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DISSERTATION

INTONATION OF QUESTIONS IN GREEK

BY

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*This work is dedicated to my parents for their continuous support,
and to language itself, for its power and inspiring beauty.*

*Αυτή η εργασία είναι αφιερωμένη στους γονείς μου για τη συνεχή
τους υποστήριξη, και στην ίδια τη γλώσσα, για τη δύναμη και
την ομορφιά της που αποτελεί για μένα πηγή έμπνευσης.*

I certify that the research presented in this dissertation has not already been submitted for any other degree, and that –to the best of my knowledge- all sources used and any help received in the preparation of this dissertation have been acknowledged.

_____ (*Maria Karra*) _____

Acknowledgments

I started this research having minimal background in phonetics, and knowing that I could not rely on existing literature, which was very limited. I had to rely on my “Phonetics and Phonology” course notes, which were my main source of knowledge in the beginning of this study. This work would therefore not have been possible without the background in this area that my professor, Felicity Cox, gave me through this course. As I had to interview participants for this study and obtain data recordings, I am grateful for the solid background that my professor Jan Tent gave me on how to conduct such research, on ethics issues, and on how to conduct data analysis in linguistics. Without his guidance, teaching enthusiasm, and detailed answers to my questions, my task would have been very difficult. I would also like to thank the participant in my study for her cooperation, enthusiasm, and patience. Finally, I am grateful to my advisor, Robert Mannell, for agreeing to supervise my thesis, knowing that I had limited background in this field and that this might make his task more challenging. I am thankful for his help during my research, for his ideas and suggestions, and I feel honoured to have worked with him.

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Abstract

In this dissertation the intonation of questions in Greek are examined. Since research conducted in Greek intonation has been limited, and even more so as regards question intonation, the purpose of this study is to serve as starting point for further research and contribute to the development of intonation theories for the Greek language. In order to examine intonation patterns, Greek questions are divided in Y/N and Wh-questions, which are in turn divided into sub-categories: Y/N questions are described with respect to whether they are stressed on the *last*, *penultimate*, or *antepenultimate syllable*, as well as whether they are *positive* or *negative*. Wh- questions are divided into the categories of *simple curiosity* or *predisposition*. The data analysed consist of the recorded speech of a native Greek speaker, who was asked to read questions belonging to each category. The analysis includes the production of waveforms and pitch contours, the identification of pitch accents and boundary tones in the contours, and subsequently the identification of intonation patterns for each question category. Finally, the notion of intended meaning is discussed, and it is demonstrated that intended meaning and emotions may affect the intonation of questions.

Chapter 1

Introduction

1.1 Overview of Question

This dissertation examines the intonation of questions in the Greek language. In particular, I examine the different ways in which a speaker can produce Yes/No questions (those that require “yes” or “no” as an answer), and wh- questions (those that start with the Greek equivalents of *where, how, who, when, why, what, which, etc.*).

1.2 Purpose of Research

Von Heusinger (1999): “Intonation [...] was for most of the time not an object for linguistic investigations. Language structure was mainly investigated on written texts and therefore, syntactic structure stood at the center of interest. Even though there have been notes on intonational phenomena from time to time, no serious

investigation into this field has been undertaken before this century. This lack of interest in intonation has lasting effects [...]. Even if intonation is now considered in linguistic research it is still put on a secondary position because intonation was not treated in linguistic theory for a long time.”

Research conducted in Greek intonation has been even more limited, and as regards intonation of questions, the work conducted has been minimal. Thus the present study is not based on or extends any developed theory of Greek intonation. Instead, it is one of the initial steps in Greek-question intonation, where an attempt is made to form conclusions or theories based on the analysis of data collected: verbally produced questions are recorded, and then their intonation pattern is examined.

1.3 Existing Research

Very limited research has been conducted on intonation of the Greek language. There have been some initial steps into this field (ex. by Arvaniti (2001), Arvaniti and Baltazani (to appear), etc.), but in order to fully understand intonation in Greek, more research is required. The existing literature only includes descriptive studies of Greek intonation: speech is recorded and then pitch contours are presented. However, not much discussion has taken place – to my knowledge- about the justification of specific intonation patterns (i.e. why a particular phrase is produced with a specific intonation, whether intonation changes according to the intended meaning, and what that intended meaning is).

We find in von Heusinger (1999), in his discussion of intonational meaning, that this is not a limitation of Greek linguistics only, but a general phenomenon due to the fact that more attention has been given to elaborating phonological systems than to the semantics behind intonation. He states that in the development of a phonological theory of intonation, “the separation between a linguistic and a paralinguistic or non-linguistic meaning was essential to establish the proper domain of intonational data. And the contrast in meaning between minimal pairs defined the smallest units of other intonational systems. Thus, many aspects of intonational phonology are based on the assumption that intonational patterns convey meaning. However, there is no agreement on what kind of meaning.” (p. 90). However, the importance of meaning and its tight relation to intonation is known since the 1940s, when Pike (1945, cited in von Heusinger 1999), described intonation as follows: “The intonation meaning is quite the opposite to lexical meaning. Rather than being a stable inherent part of words, it is a temporary addition to their basic form and

meaning. Rather than being carried by permanent consonants and vowels, it is carried by a transitory extrinsic pitch contour. Rather than contributing to the intrinsic meaning of a word, it is merely a shade of meaning added to or superimposed upon that intrinsic lexical meaning, according to the attitude of the speaker. [...] In English, then, an intonation meaning modifies the lexical meaning of a sentence by adding to it the speaker's attitude towards the contents of that sentence.”

It will be shown in this study that the intonation pattern of questions in Greek expresses the speaker's attitude.

1.4 Constructs Underlying the Question

In order to understand what intonation is, it is first important to explain *frequency* and *pitch*.

“*Frequency* is a technical term for an acoustic property of a sound – namely, the number of complete repetitions (cycles) of variations in air pressure occurring in a second.” Ladefoged (1993:186)

“For a male voice, the frequency of the vocal cord vibrations in speech may be between 80 and 200 Hz. A woman’s voice may go up to about 400 Hz. The predominant frequencies in voiceless sounds are usually above 2000 Hz.” (p. 187)

Ladefoged (1993:186) defines *pitch* as “that auditory property [of a sound] that enables a listener to place it on a scale going from low to high, without considering its acoustic properties.”

Intonation = “the variations which take place in the pitch of the voice in connected speech, i.e. the variations in the pitch of the musical note produced by vibration of the vocal cords.” Jones (1960)

1.5 Operationalised Constructs

intonation of questions → variations in the pitch of the voice in the production of questions

Yes/No questions → questions that require either “yes” or “no” as an answer.

wh- questions → questions that do not receive the answer Yes or No, and which start with wh- words (who, what, when, where, why, how, etc.)

1.6 Structure of Dissertation

The remaining body of this dissertation consists of the following sections: Method, Results and Analysis, Discussion of Results, and two Appendices.

Appendix I consists of a short questionnaire which was used to obtain information on the subject’s language background, in order to determine whether the subject could be used as a representative standard-modern-Greek speaker. This form includes questions such as “What is your native language”, and unsatisfactory answers (ex. a language other than Greek, for this particular question) would cause the conductor of the study to reject the subject.

Appendix II includes a list of figures that were used to examine intonation contours. Each figure consists of the question written in Greek, its phonetic transcription (IPA representation), its waveform and pitch contour (as constructed with MATLAB), and a two-tier part, where one tier shows the pitch-accented syllable(s) (and in some cases, some more syllables to help map the intonation

contour to each sentence) and the tone(s), and the other tier shows the pitch accent(s) and the boundary tone(s). The figures are presented in the following groups:

- a) Yes/No positive questions, stressed on the antepenultimate syllable,
- b) Yes/No negative questions, stressed on the antepenultimate syllable,
- c) Yes/No positive questions, stressed on the penultimate syllable,
- d) Yes/No negative questions, stressed on the penultimate syllable,
- e) Yes/No positive questions, stressed on the last syllable,
- f) Yes/No negative questions, stressed on the last syllable,
- g) Wh- questions of simple curiosity,
- h) Wh- questions of predisposition, and
- i) Questions without verb (neither Yes/No nor Wh-).

It should be added that a much bigger number of questions were recorded and had their pitch contours constructed, than those included in the appendix, but they were included in the thesis because it was deemed that the figures included are representative; some questions whose pitch contours were not clear because they were obstructed by noise present during the recording, were also rejected.

In the *Method* section I describe how the data was collected (location, recording means and conditions), the tasks that were used, and why these particular tasks were designed; in addition, information about the participant in the study is included. Any issues regarding the reliability and the validity of the study – particularly the data collection- are also examined in this section.

In section *Results and Analysis* I provide a summary of Appendix II: this includes the questions analysed, their pitch accents, and their boundary tones.

Waveforms and pitch contours are shown only for a few questions which are representative of the contours shown in Appendix II.

In the *Analysis of Results* I elaborate on the pitch contours and discuss the patterns observed. In addition, I discuss possible meanings conveyed by the intonation contours presented.

Finally, the *Discussion of Results* includes an evaluation of the study and its results; in addition, in this section I discuss the consistency of these findings with the findings of related studies, and suggest future steps to expand on this thesis and its results.

Chapter 2

Method

2.1 Data-Collection Method

The subject chosen for this study was of Greek native language. The data collection took place in Thessaloniki (Greece), at the subject's home. This was done in order to help the subject feel comfortable and produce as natural speech as possible, without being influenced by the fact that her speech was recorded and that it would later be analysed. In addition, this environment was quiet, which minimised distractions and the risk of having to repeat the recording, or parts of it, because of noise recorded accidentally.

The conductor of the study had prepared the tasks in advance; the material used in 3 out of the 4 tasks was made up by her, and the 4th task was chosen from a Greek novel. For tasks 1, 2a, and 3, no major preparation was necessary; before the recording, the subject was presented with the material for task 1, and was given a few minutes to read it over; then she was asked to read it aloud in a natural way, as in her

every-day speech, and her speech was recorded. A similar procedure was followed for the remaining tasks. More detailed instructions were provided for task 2b. This task included predisposition questions, which were presented in a list, and thus were out of context; since, as mentioned, context is necessary for the reader to know how to produce predisposition questions, the conductor of the study had to explain how these should be produced, by giving an example, and by enhancing this predisposition in the participant by adding “pretend that you’re angry”, or “assume you are annoyed”, etc. This was not an issue in the passage of task 4, which also includes predisposition questions, since the text provided the necessary context. However, more preparation *time* was needed for task 4 than for the other tasks, not only because this consisted of a rather long passage (572 words), but also because the subject had to understand the context first, and then read the passage in the appropriate tone.

The recording device was a portable computer with audio-recording software (part of the software package MATLAB). This particular recording method was chosen in order to obtain a high-quality recording with minimal noise, and also to facilitate the manipulation and subsequent analysis of the data. After the recording, the data collected was saved in *.wav* format, and later on converted to *.dat* format in order to be analysed.

2.2 Internal and External Reliability and Validity, and Limitations

Internal reliability requires that re-analysis of data by an independent researcher lead them to the same conclusions. This is an issue for all research studies, to a certain extent, since every person may interpret data in a different way. In order to increase

the possibility that data will be interpreted in the same way, the reasoning behind the conclusions drawn was explained in detail. Where the interpretation of results was using prior work as basis, the corresponding references were given. Where the results agreed or disagreed with existing theories, examples were provided to justify the agreement/disagreement.

External reliability concerns the replication of a study by other researchers. To ensure external reliability, a description of the subject was given, as well as a description of recording location and conditions, the recording device, and the software used. In addition, a detailed description of the steps taken in the study was provided; these steps included the data-collection process, the tasks used, and the preparation that took place before the tasks were performed.

External validity entails generalizing findings to a wider population. As mentioned above, research on the intonation of Greek questions has been limited, and there is a great need to conduct studies and form theories that apply to the intonation of Greek as a whole; however, this thesis is a pilot study, where the analysis of speech of only one subject is presented, and thus we can only go so far as to claim that since the language spoken by this subject is *standard Greek*, it is likely that analysis of other subjects will yield similar results; however, since proof that this is the case is not provided in this study, I am not claiming that external validity is ensured. The claim made is that the results are accurate and the conclusions are reasonable for this particular subject and study, and that these can be used as a starting point for further research.

Internal validity is satisfied when variables are properly controlled and results are not affected by other uncontrolled variables. One way to ensure internal validity is by triangulation, which helps to verify the consistency of findings. Triangulation in

this study entailed the use of various tasks with several questions each. Task 1 included yes/no questions presented in a list (independent of one another), while task 3 included yes/no questions in a dialog in order to provide context. Task 2b included wh- predisposition questions presented in a list, while task 4 included such questions in a passage which provided the context necessary to convey that these were indeed predisposition questions. Finally, task 2a included wh- questions of simple curiosity presented in a list, while tasks 3 and 4 included such questions in context. An uncontrolled variable could be the presence of context: the “predisposition” mentioned repeatedly in this study results from context in a written text (and from the speaker’s attitude in speech). If only a list of wh- questions was given to the subject (ex. only task 2a), and the conductor of the study ignored context, then all wh- questions would be produced as if they were of simple curiosity. By using two different tasks, the variable of context is taken into account.

Another uncontrolled variable is continuity: does the intonation contour of a question differ depending on whether another question follows or not? This issue is addressed by using tasks with independent questions (i.e. in a list) in addition to a dialog and a passage.

One limitation in this study is that the speech of only one subject is analysed. Although, according to the researcher, this is a subject representative of modern-Greek native speakers, it is not possible to claim with certainty that results apply to a wide population (which poses a threat to external validity, as already mentioned.)

Another issue is that there is limited existing literature on Greek intonation that this study could rely on. Thus, the literature used as a starting point included work in English intonation, or intonational theories in general.

Finally, it should be noted that bias is an issue as regards the design of the study itself. Burns (2000) points out the role of human sensitivity which may not only influence the findings and the conclusion, but also the design of questionnaires and experiments (p. 473). The researcher believes that the tasks with lists of questions and a passage that she designed are the appropriate medium to gather data for the analysis of intonation in Greek questions. In this particular study, this limitation is minimised because the tasks used to create the corpus were assessed by peer judgment (i.e. the dissertation supervisor).

2.3 Description of Questions and Data Needed

In his overview of intonation of English words and sentences, Ladefoged (1993:111) states that a rising pitch is typical in questions requiring the answer “yes” or “no”, while those questions that begin with *wh*-question words are usually pronounced with a falling intonation. Similarly to many other linguistic rules, this cannot be applied to all languages. It will be shown that Greek does not follow this pattern, and that while some yes/no and *wh*- questions have a falling intonation, others have a rising one. To demonstrate this, a variety of yes/no and *wh*- questions were needed. Because I was not certain of the outcome of this study and what intonation contours Greek questions would be characterised by, I had to include questions of various types: questions where the tonic syllable varied, short (2-4 syllables) and long (greater than 5 syllables) questions, and also try to place myself in different situations and emotional states and think how I – as a native Greek speaker – would produce these questions. From my every-day conversations I realised that the feelings of

exasperation or anger caused me to produce wh- questions in the same way as statements; that is why I chose to include such questions (which I called “predisposition questions”), in addition to wh- questions of simple curiosity.

In their discussion of phonological representations in English, Halle and Clements (1983, p. 11) state that “written English does not provide a fully adequate analogy for phonological representation, since there is much information of relevance to spoken English that is not preserved in the standard writing system. One such type of information is stress. For example, when the word *convert* is used as a verb, main stress falls on the second syllable [...], but when this word is used as a noun, main stress falls on the first syllable [...]” Halle and Clements go on to say that in addition to stress, intonation is another aspect of English systematically omitted in the linear representations of written language. This picture agrees only partly with the Greek language; the stress of a word does not change depending on context. There are some rare cases where words can be pronounced with different stress in order to express different meaning (ex. πορτοκάλι (/pɔrtɔ'kali/) = orange (fruit) and πορτοκαλί (/pɔrtɔka'li/) = orange colour), but a stress mark is used to denote the stress location, thus making the existence of context unnecessary for determining where the word should be stressed. However, although the stress of independent words is well represented phonologically in Greek, the intonation of sets of words forming questions is not adequately represented. A question mark at the end of a set of words implies that this set forms a question, but when a speaker is to read it, there are certain assumptions he makes as to the appropriate intonation. For this reason, an additional notation system must be used to convey the intonation information otherwise assumed by readers or understood by listeners. Autosegmental phonology, according to which speech can be phonologically represented as successive discrete

segments (Goldsmith 1976), provides this capability. Following the autosegmental-phonology notation, words can be represented on two tiers: the phoneme tier and the tonal tier. Halle and Clements (1983, p. 12) note that a strong point of the autosegmental notation is that it permits a one-to-many relationship between units on two tiers (as opposed to a one-to-one relationship), since this is the relationship found in actual languages. Therefore the autosegmental notation is used in this thesis (in the figures included in the main body as well as Appendix II), where the tonal tier includes pitch accents and boundary tones, and the phoneme tier includes the IPA representation of questions.

As regards production of utterances in general, Ladefoged (p. 183) explains that “sounds with the same length can differ from one another in three ways. They can be the same or different in (1) pitch, (2) loudness, and (3) quality. [...] they might have the same vowel quality, but differ in that one was said on a higher pitch than the other or that one of them was spoken more loudly.” This is exactly what is explored in this dissertation; it is shown that a particular question in Greek can be produced in more than one way, i.e. with the same loudness and quality, but different pitch, depending on the context and what the speaker wants to express. Of course it can be produced with different loudness by two speakers or even by the same speaker, but that is of no interest to the present study.

Let us first consider Y/N questions. A particular Y/N question can be produced in three different ways as regards intonation, depending on the *meaning* the speaker wishes to convey, as well as on whether the question is preceded by a statement of related meaning. To illustrate this, let us consider the question “Θέλεις να έρθεις μαζί μου;” (/’θelis na ’erθis ma’zi mu/, literally translated as “Do you want to come with me?”). It can be produced

- with the nucleus on the word *θέλεις* (/ˈθελis/), and the syllable *ζι* (/zi/) produced at a high pitch, in which case it means “would you *like* to come with me?”
- with the nucleus on *μαζί μου* (/maˈzi mu/), where the syllable *ζι* is produced at a low pitch, and *μου* (/mu/) at a higher pitch, in which case it could be translated as “is it with *me* that you want to come?”, or
- with the nucleus on *μαζί μου*, where the syllable *ζι* is produced at a high pitch and *μου* at a lower pitch. In this case the intonation pattern implies that the question is preceded by a statement such as “I want to come with you”, and the question really means “[What?] You want to come with me? [Is that what you said?]”. In other words, the speaker repeats in the form of a question what was said before, in order to confirm what he/she heard.

It should be added that Y/N questions can also be produced in an inverted form, where instead of the usual subject-verb-argument structure, we find the structures argument-verb-subject or verb-argument-subject. When the subject is omitted (implied), the structure of a question can be either argument-verb or verb-argument. Thus, the question “Θέλεις να έρθεις μαζί μου;” presented here can also be produced as “Μαζί μου θέλεις να έρθεις;” (/maˈzi mu ˈθελis na ˈerθis/, equivalent to the English “is it *with me* that you want to come?”). These inverted questions do not present a separate intonation pattern, but fall into the same intonation category as item 1, described above. In other words, they have a different syntactic structure, but not a different intonation, and therefore they are not examined in a separate section in this thesis.

Now let us examine wh-questions. As mentioned previously, these can be produced in different ways in terms of intonation, depending on whether there is predisposition or simple curiosity. In questions of simple curiosity, the listener can understand from

the pitch that a particular phrase is a question. Questions of predisposition, however, are produced with the same intonation as a statement, and thus the listener cannot infer from the pitch that it is a question; instead, the context (i.e. the “wh-” word in the beginning) is what provides that information. This type of question conveys not only lexical meaning, but also the psychological state of the speaker (such as anger, exasperation, annoyance, etc.).

To these two forms we can add a third one, as was done for Y/N questions, which is used for confirmation. To demonstrate these three intonation ways, let’s examine the question “Ποιόν ζητούν;” (/pɔ:n zi'tun/, which in English corresponds to “Whom are they asking for?”), which can be produced:

- with rising intonation when the syllable *τούν* (/tun/) is reached,
- with falling intonation (in which case it sounds like a statement, rather than a question), and
- with and extended production of the phoneme *ού* as /uu/, and where the pitch is raised when the first /u/ is produced, and falls again for the second /u/. In this case the question is to confirm what has been said previously, and it really means “Whom they’re asking for? [Is that what you asked?]”

As mentioned, wh-questions can have different meaning depending on their intonation, and they can express the speaker’s feelings. One such example is the question “Τί θέλεις;” (/ˈti ˈθɛlis/, literally translated as “what do you want?”). When produced with an intonation of simple curiosity, it would be translated as “What would you like?”. When produced with an intonation of predisposition, it would be translated as “What do you want now?” or even “Why are you disturbing me?”.

2.4 *Materials and Procedures*

The corpus of the study consists of sets of Yes/No and Wh- questions, distributed among four tasks. Task 1 includes a set of Y/N positive questions (i.e. which include no negation, and which would be translated in English as “do you..., will you..., have you..., etc.) and a set of negative Y/N questions (which start with “δεν” (/ðɛn/), the equivalent of *isn't, don't you, won't you*, etc.).

Task 2 includes two sets of Wh- questions: the first set has questions that express simple curiosity. The second set includes questions which suggest some predisposition on the speaker's part. Since these questions were presented in a list and not in context, in order for the subject to produce them in the desired manner, it was necessary to clarify what this desired manner was; in other words, the conductor of the study had to specify that these questions must express predisposition, and also had to read a couple of them for demonstration. If clarifications had not been made, these questions could be produced in either way (simple curiosity or predisposition) with higher possibility that they be produced in the former way, due to lack of context which would help to show that predisposition exists.

The third task is a short dialog which includes Y/N as well as Wh-questions. The context is such that the Wh- questions express simple curiosity.

The fourth task is an extract from a Greek novel; it is a monologue, which includes Y/N and Wh- questions. This monologue expresses feelings of exasperation and anger, which make up the predisposition mentioned above, causing the production of Wh – questions with a specific intonation scheme.

Although the first two tasks include enough questions that can be described and lead to basic conclusions about the intonation of questions in Greek, it was

deemed advantageous to also include tasks where context was provided (namely tasks 3 and 4), for the following reasons: it was not known in advance if and how continuity (context) in a text influences the intonation pattern of questions; thus, additional tasks with questions in context were used. Furthermore, task 2 was “guided”: the experimenter had to specify that the first set of questions should be produced as if the speaker was simply curious, and the second set as if the speaker was angry or exasperated. On the other hand, for the third and fourth tasks, no guidance was necessary, since the context itself helped to determine how the questions should be produced. Thus, by using tasks 3 and 4, the speech produced was close to natural.

2.5 Description of Subject

The subject whose speech was recorded is a 29 year-old female, born and raised in Thessaloniki, Greece. Her native language is standard Greek, which is not characterised by any regional accent. The subject’s education is of university level. Because this was a short-term study, information on the subject’s linguistic background was obtained by means of a questionnaire (Appendix I).

Chapter 3

Results and Analysis

Below are tables including the questions analysed and presented in Appendix II, along with their pitch accents and boundary tones. For details on which syllable each pitch accent corresponds to, see Appendix II.

