

# FOCUS AND TOPIC INTONATION IN GREEK

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## ABSTRACT

In this paper, we investigate the phonological and phonetic markers of focus and topic intonation in Greek. We have found that both focus and topic are marked by phrasing, type of pitch accent and boundary tone. One difference between the two is that, on the one hand, focus deletes a boundary after the focus word and de-accented all following words. On the other hand, topicalization creates an IP boundary at the end of the topic phrase. The second difference is that, in declarative sentences, topic has a L\* Nuclear Pitch Accent (NPA) followed by a H%, whereas focus has a H\* NPA followed by a L%; in interrogatives, the topic NPA is H\* followed by L% and the focus NPA is L\* followed by the HL% of Greek polar questions. In addition, we found that focus is phonetically marked by lengthening of the whole sentence.

## 1. INTRODUCTION

This paper studies two phenomena that are very common cross-linguistically: focusing and topicalization. Descriptively, both a focus and a topic are given special prominence within the sentence.

In English, among other languages, focus affects the prosodic structure of the whole sentence: it assigns the nuclear pitch accent on the focus word and all post-focal pitch accents are de-accented [3,8]. Furthermore, on the phonetic level, focusing has been found to shorten the duration of the sentence both before and after the focus word in languages such as Korean [6], French [5], and English [4]. On the other hand, a topicalized word or phrase in languages such as English, French, and Korean, usually appears at the beginning of the sentence, forming its own intonational phrase separated from the rest of the sentence, and --in purely descriptive terms-- having a 'special' kind of intonation.

Turning to Greek, the difference between topics and foci is marked in syntax, as well as prosody. Syntactically, the most striking difference is that whereas a topicalized object will obligatorily trigger clitic-doubling (the appearance of a pronoun cliticizing on the verb), a focused object will not allow clitic doubling.

In this paper we will examine the intonational properties of these two phenomena, adopting the framework of Pierrehumbert and her colleagues [3, 8]. Regarding focus, we will investigate how it is realized both phonologically and phonetically. At the phonological level, we will determine what the pitch accent type associated with focus is, what the boundary tone type is, and how focus influences the prosodic structure of the sentence. At the phonetic level, we will examine whether the duration of sentence parts before and after focus changes. Another problem to address is the interaction of focus with polar questions. The

intonation of neutral polar questions in Greek has been the subject of a recent study by [2]. As they demonstrate, the typical contour of such questions is a L\* nuclear pitch accent, followed by a HL% boundary tone. In the same paper, it is shown that the H part of the HL% boundary tone --which they call a H phrase accent-- is realized on a phrase-final stressed syllable, if available. We will examine whether polar questions with focus have the same structure as neutral ones. We will show from our focus data that the H part of the HL% boundary tone is not a pitch accent as is claimed in [7].

Regarding topics, we will examine what type of pitch accent and what boundary tone type they are associated with, as well as what their interaction with polar questions is. Furthermore, we will examine the behavior of topics that appear sentence medially.

## 2. EXPERIMENT 1: FOCUS

### 2.1. Method

Ten versions of the same sentence (shown in Table 1) were used: four declarative and four interrogative, differing in the location of focus (on the second, third, fourth or fifth words), and two neutral ones for control, again declarative and interrogative. The sentences were written on cards in Greek and randomized. Each of the resulting 10 sentences was repeated 5 times by three speakers of Athenian Greek (1 female, F, and 2 males, M1 and M2). In order to trigger a focus reading, the focus word was underlined, and an additional sentence was put in parentheses saying "X (=focus word) not Y (=an alternative)". Sentences were digitized, and f0 tracks as well as duration measurements were made using *PitchWorks (Scicon)*. To check the effect of focus on the duration of sentence parts, we measured the part of sentence before and after the focus word and the focus word itself.

<i>vgeni</i>	<i>neo</i>	<i>aroma</i>	<i>gia mora</i>	<i>ton iúlio</i>
comes	new	perfume	for babies	in July
'A new perfume for babies is coming out in July'				

Table 1. Sentence of experiment 1.

### 2.2. Results and discussion

Figure 1 shows the pitch track of a neutral declarative sentence. The nuclear pitch accent is a H\* on the last stressed syllable, followed by a L% boundary tone, and all pre-nuclear pitch accents are L\*+H, confirming the description of Greek neutral sentence intonation in [1].

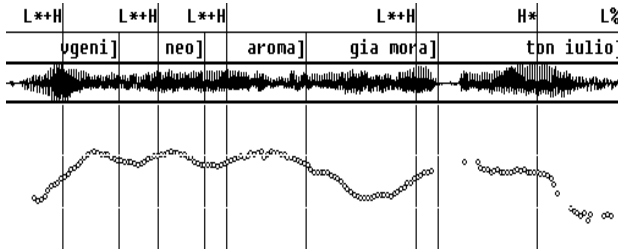


Figure 1. Neutral declarative sentence.

