# On the nature of preverbal focus in Greek : a theoretical and experimental approach

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## A theoretical and experimental approach

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# Contents

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# Abbreviations

| | |
|---|---|
| 1 | first person |
| 2 | second person |
| 3 | third person |
| ACC | accusative |
| C | contrast |
| C-Foc | contrastive focus |
| C-Top | contrastive topic |
| CL | clitic |
| DAT | dative |
| D-move | discourse move |
| D-Top | discourse topic |
| Foc | focus |
| GEN | genitive |
| I-Foc | new information focus |
| IO | indirect object |
| NOM | nominative |
| NP | noun phrase |
| O | direct object |
| POSS | possesive |
| PRT | particle |
| S | sentence |
| SG | singular |
| S-Top | sentence topic |
| PL | plural |
| Top | topic |
| VP | verb phrase |

# 1 Introduction

Since the early 1970s, researchers have observed a link between the focus and the main prosodic prominence of a sentence (Halliday 1067, Chomsky 1971, Jackendoff 1974). Besides this prosodic aspect, focus has also syntactic and semantic aspects (see Szabolcsi 1981, Rooth 1992, Kiss 1996, Krifka 1993, Rizzi 1997, Belletti 2001, among many others). The relation between prosodic realization, syntactic structure, interpretation and focus has not been uncontroversial and has caused much debate in the literature. This thesis aims at contributing to our understanding of the semantic and prosodic properties of object foci. The main language under consideration is Greek. In Greek, object foci can appear in postverbal or preverbal position. An example is given in (1). Brackets and the subscript $_{\text{Foc}}$ indicate focus.

(1) *Question*

a. Ti ftiahni i Eleni?
what make.3SG the.NOM Helen.NOM
'What is Helen preparing?'
*Answer*1

b. I Eleni ftiahni [ntolmadakia]$_{\text{Foc}}$.
the.NOM Helen.NOM make.3SG stuffed.wine.leaves.ACC
'Helen is preparing [stuffed wine leaves]$_{\text{Foc}}$.'
*Answer*2

c. [Ntolmadakia]$_{\text{Foc}}$ ftiahni i Eleni.
stuffed.wine.leaves.ACC make.3SG the.NOM Helen.NOM
'[Stuffed wine leaves]$_{\text{Foc}}$ Helen is preparing.'

In example (1a), there is a *wh*-question that triggers focus on the object. Example (1b) as well as (1c) answer felicitously the question in (1a). In (1b), the focused object appears in postverbal position, while in (1c) the focused object appears in preverbal position. At first sight, the example in (1) seems to suggest that postverbal and preverbal object foci in Greek can be used interchangeably, and that consequently, Greek postverbal object foci do not differ from their preverbal counterparts with respect to interpretation. If this were true, this would be an unexpected and theoretically unattractive finding, given the theoretical discussion about economy and optionality in grammar (Reinhart 1995, 2006, Fox 2000). In particular, if it were true that (1b) and (1c) can be used in identical contexts,

receiving exactly the same interpretation, then (1c) would be problematic, as it would seem to violate the economy condition by being a 'costly' derivation that does not give rise to any additional interpretation. It would also be an unexpected finding given the discussion in the literature about the correlation between the linear position of foci and their interpretation (Tsimpli 1995, Rizzi 1997, Kiss 1998, Horvath 2000, Frascarelli 2000, Belletti 2001). Specifically, in the literature, it is claimed that there are two types of focus, namely, new information focus and contrastive/identificational focus. Preverbal foci are associated with exhaustive and/or contrastive interpretation (±exhaustive, ±contrastive), while postverbal foci are associated with new information focus. The aim of this dissertation is to compare preverbal and postverbal object foci in Greek, scrutinizing their semantic and phonetic properties. Thus, the main research question that is addressed in this dissertation is stated in (2).

(2) Do preverbal object foci in Greek differ from their postverbal counterparts?

This study is not the first one that examines properties of focus in Greek (see Agouraki 1990, Tsimpli 1995, 1998, Baltazani 1998, Tsiplakou 1998, Alexiadou 1999, Alexopoulou 1999, Baltazani & Jun 1999, Keller & Alexopoulou 2000, Haidou 2004, Revithiadou 2004 among many others). The contribution of this study is the examination of the semantic as well as the prosodic aspects of object focus, employing theoretical and experimental tools. The added value of such a combination is that we achieve a better understanding of the phenomenon under consideration.

In this thesis, theory is complemented with empirical testing. On the theoretical side, I compare Greek preverbal object foci to their postverbal counterparts with respect to exhaustivity, contrast and discourse topichood. For this purpose, a number of tests are applied to the Greek data. On the experimental side, a production and two perception experiments were carried out to investigate the phonetic properties of preverbal and postverbal object foci in Greek. Moreover, a production and a perception experiment were carried out to investigate the phonetic realization of contrast in Greek.

## 1.1 The structure of the thesis

The thesis is organized in two parts, part one examines the semantic properties of preverbal and postverbal object foci in Greek, while part two examines the phonetic properties of preverbal and postverbal object foci in Greek.

Part one

**Chapter two**. Chapter two compares preverbal and postverbal object foci in Greek with respect to exhaustivity. In particular, it aims at answering the question given in (i).

i. Do Greek preverbal object foci differ from their postverbal counterparts with respect to exhaustivity?

To answer the question in (i), two tests are used; one test for identifying new information focus and another one for identifying exhaustivity. The results of the first test show that Greek preverbal object foci as well as their postverbal counterparts can be interpreted as new information foci. The results of the second test indicate that preverbal object foci in Greek are not interpreted exhaustively. The chapter ends with a brief note on focus in Hungarian. Preverbal object foci in Hungarian differ from their postverbal counterparts with respect to exhaustivity.
**Chapter three**. Discussing both syntactic and semantic approaches, chapter three examines the notion of contrast, aiming at answering the questions in (ii) and (iii).

ii. What is the status of contrast in grammar?
iii. What is the relation between preverbal object foci and contrast?

To tackle the questions in (ii) and (iii), I discuss contexts that trigger contrast and put together a number of tests that identify contrast. These tests are applied to Greek. The results of the tests indicate that preverbal objects in Greek do not differ from their postverbal counterparts with respect to contrast. In this chapter, I also examine the relation between contrast and exhaustivity, examining data from Italian. Applying the relevant tests, it is shown that contrastive preverbal object foci in Italian are not interpreted exhaustively.
**Chapter four**. Chapter four builds on the results of chapters two and three. Having shown that preverbal object foci in Greek do not differ from their postverbal counterparts with respect to exhaustivity or contrast, chapter four returns to the main research question of the thesis. The main research question is repeated in (iv).

iv. Do preverbal object foci in Greek differ from their postverbal counterparts?