3.1 *Yes/No Questions Stressed on the Penultimate or the Antepenultimate Syllable*

Question	Pitch Accents	Boundary Tone	Positive/ Negative
Καλόγριες θα γίνουμε; /κα'λογριες θα 'γινουμε/	L* H*	L-L%	P
Εγώ φταίω; /ε'γω 'φτεω/	L* H*	L-L%	P
Ξέρεις γιατί με είχε δείρει; /'kseiris ja'ti me 'ice 'ðiri/	L* H*	L-L%	P
Καλά είναι; /κα'λα 'inei/	L* H*	L-L%	P
Θες να πάμε για κανα καφέ μια απ' αυτές τις μέρες; /θες na 'rame ja kana ka'fe mja apa'ftes tis 'meres/	L* H*	L-L%	P
Δεν ξέρεις τι μέρα είναι σήμερα;	L* H*	L-L%	N

/ðeŋ 'gzɛris ti 'mɛra 'inɛ 'simɛra/			
Δε θέλεις να έρθεις μαζί μου; /ðɛ 'θɛlis na 'ɛrθis ma'zi mu/	L*	H*	L-L% N
Δε νομίζεις πως έχω δίκιο; /ðɛ nɔ'mizis pɔs 'ɛxɔ 'ðikjɔ/	L*	H*	L-L% N
Φοβάμαι μη μου φύγει, μη μου την πάρει κάνας άλλος, μην πάει με κάποιον άλλο; /fɔ'vame mi mu 'fiɣi:/ /mi mu tin 'paɾi kanas 'alɔ:s/ /min 'pai me 'kapɔn 'alɔ:/		L* L* L*	H-L% H-L% H-L% P P P
Κατάλαβες; /ka'talaves/		L*	H-L% P
Τρεις μήνες δεν πέρασαν από τότε που ειδοθήκαμε; /tris 'minɛs ðɛm'bɛrasan apɔ 'tɔtɛ pu iðɔ'θikame/	H*	H*	L-L% N
Πέρασες ωραία στη συναλία; /'pɛrasɛs ɔ'rea sti sina'vlia/	H*	L* H*	L-L% P

Table 1: Summary of pitch accents and boundary tones in Y/N questions, where the antepenultimate or the penultimate syllable of the sentence is stressed.

The above table shows that when the pitch accent immediately before the boundary tone (BT) is L*, then the BT is H-L%. When the pitch accent before the BT is H* (preceded by either a L* or a H*), the BT is L-L%.

From this observation we infer that there is a tendency in yes/no questions stressed on the antepenultimate or penultimate syllable to drop the pitch at the end, either sooner via a L-L% boundary tone, or later via a H-L% boundary tone. As regards the pitch accent of yes/no questions stressed on the antepenultimate or penultimate syllable, we see that the pitch accent before the boundary tone can be either H* or L*. Let's examine the differences between these questions to determine if and how this pitch accent is justified. Questions 9 and 10 (“Φοβάμαι μη μου φύγει;” /fɔ'vame mi mu 'fiɣi:/, “Κατάλαβες; /ka'talaves/”) are positive yes/no

questions where the pitch-accented word is the last one in the sentence (in the case of “Κατάλαβες;” the last word happens to be the only word), and it has a L* pitch accent. Their pitch contours are as follows:

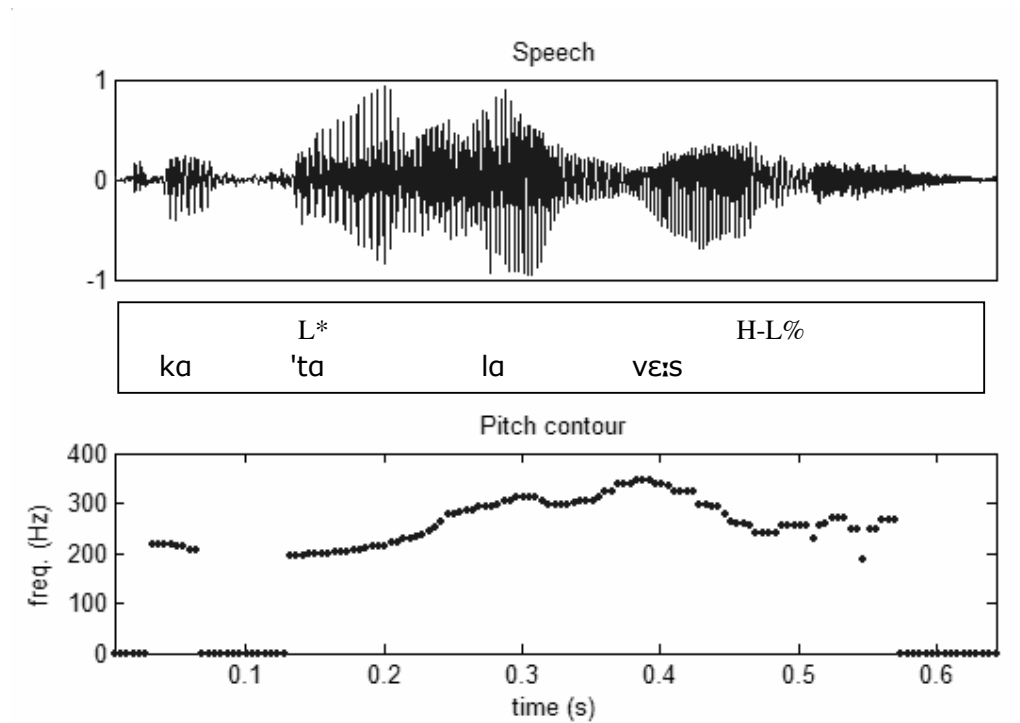


Fig 1. Κατάλαβες;

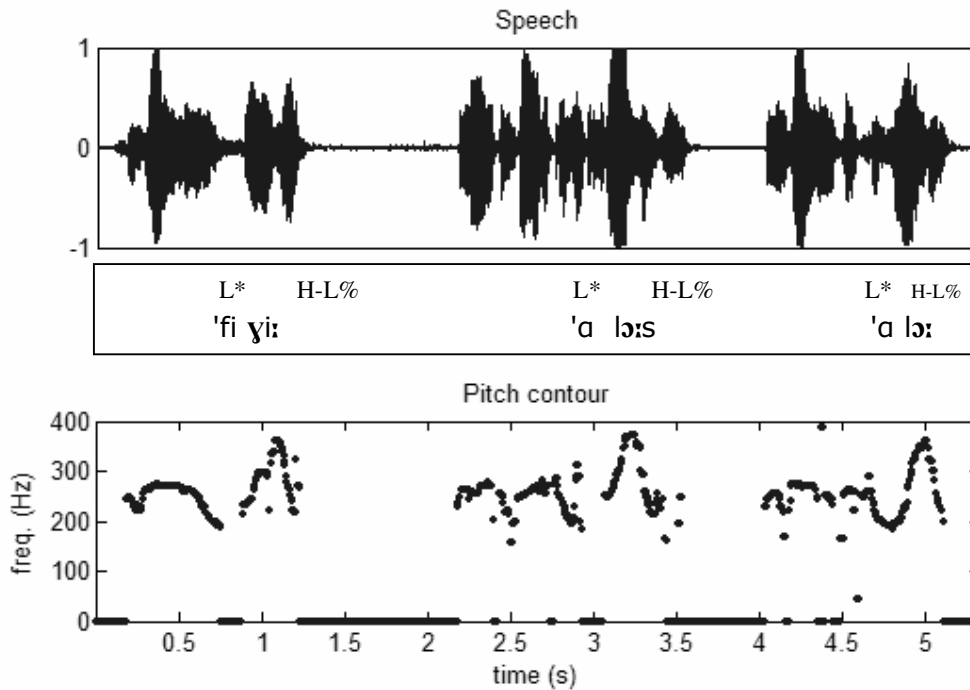


Fig 2. Φοβάμαι μη μου φύγει, μη μου την πάρει κάνας άλλος, μην πάει με κάποιον άλλο;

If we “attach” the pitch accents and the boundary tone we get the sequence L + H + L. In questions 1-8, the nuclear accented word is the one carrying the H* pitch accent, and it is preceded by a L*. This L* is the pitch accent (PA) of the first word. It can be seen that the place of the PA does not depend on what part of speech the word is, since this word is a noun in questions 1 and 2, a verb in questions 3 and 5, an adverb in question 4, and the negative “Δεν” (/ðɛn/) in questions 6, 7, and 8 (the negative yes/no questions). A question that arises when making these observations is the following: Is the L* placed on the first word *because* it is the first word, or is the L*-accented word *placed* first? I claim that it is the second hypothesis that occurs: the speaker places first the word to which he wants to direct the attention. For example, in “Εγώ φταίω;” (/ɛ'ɣɔ 'ftɛɔ/; in English, “Is it me who is at fault?”), where “Εγώ” corresponds to “me”), the speaker obviously wants to put more emphasis to the

word “Εγώ”. Here, if we attach the pitch accents and the boundary tones, we have the sequence L + H + L + L.

Questions 11 and 12 have a different intonation pattern than the above two groups. Q11 (“Τρεις μήνες δεν πέρασαν από τότε που ειδοθήκαμε;” /tris 'mines ðem'berasan apɔ 'tɔtɛ pu iðɔ'θikame/; “Hasn’t it been three months since we saw each other?”) is a negative yes/no question, but the stress is not on “δεν”; the speaker is not asking whether it has or has not been three months; he is asking for confirmation on the time passed (three months), and thus has placed this part of the question in the beginning. This is therefore an *inverted* yes/no negative question, and for that reason it does not fall in the groups mentioned above. The intonation contour for this question is H* followed by a lower PA (but not showing a trough which would make it a L*) which remains almost constant until the final H* is reached. Here the sequence of PA and BT is H + H + L + L. In question 12 (“Πέρασες ωραία στη συναυλία;” /'perases ɔ'rea sti sina'vliɔ/; “Did you have fun at the concert?”) the stress is on the second word (“ωραία” :“fun”), because this is what the speaker wants to direct attention to. It should be noted that this question or similar ones (where a verb is followed by an adverb) are often inverted; thus, in Greek, one would encounter this question equally (if not more) frequently in the form “ωραία πέρασες στη συναυλία;” (/ɔ'rea 'perases sti sina'vliɔ/). The sequence of PAs and BT here is H + L + H + L + L.

In all of the above questions (except the inverted question 11), in the pitch-accent and boundary-tone sequences, we can distinguish the sequence L + H + L occurring consistently.

Let's take the two main groups of these questions, i.e. the groups where most yes/no questions stressed on the antepenultimate or penultimate syllable fall into: questions with PA and BT sequence [L*, H*, L-L%], and [L*, H-L%]. The question that arises here is why we have two different sequences and what determines what sequence will be used in a question. First we will examine the question “Φοβάμαι μη μου φύγει;” (/fɔ'vame mi mu 'fiɣi:/), which has the sequence [L*, H-L%] : why is it not produced with the sequence [L*, H*, L-L%]? In fact, it could be, but that would put a pitch accent on the first word (Φοβάμαι /fɔ'vame/: am I afraid); in other words, the speaker would really be asking: is *this* what I'm feeling or something else? However, in task 4 (where this question appears) the stress is on “μη μου φύγει” (/mi mu 'fiɣi:/, that he will leave me), i.e. the question is “is *that* what I'm afraid of, or something else?”. It can be seen that a particular sequence is not always associated with a question, that different sequences are possible, and that what determines the sequence to be used is *meaning*, and which idea the speaker wants to put the highest importance on.

3.2 Yes/No Questions Stressed on the Last Syllable

Question	Pitch Accents	Boundary Tone	Positive/Negative
Είσαι καλά; /'i:se ka'la:s/	L*+H	H-L%	P
Συμφωνείς; /simfɔ'ni:s/	L*+H	H-L%	P
Είσαστε καλά; /'isaste ka'la:s/	L*+H	H-L%	P
Φταίω εγώ; /'fteɔ e'ɣɔ:/	L*+H	H-L%	P
Μου λες; /mu 'le:s/	L*+H	H-L%	P
Σ'αρέσουν τα γλυκά; /sa'resun ta ɣli'ka:s/	(L*) H*	H-L%	P
Δεν πεινάς; /ðembɪ'na:s/	(L*) H*	H-L%	N
Δε μ'ακούς; /ðema'ku:s/	(L*) H*	H-L%	N
Δηλαδή, δε μ'αγαπάς; /ðila'ði ðe maɣa'pa:s/	(L*) H*	H-L%	N

Table 2: Summary of pitch accents and boundary tones in Y/N questions, where the last syllable of the sentence is stressed

The parentheses imply that the L* pitch accent is not very prominent, i.e. there is no clear trough seen in the intonation contour; instead, in some questions the contour seems rather linear: it starts at a low value and stays low, until the H* pitch accent is reached. However, the L* refers to a stressed syllable which does not have a H* pitch accent, and which influences the shape of the pitch contour.

In all Y/N questions where the last syllable of the sentence is stressed, all questions have a H-L% boundary tone. As regards the pitch accents, the pitch accented syllable before the BT is either L*+H or H*. Where it has been noted as H*,

the vowel is in fact longer than one syllable, and if the pitch accent H*+L had been found in the literature, I would not have hesitated to use it; neither can the vowel be considered two syllables with two distinct pitch accents (since according to the Greek grammar a single vowel cannot constitute more than one syllable). Thus it is marked as H*, and the drop in the pitch is denoted by the H-L% boundary tone.

Here again there is consistency between the pitch-accent and boundary-tone sequences in all questions analysed. The sequence we note is [(L*), H^(*), H-L%], where the first L* is either part of the pitch accent or a pitch accent by itself (in some cases not very prominent, but nevertheless existent).

Now let's take a closer look at the questions with a L*+H pitch accent, versus those with pitch accents L* and H*. The pitch contours of four questions with L*+H PA are shown below:

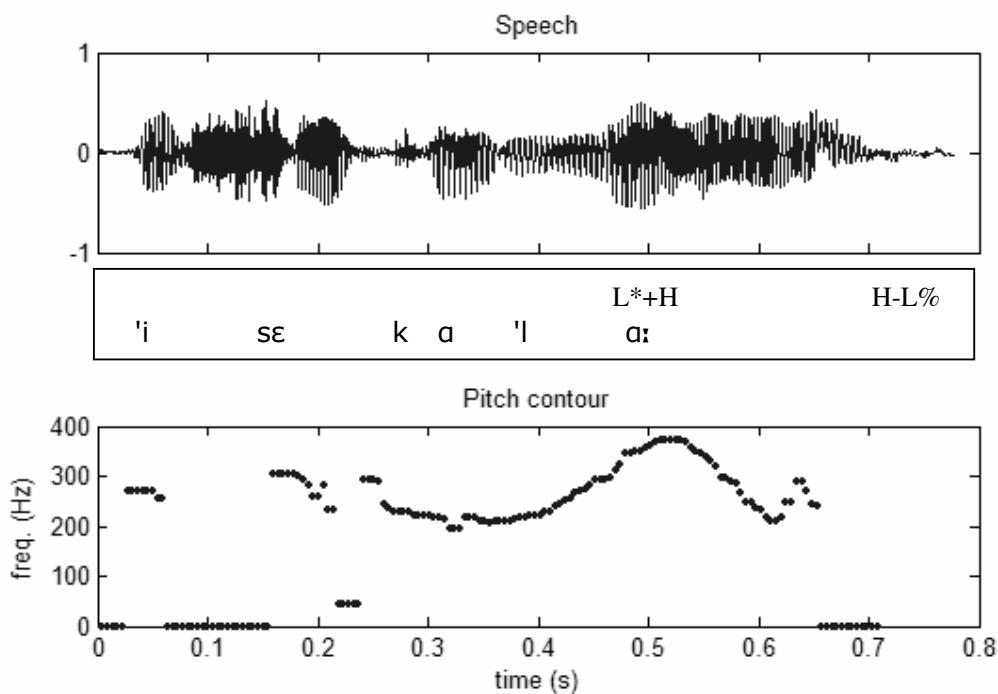


Fig 3: Είσαι καλά;

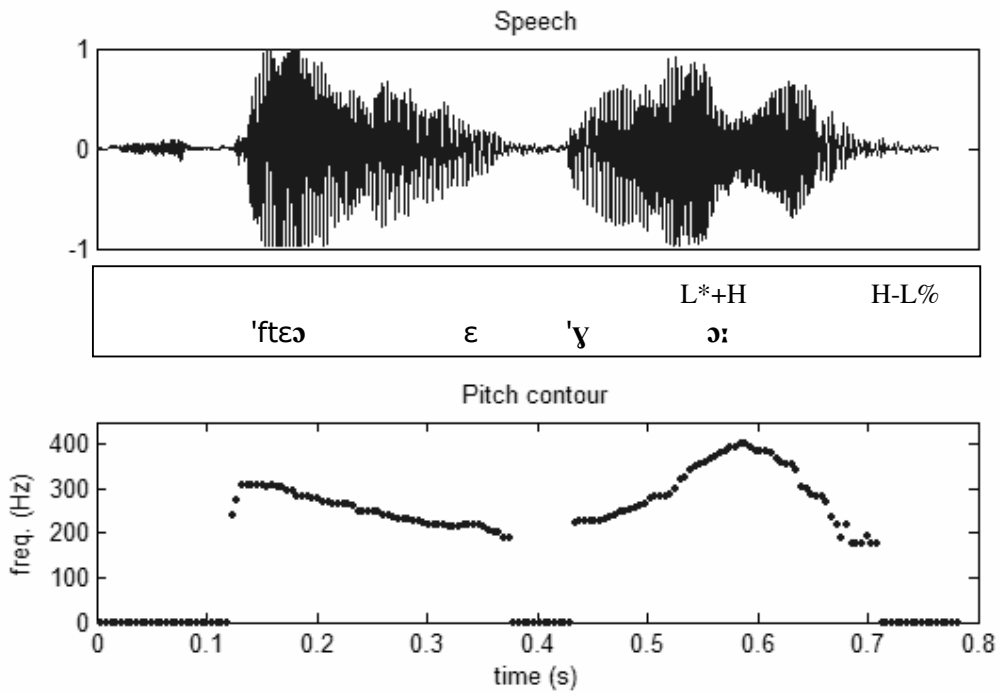


Fig 4: Φταίω εγώ;

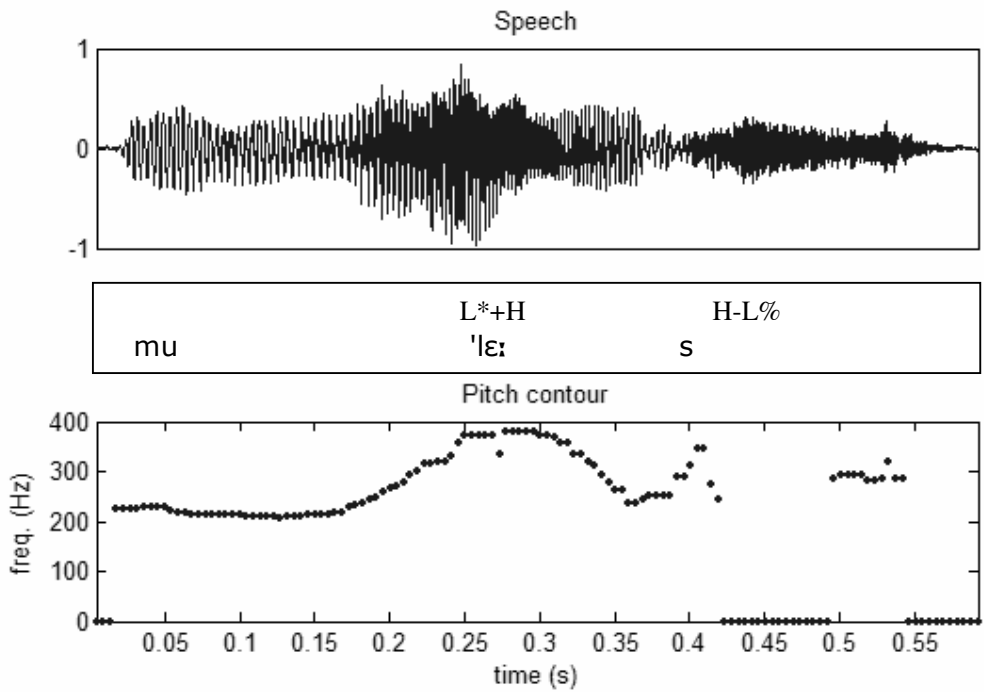


Fig 5: Μου λες;

We consistently observe a contour that drops, rises, and drops again, and this happens while one single vowel is produced. In question “Είσαι καλά;” (/’iɛ ka’la:/) the duration of the vowel is 0.3 seconds (from 0.32 s to 0.62 s) according to figure 3. For the similar question “Είσαστε καλά;” -shown in Appendix II- (where the same verb is in the plural, i.e. addressed to more than one person, and where the second word is identical), the same vowel is produced during 0.4 seconds (from 0.33 s to 0.73 s). In “Συμφωνείς;” /simfɔ’ni:s/ (shown in Appendix II), the duration of “εί” (/i:/) is 0.39 seconds (from 0.33 to 0.72 s on the graph); in “Φταίω εγώ;” /’ftɛɔ ε’ɣɔ:/, shown in figure 4, the stressed /o/ is produced for 0.275 seconds (from 0.425 to 0.7 s)¹; finally, figure 5 shows that the /ɛ:/ in “Μου λες;” /mu ’lɛ:s/ is produced for 0.3 seconds (from 0.06 s to 0.36 s). The long duration of the last syllable was obvious even by merely listening to the recording; very clear perceptually was also the manipulation of the voice from a low to a high pitch, and then back to a low level.

The questions with pitch accents [L*, H*], or [(L*), H*] differ from the above questions in that the first PA is placed on the first word (note that in “Δηλαδή, δε μ’αγαπάς;” /ðila’ði ðɛ maɣa’pa:s/, the first word is considered to be “δε” /ðɛ/, while “Δηλαδή” /ðila’ði/ is merely another intermediate phrase which does not affect the intonation contour of the question); that is because it is on the first word that the speaker wants to put emphasis. In the negative question “Δεν πεινάς;” (/ðɛmbi’na:s/, “Aren’t you hungry?”) it is *aren’t* that the speaker wants to stress. Similarly, in the other yes/no negative questions, a L* is placed on the negative δε(ν)

¹ Note that this question is the inverted form of “Εγώ φταίω;” /ε’ɣɔ ’ftɛɔ/, examined in the previous section.

(/ðɛ/ or /ðɛn/). As regards the positive question “Σ’αρέσουν τα γλυκά;” (/sa'rɛsun ta ɣli'ka:/, rendered in English as “Do you like sweets?”), which is also produced with pitch accents L* and H*, we once again have to look for an explanation of the PAs in the meaning of the question. Why is this question produced with L* and H*? Could it be produced with L*+H and fit in the previous category? If yes, would it have the same meaning? Note that here the duration of the pitch-accented syllable is shorter than in the previous group; in the graphs (see figures 6, 7, and Appendix II) its vowel is shown to extend through less than 0.2 seconds for each question.

