshop on Prosodic Morphology, Utrecht University. Rutgers Optimality Archive, ROA 39.
- Inkelas, Sharon (1999). Exceptional stress-attracting suffixes in Turkish: Representations versus the grammar. In *The Prosody-Morphology Interface*, René Kager, Harry van der Hulst and Wim Zonneveld (eds.), 134-187. Cambridge: Cambridge University Press. [Revised version of Inkelas, Sharon. 1994.]
- Inkelas, Sharon & Orhan C. Orgun. (2003) Turkish stress: A review. *Phonology* 20: 139-161.
- Janse, Mark (2004). Animacy, definiteness and case in Cappadocian and other Asia Minor Greek dialects. *Journal of Greek Linguistics* 5: 3-26.
- Kabak, Barış & Anthi Revithiadou (to appear). From edgemost to lexical stress: Diachronic paths, typology and representation. To appear in *The Linguistic Review*.
- Kabak, Barış & Irene Vogel. (2001) The phonological word and stress assignment in Turkish. *Phonology* 18: 315-360.

- Kesisoglou, I.I. (1951). *Το Γλωσσικό Ιδίωμα του Ουλαγάτς* [The Dialect of Ulaghatsh]. Κέντρο Μικρασιατικών Σπουδών, Μουσικό Λαογραφικό Αρχείο: Εκδόσεις του Γαλλικού Ινστιτούτου Αθηνών.
- Kornfilt, Jaklin (1997). *Turkish*. London and New York: Routledge.
- Kostakis, Thanassis P. (1968). *Το γλωσσικό ιδίωμα της Σίλλης*. [The dialect of Silly.] Αθήνα: Κέντρο Μικρασιατικών Σπουδών.
- Mauroxalyvidis, G. & I.I. Kesisoglou (1960). *Το γλωσσικό ιδίωμα της Αξού*. [The dialect of Axos.] Κέντρο Μικρασιατικών Σπουδών, Καππαδοκία 6. Αθήνα: Εκδόσεις του Γαλλικού Ινστιτούτου Αθηνών.
- Oikonomidis, Demosthenis E. (1958). *Grammatiki tis Ellinikis Dialektou tou Pontou*. [Grammar of the Pontic Greek dialect.] Athens: Academy of Athens.
- Oostendorp, Marc van (2005). Greek vowel harmony is no vowel harmony. Paper presented at the *Workshop on Greek Phonology*, University of the Aegean, Rhodes, November 8, 2005.
- Oostendorp, Marc van (2006). The theory of faithfulness. Ms., Meertens Institute/KNAW, Amsterdam.
- Oostendorp, Marc van & Anthi Revithiadou (2005). Quasi-opacity and headed spans in Silly and Megisti Greek. Paper presented at the 13th Manchester Phonology Meeting, University of Manchester, Manchester, May 26-28, 2005.
- Papadopoulos, Anthimos A. (1955). *Ιστορική Γραμματική της Ποντικής Διαλέκτου*. [Historical grammar of the Pontic dialect.] Παράρτημα 1. Αθήνα: Επιτροπή Ποντιακών Μελετών.
- Papadopoulos, Anthimos A. (1958). *Ιστορικών Λεξικόν της Ποντικής Διαλέκτου*. [Historical dictionary of the Pontic dialect.] Επιτροπή Ποντιακών Μελετών. Παράρτημα 3, том. 1. Αθήνα: Μυρτίδης.
- Papadopoulos, Anthimos A. (1961). *Ιστορικών Λεξικόν της Ποντικής Διαλέκτου*. [Historical dictionary of the Pontic dialect.] Επιτροπή Ποντιακών Μελετών. Παράρτημα 3, том. 2. Αθήνα: Μυρτίδης.
- Postma, Gertjan, Ben Hermans & Marc van Oostendorp (2006). Antisymmetry in Morphosyntax - two types of affixes and their linearization. Ms., Meertens Institute/KNAW, Amsterdam.
- Revithiadou, Anthi (2007). Colored Turbid accents and Containment: A case study from lexical stress. In *Freedom of Analysis?*, Sylvia Blaho, Patrik Bye and Martin Krämer (eds.), 149-174. Berlin and New York: Mouton de Gruyter.
- Revithiadou, Anthi & Marina Tzakosta (2007). *Η Φωνολογία στην Εκμάθηση της Ελληνικής ως Ξένης Γλώσσας*. [Phonology in the Acquisition of L2 Greek.] Αθήνα: Εκδόσεις Πατάκη.
- Revithiadou, Anthi, Marc Van Oostendorp, Kalomoira Nikolou & Maria-Anna Tiliopoulou (2006). Vowel harmony in contact-induced systems: The case of Cappadocian and Silly. In *Proceedings of the 2nd International Conference on Modern Greek Dialects and Linguistic Theory*, Janse, M., B. Joseph & A. Ralli & (eds.), 350-365. University of Patras, Patras.
- Spyropoulos, Vassileios & Konstantinos Kakarikos (2007). Aspects of dialectal variation in the Greek declension system: A feature-based approach. Paper presented at the 6th Mediterranean Morphology Meeting, Ithaca, September 27-30, 2007. [To appear in the Conference Proceedings.]
- Spyropoulos, Vassilios & Maria-Anna Tiliopoulou (2006). Definiteness and case in Cappadocian Greek. In Mark Janse, Brian Joseph & Angela Ralli (eds.), *Proceedings of the 2nd International Conference on Modern Greek Dialects and Linguistic Theory*. Patra: University of Patras, 366-378.
- Thomason, Sarah Grey (2001). *Language Contact: An Introduction*. Edinburgh: Edinburgh University Press.
- Thomason, Sarah Grey & Terrence Kaufman (1988). *Language Contact, Creolization and Genetic Linguistics*. Berkeley: University of California Press.
- Tombaidis, Dimitris E. (1996). *Μελετήματα Ποντιακής Διαλέκτου* [Studies on Pontic Greek.] Θεσσαλονίκη: Κώδικας.
- Tsopouridis, Thomas (2002). *Leksiko Pontiakis Dialektou*. [Dictionary of the Pontic dialects.] Θεσσαλονίκη: Εκδόσεις Τσιπουριδίη.

Winford, Donald (2003a). Contact-induced changes – Classification and processes. In Hope C. Dawson, Robin Dodsworth, Shelome Gooden, and Donald Winford (eds.), *OSU Working Papers in Linguistics* 57, 129-150. The Ohio State University.

Winford, Donald (2003b). *An Introduction to Contact Linguistics*. Malden, MA [etc.]: Blackwell Publishing.