In this chapter, I argue that preverbal object foci in Greek differ from their postverbal counterparts with respect to discourse topichood.. In this sense, the difference between Greek preverbal and postverbal object foci has nothing to do with focus. Specifically, it is shown that in Greek "discourse topics" can be syntactically marked, and that preverbal object foci in Greek must obligatorily function as discourse topics. Evidence for this claim is provided by the results of backward anaphora resolution and by the results of a continuation test that was implemented by means of a questionnaire.

Part two
**Chapter five**. Chapter five examines the phonetic properties of preverbal and postverbal object foci in Greek, by means of a production and two perception experiments. The two perception experiments differ with respect to the type of

stimuli that are used. In the first experiment, I used natural stimuli, whereas in the second experiment, I used manipulated stimuli. The ordering OVS may give rise to a preverbal object focus, ([$_{NP}$O]$_{Foc}$VS), while it is not possible to give rise to a verb-phrase focus, (*[$_{VP}$OV]S), or an all sentence focus (*[$_{S}$OVS]$_{Foc}$). Contrary to OVS, the ordering SVO may give rise to three different focus conditions, namely, an all-sentence focus, ([$_{S}$SVO]$_{Foc}$), a verb-phrase focus, (S[$_{VP}$VO]$_{Foc}$), and a postverbal object focus, (SV[$_{NP}$O]$_{Foc}$). Taking this into account, the production experiment aimed at answering the question given in (v).

v. Do speakers produce a difference among sentence focus, verb phrase focus and object focus?

The results of the production experiment show that preverbal object focus [$_{NP}$O]$_{Foc}$VS and postverbal object focus SV[$_{NP}$O]$_{Foc}$ differ significantly; in preverbal object focus, there is a pitch rise followed by a pitch fall, and the post-focus sequence is flat, while in postverbal object focus there are more pitch movements. Sentence focus, verb-phrase focus and postverbal object focus do not present radical differences. However, there are some differences among them. Specifically, the first pitch rise in verb-phrase focus is larger than in postverbal object focus. The two also differ at the second pitch rise, verb-phrase focus showing a larger rise than postverbal object focus. Moreover, the second pitch rise of verb-phrase focus is larger than the second pitch rise of sentence focus.

The perception experiment that used natural stimuli aimed at answering the question in (vi), while the perception experiment that used manipulated stimuli aimed at answering the question in (vii).

vi. Do listeners perceive a difference among sentence focus, verb phrase focus and object focus?
vii. What is the relative importance of break, accent on the verb and accent on the object on focus perception?

The results of the perception experiment that used natural stimuli show that listeners perceive postverbal object focus SV[$_{NP}$O]$_{Foc}$ well above chance level (74.7%), verb-phrase focus S[$_{VP}$VO]$_{Foc}$ above chance level (42.2%) and sentence focus [$_{S}$SVO]$_{Foc}$ below chance level (14.1%). The results of the perception experiment that used manipulated stimuli indicate that break is the most important variable among break, accent on the verb and accent on the object on focus perception. Next in importance comes accent on the object, while accent on the verb comes last in importance.

**Chapter six**. Chapter six investigates the phonetic realization of contrast in Greek by means of a production experiment. Taking into consideration the fact that in Greek contrastive foci and contrastive topics can appear in preverbal or postverbal position, chapter six aims at answering the question stated in (viii).

viii. Do speakers produce a difference between contrastive focus and contrastive topic?

To answer the question in (viii), one needs first to tackle the following questions.

a. Do speakers produce a difference between new-information and contrastive focus?
b. Do speakers produce a difference between C-Top/complex discourse moves and C-Top/simple discourse moves?

The results of the experiment show that new-information focus, corrective-contrastive focus and closed-set/contrastive focus do not differ in a statistically significant way. The results also indicate that C-Top/complex discourse moves differ from C-Top/simple discourse moves; the latter having shorter duration and higher intensity than the former ones. With respect to the question in (viii), it is shown that contrastive foci differ from contrastive topics. Specifically, [IO]$_{\text{C-Top/Complex D-move}}$VO differs from [IO]$_{\text{Corrective-contrastive Foc}}$VO, the first one presenting more pitch movements, ending with a final pitch rise, and having longer duration as well as higher intensity. Moreover, OV[IO]$_{\text{C-Top/Complex D-move}}$ differs from OV[IO]$_{\text{Corrective-contrastive Foc}}$; the first pitch rise in OV[IO]$_{\text{C-Top/Complex D-move}}$ is larger than the first pitch rise in OV[IO]$_{\text{Corrective-contrastive Foc}}$, while the second pitch rise in OV[IO]$_{\text{C-Top/Complex D-move}}$ is shorter than the second rise in OV[IO]$_{\text{Corrective-contrastive Foc}}$. The two also differ with respect to duration and intensity, the first one having longer duration and higher intensity.

**Chapter seven**. Chapter seven builds on the findings of chapter six, and it reports on the results of a perception experiment on contrast. In particular, it aims at answering the questions given in (ix) and (x).

ix. Do listeners perceive any difference among new information focus, corrective-contrastive focus, C-Top/complex and C-Top/simple discourse moves?
x. Can the final rise of [IO]$_{\text{C-Top/Complex D-move}}$VO be associated with C-Top/complex discourse moves?

The results of the experiment indicate that listeners perceive corrective and new information focus well above chance level. C$_{\text{-Top/Complex D-move}}$ is perceived above chance level, but listeners confuse it with C$_{\text{-Top/Simple D-move}}$. In particular, when the intended information structure was [IO]$_{\text{C-Top/Complex D-move}}$VO then it was perceived as such in 42% of the relevant cases, while it was confused with a C$_{\text{-Top/Simple D-move}}$ in 42%. When the intended information structure was OV[IO] $_{\text{C-Top/Complex D-move}}$, then it was perceived correctly in 32.1% of the relevant cases, whereas in 56.4%, it was confused with a C$_{\text{-Top/Simple D-move}}$. It should be noted that C$_{\text{-Top/Simple D-move}}$ is not confused with C$_{\text{-Top/Complex D-move}}$; it is rather confused with new-information focus or with corrective-contrastive focus. Specifically, when the intended

information structure was [IO]$_{\text{C-Top/Simple D-move}}$VO, then in 82.1% of the relevant cases, it was confused with new-information focus. When the intended information structure was OV[IO]$_{\text{C-Top/Simple D-move}}$, then in 52.6% of the relevant cases, it was confused with corrective-contrastive focus. With respect to the question in (x), the likelihood of selecting new information focus or corrective-contrastive focus as an answer instead of selecting C$_{\text{-Top/Complex D-move}}$ decreases with the final rise. The likelihood of selecting C$_{\text{-Top/Simple D-move}}$ instead of selecting C$_{\text{-Top/Complex D-move}}$ does not dependent significantly on the final rise.