Ex.: “Δεν πεινάς;” /ðɛmbi'na:s/ : 0.38 s → 0.55 s = 0.17 s

“Δε μ’ακούς;” /ðɛma'ku:s/ : 0.42 s → 0.56 s = 0.14 s

“Σ’αρέσουν τα γλυκά;” /sa'rɛsun ta ɣli'ka:/ : 0.73 s → 0.88 s = 0.15 s

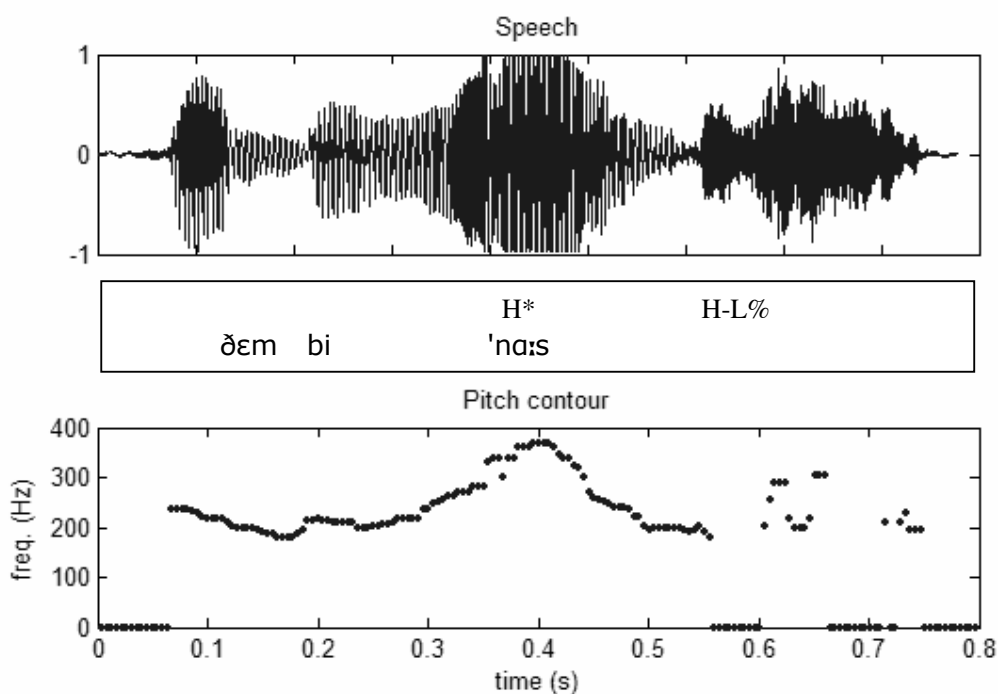


Fig 6: Δεν πεινάς;

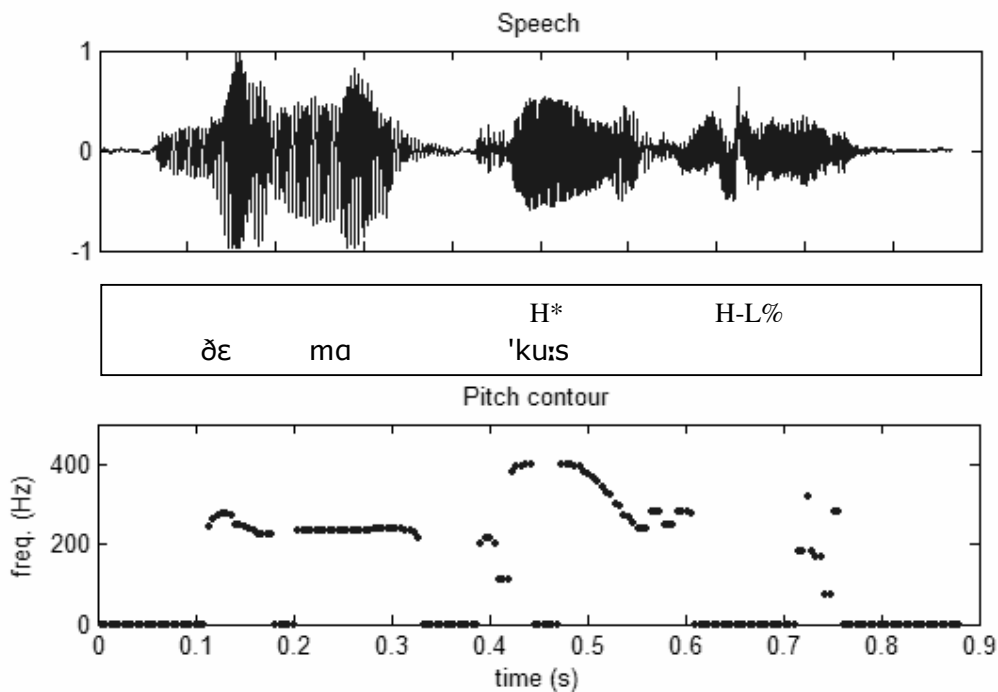


Fig 7: Δε μ' ακούζ;

By placing a PA on the stressed syllable of “αρέσουν” (/ɑ'resun/, corresponding to the English verb “like”) the question could be asked as “Do you like sweets, or don't you?”, whereas if no PA was on “αρέσουν”, and instead a L*+H was on the stressed syllable of “γλυκά” (/ɣli'ka:/, “sweets”), then we could ask this question in the following way: “Is it *sweets* that you like, or something else?”. This shows that more than one pitch-accent choice is possible, but this choice is not random; rather, it is determined by meaning. To confirm this, let us do the reverse exercise, i.e. take one of the questions with PA L*+H and see if it can be produced with different PA. “Είσαι καλά;” (/i:se ka'la:/, “Are you (feeling) well?”) has a L*+H pitch accent on the stressed syllable of “καλά” /ka'la:/, and no PA on “Είσαι” /i:se/. Thus it could be rendered as “Are you feeling *well* or bad?”. A PA on the word “είσαι” would place

importance on this word, which would change the intended meaning of the question to be “*Are* you well, or are you not well?”. This demonstrates that the speaker, knowing –of course- what meaning he/she intends to convey, makes a choice of what intonation to use.

3.3 Wh- Questions of Simple Curiosity

Question	Pitch Accents	Boundary Tone
Ποιό είναι το νούμερό σου; /pjo 'ine to 'nume'ro su/	H*	L-H%
Πόσο είναι τώρα; /'pɔso 'ine 'tora/	H*	L-H%
Γιατί δε με υπάκουσες; /ja'ti ðe me i'pakuses/	H*	L-H%
Γιατί έφυγες; /ja'ti 'efiges/	H*	L-H%
Πόσα χρήματα έχεις πάνω σου; /'pɔsa 'xrimata 'egis 'panɔ su/	H*	L-H%
Πόσην ώρα έχεις που περιμένεις; /'pɔsin 'ɔra 'egis pu peri'menis/	H*	L-H%
Πόσο συχνά βγαίνεις έξω; /'pɔso si'xna 'vɣenis 'eksɔ/	H*	L-H%
Πότε θα φάμε; /'pɔte θa 'fame/	H*	L-H%
Πού θα ήθελες να σπουδάσεις; /'pu θa 'itheles na spu'dasis/	H*	L-H%
Πώς προφέρεται τ' όνομά σου; 'pɔs pɔ'ferete 'tonɔ'ma su/	H*	L-H%
Πώς σε λένε; /'pɔse'lene/	H*	L-H%
Τι θέλεις; /'ti 'θelis/	H*	L-H%
Πόσο μ' αγαπάς; /'pɔso maga'pɔs/	H*	L-H%
Πότε ήρθες στην Αμερική; /'pɔte 'irθes stin ameri'ki/	H*	L-H%

Table 3: Summary of pitch accents and boundary tones in Wh- questions of simple curiosity.

Table 3 shows that in wh- questions of simple curiosity the PA and BT sequence is always [H*, L-H%]. In all of these questions there is only one pitch-accented word, and that is the wh- word. This observation agrees with Arvaniti (2001), who provides

an example of a wh- question and states that “the initial peak [in the intonation contour] must be a pitch accent [...] since it coincides with the stressed vowel of the wh-word, and the undisputed intuition of the native speakers is that in these questions the focus is on the wh-word. Consequently the wh-word becomes the nucleus of the intonation.” (p. 2).

As regards the boundary tone, it is always L-H%, as mentioned above. Whether it is the last, the penultimate, or the antepenultimate syllable that is stressed, does not affect the boundary tone. Figures 8, 9, and 10 show the pitch contours of some wh- questions of simple curiosity stressed on the penultimate or antepenultimate syllable, while figures 11 and 12 show questions of this type stressed on the last syllable.

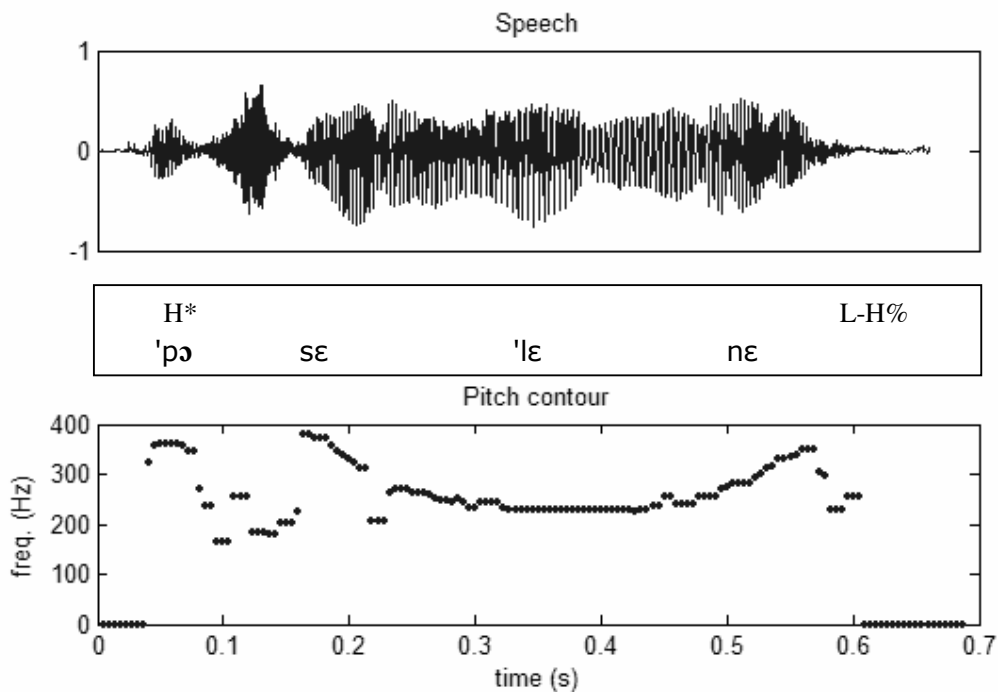


Fig 8: Πώς σε λένε;

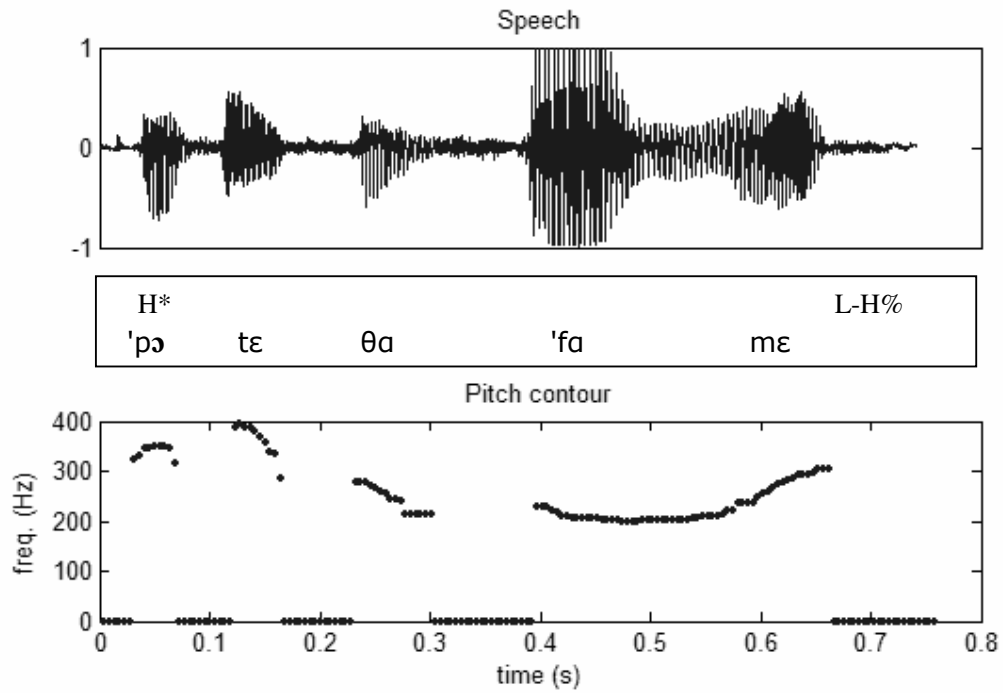


Fig 9: Πότε θα φάμε;

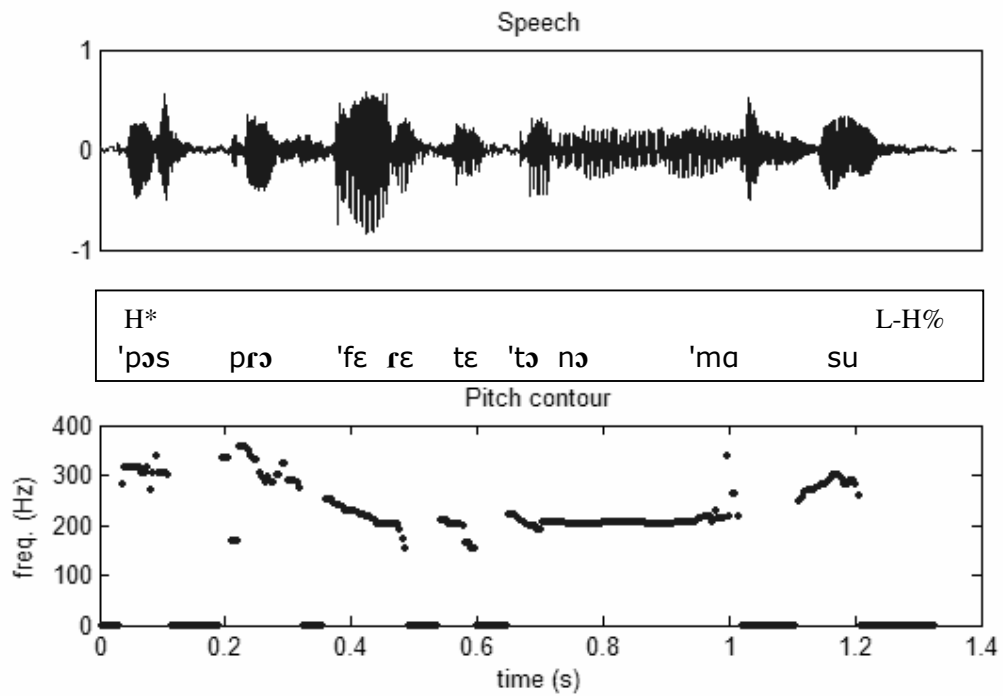


Fig 10: Πώς προφέρεται τ'όνομά σου;

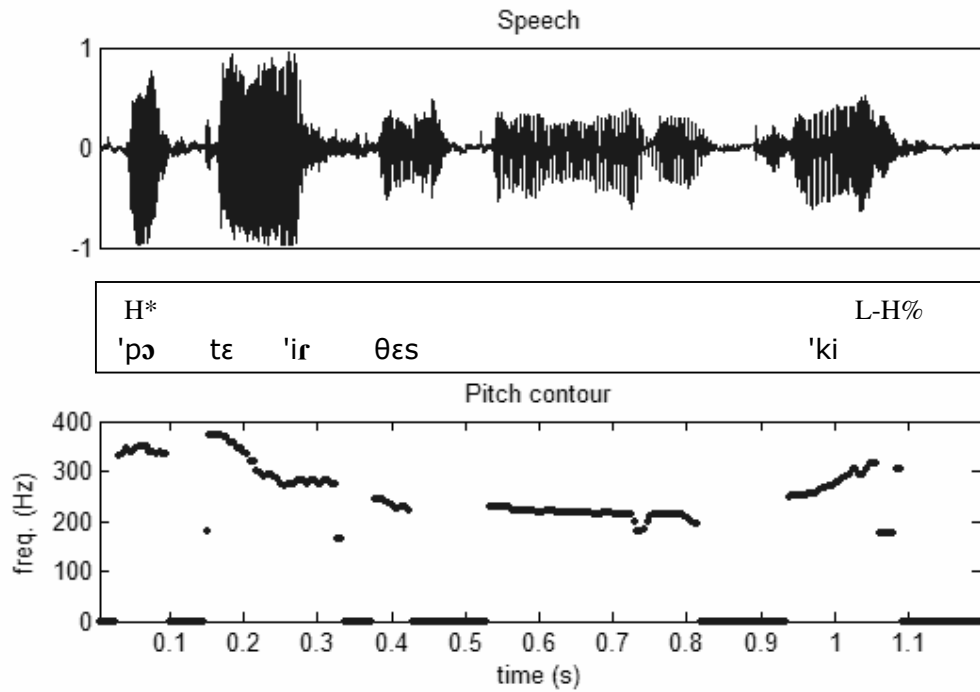


Fig 11: Πότε ήρθες στην Αμερική;

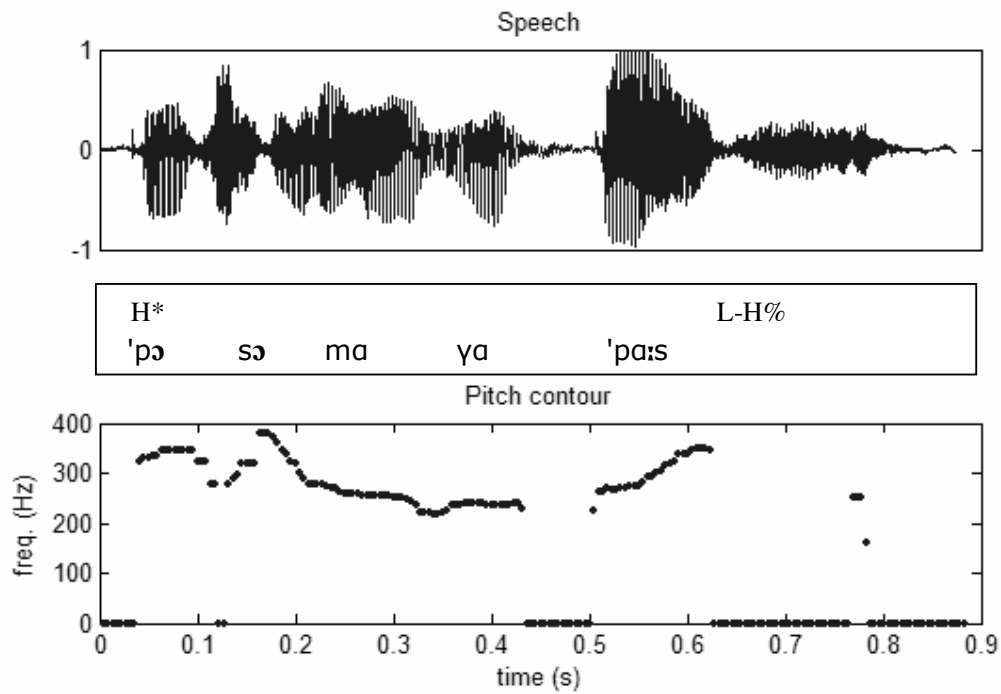


Fig 12: Πόσο μ'αγαπάς;

We infer from the above observations and the graphs that in Greek wh- questions of curiosity there is a tendency to drop the pitch on the stressed syllables before the final rise, and gradually raise it until the boundary tone is reached. In those questions stressed on the penultimate or antepenultimate syllable, this syllable is already at a lower pitch than the H* pitch accent and the H-H% boundary tone. For example, in the question “Πώς σε λένε;” /'pɔsɛ'lenɛ/, shown in figure 8, the stressed syllable (the penultimate syllable of the question) of “λένε” (/lenɛ/) is dropped to ~240 Hz, and is gradually raised until it reaches ~350 Hz. A similar pattern is observed for the other questions stressed on the penultimate or antepenultimate syllable. In questions where the last syllable is stressed, this syllable is not suddenly raised to a high pitch accent, but tends to follow smoothly from the adjacent pitch and raise to a higher value, which is denoted by the L-H% boundary tone. It should be added that this type of question (wh- question of simple curiosity) is the only case (perhaps with the exception of elliptical questions without verb –briefly described below) where the pitch rises and ends in a H% boundary tone. This observation does not agree with Ladefoged’s (1993) statement (mentioned previously) about English, where wh- questions are usually pronounced with a falling intonation.

3.4 Wh- Questions of Predisposition

Question	Pitch Accents	Boundary Tone
Γιατί δεν παίρνεις μια απ' τις χιλιάδες που κυκλοφορούν; /ja'ti ðe'mbɛrnis mɪ̃na ap tis çi'laðes pu kikiɫɔ'run/	H*	L-L%
Τι σε νοιάζει αν οι άλλοι με κοιτάνε; /ti se 'ɲazi an i 'ali me ki'tane/	H*	L-L%
(Ε, τώρα) τι να σου πώ; /ɛ 'tɔra ti na su pɔ/	H*	L-L%
Γιατί όλες οι ατυχίες συμβαίνουν σε μένα; /ja'ti 'ɔles i ati'çies simɻ'venun se 'mena/	H*	L-L%
(Με τόση δουλειά) πότε να προλάβω να κοιμηθώ; /me 'tɔsi ðu'la 'pɔte na pɔ'lanɔ na kimi'tɔ/	H*	L-L%
Ποιός είναι πάλι; /pɔs 'ine 'pali/	H*	L-L%
Ποιός χτυπάει τέτοια ώρα; /pɔs xti'pai 'tɛtja 'ɔra/	H*	L-L%
Πώς να το κάνουμε; /pɔs na tɔ 'kanume/	H*	L-L%

Table 4: Summary of pitch accents and boundary tones in Wh- questions of predisposition.

It is clear from the above table that all predisposition questions are produced with the same intonation. The pitch-accented word is always the wh- word, and it carries a H* pitch accent. Note that in the above table the parentheses are used to denote intermediate phrases, which do not affect the intonation contour of the wh- questions. All the boundary tones in these questions are also the same: L-L%. This reinforces the claim that wh- questions of predisposition are produced like statements. A mere look at the intonation contour in the following figures would not show that the sentences represented are questions.