Figure 2 gives an example of the pitch track of a declarative focus sentence. Here, the third word, ‘*ároma*’, is in focus and carries the nuclear pitch accent H\*. Pre-focal pitch accents are preserved as L\*+H, the type found in neutral sentences, and the post-focal words are all de-accented, showing a low plateau, followed by a L%. In all other variations of the declarative focus sentence differing in the location of stress, the same tonal pattern was found with the nuclear pitch accent on the focus word.

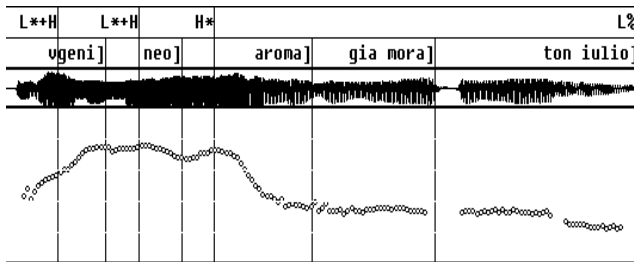


Figure 2. Declarative focus sentence.

Interrogative focus sentences (Figure 3) have the typical HL% boundary tone found in neutral polar questions in [2], and the default L\*+H pre-nuclear pitch accents. The only change from declarative focus sentences is that the nuclear pitch accent changes from H\* to L\*, that is, the focused word ‘*ároma*’ is realized with a L\*. This is probably the effect of the H phrase accent of polar questions in Greek.<sup>1</sup> That is, the reversal of H\* to L\* is a good way to enhance the contrast of the focus word to the H phrase accent. Furthermore, as in declarative focus sentences, all post-nuclear pitch accents are de-accented, but the H phrase accent does not undergo de-accenting, supporting the claim in [2] that this tone is not a pitch accent.

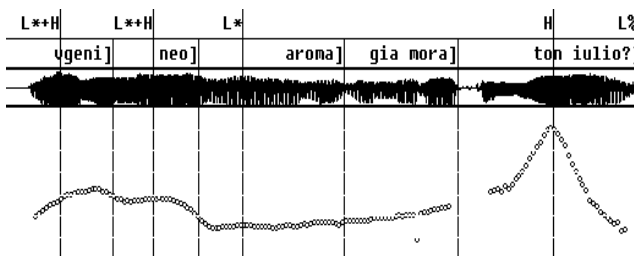


Figure 3. Interrogative focus sentence.

**2.2.1. Duration in focus.** Cross-linguistic studies of the effect of focus on the duration of pre- and post-focal sentence parts show

that these parts tend to be shorter in the focus sentences than in the neutral ones. The duration of the focus word and the sequence before and after focus were measured and compared to the respective sequence in the neutral sentence. The results are shown in Figure 4. The whole sentence was lengthened in focus but the focus word itself and the post-focal sequence were significantly longer than in the neutral sentence.

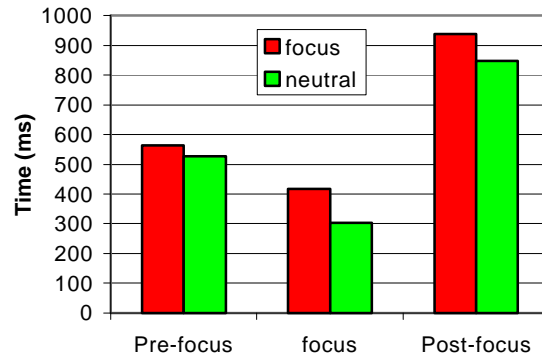


Figure 4. Duration in focus and neutral sentences.

### 2.3. Summary

What we found in this experiment is that focus is realized by making the focus word a nuclear pitch accent and by de-accenting all the following pitch accents. The tone type of the nuclear pitch accent is opposite to that of the boundary. Phonetically, focus has longer duration than in neutral sentences. In both dimensions the aim is to perceptually give the focus word more salience than the rest of the sentence.

## 3. EXPERIMENT 2: TOPIC

### 3.1. Method

To investigate the prosodic patterns of topics, we designed 13 sentences, differing in the location of the topic phrase –sentence-initial or sentence-medial— in the number of words included in the topic phrase (one, two, or three), and in sentence type (declarative or interrogative). We also included a neutral sentence without a topic phrase, but with the same segmental material as the one-word initial topic sentence. Table 2 shows the resulting 7 declarative sentences with the topic phrase italicized; polar questions in Greek are only marked by intonation, so they are not shown.

The same method as in Experiment 1 was used here.