# 2 Focus and Exhaustivity

## 2. Introduction

Object foci in Greek can appear in preverbal or postverbal position. An example is given in (1). Brackets and the subscript $_{\text{Foc}}$ indicate focus.

(1) a. [Ti Maria]$_{\text{Foc}}$ filise o Yanis.
the.ACC Mary.ACC kiss.3SG the.NOM John.NOM
'[Mary]$_{\text{Foc}}$, John kissed.'

b. O Yanis filise [ti Maria]$_{\text{Foc}}$.
the.NOM John.NOM kiss.3SG the.ACC Mary.ACC
'John kissed [Mary]$_{\text{Foc}}$.'

In (1a) the object focus appears in preverbal position, while (1b) is an example of postverbal object focus. The relation between the position of the focused object and its interpretation has been widely discussed in the literature. In particular, it is argued that preverbal object foci receive an exhaustive or contrastive interpretation, while postverbal object foci are interpreted as new information foci. For instance, Kiss (1996) and Horvath (2000) argue that in Hungarian preverbal object foci are interpreted exhaustively, while postverbal object foci are interpreted as new information foci. For Italian, Frascarelli (2000) and Belletti (2001, 2004) argue that preverbal object foci receive a contrastive interpretation, whereas postverbal object foci are interpreted as new information foci.

Baltazani (1998) argues that postverbal object foci in Greek are interpreted as new information foci, whereas preverbal object foci receive an exhaustive interpretation (see also Roussou & Tsimpli 2006). In this chapter, I question the assumption that Greek preverbal object foci receive an exhaustive interpretation. I argue that exhaustivity is not part of the semantics of focus in Greek. Thus, the aim of this chapter is to show that in Greek the preverbal position, where foci appear, should not be associated with exhaustivity.

The chapter is organized as follows. In section 2.1, I discuss wh-question/answer pairs with respect to exhaustivity. The section concludes with a test for new information focus and its application to Greek. Section 2.2 discusses a test for exhaustivity and its application to Greek. In this section, I show that the test for exhaustivity interacts with the interpretation of the predicate. In the same section, it is demonstrated that preverbal object foci in Greek are not interpreted

exhaustively. The section concludes with a modified test for exhaustivity. Section 2.3 addresses the issue of co-ordination and distributivity. Section 2.4 is a brief note on Hungarian. Section 2.5 concludes.

## 2.1 *Wh*-question/answer pairs, exhaustivity and focus

This section provides initial evidence for the claim that Greek preverbal and postverbal object foci are interpreted as new information foci. Specifically, I discuss the major test for identifying new information focus and examine its relation to exhaustivity. I show that there is a problem with this test; the test has a pragmatic effect. Therefore, we have to control for this effect by slightly modifying the test. Then, the modified test is applied to Greek. The results of the test offer the first piece of evidence that Greek preverbal object foci are not exhaustive.

The major test for identifying new information focus is the *wh*-question/answer pair. This test is based on the definition of new information focus as the part of the sentence that answers the relevant question in a question/answer pair. (See Dik (1978), de Hoop & de Swart (2000), Büring (1997), Kadmon (2001) among others.) An illustration of new information focus is given in (2). The sign # marks infelicity.

(2) *Question*

a. Pjos espase to vazo?
who.NOM break.3SG the.ACC vase.ACC
'Who broke the vase?'

b. *Answer* 1
[O Yanis]$_{Foc}$ espase to vazo.
the.NOM John.NOM break.3SG the.ACC vase.ACC
'[John]$_{Foc}$ broke the vase.'

c. *Answer* 2
#O Yanis espase [to vazo]$_{Foc}$.
the.NOM John.NOM break.3SG the.ACC vase.ACC
'John broke [the vase]$_{Foc}$.'

The *wh*-question in (2a) requires an answer with focus on the subject. In (2b) the subject is in focus, as indicated by the brackets, and the question/answer pair is congruent. In contrast to (2b), in (2c) the focus is on the object and the answer is infelicitous. Example (2) shows that the *wh*-question imposes a restriction on the focus of its answer. This observation is not new. Here, I discuss a specific property of *wh*-questions, namely, that *wh*-questions may be interpreted as asking for an exhaustive or a non-exhaustive answer. Exhaustivity is to be understood as selecting a set-member and excluding all others.

Imagine the following context. Peter and Anna are going to have friends over for dinner. Anna has made the invitations, but Peter is in charge of cooking and he

would like to know for how many persons he should cook. So, he asks Anna about it.

(3) *Question*
a. Pji tha erthun?
who.NOM will come.3PL
'Who is coming for dinner?'
*Answer*
b. [O Kostis, i Eleni ke
the.NOM Kostis.NOM the.NOM Eleni.NOM and
i Maria]$_{Foc}$ tha erthun.
the.NOM Maria.NOM will come.3PL
'[Kostis]$_{Foc}$, [Eleni]$_{Foc}$ and [Maria]$_{Foc}$ are coming for dinner.'

The question in (3a) is interpreted as asking for an exhaustive answer. Peter wishes to know the exact number of persons that are coming for dinner. If somebody else were coming as well, then, Anna should mention him/her. In this respect, the answer in (3b) is an exhaustive answer. There is another term that is used in the literature for this type of answers, namely, mention-all answers; mention-all in the sense that all participants relevant for the situation should be mentioned. In the specific example, everybody who is coming for dinner should be mentioned.

Contrary to the question in (3a), the question in (4a) is interpreted as asking for a non-exhaustive answer. Imagine the following context. Linda has just moved to Leiden and she would like to buy an Italian newspaper, but she does not know where. So she asks Ben about it.

(4) *Question*
a. Pjos ehi italikes efimerides?
who.NOM have.3SG Italian.ACC newspaper.ACC
'Who sells Italian newspapers?'
*Answer*
b. [O peripteras sto stathmo]$_{Foc}$
the.NOM kiosk-owner.NOM at.the.ACC train-station.ACC
ehi italikes efimerides.
have.3SG Italian.ACC newspapers.ACC
'You can buy Italian newspapers [at the kiosk in the train station]$_{Foc}$.'

The question in (4a) does not require an exhaustive answer. Linda does not wish to know all places in Leiden that sell Italian newspapers. In this context, mentioning one place is sufficient. The answer that is given by Ben in (4b) is expected by Linda to be non-exhaustive. The answer in (4b) can also be called a mention-some answer; in the sense that it is sufficient, if Ben mentions only one or some of the places that sell Italian newspapers.