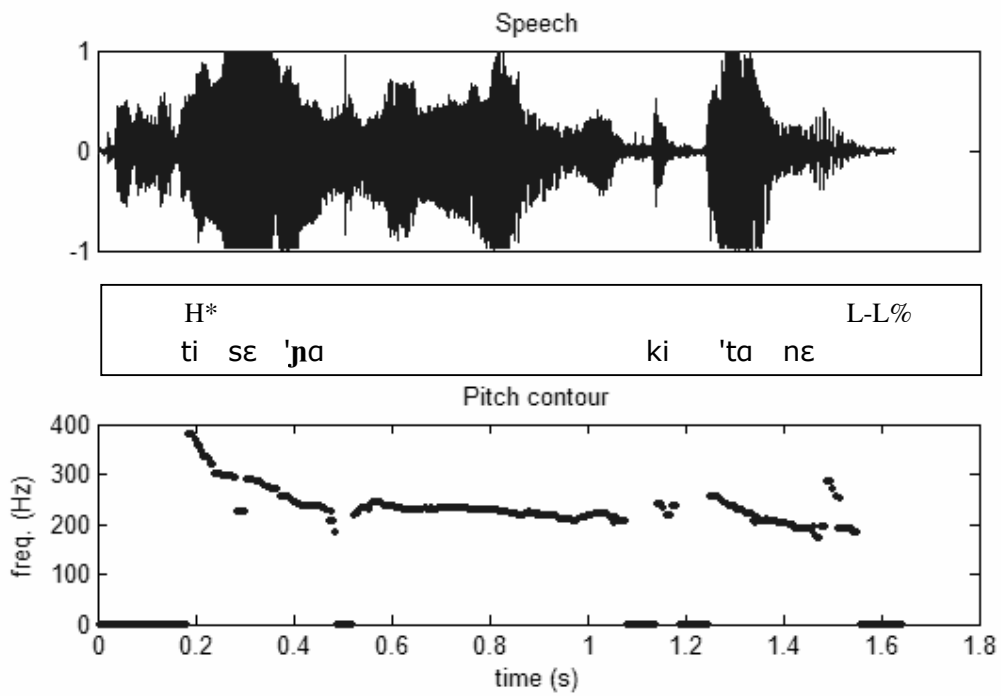


Fig 13: Τι σε νοιάζει αν οι άλλοι με κοιτάνε;

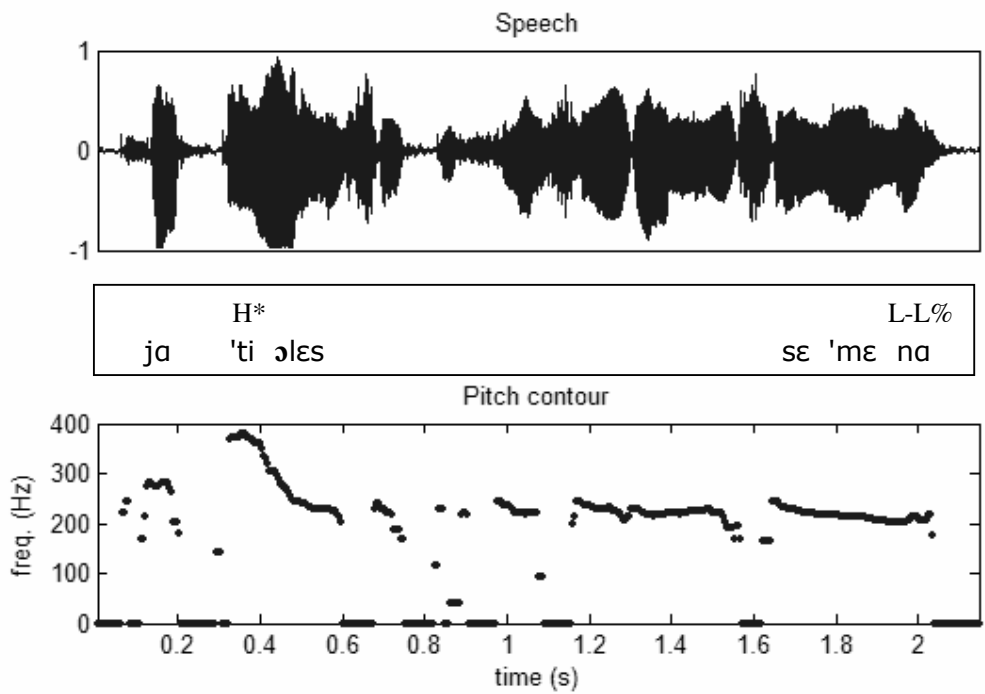


Fig 14: Γιατί όλες οι ατυχίες συμβαίνουν σε μένα;

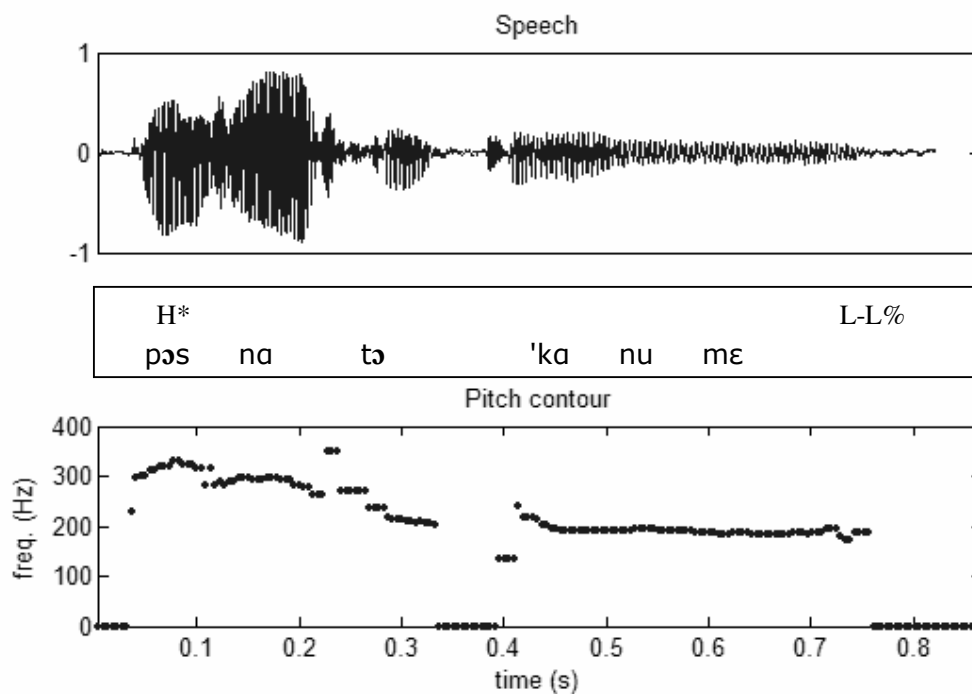


Fig 15: Πώς να το κάνουμε;

The pitch in these questions is shown to be high for the wh- word, and then drop to a lower value and remain constant until the L-L% boundary tone is reached.

It should be added that the intended meaning in these questions determines not only the overall pitch contour, but also the *intensity* of the pitch-accented syllable (i.e. the value of the frequency at which the syllable is produced). As an example we can consider the above three figures, where the questions “Γιατί όλες οι ατυχίες συμβαίνουν σε μένα;” (/ja'ti 'ɔles i ati'çies simɣ'venuŋ se 'mɛna/) and “Τι σε νοιάζει αν οι άλλοι με κοιτάνε;” (/ti se 'ɲazi an i 'ali me ki'tanɛ/) have the pitch-accented syllable at approximately 400 Hz, while the question “Πώς να το κάνουμε;” (/pɔs na to 'kanume/) has the pitch-accented syllable at ~325 Hz. This difference is not random. Although it is undeniable that this frequency value can differ from

speaker to speaker, these questions were produced by the same subject. One must look at the intended meaning of these questions to find a justification for this frequency difference. The first two questions (rendered in English as “*What* do you care if others look at me?” and “*Why* do all bad things happen to me?”) express a feeling of *exasperation*; they are questions which imply that the asker is desperately looking for the answer to something inexplicable. The question “Πώς να το κάνουμε;” (“What can you (we) do?”), which follows the intermediate phrase “Έτσι είναι” (/’etsi ’inε/, “That’s the way it is”), is also a predisposition question, but it expresses a feeling not as strong as the two other questions; rather, it is produced with a feeling of resignation. An examination of more such questions (in Appendix II) leads to the conclusion that the intensity of the *feeling* expressed (which is an aspect of what we generally call *intended meaning*) is proportional to the pitch value of the pitch-accented word.

3.5 Other Question Types

Finally there are two more categories of questions that should be mentioned, although it is not within the scope of this thesis to analyse them in detail. The first category includes *confirmation questions*, which are repetitions of utterances produced previously. In other words, a confirmation question is one that we use to ensure that we heard or understood correctly. To demonstrate this category, a simple example in English is:

- “What do you want?” - question of simple curiosity or predisposition
- “What do I want?” - confirmation question

Unfortunately when the tasks were designed, this type of question had not been considered, and thus such questions are not found in the corpus of this study.

The last category is elliptical questions without verb; these are usually short and have a noun (often a proper name) as the nuclear accented word. Their purpose is most often to inquire about the status of someone or something. Two examples are found in tasks 3 and 4, and are included in the following table:

Question	Pitch Accents	Boundary Tone
Η δική σου η κορούλα; /i ði'ki su i kɔ'rula/	H*	H-H%
Αμ ο άλλος; /amɔ 'alɔ:s/	H*	H-H%

Table 5: Summary of pitch accents and boundary tones in elliptical questions with no verb.

In task 3, where the question “Η δική σου η κορούλα;” (/i ði'ki su i kɔ'ruɫa/, “And your daughter?”) is found, we find another question before it: “Πώς είναι τα παιδιά;” (“How are the children?”), as well as immediately after it: “Καλά είναι;” (“Is she well?”); thus it is clearly implied that this question fits in that context and is used to inquire on the status of someone.

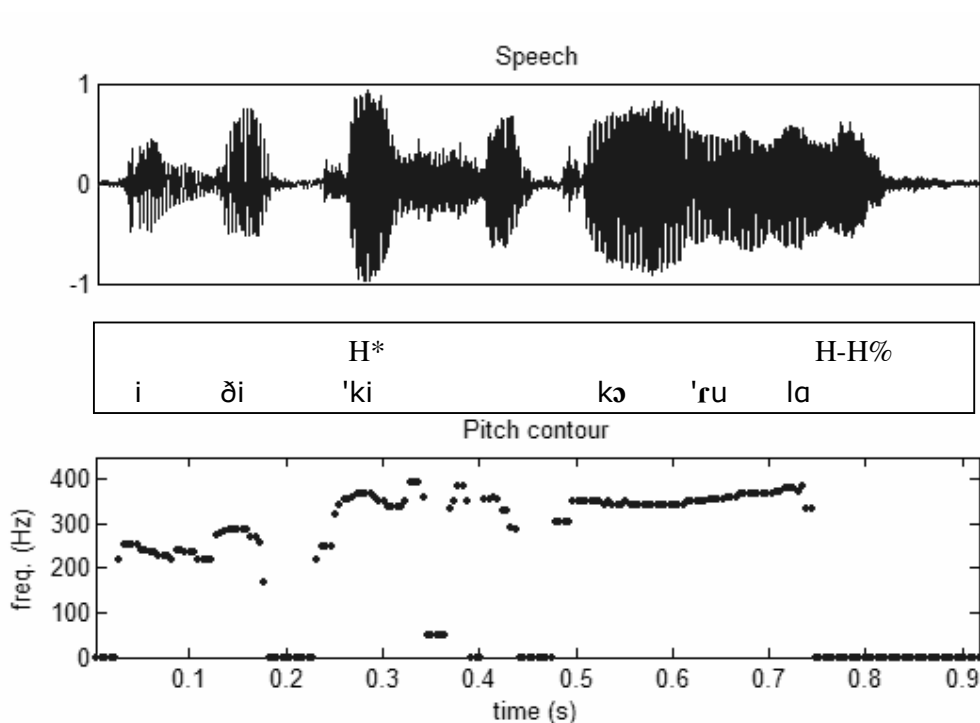


Fig 16: Η δική σου η κορούλα;

The above figure shows that the pitch rises until the H-H% boundary tone is reached. There does not seem to be a clear peak or trough (the contour is even flatter in the question “Αμ ο άλλος;” (/amɔ 'alɔ:s/, found in Appendix II) which belongs to the same category). Since it is difficult to determine solely from the pitch contour what the accented word is, the H* pitch accents in these questions were confirmed perceptually (i.e. by listening to the recordings).

Chapter 4

Discussion

4.1 Summary of Findings

In order to examine the intonation pattern of Greek questions, we distinguished the following categories: Yes/No positive and negative questions stressed on the antepenultimate syllable, on the penultimate syllable, and on the last syllable, and wh-questions of simple curiosity and predisposition. For each type of question the pitch accents and boundary tones were determined by observing the pitch contours, and were confirmed perceptually. The observations made were as follows:

In Yes/No positive and negative questions that are stressed on either the penultimate or the antepenultimate syllable, the pitch-accent and boundary-tone sequence is [L*, H*, L-L%] or [L*, H-L%]. There is a tendency to drop the pitch either after the H* pitch accent (resulting in a L-L% boundary tone), or via the H-L% boundary tone. The placement of the pitch accent depends on which part of the question the speaker wants to emphasise.

In Yes/No positive and negative questions stressed on the last syllable, the PA and BT sequence is either [L*+H, H-L%] or [(L*), H*, H-L%]. All of these questions have the same boundary tone, and the type of pitch accent depends on the part of the question the speaker wants to place importance on. It was also observed that when the last syllable is produced, the contour drops, rises, and drops again, and that the duration of the vowel of this syllable is long (compared to other pitch-accented syllables or stressed syllables).

Wh- questions of simple curiosity always have a H* pitch accent (associated with the only pitch-accented word in the question, which is the wh- word) and a L-H% boundary tone. This boundary tone reflects that these questions are always produced with a rising intonation.

Wh- questions of predisposition on the other hand are always produced with falling intonation. They also have one H* pitch accent (associated with the wh-word), but the boundary tone is L-L%. In the examination of these questions it was also found that the pitch is proportional to the intensity of the feeling that is expressed during their production.

In all of the above questions the importance of intended meaning and its influence on the pitch contours was demonstrated. Finally, although syntactic structure is beyond the scope of this thesis, it was briefly shown that intended meaning (such as emphasis) may also affect the syntax of a Y/N question, i.e. the placement of the pitch-accented word in the question.

4.2 Agreement with Previous Research

The role of *intended meaning* in the intonation contour is evident from the above results. And since questions reflect the speaker's attitude or intended meaning, it is the speaker who decides on the intonation to be used, or more specifically, on which part of the question the focus is. This agrees with what Bolinger has explained in his article "*Accent is Predictable (if You are a Mind-Reader)*" (1972, cited in von Heusinger 1999, p. 86): "The distribution of sentence accents is not determined by syntactic structure but by semantic and emotional highlighting." It is the speaker who gives intonational prominence to a particular expression (or word) in his speech that he considers most informative.

Furthermore, as regards intonational meaning, i.e. the relation between the meaning one wishes to convey through a specific intonation manner, these results were compared against the holistic view of intonation and the compositional view. According to the holistic view, (explained in Bolinger 1964, Liberman 1975, Liberman & Sag 1974, cited in von Heusinger 1999), "the intonation contour expresses one function, which cannot be decomposed into meaningful elements. If the contour is composed of smaller units like the movements in the British School or the level tones in the American structuralist view, these units have only phonemic status. In other words, the meaning of the contour cannot be composed from the meaning of its parts, since phonemes do not contribute to meaning." (von Heusinger 1999, p. 90). The holistic view opposes the compositional view; according to the latter, the intonation contour is composed of smaller units that carry meaning: the abstract tones, and can be derived from the meaning of these units.

Let's examine briefly whether these theories apply to Greek questions.

Compositional view: Can the contour be divided into smaller parts that carry

meaning, and if yes, what are these parts? It should be clear from the above analysis that these parts cannot be individual words; even in wh-questions, the wh- word, which denotes a question when placed at the beginning of an utterance, cannot give any definitive information about the intonation; in other words, it is not clear, as shown above, whether the question is one of simple curiosity, or it is produced with a pitch similar to that of a statement. A similar claim can be made about punctuation marks, such as question marks.

However, one should go beyond the syntactic or phonemic units, since intonational meaning is examined, and look for meaningful units in tiers other than the phoneme tier. (This is what the compositional view dictates, since it considers tones to be the meaningful units that make up the intonation contour.) Let us look at the question “Ποιόν θέλουν πάλι;” (/pɔːn 'θɛlun 'pali/, “Whom do they want again?”). It is not clear what the meaningful elements of this question would be, since it is not possible to infer the intonation contour or draw conclusions about the intonational meaning by looking at individual tones. For example, by knowing the pitch accent of the wh- word, we cannot infer the rest of the pitch accents or the boundary tone, and therefore cannot determine whether it is a predisposition question or a simple-curiosity question.

Holistic view: According to this view, the intonation contour is one indivisible unit which reflects the intonational meaning. Let us examine the same question as before; if it is a predisposition question, then it is produced with the same intonation as a statement; thus, if the wh-word was replaced with another word, forming -for example- the utterance “Αυτόν θέλουν πάλι.” (/a'ftɔːn 'θɛlun 'pali/, “it’s him they want again”), no difference would be seen in the tonal tier or the pitch contour. As a result, it would not be possible to know with certainty whether it is a statement or a

predisposition question. However, if we know from the phoneme tier that there is a wh-word or a question mark in the utterance, it is easy to make that distinction. The holistic view therefore applies to Greek questions, but only if certain syntactic information is also present.

The words *feeling*, *predisposition*, as well as *importance/emphasis* (placed on a word) were used repeatedly throughout this thesis. These notions have been mentioned by Halliday (1970) in his discussion of tones : “In general, tone expresses speech function, while tonic prominence expresses the structure of information. That is to say, the choice of tone – tone 1, tone 2, etc.- relates to mood (kinds of statement, question, etc.), modality (assessment of the possibility, probability, validity, relevance, etc. of what is being said), and key (speaker’s attitude, of politeness, assertiveness, indifference, etc.); in other words all the factors which go to make up the relation between the speaker and the hearer, in a speech situation.” (p. 22). Although Halliday made these remarks for expressions in general, and not specifically for questions, it is obvious that these remarks agree with the findings of this thesis, i.e. apply to the production of questions in the Greek language.

The results of this study also showed that that the intensity of the feeling expressed is proportional to the pitch value of the pitch accented word. A similar observation was made by Davitz (1964, cited in Pereira 2000), who found that utterances produced with emotions of similar arousal level have a similar pitch. The emotions of *anger* and *despair* mentioned by Davitz were present in the production of questions described in this thesis as well (in particular, wh- questions of predisposition). Furthermore, in an effort to relate emotion ratings (cold and hot anger, happiness, sadness, or neutrality) to acoustic analysis, Pereira (2000) also found that “emotions with a similar level of arousal, and sometimes level of power,

share acoustic characteristics in terms of F0 range and mean, and particularly intensity mean.”

Finally, an interesting observation made *during* the recording was the body language of the participant. Von Heusinger (1999) mentions that speech can be coordinated with gestural features like nods, hand gestures or eye contact; he goes on to reference Levy and McNeill (1992) who have shown that hand movements often coincide with accented syllables. This happened with the subject of this study. In particular, hand movements were expressive and prominent during wh-questions, both of simple curiosity and of predisposition. The type of gesture was different in the two types, but consistent among most questions in each type). These gestures do not *affect* intonation, but –similarly to intonation- they are the *result* of a particular feeling, mood, or predisposition.

4.3 Further Research

Since there was only one participant in this study, the next step planned is to conduct a similar study with more subjects. That will provide a more solid support for the findings presented here, and will allow us to use statistical analysis in order to be able to generalise findings to a wider population of native Greek speakers.

Another question that arises from this study is the influence of Greek intonation patterns to foreign-language acquisition by native Greek speakers. A frequent manifestation of foreign accent in native Greek speakers of English is intonation of questions. Non-native-like production of questions in English may be the effect of L1 transfer, i.e. native Greek speakers tend to produce questions in English by using the Greek intonation system. In order to examine this hypothesis, it is necessary to make a comparison of the intonation pattern of questions between English and Greek. Since the research conducted in the field of Greek intonation of questions has been limited, a substantial comparison has not been feasible. Thus, this study, which provides a preliminary descriptive analysis of Greek-question-intonation patterns, can be used as a first step for more detailed research, and serve as a framework for future comparisons with other languages such as English.

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Appendix I

Linguistic-background questionnaire

1. What is your native language?

Greek.

2. Which city of Greece were you born in? Which city were you raised in?

I was born and raised in Thessaloniki.

3. Have you ever lived abroad (for more than 3 months)?

No.

4. What is the language you speak at home?

Greek only.

5. What was the language you spoke at school?

Greek. French was taught as a foreign language in high school.

6. Did you learn Greek by formal instruction (ex. in a classroom)?

I learned it from my parents and in school.

7. Were your teachers native speakers of Greek?

Yes.

8. What is your educational level?

University (4 years).

9. Do you speak other languages? If yes, which?

English and French.

10. When did you start to learn foreign languages? (At what age, at what educational level?)

English: 5 years old, and French: 12 years old.

11. What is your work language?

Greek.

12. Which language do you think in when you speak Greek?

Greek.

Appendix II

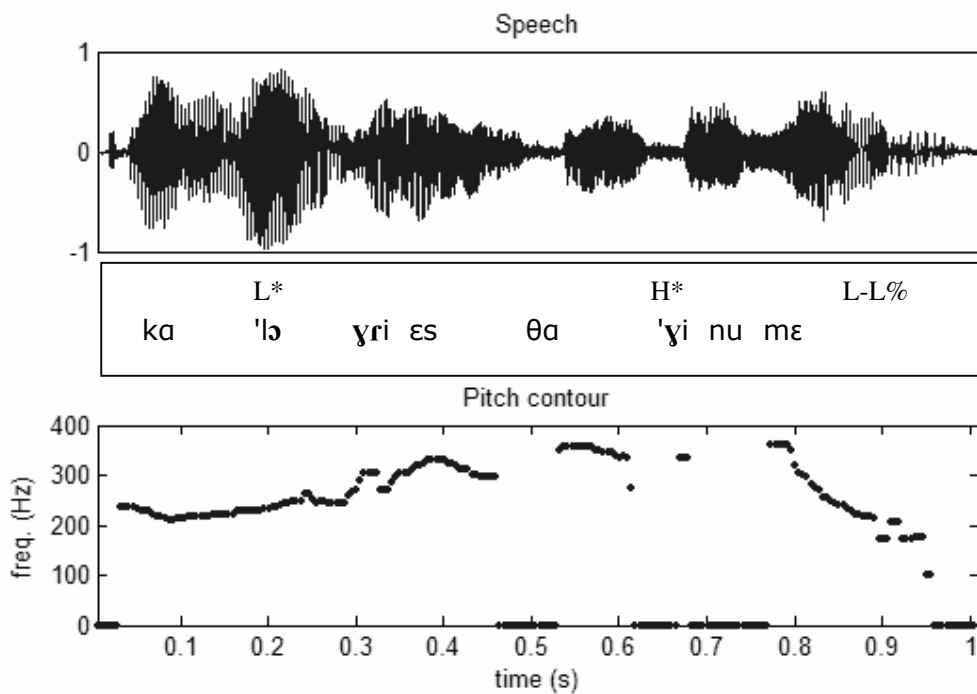
Figures

The figures below are categorised according to which the last stressed syllable in the sentence is (last, penultimate, antepenultimate). Shown in parenthesis next to each question is the number of the task where these appear.