Neutral sentence		
i Lida	anagnorizi	olus tus viologus
Leda	recognizes	all biologists
'Leda recognizes all biologists'		

Sentence initial 1-word topic			
<i>ti Lida,</i>	<i>tin anagnorizun</i>	<i>oli i viologi</i>	
Leda	recognize	all biologists	
'As for Leda, all biologists recognize her'			

Sentence medial 1-word topic			
<i>tin anagnorizun</i>	<i>ti Lida,</i>	<i>oli i viologi</i>	
recognize	Leda	all biologists	
'As for Leda, all biologists recognize her'			

Sentence initial 2-word topic			
<i>tis Lidas</i>	<i>ti dulia</i>	<i>tin anagnorizun</i>	<i>oli i viologi</i>
Leda's	work	recognize	all biologists
'As for Leda's work, all biologists recognize it'			

Sentence medial 2-word topic			
<i>tin anagnorizun</i>	<i>tis Lidas</i>	<i>ti dulia</i>	<i>oli i viologi</i>
recognize	Leda's	work	all biologists
'As for Leda's work, all biologists recognize it'			

Sentence initial 3-word topic			
<i>tis Lidas</i>	<i>ti nea dulia</i>	<i>tin anagnorizun</i>	<i>oli i viologi</i>
Leda's	new work	recognize	all biologists
'As for Leda's new work, all biologists recognize it'			

Sentence medial 3-word topic			
<i>tin</i>	<i>tis Lidas</i>	<i>ti nea dulia</i>	<i>oli i viologi</i>
anagnorizun	Leda's	new work	all biologists
recognize 'As for Leda's new work, all biologists recognize it'			

Table 2. Topic sentences for Experiment 2. Topic phrases are italicized.

### 3.3. Results and discussion

Figure 5 shows a declarative sentence-initial topic sentence. The two-word topic phrase, '*tis Lidas ti dulia*', forms its own Intonation Phrase (IP) and has a H% boundary tone. The stressed syllable of the last word in the topic phrase is realized with a low tone, i.e., a L\* nuclear pitch accent. The pre-nuclear pitch accent in the topic phrase is the typical L\*+H found both in neutral and focus sentences. The main clause forms one IP with L\*+H pre-nuclear pitch accents, a H\* nuclear pitch accent and a L% boundary tone.

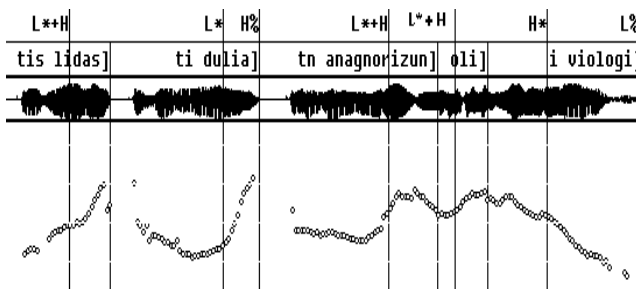


Figure 5. Declarative sentence-initial topic sentence.

An example of an interrogative sentence with the same

initial topic is shown in Figure 6. Unlike in the declarative, the topic phrase boundary tone is now L%, and the nuclear pitch accent on the last word of the topic phrase is H\*. The pre-nuclear pitch accents are the default L\*+H as in the declarative. As for the rest of the sentence, the verb '*tin anagnorizun*' following the topic phrase carries a focus pitch accent, a L\*, and all post-focal tones are de-accented. The HL% boundary tone of polar questions is also present here and this is probably the trigger for the reversal of tones in the topic phrase.

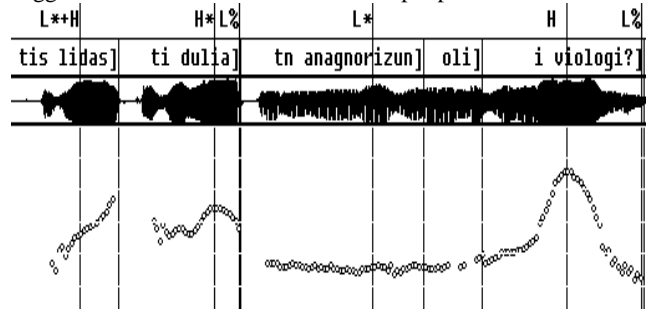


Figure 6. Interrogative sentence-initial topic sentence.

Medial topic sentences have the following structure: [Verb – Topic – Rest of sentence]. We found that, in the declarative, medial topic phrases have exactly the same structure as initial topic ones, and the sentence initial verb either forms its own IP with a H\* nuclear pitch accent and L% or forms part of the topic phrase with a L\*+H pre-nuclear pitch accent. The rest of the main clause, which follows the topic phrase, forms one IP with the default declarative pattern.