Examples (3) and (4) show that *wh*-questions can be interpreted as asking for an exhaustive or a non-exhaustive answer, (3b) is an exhaustive answer, while (4b) is a non-exhaustive answer. This raises a question about the source of exhaustivity. Trying to answer this question, one could argue that in (3b) exhaustivity results from the semantics of the *wh*-question. Such argumentation would leave examples like the one given in (4) unaccounted for. Moreover, it would mean that the part of the answer which is in focus is always interpreted exhaustively.

The possibility of a mention-some answer to a *wh*-question as in (4b) shows that exhaustivity does not result from the semantics of the *wh*-question, and that it is pragmatic rather than semantic in nature. The contrast between (3) and (4) can be easily accounted for by the Gricean conversational maxim of quantity. The maxim of quantity is given in (5).

(5) Maxim of Quantity (Grice, 1975)
   a. Make your contribution as informative as is required for the current purposes of the exchange.
   b. Do not make your contribution more informative than is required.

In examples (3) and (4), Anna and Ben, respectively, are cooperative and make their contributions as informative as required by the situation; Anna provides an exhaustive list of people that are coming for dinner, while Ben mentions only one place where one can buy an Italian newspaper.

What I have shown so far is that *wh*-questions can be interpreted as asking for an exhaustive or an non-exhaustive answer. This means that when using the *wh*-question/answer pair test one should control for exhaustivity. This can be done by inserting a mention-some expression in the question. The presence of a mention-some expression in the question allows the speaker to give a non-exhaustive answer. Such mention-some expressions are among other things and for example (Groenendijk and Stokhof, 1984). An illustration of the slightly modified *wh*-question/answer pair test is given in (6). The subscript $_{\text{I-Foc}}$ marks new information focus.

(6) *Question*
   a. Ti agorases metaksi alon?
      what buy.2SG among other.GEN
      'What did you buy among other things?'
      *Answer*
   b. Agorasa [ena vivlio]$_{\text{I-Foc}}$ ke [ena mpluzaki]$_{\text{I-Foc}}$.
      buy.1SG a.ACC book.ACC and a.ACC blouse.ACC
      'I bought [a book]$_{\text{I-Foc}}$ and a [blouse]$_{\text{I-Foc}}$.'

In (6a), the mention-some expression *metaksi alon* 'among other things' makes the question to be interpreted as requiring a non-exhaustive answer; in this respect (6a)

asks for a non-exhaustive answer. Example (6b) mentions two of the things that were bought and provides a non-exhaustive answer to the question in (6a). [1]

As mentioned in section 2, Greek object foci may appear in preverbal and postverbal position. The slightly modified *wh*-question/answer pair test is applied to Greek postverbal and preverbal object foci in examples (7) and (8). Example (7) is an instance of direct object focus, while (8) is an example of indirect object focus.

In (7a), the mention-some expression *metaksi alon* 'among other things' asks for a non-exhaustive answer to the *wh*-question. This means that the answer to the question in (7a) is expected to be a non-exhaustive answer.

(7) a. *Question*
Ti harise metaksi alon o Yanis stin Ilektra?
what give.3SG among other.GEN the.NOM John.NOM to.the.ACC Ilektra.ACC
'What did John give to Ilektra among other things?'

[1] As already noted, the question in (6a) is interpreted as requiring a non-exhaustive answer. The most neutral way of answering the question in (6a) is by providing a non-exhaustive answer. This does not mean that a question that contains a mention-some expression can never be answered with an answer that contains *mono* 'only', a focus sensitive operator that triggers exhaustivity. If a sentence that contains a focus sensitive operator which triggers exhaustivity is used to answer a question that contains a mention-some expression, then, the answer is negating/cancelling the presupposition of the question. In this case, we are not dealing with an application of the *wh*-question/answer pair test as a test for identifying new information focus.

An example is given in (i). The examiner asks the question in (ia). A student can answer the question in (ia) with (ib). In (ib), the student mentions two historical figures, and continues with (ic). Example (ic) shows that the student has interpreted the question in (ia) as a question that asks for a non-exhaustive answer, has provided a non-exhaustive answer in (ib) and wonders whether the non-exhaustive answer that he provided in (ib) is enough. Another student can answer the question in (ia) with (id). In (id), the student says that he can recognize only one historical figure, namely, Chruchill. Example (id) negates/cancells the presupposition of (1a).

(i) *Question*
a. Pjus diakrinis metaksi alon sti fotografia?
who.ACC identify.2SG among other.GEN in.the.ACC photo.ACC
'Who can you recognize among others in this photo?'
*Answer*1
b. Diakrino ton Roosevelt ke ton Churchill.
identify.1SG the.ACC Roosevelt ke the.ACC Churchill
'I recognize Roosevelt and Churchill.'
c. Na po ke alus?
to mention and more.ACC
'Shall I mention more?'
*Answer*2
d. Diakrino mono ton Churchill.
identify.1SG only the.ACC Churchill
'I recognize only Churchill..'

b. *Answer*1
Harise [ena vivlio]$_{\text{I-Foc}}$ stin Ilektra. V[O]$_{\text{I-Foc}}$
give.3SG a.ACC book.ACC to.the.ACC Ilektra.ACC
'John gave [a book]$_{\text{I-Foc}}$ (among other things) to Ilektra.'

c. *Answer*2
[Ena vivlio]$_{\text{I-Foc}}$ harise stin Ilektra. [O] $_{\text{I-Foc}}$V
a.ACC book.ACC give.3SG to.the.ACC Ilektra.ACC
'[A book]$_{\text{I-Foc}}$, (among other things) Haris gave to Ilektra.'

The question in (7a) can be answered in two ways; the focused object may appear in postverbal (7b) or in preverbal position (7c). In both positions, the focused direct object is interpreted as non-exhaustive new information focus.

The same observation holds for indirect object focus. An example of indirect object focus is given in (8).

(8) a. *Question*
Se pjon milise metaksi alon i Maria?
to who.ACC talk.3SG among other.GEN the.NOM Maria.NOM
'To whom (among others) did Maria talk?'

b. *Answer* 1
Milise [ston Petro]$_{\text{I-Foc}}$. V[IO]$_{\text{I-Foc}}$
talk.3SG to.the.ACC Peter.ACC
'Maria talked [to Peter]$_{\text{I-Foc}}$ (among others).'

c. *Answer* 2 [IO]$_{\text{I-Foc}}$V
[Ston Petro]$_{\text{I-Foc}}$ milise.
To.the.ACC Peter.ACC talk.3SG
'[To Peter,]$_{\text{I-Foc}}$ (among others) Maria talked.'