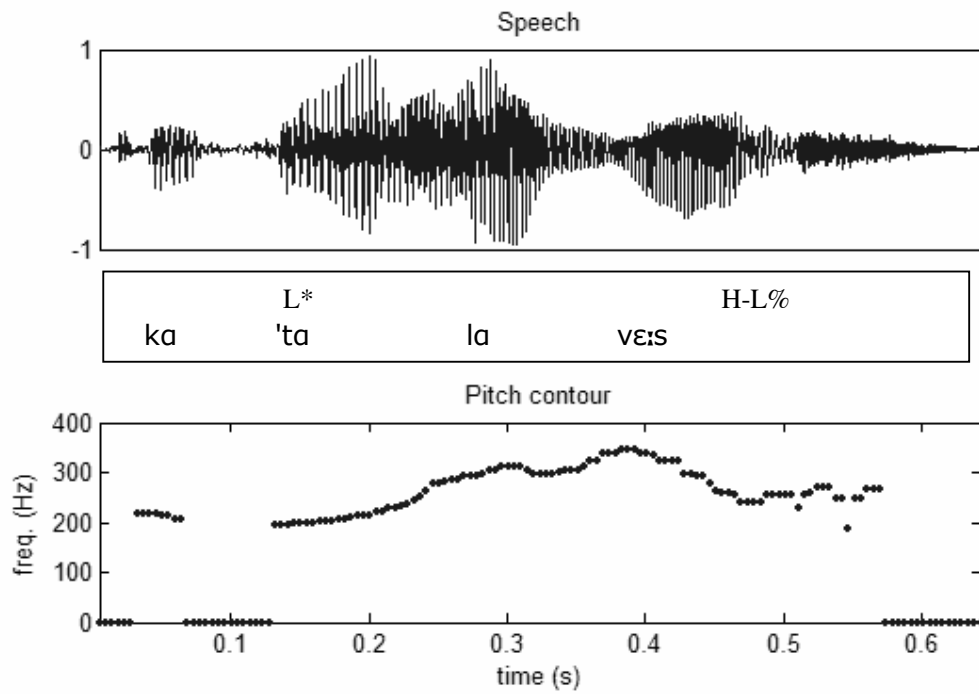
Y/N positive questions, stressed on antepenultimate syllable :

Καλόγριες θα γίνουμε; (4)

/ka'loɣriɛs θa 'ɣi nu me/



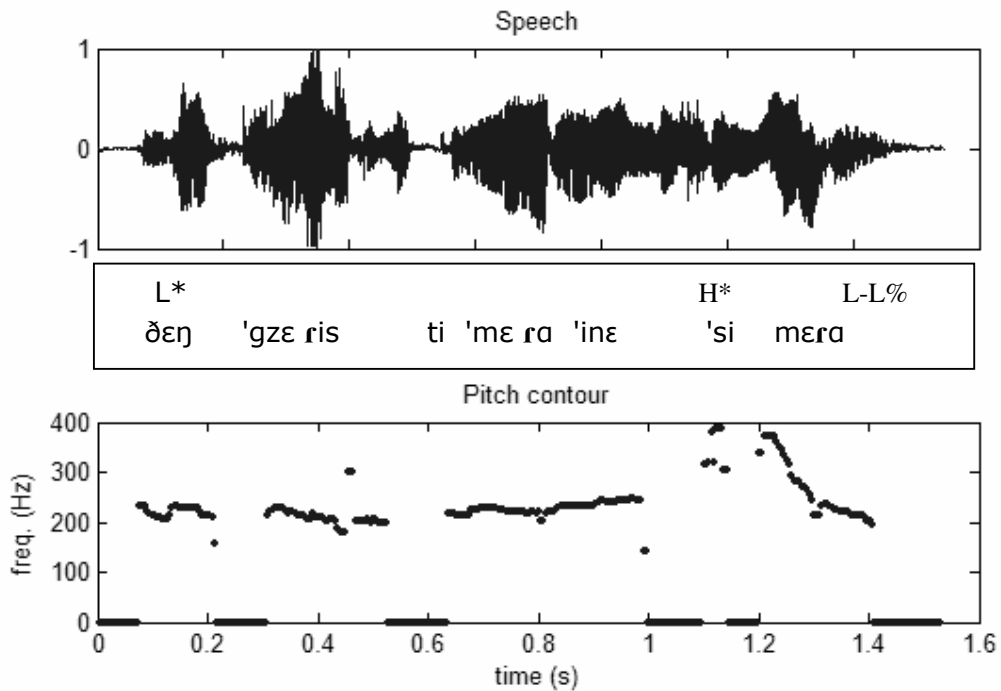
Κατάλαβες; (4)
/ka'talaves/



Y/N negative questions, stressed on antepenultimate syllable :

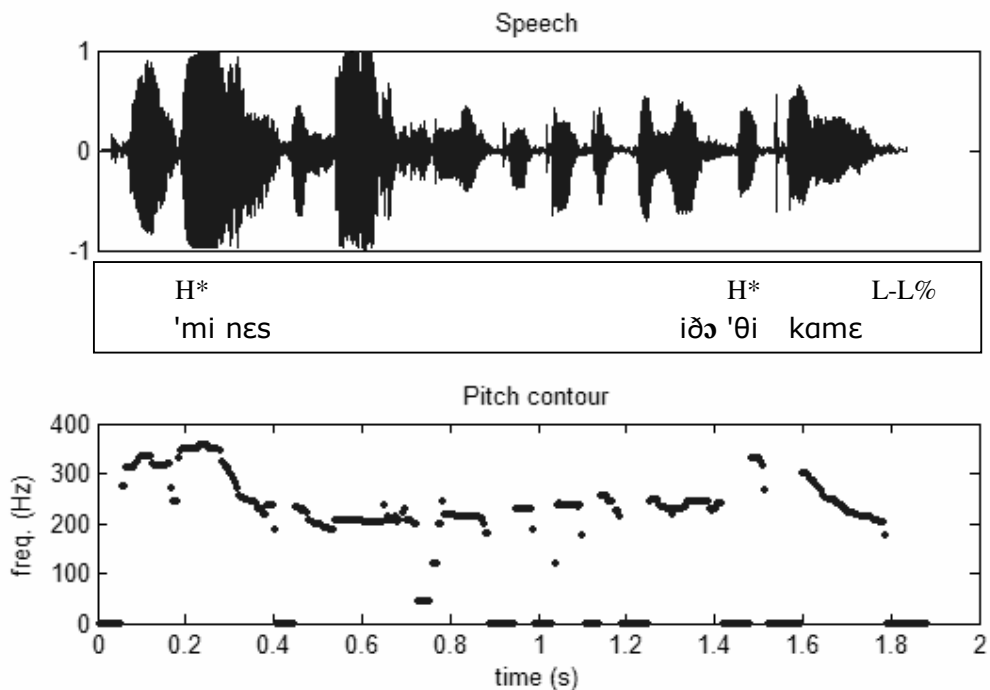
Δεν ξέρεις τι μέρα είναι σήμερα; (1)

/ðɛŋ 'gzeɾis ti 'mɛɾa 'inɛ 'si mɛɾa/



Τρεις μήνες δεν πέρασαν από τότε που ειδοθήκαμε; (3)

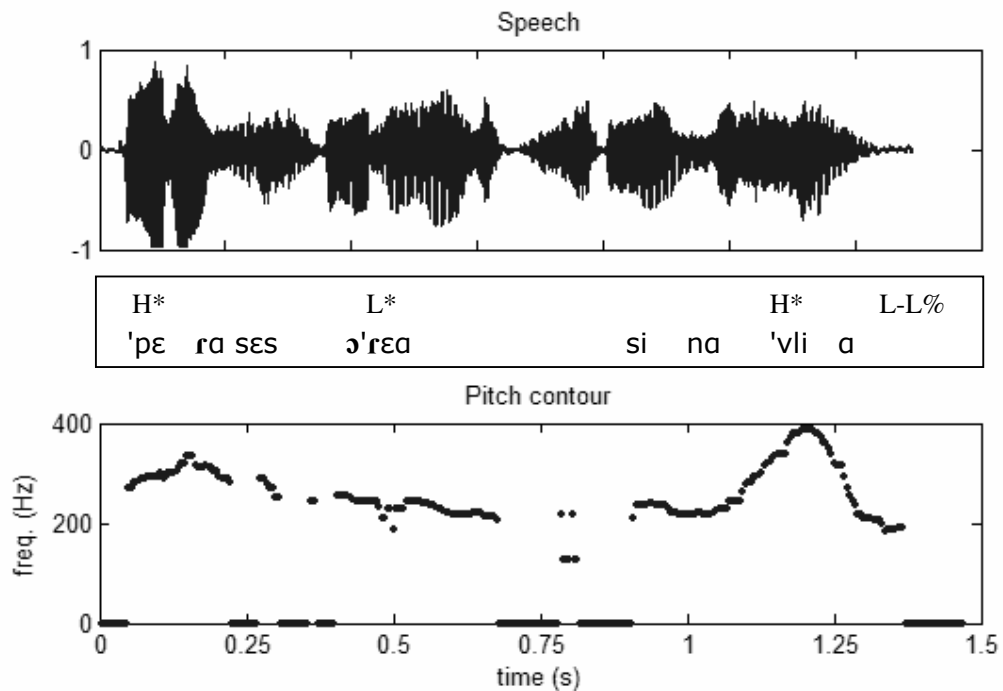
/tris 'minɛs ðɛm'βɛɾasan apɔ 'tɔtɛ pu iðɔ'θikamɛ/



Y/N positive questions, stressed on penultimate syllable:

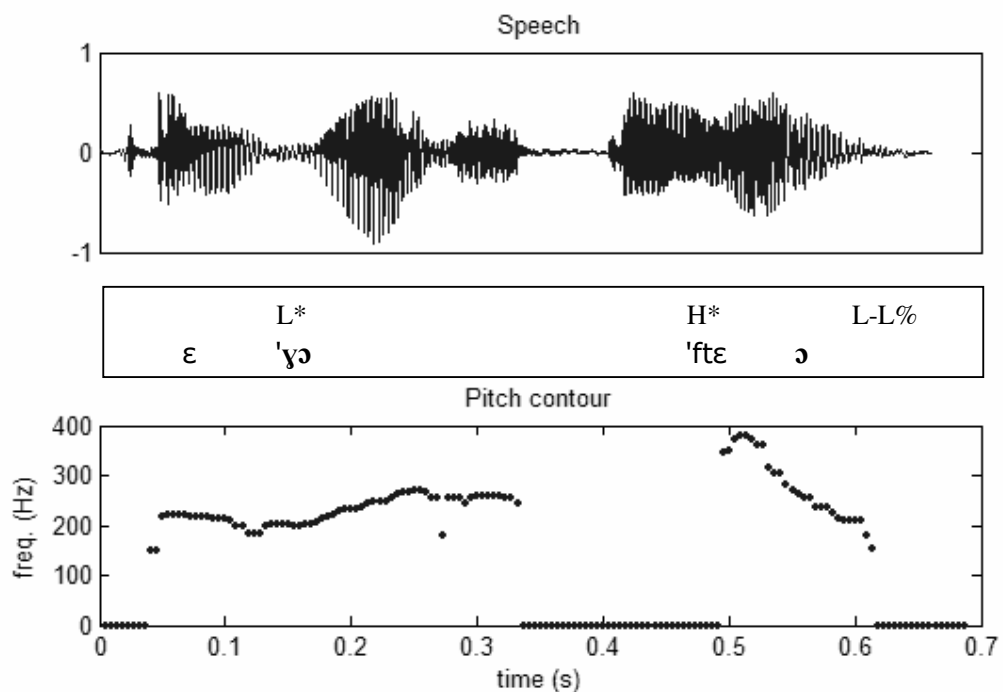
Πέρασες ωραία στη συναλία; (1)

/ˈpɛrasɛs əˈrɛa sti sinaˈvli a/

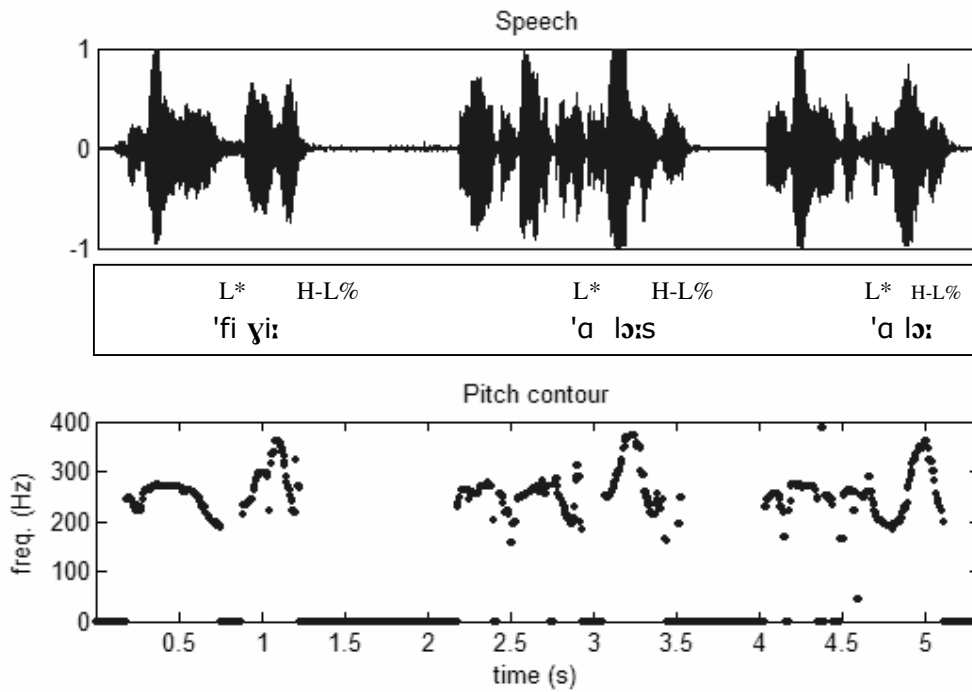


Εγώ φταίω; (4)

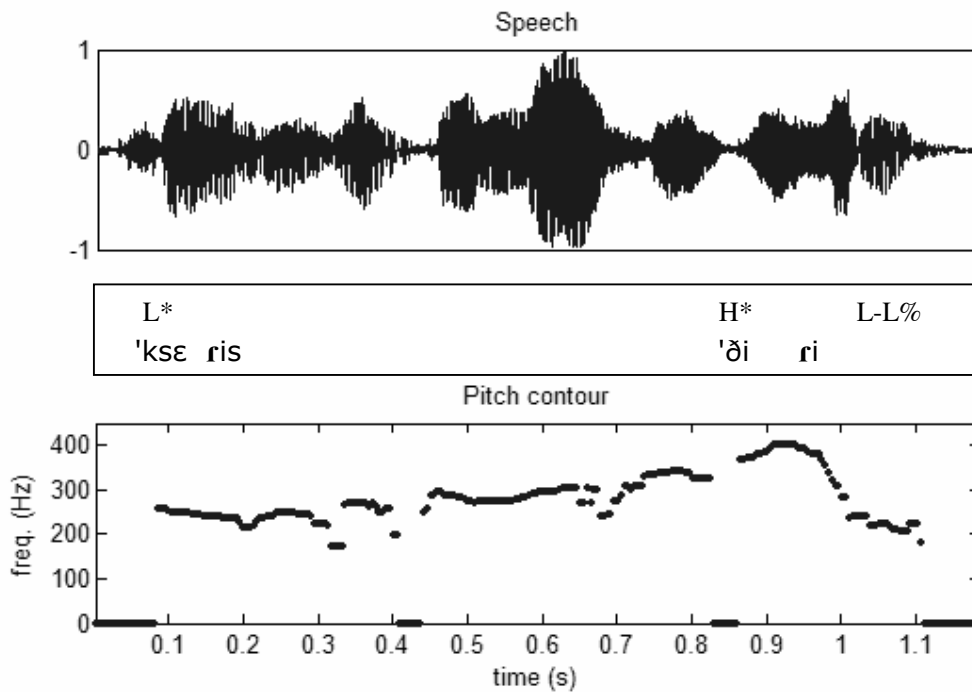
/ɛˈɣɔ ˈftɛɔ/



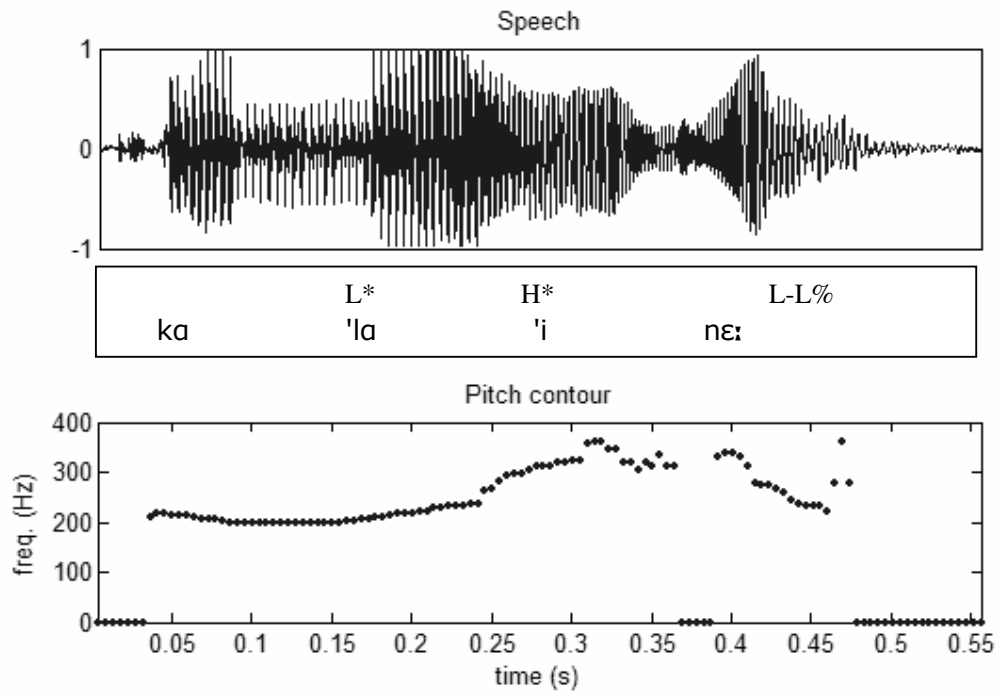
Φοβάμαι μη μου φύγει, μη μου την πάρει κάνας άλλος, μην πάει με κάποιον άλλο; (4)
 /fɔ'vame mi mu 'fiɣiː mi mu tin 'paɾi kanas 'alɔːs min 'pai me 'kaɾjɔn 'alɔː/



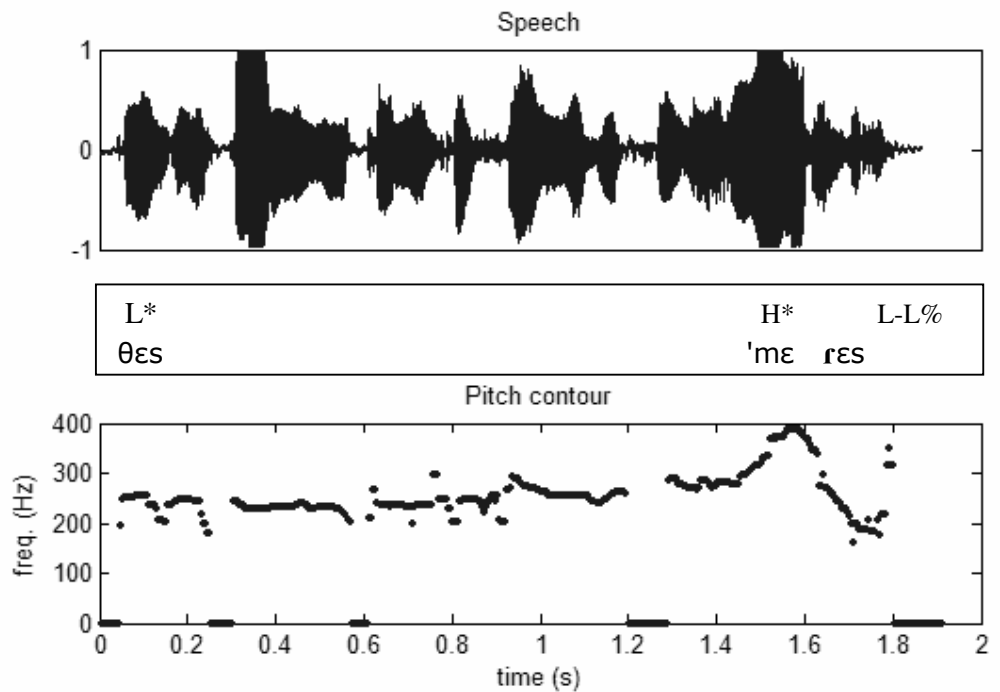
Ξέρεις γιατί με είχε δειρεί; (4)
 /'kseɾis ja'ti me 'iɣe 'ðiri/



Καλά είναι; (3)
 /ka'la 'ine:/



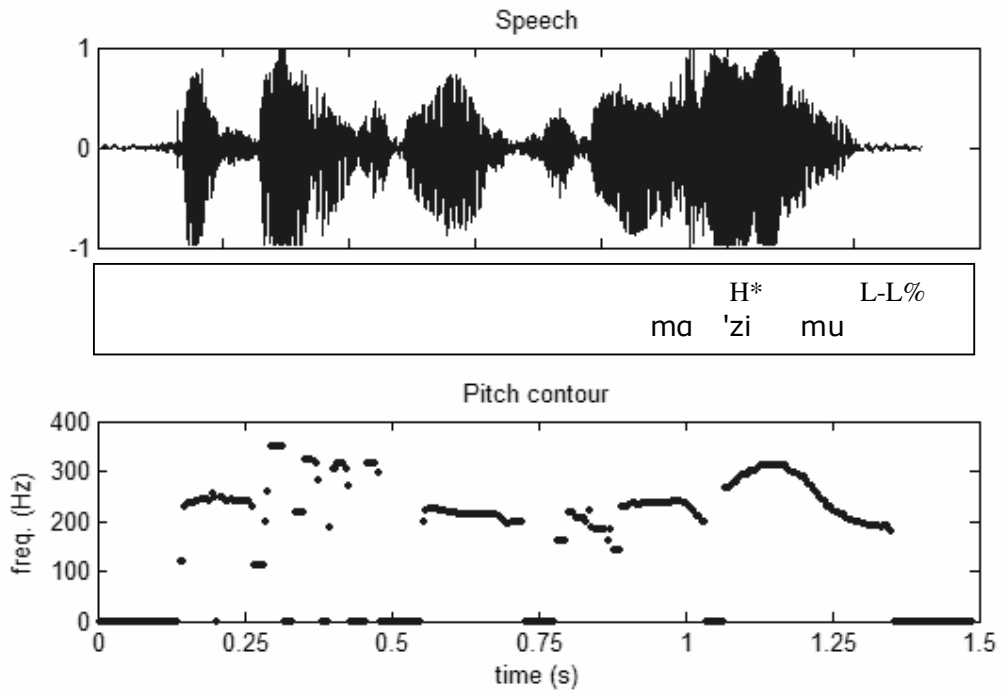
Θες να πάμε για κανα καφέ μια απ' αυτές τις μέρες; (3)
 /θες na 'rame ja kana ka'fe mja apa'ftes tis 'me:res/



Y/N negative questions, stressed on penultimate syllable :

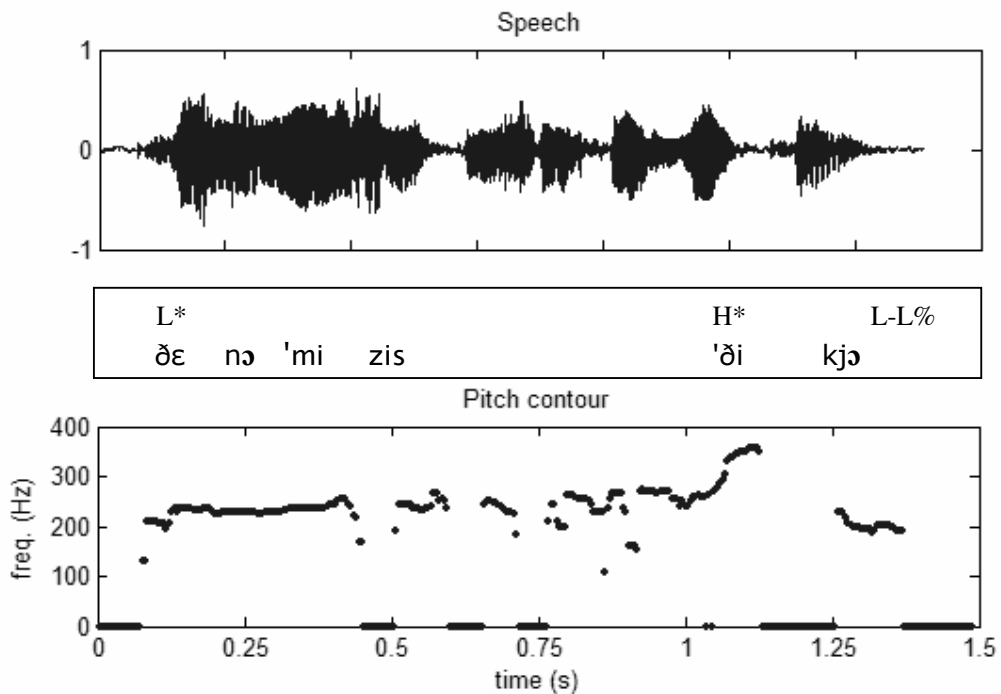
Δε θέλεις να έρθεις μαζί μου; (1)

/ðe 'θelis na 'erθis ma'zi mu/



Δε νομίζεις πως έχω δίκιο; (1)

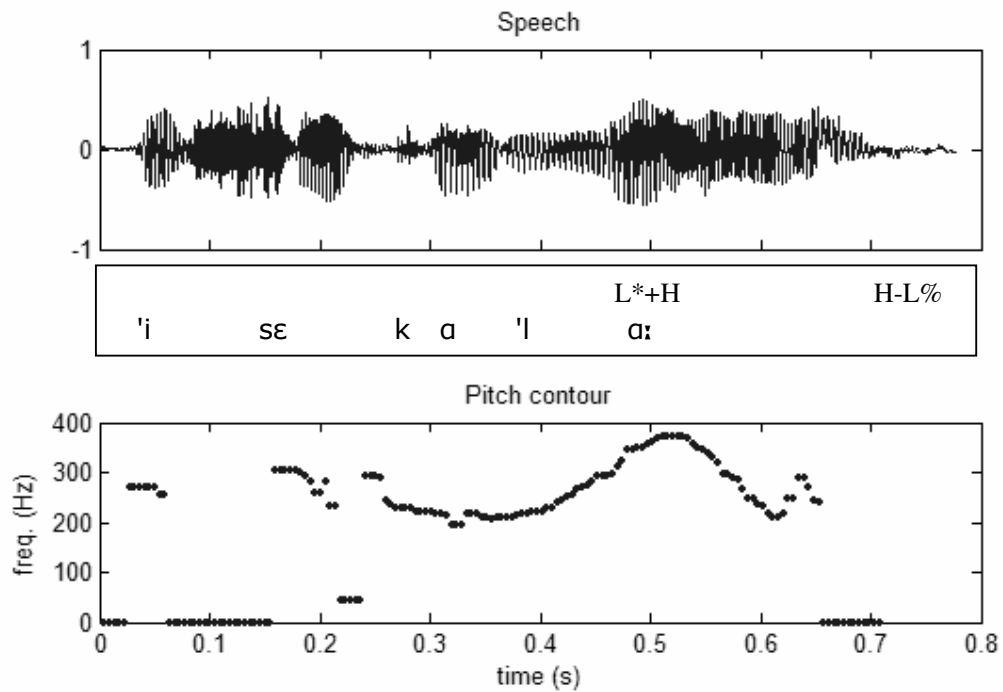
/ðe nɔ'mizis pɔs 'exɔ 'ðikjo/



Y/N positive questions, stressed on last syllable :