As for interrogative medial-topic sentences (Figure 7), we found an unexpected intonation pattern: The verb '*tin anagnorizun*' preceding the topic phrase is focused because it is the question word, and so all following words are de-accented, including the topic phrase. This shows that the effect of focus in Greek is so strong, that even the effects of topicalization are muted. However, the meaning of topicalization is preserved by the presence of the morphological marker, the clitic word '*tin*'.

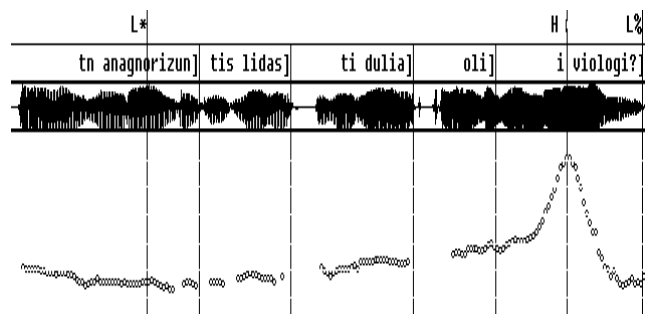


Figure 7. Interrogative sentence-medial topic sentence.

The investigation of topics raises a lot of interesting questions. Is the H% topic boundary tone special to topics or is it shared by other types of phrases? If it is shared by other phrases, first, what types are they, and second, does the H phrase accent trigger a reversal of the nuclear pitch accent and boundary tone as it did in topic intonation? The third experiment

was designed to answer these questions.

### 3.4. Experiment 3: Lists and parenthetical phrases

The intonation characteristic of topics was shared by at least two more types of sentence: lists and parenthetical phrases.

**3.4.1. Method.** For the initial investigation of these sentence types, four sentences were designed –a list sentence, and a sentence with a parenthetical phrase (Table 3), both in declarative and interrogative types.

1. i Maria agorase mila, nero, ladi ke gala 'Maria bought apples, water, oil and milk.'
2. o gios mu, prin gini efedros, emine ena mina sti gallia 'My son, before becoming a reserve, stayed a month in France'

Table 3. Sentences for Experiment 3.

The interrogative list turned out to have two possible versions, one with the verb as a question word and one with the list items as question words. As in all other polar questions in Greek the question is only marked by intonation, and so the difference between the two versions of the list question is in intonation only. Both these versions were examined. So in total 75 sentences were produced (5 repetitions of 5 sentences by the same three speakers). In order to trigger each of the two versions of the list question, a question was added in parenthesis on the cards (Table 4).

i Maria agorase mila, nero, ladi ke gala?
'Did Maria buy apples, water, oil and milk?'
VERSION 1: (i den agorase?)
(or didn't she buy (them)?)
VERSION 2: (i agorase krasi ke patates?)
(or did she buy wine and potatoes?)

Table 4. Two versions of the list question.

**3.4.2. Results and discussion.** Both lists and parenthetical phrases have the same intonation as topics with a L\* nuclear pitch accent, and a H% boundary tone in declaratives and the (by now familiar) change of L\* to H\* and H% to L% in questions. In the version of question where the verb is the question word, the verb is realized with a L\* nuclear pitch accent and there is a de-accented low plateau throughout the rest of the sentence, including the list.

### 3.5. Summary

Our main findings regarding topics are, first, that the right edge of the topic phrase is separated from the main clause with an IP boundary, except for sentence-medial interrogative topics. Second, in the declarative, the nuclear pitch accent of the topic phrase is L\* and the boundary tone H%, when the main clause has a H\* and a L%, and the reverse pattern in the interrogative. That is, topics have the opposite pattern of nuclear pitch accent and boundary tone to that of the main clause. The same pattern was found in parenthetical sentences and lists. However, it is not always true that sentence internal IP boundaries in Greek

declaratives are realized as H%: We found that quotations form their own IP with a L% boundary.

## 4. CONCLUSION

In this paper we have shown that focus and topic in Greek are marked by phrasing, type of pitch accent and boundary tone. The tonal type of pitch accent and boundary tone in both focus and topic are the opposite of the tonal pattern in the main clause, enhancing contrast to or separateness from the main clause. The difference between the two is that on the one hand, focus deletes a boundary after the focus word and de-accent all following words. On the other hand, topicalization creates an IP boundary at the end of the topic phrase, and the main clause forms its own IP. In addition, we found that focus is phonetically marked by lengthening of the whole sentence.

## NOTES

1. The term 'H phrase accent' implies the existence of an intermediate phrase between the Intonation Phrase and the phonological word. Although we have no evidence for the existence of this level, we will use the term in this paper for the sake of convenience.

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