The question in (8) asks for a non-exhaustive answer, as it contains a mention-some expression. As shown in (8b) and (8c), preverbal as well as postverbal objects may be used to answer a mention-some *wh*-question. This shows that both preverbal and postverbal indirect object foci may function as new information foci, and more importantly, that they do not need to have an exhaustive interpretation.

Recapitulating, in this section it was shown that the exhaustive interpretation of an answer to a *wh*-question is an effect of pragmatics. It was also shown that this effect can be controlled for, by inserting a mention-some expression in the question. This resulted into a modified *wh*-question/answer pair test for identifying new information focus. The modified test was applied to Greek; its results indicate that Greek preverbal and postverbal object foci are interpreted as new information foci and are not exhaustive. This finding shows that preverbal and postverbal object foci in Greek do not differ with respect to exhaustivity.

## 2.2 Exhaustivity and the co-ordination test

In the previous section, it was shown that in Greek the appearance of a focused DP in a preverbal position does not entail an exhaustive interpretation of the focused DP. In this section, I provide further evidence for this claim. This evidence is based on the standard test for exhaustivity. The section is structured as follows. First, I present the standard test for exhaustivity, then I discuss its application to Greek by Baltazani (1998) and finally, I show that the data that were discussed by Baltazani need to be reinterpreted.

Exhaustivity has been associated with focus (cf. inter alia Kuno (1972), Szabolcsi (1981), Kiss (1998) ). In particular, Kuno used the term 'exhaustive listing' to describe the interpretation of a type of *ga*-constructions in Japanese, while Szabolcsi regarded "exhaustive listing as the predominant semantic characteristic of Focus" (Szabolcsi, 1981: 519). Drawing on Szabolcsi (1981), Kiss (1998) introduces the term identificational focus. According to Kiss, exhaustivity is one of the semantic properties of identificational focus, the other being contrastivity.[2] It is not, however, clear what Kiss' assumptions are with respect to the relation between exhaustivity and contrastivity. She seems to treat contrastivity as a parameter, assuming that identificational foci are [+exhaustive, ±contrastive]. Kiss gives the following definition for identificational focus.

(9) Identificational focus
"An identificational focus represents a subset of the set of contextually or situationally given elements for which the predicate phrase can potentially hold: it is identified as the exhaustive subset of this set for which the predicate phrase actually holds."

(Kiss, 1998: 249)

Identificational focus has also been associated with a specific syntactic position, namely a preverbal one. Kiss (1998) based on Szabolcsi (1981: 519) constructed a test for identificational focus. This test is widely used in the focus literature (see, for instance, Costa (1998) for Portuguese, Elordieta (2001) for Basque) and is defined in (10).

(10) "Szabolcsi's test involves a pair of sentences in which the first sentence contains a focus consisting of two coordinate DPs and the second sentence differs from the first one only in that one of the two coordinate DPs has been dropped. If the second sentence is not among the logical consequences of the first one, the focus expresses exhaustive identification."

(Kiss, 1998: 250)

[2] The notion of contrast will be discussed in detail in chapter three of this dissertation.

The test in (10), which I name the co-ordination test, has initially been applied to Hungarian. An illustration of the test is given in (11). The data are from Kiss (1998).

(11) a. Mari [egy kalapot és [egy kabátot]$_{Foc}$ nézett ki magának.
Mary a hat.ACC and a coat.ACC picked out herself.ACC
'It was [a hat and a coat]$_{Foc}$ that Mary picked out herself.'
—/→
b. Mari [egy kalapot]$_{Foc}$ nézett ki magának.
Mary a hat.ACC picked prt herself.ACC
'It was [a hat]$_{Foc}$ that Mary picked for herself.'

[Hungarian]

Example (11a) contains a coordinated DP phrase *egy kalapot és egy kabátot* 'a hat and a coat' that is in focus and appears in preverbal position, while (11b) contains only one of the two conjuncts. Examining the logical entailment, we see that (11b) is not among the logical entailments of (11a). Thus, according to the co-ordination test in (10), the preverbal focused DP is interpreted exhaustively. It is important to note that the key sentence in the co-ordination test is the (b) sentence. It is the exhaustivity of the focused DP in (11b) that causes the failure of the entailment, that is, if it is true that the only thing that Mary bought is a hat, (11a) cannot be true. This obviously excludes the possibility that (11a) entails (11b).

As already mentioned, identificational focus has been associated with a preverbal position. This predicts that foci appearing in postverbal position should behave differently from foci appearing in preverbal position. It also predicts that postverbal foci should not qualify as identificational foci. This means that when the co-ordination test is applied to postverbal foci, the entailment should go through. The predictions are verified by the data, as showm in example (12).

(12) a. Mari kinézett magának [egy kalapot és egy kabátot]$_{Foc}$.
Mary out-picked herself.ACC a hat.ACC and a coat.ACC
'Mary picked [a hat]$_{Foc}$ and [a coat]$_{Foc}$ herself.'
→
b. Mari kinézett magának [egy kalapot]$_{Foc}$.
Mary out-picked herself.ACC a hat.ACC
'Mary picked [a hat]$_{Foc}$ for herself.'

[Hungarian]

Example (12a) contains a coordinated DP phrase which is in focus and appears in postverbal position, whereas (12b) contains only one of the two conjuncts. As shown in (12), the entailment goes through. This means that the postverbal focused object in (12b) is not interpreted exhaustively.

Besides preverbal foci, there is another syntactic construction which has been associated with exhaustivity, namely clefts (see Horn (1981), Percus (1997), Meinunger (1998), Kiss (1998) among others). An example is given in (13).

(13) a. It was [a hat and a coat]Foc that Mary picked for herself.
—/→
b. It was [a hat]Foc that Mary picked for herself.

In example (13a), the clefted constituent consists of a coordinated DP phrase, while in example (13b) the clefted constituent consists of only one of the two conjuncts. As shown in (13), (13b) is not entailed by (13a). This means that the clefted constituent in (13b) is interpreted exhaustively. As already pointed out, it is the exhaustive interpretation of the focused DP in (13b) that causes the failure of the implication.

Having illustrated that in the co-ordination test the key sentence is the (b) sentence and that it is the exhaustive interpretation of the focused DP in the (b) sentence that causes the failure of the implication, I turn to Greek. The remainder of this section is organized as follows. I first discuss Baltazani's data. Then, I present more data, showing that the co-ordination test interacts with a collective interpretation of the (a) sentence. Finally, I give further evidence for the claim that preverbal object foci in Greek are not exhaustive.

Baltazani (1998) applied the co-ordination test to Greek and argued that preverbal object foci have to be interpreted exhaustively. Baltazani illustrated her point on the basis of example (14).