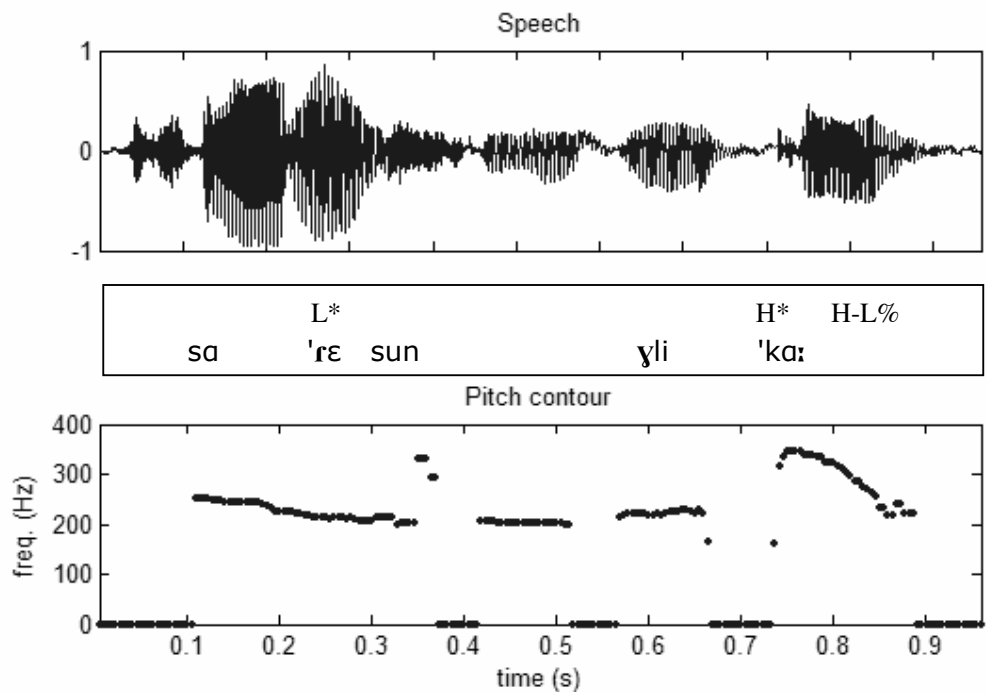
Είσαι καλά; (1)

/i:se ka'la:/

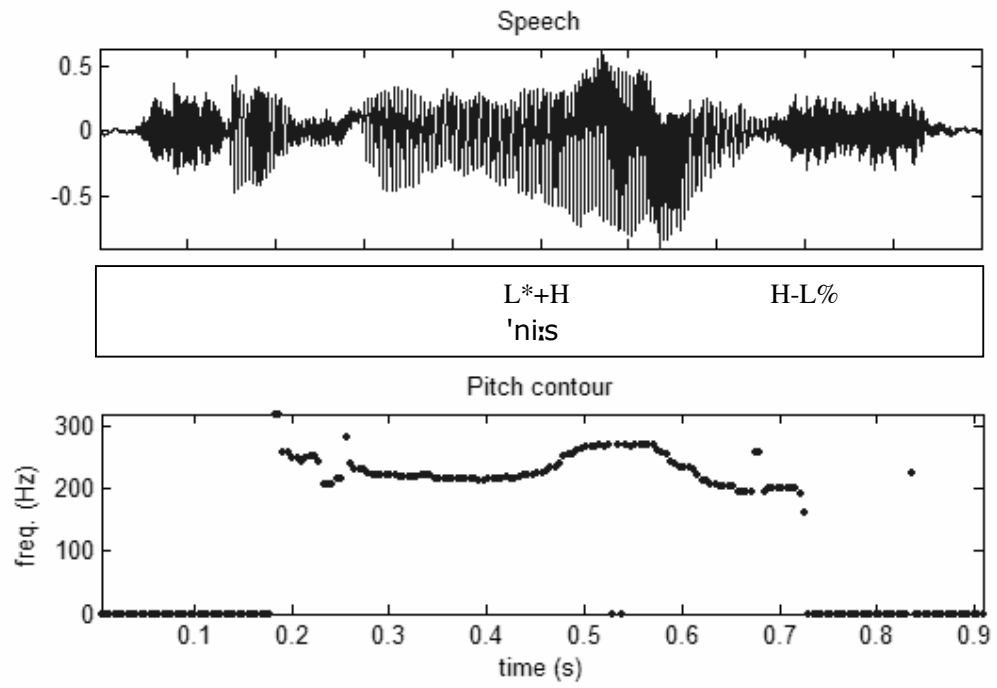


Σ'αρέσουν τα γλυκά; (1)

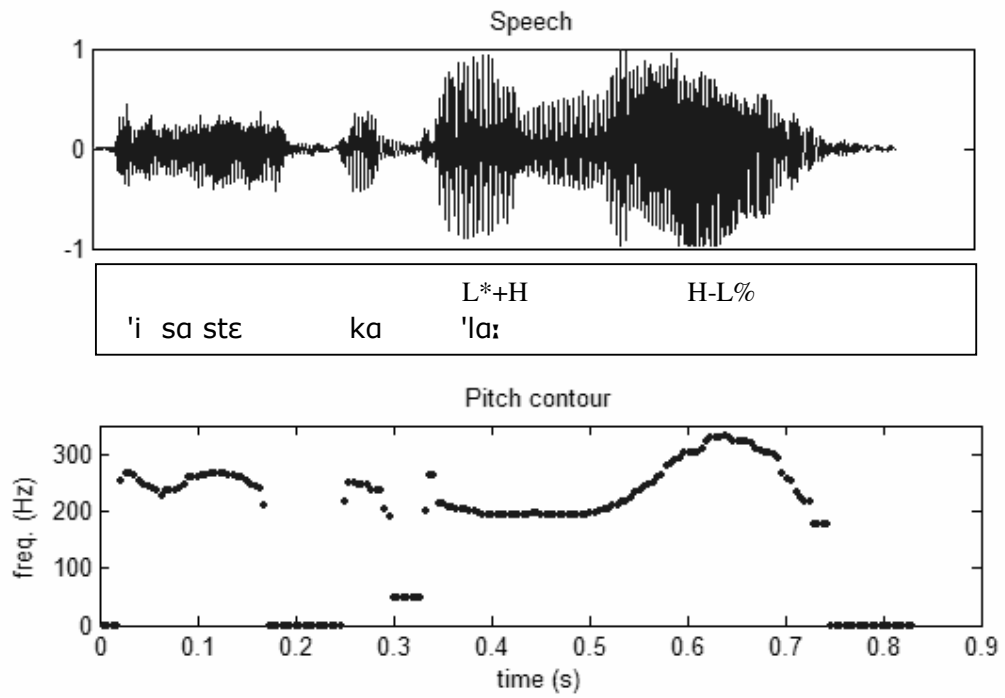
/sa'resun ta yli'ka:/



Συμφωνεί; (1)
 /simfɔ'ni:s/

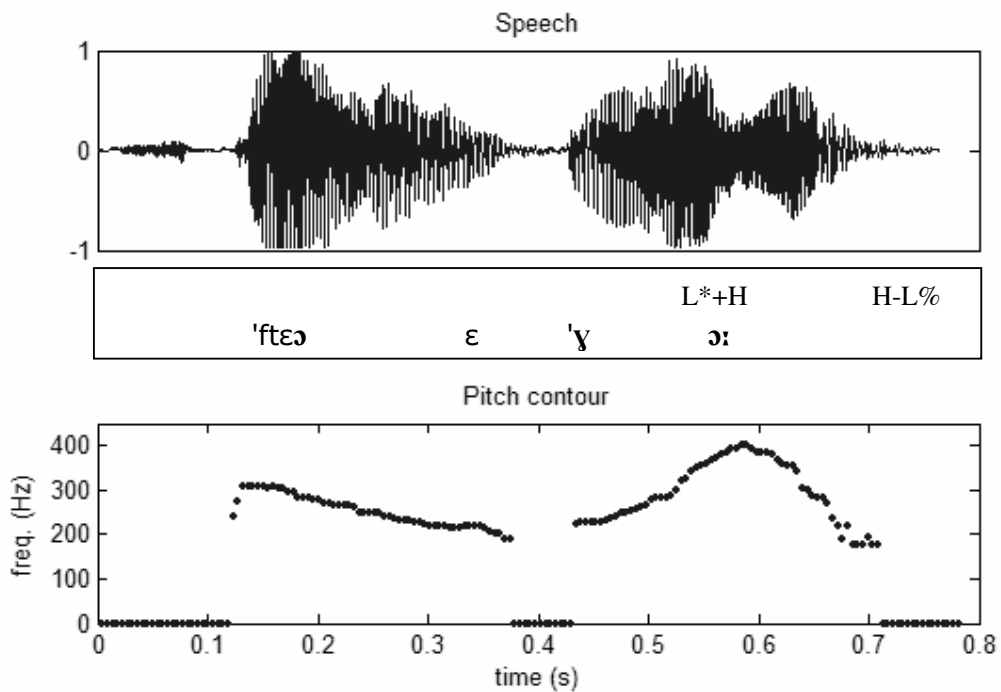


Είσαστε καλά; (4)
 /'i:sastɛ ka'la:/



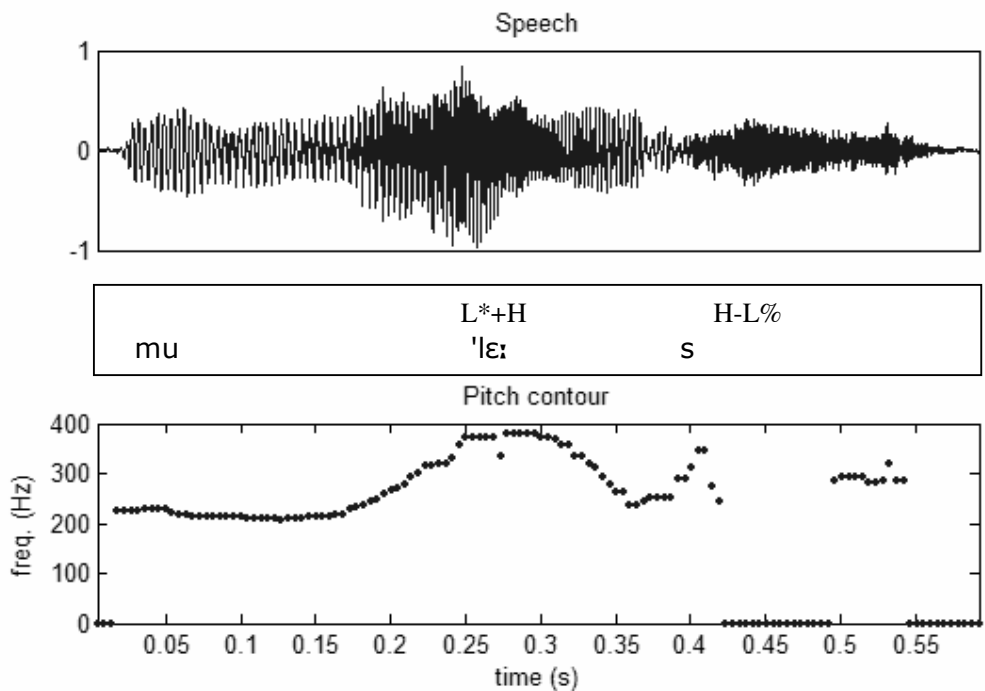
Φταίω εγώ; (4)

/ftɛɔ ε'ɣɔ:/



Μου λες; (4)

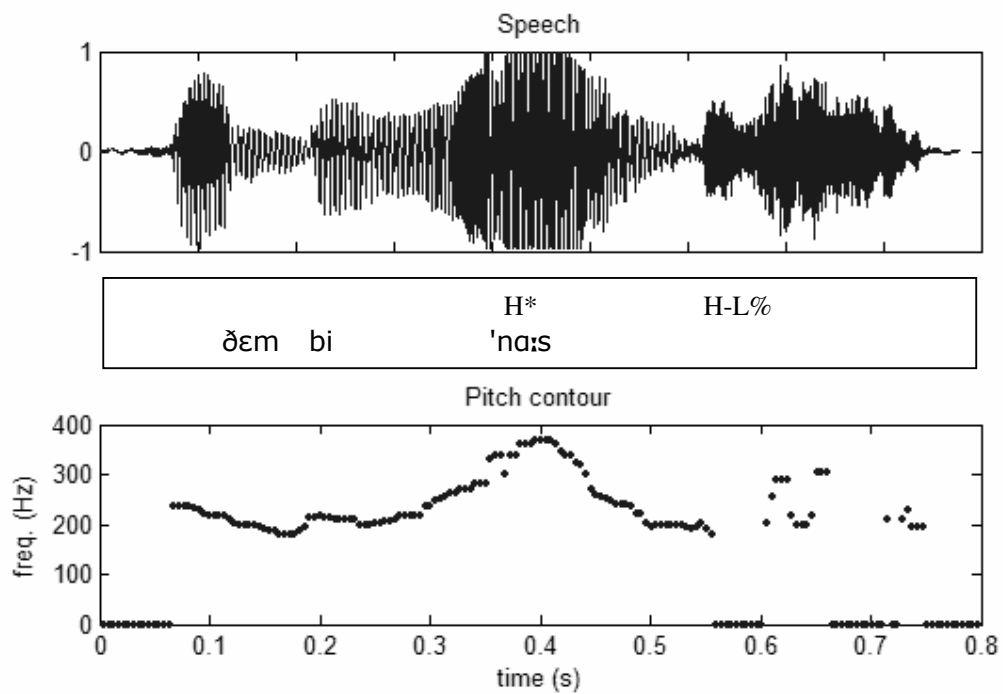
/mu 'lɛ:s/



Y/N negative questions, stressed on last syllable :

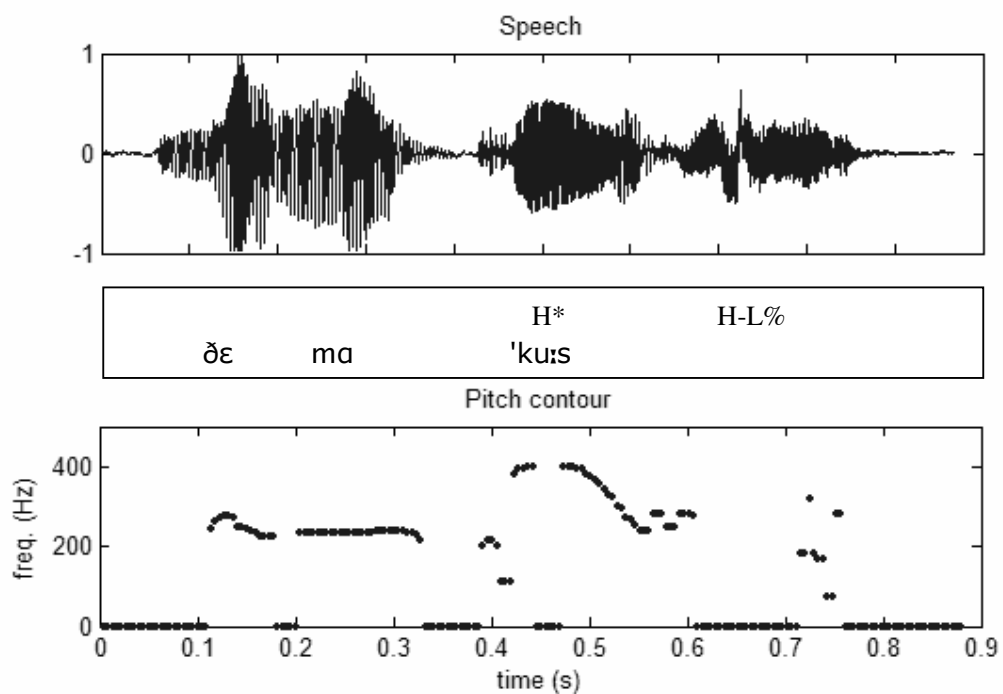
Δεν πεινάς; (1)

/ðembɪ'na:s/

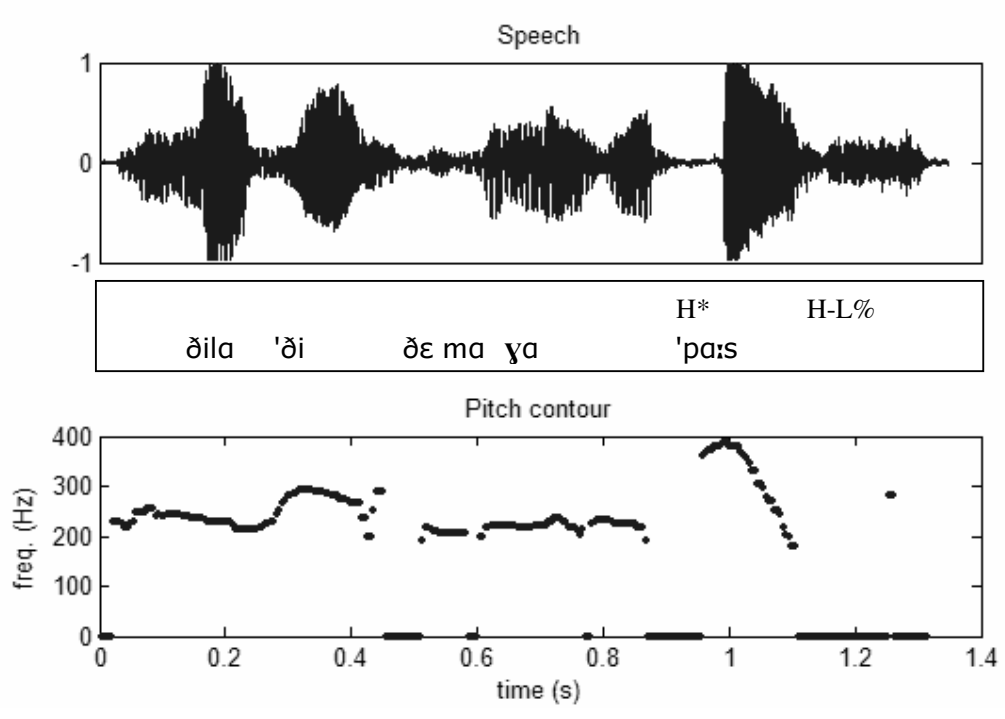


Δε μ'ακούς; (1)

/ðema'ku:s/



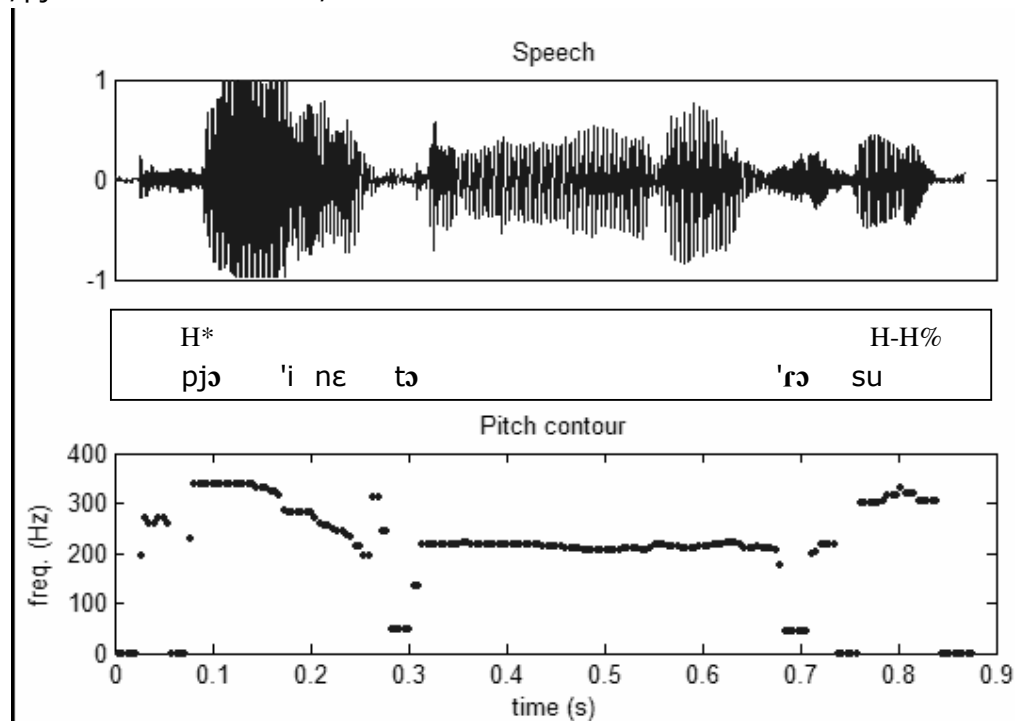
Δηλαδή, δε μ'αγαπάς; (4)
/ðila'ði ðe maɣa'ra:s/



Wh- questions, simple curiosity:

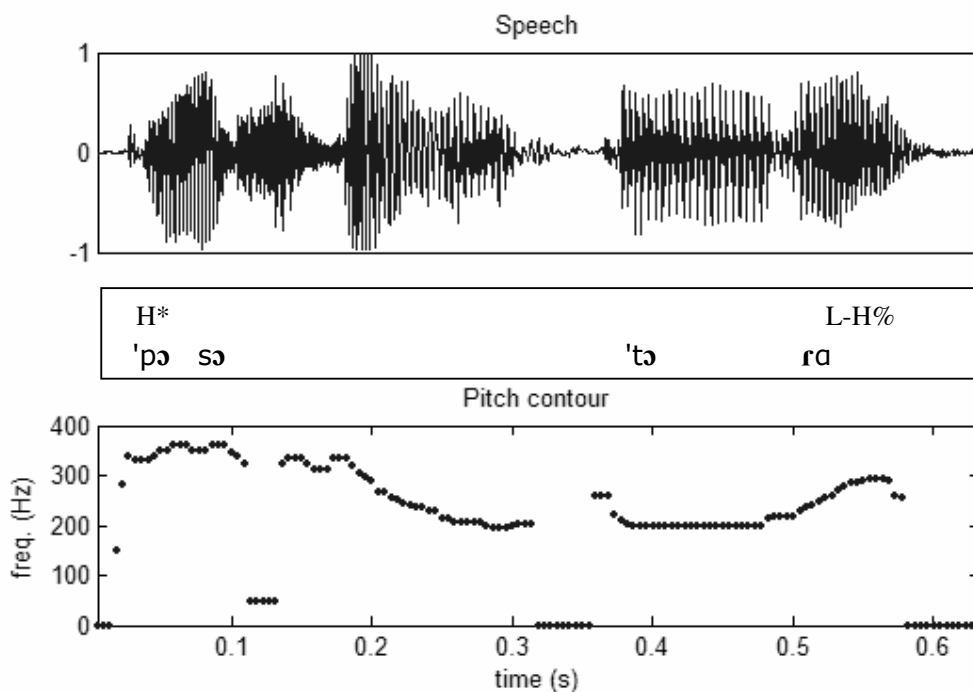
Ποιό είναι το νούμερό σου; (3)

/pjo 'ine to 'nume'ra su/

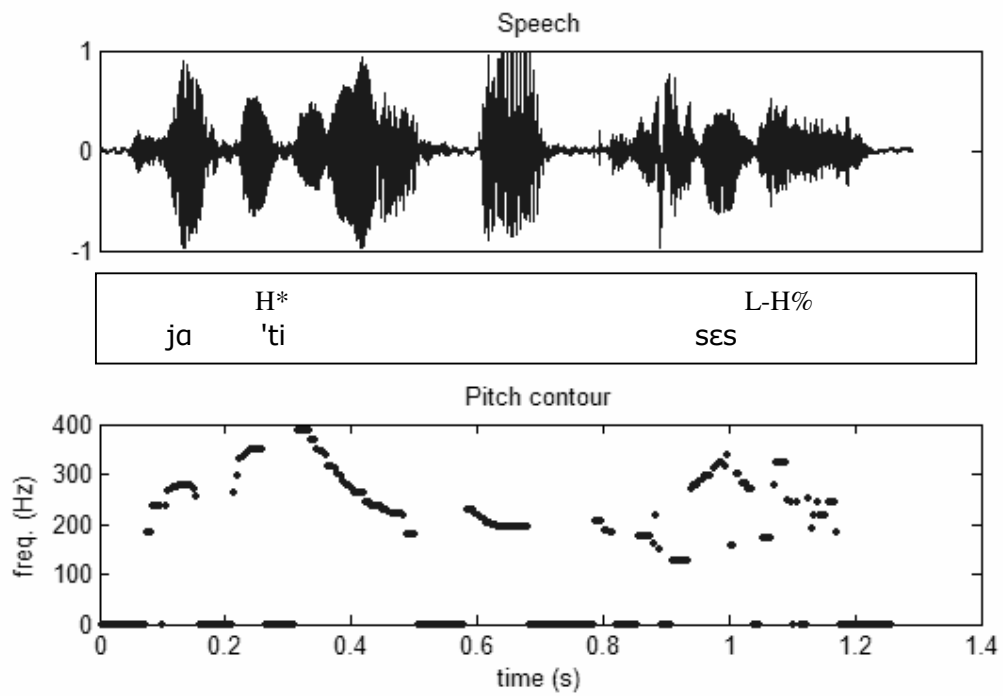


Πόσο είναι τώρα; (3)

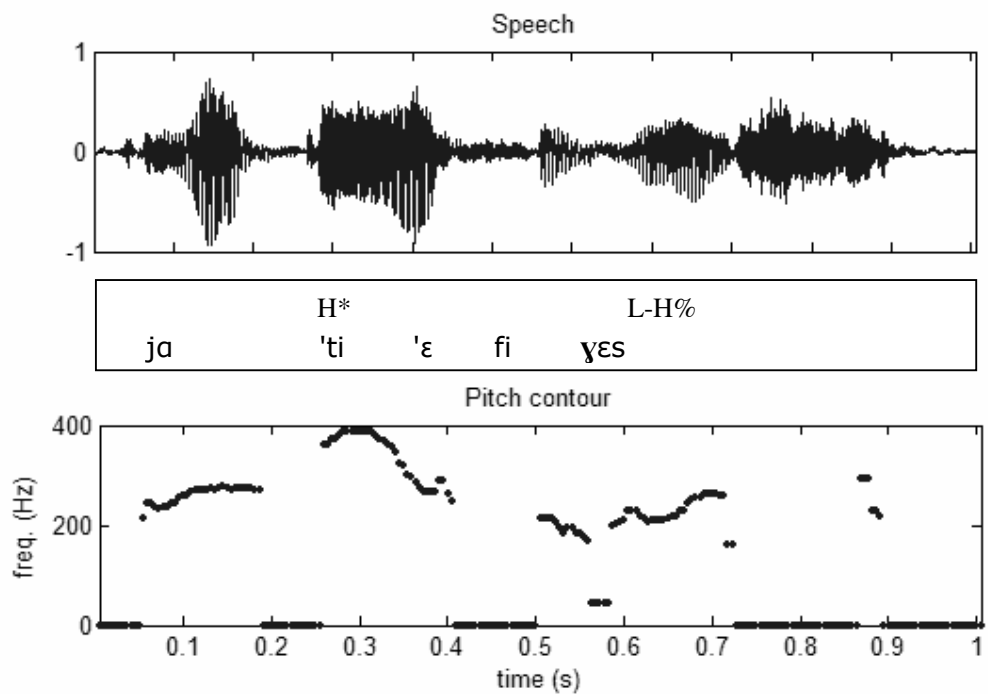
/'pɔsɔ 'ine 'tɔra/



Γιατί δε με υπάκουσες; (2α)
 /ja'ti ðe me i'pakuses/

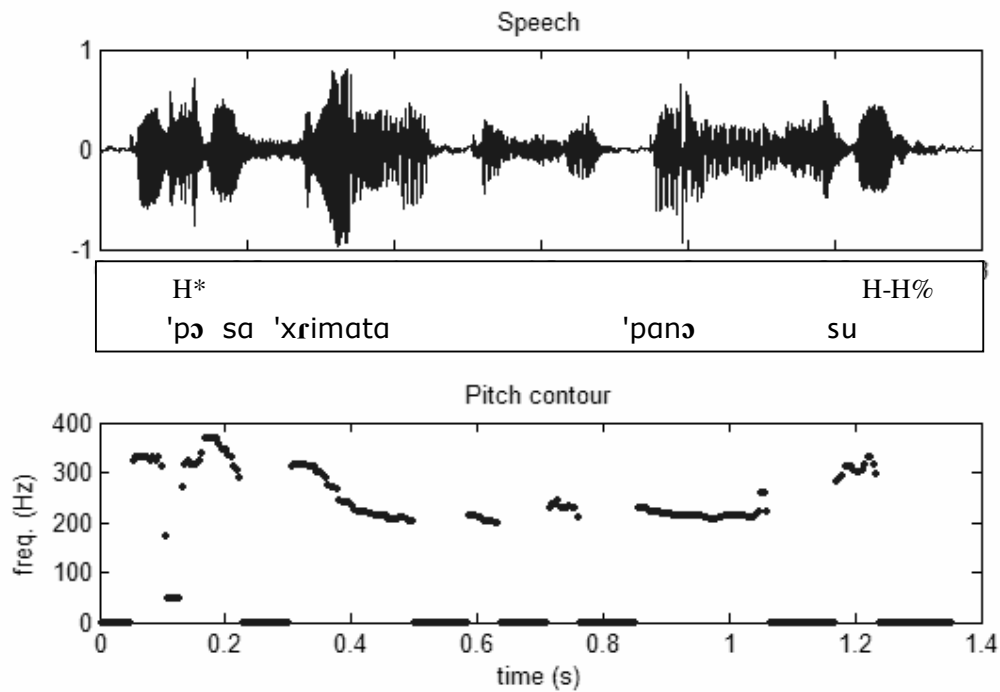


Γιατί έφυγες; (2α)
 /ja'ti 'ɛfiɣes/



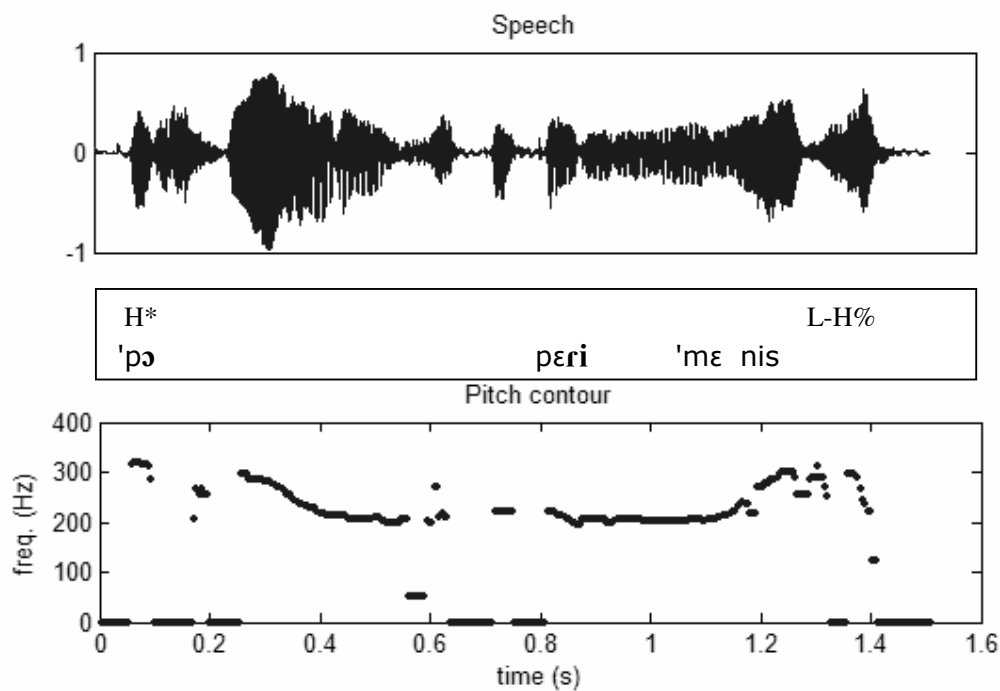
Πόσα χρήματα έχεις πάνω σου; (2α)

/ˈpɔsa ˈxɾimata ˈɛçis ˈpanɔ su/

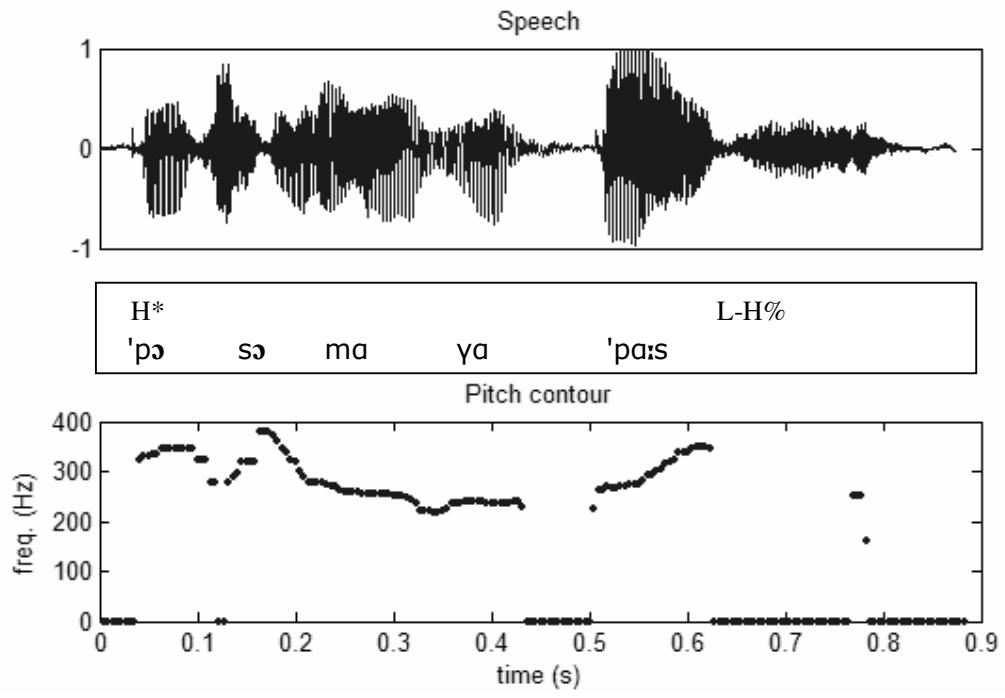


Πόσην ώρα έχεις που περιμένεις; (2α)

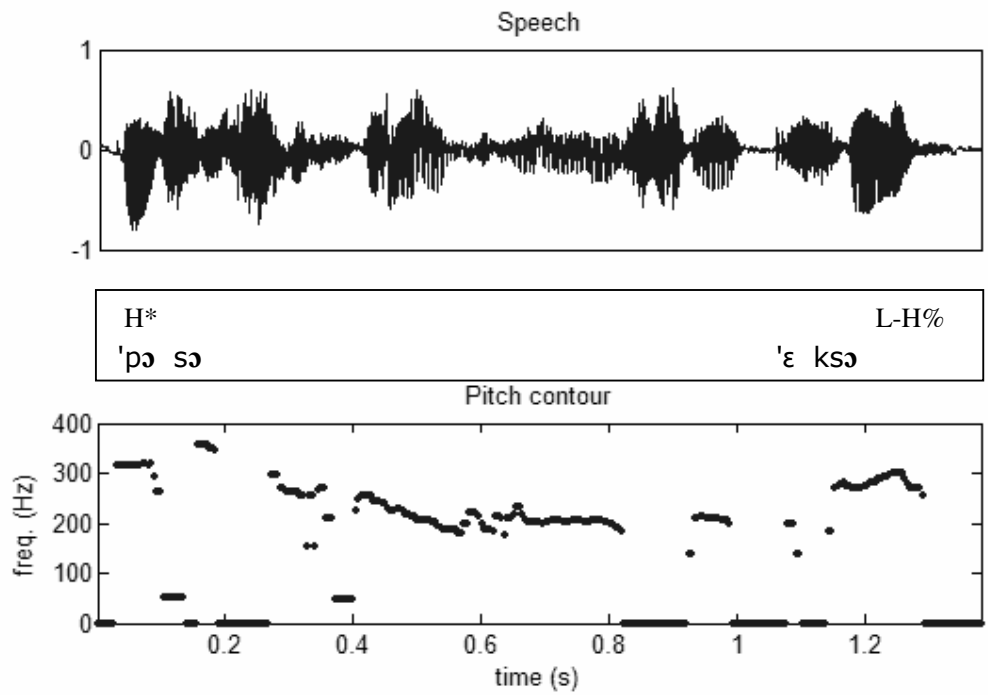
/ˈpɔsin ˈɔra ˈɛçis pu pɛɾiˈmɛnis/



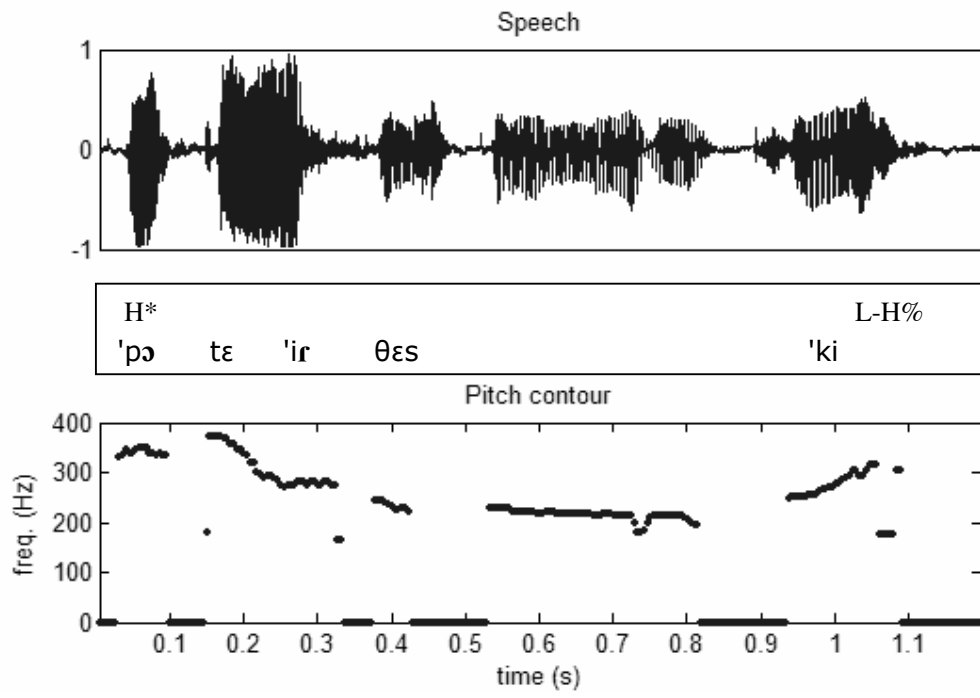
Πόσο μ' αγαπάς; (2α)
 /'pɔsɔ maɣa'ra:s/



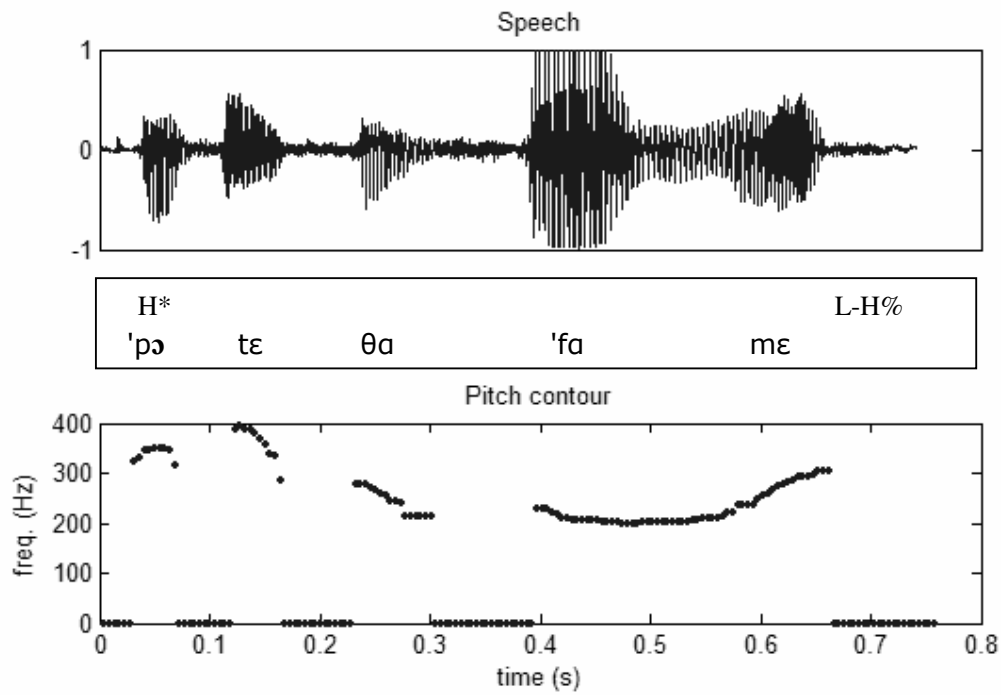
Πόσο συχνά βγαίνεις έξω; (2α)
 /'pɔsɔ si'χna 'vɣenis 'eksɔ/



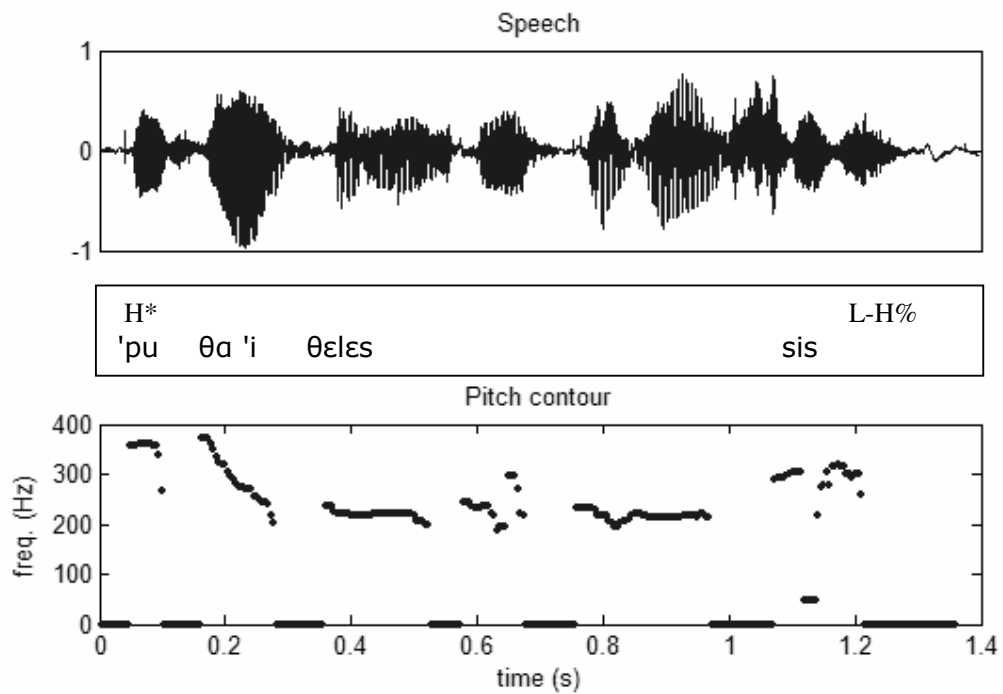
Πότε ήρθες στην Αμερική; (2α)
 /'pɔtɛ 'iɾθɛs stin amɛɾi'ki/



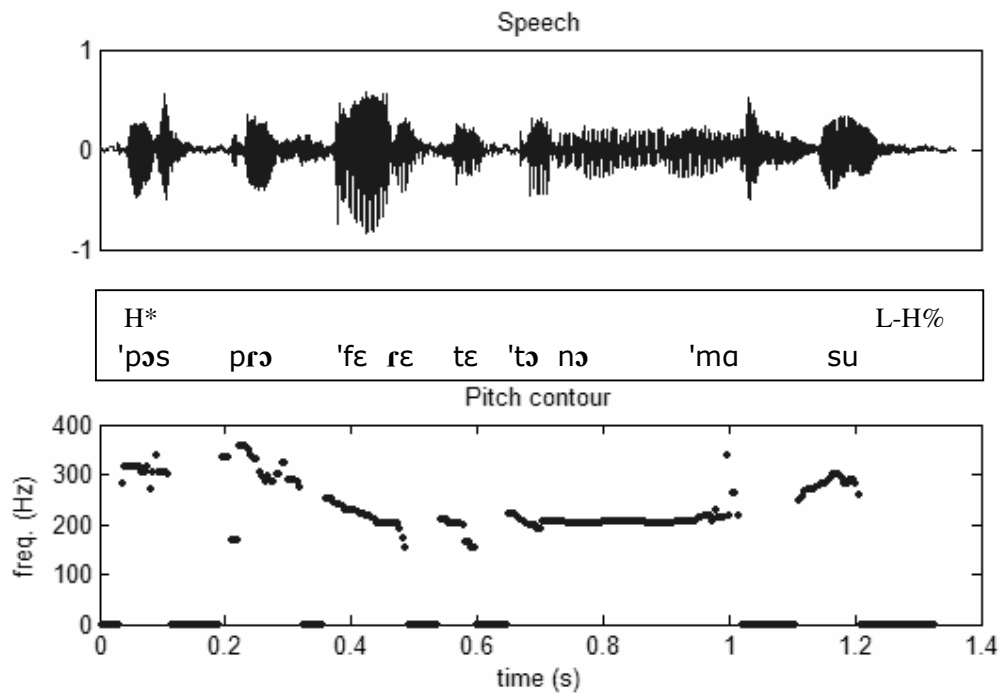
Πότε θα φάμε; (2α)
 /'pɔtɛ θa 'faɛ/



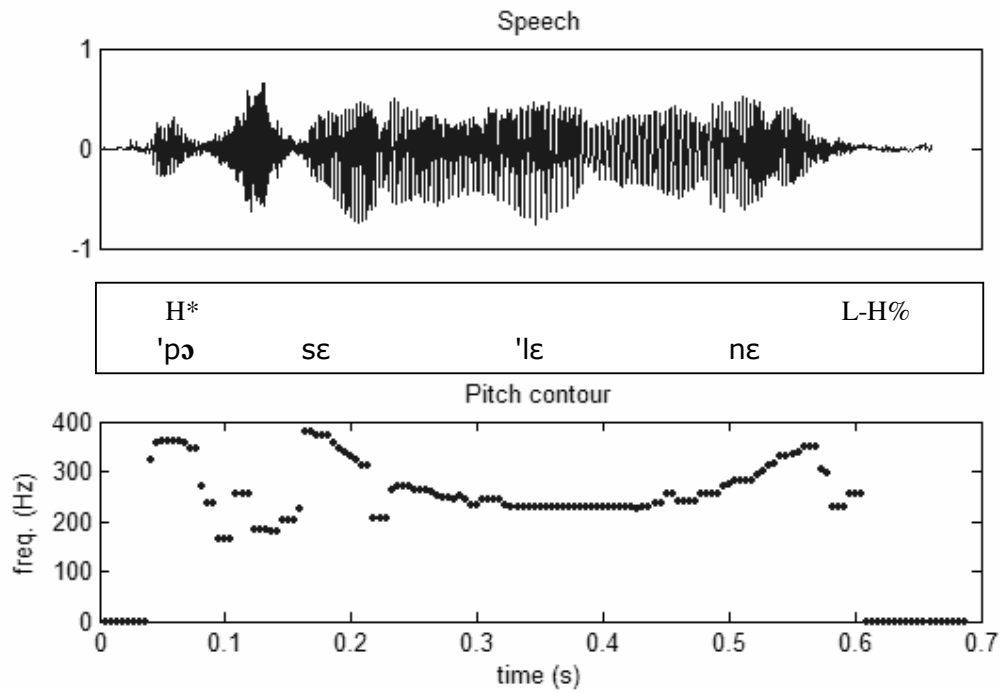
Πού θα ήθελες να σπουδάσεις; (2α)
 /'pu θa 'iθeles na spu'dasis/