In example (14a) the coordinated phrase [*sto Yani ke sti Maria*]$_{\text{Foc}}$ 'for John and for Mary' appears in preverbal position. Example (14b) contains only one of the two conjuncts, namely *sto Yani* 'for John'.

(14) a. [Sto Yani ke sti Maria]$_{\text{Foc}}$ agorasa padeloni.
to.the.ACC John.ACC and to.the.ACC Maria.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{\text{Foc}}$ and [for Mary]$_{\text{Foc}}$.'
—/→
b. [Sto Yani]$_{\text{Foc}}$ agorasa padeloni.
to.the.ACC John.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{\text{Foc}}$.'

Examining the entailment in (14), Baltazani (1998) observes that (14b) is not among the logical entailments of (14a). Thus, she concluded that the preverbal object focus in (14b) is interpreted exhaustively.

Baltazani discussed also the example in (15). In contradistinction to (14a), in example (15a), the focus appears in postverbal position.

(15) a. Agorasa padeloni [sto Yani]$_{Foc}$ ke [sti Maria]$_{Foc}$.
buy.1SG trousers.ACC to.the.ACC John.ACC and to.the.ACC Maria.ACC
'I bought a pair of trousers [for John]$_{Foc}$ and [for Mary]$_{Foc}$.'
→
b. Agorasa padeloni [sto Yani]$_{Foc}$.
buy.1SG rousers.ACC to.the.ACC John.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

Example (15a) contains a coordinated phrase that is in postverbal position and is in focus. Example (15b) contains only one of the two conjuncts. As indicated in (15), the entailment goes through; (15b) is among the logical entailments of (15a).

Examples (14) and (15) suggest that there is a contrast between preverbal and postverbal object focus. As shown in (14), the entailment is blocked in the case of preverbal object focus, whereas the entailment goes through in the case of postverbal object focus, as demonstrated in (15). Based on this contrast, Baltazani links the position of the focused object with its interpretation. She argues that every preverbal object focus in Greek has to be interpreted exhaustively, while every postverbal object focus has to be interpreted as new information focus.

Baltazani's conclusion could leave us with contradictory data, given the findings of section 2.1. In section 2.1, it was shown that Greek preverbal object foci are compatible with a mention-some reading and that they can function as new information foci. Below, I examine Baltazani's data in more detail and after discussing some more data, I show that the co-ordination test interacts with a collective interpretation of the (a) sentence. Once one has controlled for the collective interpretation of the (a) sentence of the co-ordination test, the data are not contradictory any more, and all data show that preverbal object foci in Greek are not exhaustive.

In order to get more insight into the data, a group of 40 speakers were asked to give their entailment judgements for examples (14) and (15).[3] Before presenting their judgements, it should be noted that all speakers allow for preverbal object foci as answers to *wh*-questions that ask for a mention-some answer (see examples (7) and (8) above). With respect to the entailment judgement in example (15), all speakers agreed that the entailment goes through, whereas with respect to the entailment judgement in example (14), there was a split in the group.

Specifically, 25 speakers claimed that in (14) the entailment does not go through. I name these speakers Group A. 15 speakers claimed that the entailment goes through from now on Group B. A schematic representation of the entailment judgements of the 40 speakers is given in table 2.1.

[3] All speakers come from Athens belong to the same age group (age range 25-30) and have university education. Gender does not account for any differences.

Table 2.1 Entailment judgements for examples (14) and (15)

| | Group A | Group B |
|---|---|---|
| Example 14 | the entailment fails | the entailment goes through |
| Example 15 | the entailment goes through | the entailment goes through |

According to table 2.1, Baltazani is a speaker of Group A. When looking at table 2.1, a specific question emerges, namely, why do speakers of Group B let the entailment go through in example (14)?

A closer inspection of the data suggests that there is a correlation between the interpretation of sentence (14a) and the failure or not of the entailment. In particular, Group A interpreted (14a) only collectively and as already noted, claimed that the entailment does not go through, whereas Group B interpreted (14a) primarily distributively and claimed that the entailment does go through. The entailment judgements of Group B when they interpret the (a) sentence distributively are given in (16).

Group B

(16) a. [Sto Yani ke sti Maria]$_{Foc}$ agorasa padeloni.
to.the.ACC John.ACC and to.the.ACC Maria.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{Foc}$ and one [for Mary]$_{Foc}$.'

→

b. [Sto Yani]$_{Foc}$ agorasa padeloni.
to.the.ACC John.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

Condition: (16a) is interpreted distributively.

As shown in (16), the entailment goes through; (16b) is among the logical entailments of (16a). This means that the preverbal object focus in (16b) is not interpreted exhaustively. It should be noted that the collective reading of (14a) is also available for speakers of Group B. As expected, when speakers of Group B interpreted (14a) collectively, they claimed that the entailment does not go through.

The contrast between the two groups confirms the observation that there is a correlation between the distributive interpretation of the (a) sentence and the entailment. Whenever speaker interpret the (a) sentence distributively, they claim that the entailment goes through. This finding may at first sight seem surprising, but it is not. The entailment pattern that we found in the co-ordination test is the same as the entailment pattern that is found in a known test for collectivity. An example of the collectivity test is given in (17), (cf. (Gamut, 1991): 32).

(17) a. Cheech and Chong are fun at parties.
—/→
b. Cheech is fun at parties.

Sentence (17a) contains a coordinated DP, while sentence (17b) contains only one of the two coordinated DPs. As shown in (17), sentence (17a) does not entail (17b); it may well be the case that Cheech and Chong are fun only when they are together.

The test for collectivity is in a sense the reverse of the test for exhaustivity. In the collectivity test, the entailment judgement informs us about the interpretation of the coordinated phrase in the (a) sentence, whereas in the exhaustivity test, the entailment judgement informs us about the interpretation of the preverbal focused object in the (b) sentence. In (17) the entailment does not hold because the coordinated DP 'Cheech and Chong' is interpreted collectively, while in (13) the entailment fails because the focused DP 'a hat' in (13b) is interpreted exhaustively. This means that in order to reliably use the co-ordination test, one should make sure that the (a) sentence is not interpreted collectively, as this automatically results in a failure of the entailment, independently of the interpretation (exhaustive/ non-exhaustive) of the (b) sentence.

An illustration of this is given in examples (18) and (19). Example (18a) contains a coordinated focused DP in preverbal position, while (18b) contains only one of the two coordinated focused DPs in preverbal position, and (18c) contains a focused object in postverbal position.

(18) a. [Sto Yani ke sti Maria]$_{Foc}$ agorasa padeloni.
to.the.ACC John.ACC and to.the.ACC Maria.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John and for Mary]$_{Foc}$.'

—/→

b. [Sto Yani]$_{Foc}$ agorasa padeloni.
to.the.ACC John.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

c. Agorasa padeloni [sto Yani]$_{Foc}$.
buy.1SG trousers.ACC to.the.ACC John.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

Condition: (18a) is interpreted collectively.

In example (18a), the predicate is interpreted collectively. (18b) as already mentioned, contains a preverbal focused object, and is not among the logical entailments of (18a). (18c) has a postverbal focused object and is also not among the logical entailments of (18a). This shows that the word order in the (b) and (c) sentence respectively does not matter. The entailment judgements for (18b) and (18c) constitute strong evidence for attributing Baltazani's judgements on (14) to collective interpretation, as (18a) under a collective reading does not entail (18b) or (18c). Example (19) provides further evidence for this. (19a) contains a coordinated focused DP that appears in postverbal position. (19b) contains a focused object in postverbal position, while (19c) has a focused object in preverbal position.

(19) a. Agorasa padeloni [sto Yani ke sti Maria]$_{Foc}$.
buy.1SG trousers.ACC to.the.ACC John.ACC and to.the.ACC Maria.ACC
'I bought a pair of trousers [for John and for Mary]$_{Foc}$.'

→

b. Agorasa padeloni [sto Yani]$_{Foc}$.
buy.1SG trousers.ACC to.the.ACC John.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

c. [Sto Yani]$_{Foc}$ agorasa padeloni.
to.the.ACC John.ACC buy.1SG trousers.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

Condition: (19a) is interpreted distributively.

For (19a), there are two readings available for all speakers, namely, a collective and a distributive reading. Under a distributive reading, which is the most prominent one, the entailment goes through. Specifically, when (19a) is interpreted distributively, then (19b) is among the logical entailments of (19a) and the same holds for (19c). This means that the preverbal focused object in (19c) is not exhaustive. If (19a) is interpreted collectively, then the entailment always fails, as expected.

Recapitulating, examples (18) and (19) provide important evidence for the claim that the co-ordination test interacts with the collective interpretation of sentence (a). Specifically, if sentence (a) is interpreted collectively, then the entailment is blocked, whereas if sentence (a) is interpreted distributively, then the entailment goes through. Coordinated focused DPs in preverbal position tend to be interpreted collectively; this is actually as already mentioned, the only available interpretation for speakers of Group A. Speakers of Group B allow for both interpretations, collective and distributive. Coordinated focused DPs in postverbal position tend to be interpreted distributively, both groups allow for both interpretations, but the distributive reading is the most prominent one.

It is exactly at this point that there is a problem with the way Baltazani applied the test. As shown by examples (14a) and (15a), Baltazani changed sentence (a) without taking into consideration the effects of the interpretation of sentence (a) on the co-ordination test. Moreover, the crucial sentence for deciding whether a focused DP is exhaustive is the (b) sentence. In this respect, when applying the co-ordination test, one should control for collectivity, and closely examine the (b) sentence. This can be done in a straightforward way by forcing a distributive interpretation onto the (a) sentence, as exemplified in (20) and (21).

(20) a. [Sto Yani ke sti Maria]$_{Foc}$ agorasa
to.the.ACC John.ACC and to.the.ACC Mary.ACC buy.1SG
apo ena padeloni.
each(lit.from) one.ACC trousers.ACC
'I bought [for John and Mary]$_{Foc}$ a pair of trousers each.'
→
b. [Sto Yani]$_{Foc}$ agorasa ena padeloni.
to.the.ACC John.ACC buy.1SG one.ACC trousers.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'
c. Agorasa ena padeloni [sto Yani]$_{Foc}$.
buy.1SG one.ACC trousers.ACC to.the.ACC John.ACC
'I bought a pair of trousers [for John]$_{Foc}$.'

Example (20a) can only be interpreted distributively. This is guaranteed by the insertion of an overt distributive marker *apo+numeral+noun* 'each'.[4] As shown in (20), (20b) is among the logical entailments of (20a), and the same holds for (20c). It should be noted that there is no variation with respect to the entailment judgements in (20). All speakers allow the entailment to go through. This means that the preverbal object focus in (20b) is not interpreted exhaustively.

Another example with a different exhaustivity trigger is given in (21).

(21) a. [Ena tetradio ke ena vivlio]$_{Foc}$ edosa
a.ACC notebook.ACC and a.ACC book.ACC give.1SG
se kathe mathiti
to every pupil
'I gave to every pupil a notebook and a book.'
→
b. [Ena tetradio]$_{Foc}$ edosa se kathe mathiti.
a.ACC notebook.ACC give.1SG to every.ACC pupil. ACC
'I gave to every pupil a notebook.'

c. Edosa se kathe mathiti [ena tetradio]$_{Foc}$.
give.1SG to every pupil a.ACC notebook.ACC
'I gave to every pupil a notebook.'

Similarly to (20a), example (21a) is only interpreted distributively; the distributive interpretation is due to the presence of the quantificational element *kathe* 'every'. As expected, (21b) is among the logical entailments of (21a), and the same holds for (21c). The results of the test show that the preverbal focused direct object in (21b) is not interpreted exhaustively. Thus, it can be concluded that in Greek preverbal object foci are not interpreted exhaustively.

[4] For a detailed discussion see Gryllia (2007).

## 2.3 Co-ordination and distributivity

When discussing example (14) we noted that there is a split in the group of speakers with respect to their judgements. Let me briefly recapitulate. There are two groups, Group A and Group B. Group B (N=15) is smaller than group A (N=25). Group A allows only a collective interpretation for the sentence in (14a). In this sense, example (14a) is interpreted unambiguously by the speakers of Group A. Contrary to Group A, Group B interprets example (14a) ambiguously, i.e. either collectively or distributively. This contrast is depicted in table 2.2.

Table 2.2 Available interpretations for example (14a)

| Example (14a) | Group A | Group B |
|---|---|---|
| Collective interpretation | available | available |
| Distributive interpretation | unavailable | available |

With respect to the interpretation of example (15a), there is no disagreement among speakers. Both interpretations are available to all speakers. This is shown in table 2.3.

Table 2.3 Available interpretations for example (15a)

| Example (15a) | Group A | Group B |
|---|---|---|
| Collective interpretation | Available | available |
| Distributive interpretation | Available | available |

When looking at tables 2.2 and 2.3 a couple of questions emerge; namely, (i) why is the distributive interpretation of (14a) only possible for Group B, and (ii) why are both interpretations available for (15a)? Below, I tackle these questions.