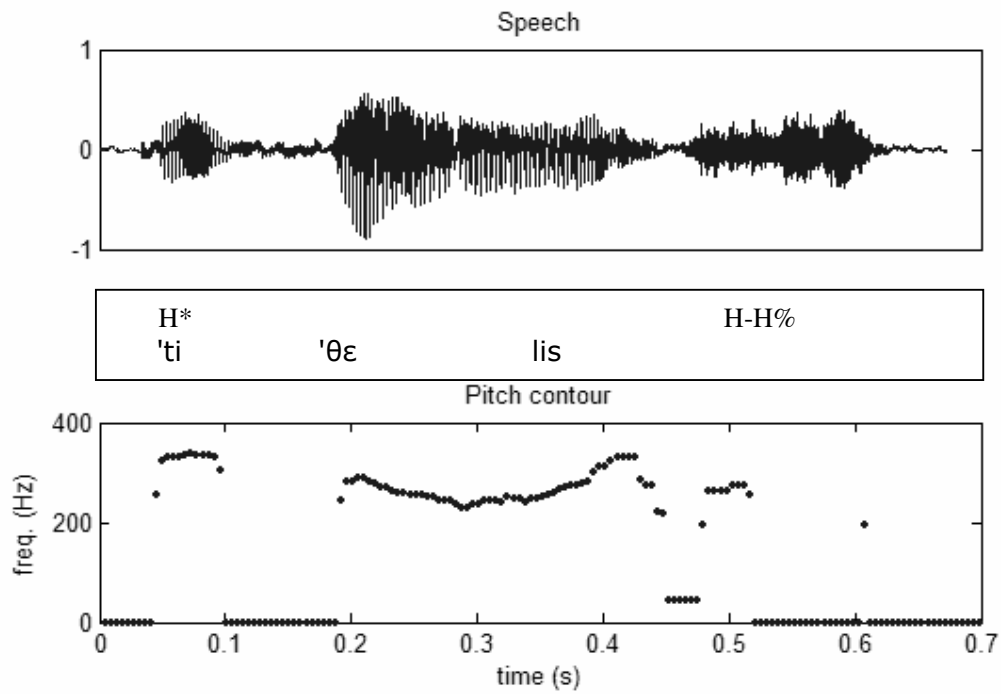
Πώς προφέρεται τ' όνομά σου; (2α)
 /'pɔs prɔ'ferete 'tɔnɔ'ma su/



Πώς σε λένε; (2α)
 /'pɔsɛ'liɛnɛ/



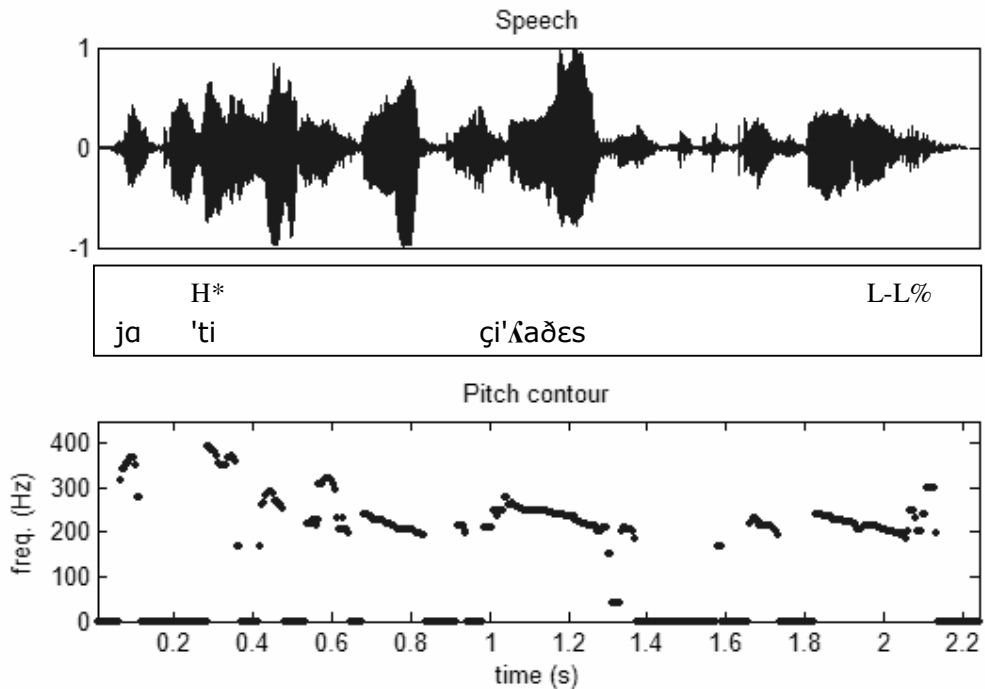
Τι θέλεις; (2α)
 /'ti 'θɛlis/



Wh- questions, predisposition:

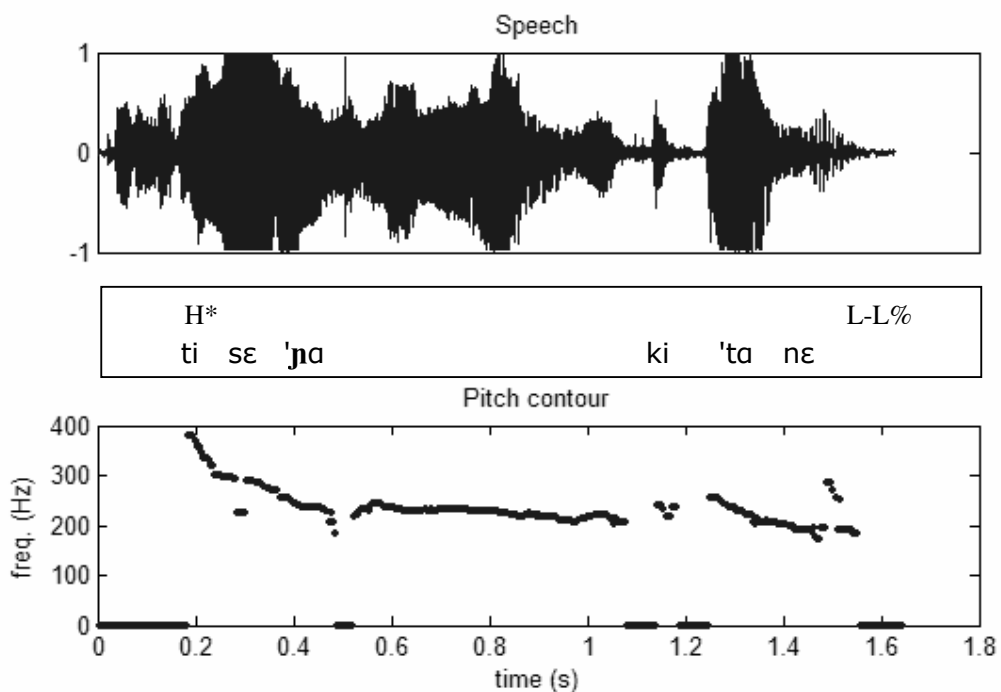
Γιατί δεν παίρνεις μια απ' τις χιλιάδες που κυκλοφορούν; (4)

/ja'ti ðe'mbɛrnis mɪa ap tis çi'laðes pu kɪklɔfɔ'run/

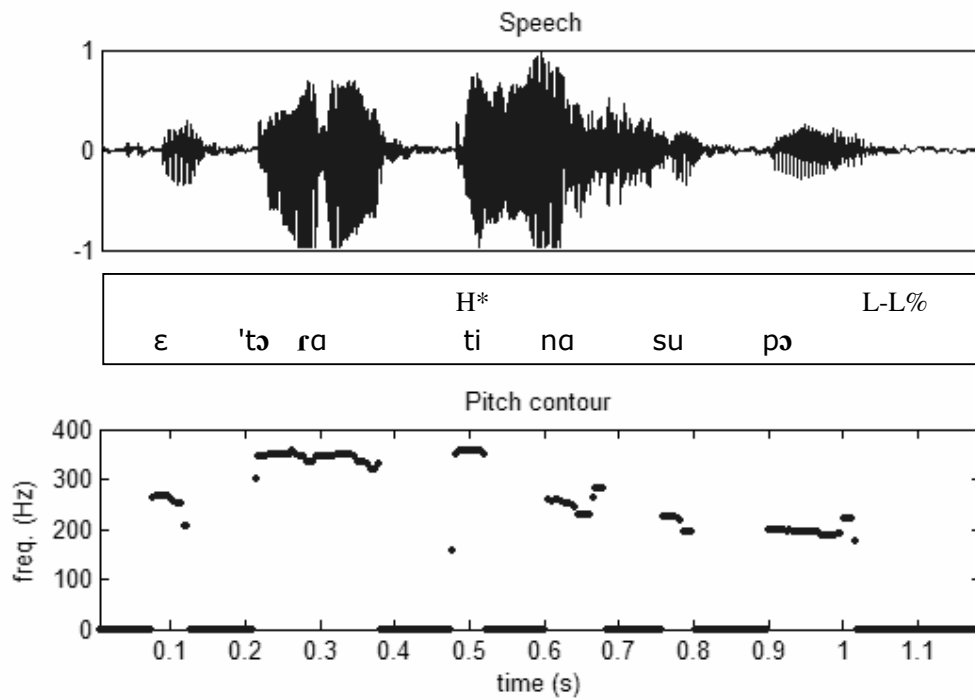


Τι σε νοιάζει αν οι άλλοι με κοιτάνε; (4)

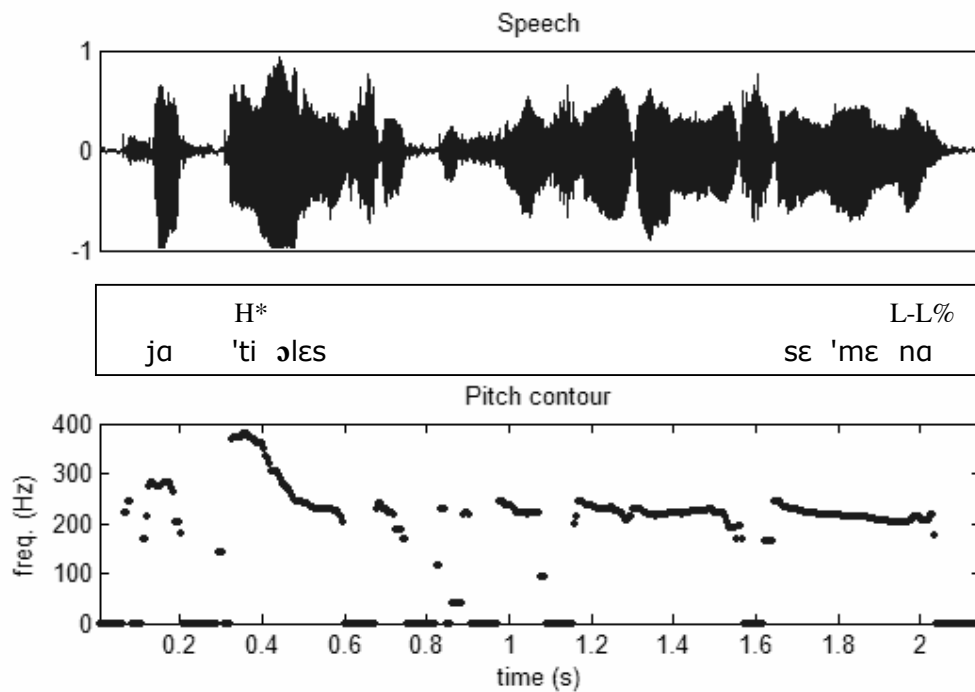
/ti se 'ɲazi an i 'ali me ki'tane/



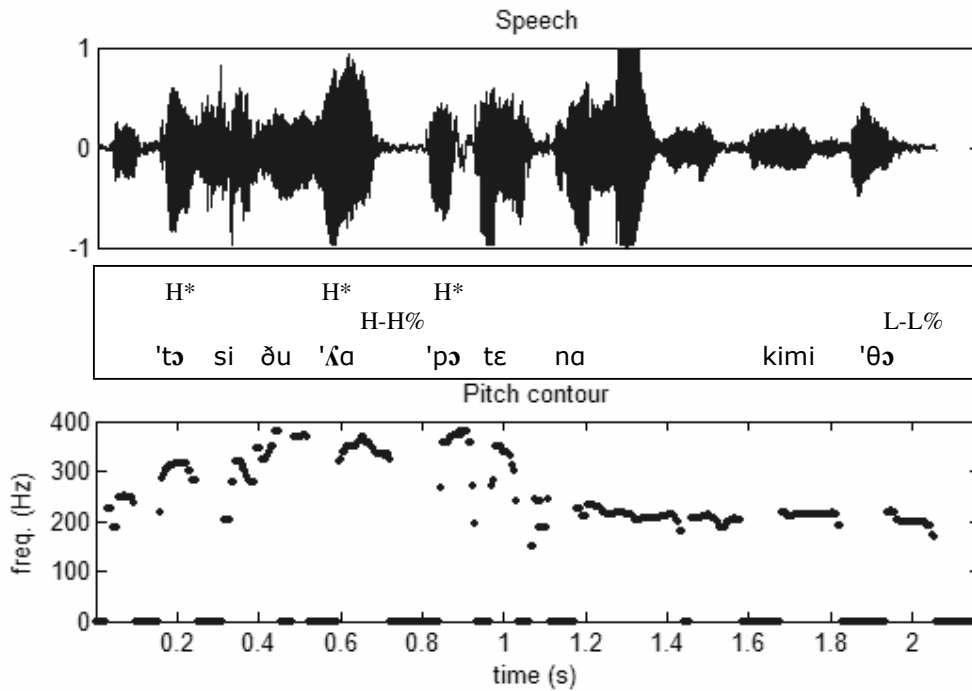
Ε, τώρα τι να σου πώ; (2b)
 /ε 'tɔra ti na su pɔ/



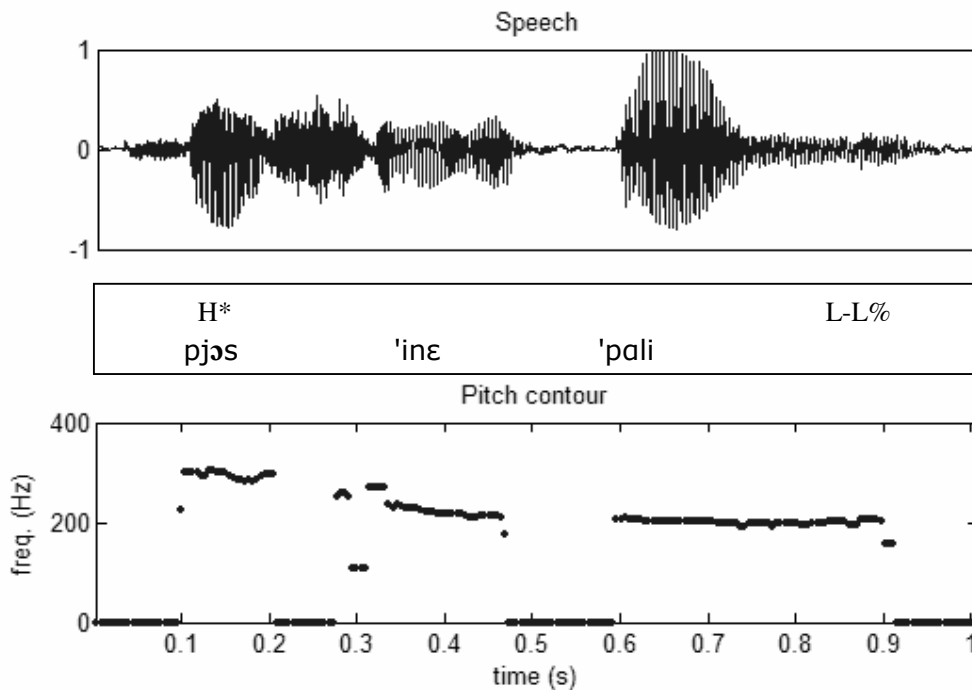
Γιατί όλες οι ατυχίες συμβαίνουν σε μένα; (2b)
 /ja'ti 'ɔles i ati'çies sim'vɛnun sɛ 'mɛna/



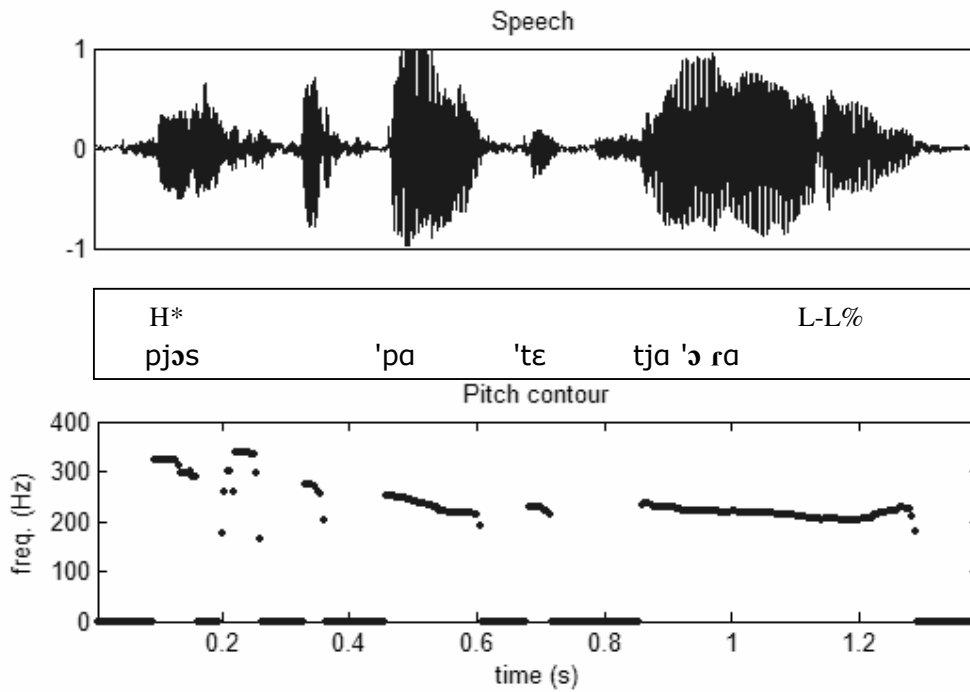
Με τόση δουλειά πότε να προλάβω να κοιμηθώ; (2b)
 /με 'tasi ðu'la 'rɔte na pɔ'lanɔ na kimi'tɔ/



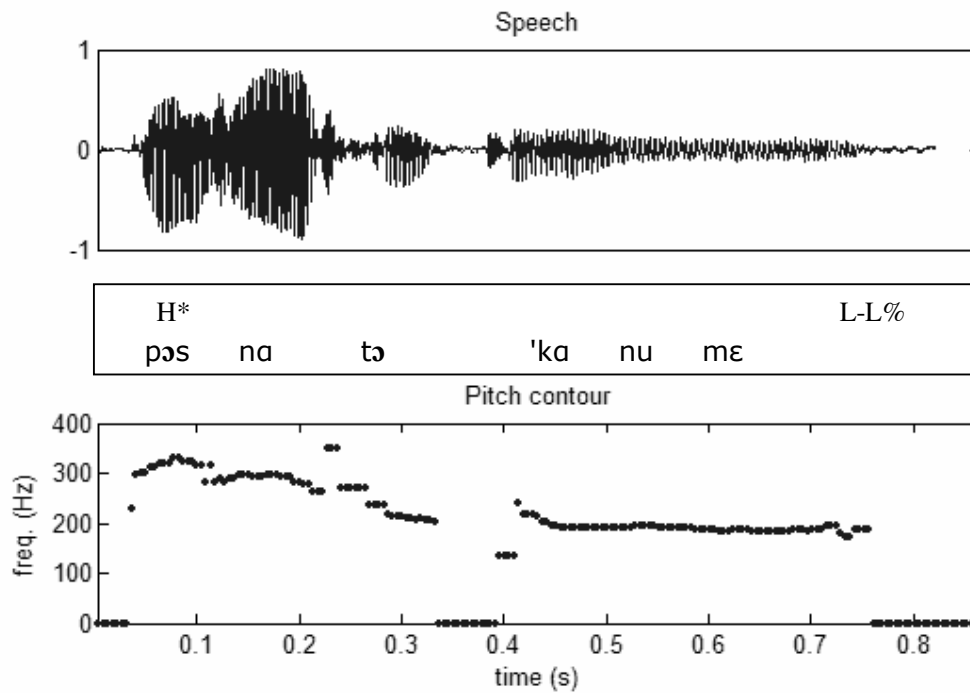
Ποιός είναι πάλι; (2b)
 /pɔs 'ine 'pali/



Ποιός χτυπάει τέτοια ώρα; (2b)
 /pɔs xti'pai 'tɛtja 'ɔra/



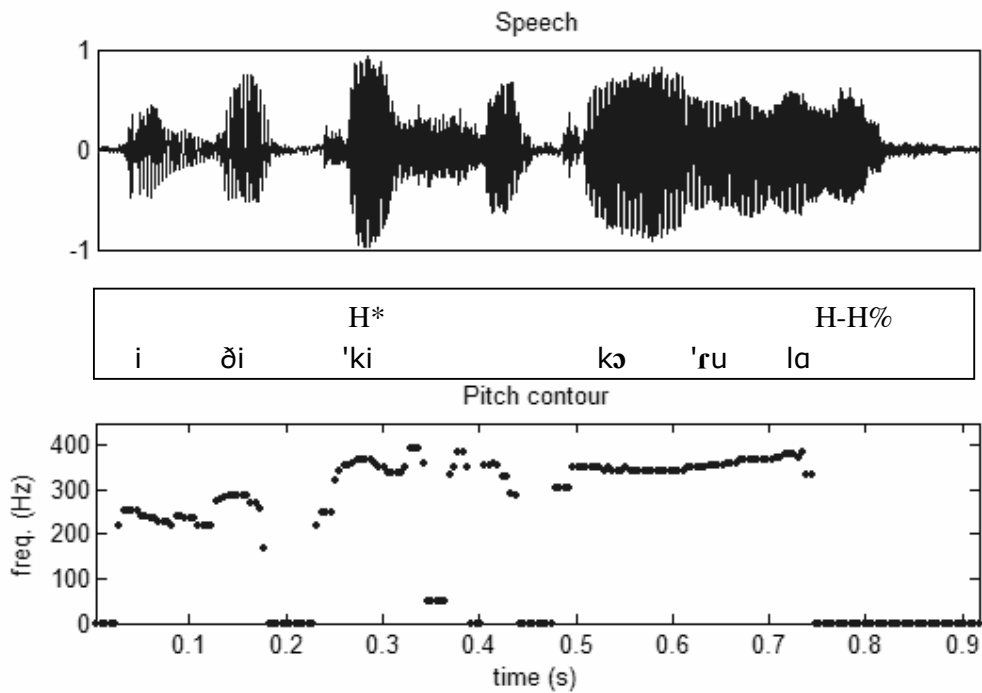
Πώς να το κάνουμε; (2b)
 /pɔs na tɔ 'kanume/



Elliptical questions without verb

Η δική σου η κορούλα; (3)

/i ði'ki su i kɔ'rula/



Αμ ο άλλος; (4)

/amɔ 'alɔ:s/