As far as question (i) is concerned, it should be noted that in (14a) the coordinated DP appears in preverbal position and *padeloni* 'trousers' is indefinite. This means that in order to get a distributive interpretation of example (14a), the coordinated DP should take scope over the indefinite. However, this scope reading, namely a DP that does not contain a quantifier such as *all*, *each* or *most* to take scope over the indefinite, turns out to be difficult for the majority of Greek speakers (see Ruys (1992), Abusch (1994) among others for discussion of similar effects in English). In this respect the unavailability of this scope reading in (14a) for Group A is expected.

Further support for the unavailability of this scope reading for Group A comes from other scope-taking elements. For instance, if the coordinated DP in (14a) is replaced with a plural definite DP, then the distributive reading remains unavailable for speakers of Group A. The relevant example is given in (22).

(22) Ta pedja agorasan ena vivlio.
the.NOM children.NOM buy.3PL a.ACC book.ACC
'The children bought a book.'

Remark: Group A: Collective interpretation
Group B: Collective/distributive interpretation

Contrary to speakers of Group A, speakers of Group B allow for a distributive reading of (22). Note that the effect is independent of the focus proprties of the subject in (22).

Furthermore, if the coordinated DP in (14a) is replaced by a quantified DP, then the distributive reading becomes available for speakers of Group A. An example with a quantified DP is given in (23).

(23) Kathe pedi agorase ena padeloni.
every.NOM child.NOM buy.3SG a.ACC trousers.ACC
'Every child bought a book.'

As already noted, both the distributive and the collective interpretations are available for example (15a),which is repeated here as (24).

(24) Agorasa padeloni [sto Yani ke sti Maria]$_{Foc}$.
buy.1SG trousers.ACC to.the.ACC John.ACC and to.the.ACC Maria.ACC
'I bought a pair of trousers [for John and for Mary]$_{Foc}$.'

The availability of both interpretations for (24) can be explained, if we assume that there are two levels of co-ordination available for (24), namely co-ordination at DP- and at sentential level. (24) is an instance of co-ordination at sentential level, followed by elision. This is shown in (25).

(25) Agorasa padeloni sto Yani ke ~~agorasa~~ ~~padeloni~~.
buy.1SG trousers.ACC to.the.ACC John.ACC and buy.1SG rousers.ACC
sti Maria
to.the.ACC Mary.ACC
'I bought a pair of trousers for John and for Mary.'

There are three arguments that come in support of this type of account of the data. The first argument in favor of the claim that there are two levels of co-ordination available for (24) is the following. When the coordinated DP in (24) is replaced by an ordinary plural DP, the effect disappears; in such cases, for speakers of Group A, the only available reading is the collective one. The relevant example is given in (26).

(26) Agorasa padeloni sta pedja.
buy.1SG trousers.ACC to.the.ACC children.ACC
'I bought a pair for trousers for the children.'

Remark: (26) is only interpreted collectively by speakers of Group A.

The second argument comes from phonological phrasing. Before presenting the argument, there is a further assumption that needs to be made, namely, that the placement of intonational boundaries depicts to a certain extent the syntactic make-up of the sentence. In this sense, intonational boundaries coincide with syntactic boundaries (see Selkirk (1986, 1990), Nespor & Vogel (1986), Truckenbrodt (1999), Steedman (2000), Revithiadou (2004), Baltazani (2006) among others). An illustration of this is given in (27). Parentheses indicate intonational boundaries.

(27) a. (Agorasa padeloni) (sto Yani ke sti Maria).
buy.1SG trousers.ACC to.the.ACC John.ACC and to.the.ACC Mary.ACC
'I bought a pair of trousers for John and for Mary.'
b. (Agorasa padeloni sto Yani) (ke sti Maria).
buy.1SG trousers.ACC to.the.ACC John.ACC and to.the.ACC Mary.ACC
'I bought a pair of trousers for John and for Mary.'

The phrasing in (27a) is fine, if the intended meaning of the sentence is collective, while it is odd, if the intended meaning is distributive. The opposite holds for (27b). The phrasing in (27b) is fine, if the intended meaning is distributive, whereas it is odd, if the intended meaning is collective. Given the assumption about intonational and syntactic boundaries, I argue that two different co-ordination structures are depicted in (27).[5] Example (27a) is an instance of co-ordination at the DP level, whereas (27b) is an example of co-ordination at the sentential level followed by elision.

Finally, there is a third indirect argument. This argument is offered by subject co-ordination and agreement data. Before presenting the argument, it is important to note that Greek attests subject verb agreement.[6] An example is given in (28).

(28) a. Argisan i mathites.
be.late.3PL the.NOM pupils.NOM
'The pupils were late.'
b. *Argisan o mathitis.
be.late.3PL the.NOM pupil.NOM
'The pupil was late.'

[5] See Anagnostopoulou (2005) for a discussion of cross-linguistic and cross-categorial variation of datives.
[6] See Spyropoulos (1999) among others for a discussion of this issue.

In (28a) there is a plural DP that appears in postverbal position and agrees with the verb in number, while (28b) is ungrammatical, as there is no subject verb agreement. The plural DP in (28a) can be replaced with a coordinated DP. This is shown in example (29).

(29) a. Argisan o Yanis ke o Vasilis.
be.late.3PL the.NOM John.NOM and the.NOM Bill.NOM
'John and Bill were late.'
b. Argise o Yanis ke o Vasilis.
be.late.3SG the.NOM John.NOM and the.NOM Bill.NOM
'John was late and Bill was late.'

In (29a) the verb is in plural and is followed by the coordinated DP *o Yanis ke o Vasilis* 'John and Bill'; (29a) is in a sense similar to (28a). Contrary to (29a), in (29b) the verb is in 3rd singular and is followed by the coordinated DP. The similarity between (28a) and (29a) as well as the contrast between (28b) and (29b) suggests that in (29a) we are dealing with co-ordination at DP level, while in (29b) we are dealing with co-ordination at sentential level followed by elision.

To the extent that there is a parallel between (24) and (29), as in (24) we are dealing with coordinated objects, whereas in (29) we are dealing with coordinated subjects, the data in (29) can be considered as an argument for claiming that there are two levels of co-ordination available for (24).

Summarizing, both the collective and the distributive interpretation of the sentence in (24a) are available for all speakers. This availability is related with the availability of two levels of co-ordination for (24a). In sentence (14a), we are dealing with co-ordination at DP level; the distributive interpretation of (14a) is only available to speakers of Group B. This is not surprising, given the fact that is not easy for a non-quantified coordinated DP to take scope over the indefinite.

## 2.4 A brief note on Hungarian

In the previous sections, it was shown that the co-ordination test interacts with the interpretation of the (a) sentence. It was also shown that for deciding whether a focused DP is interpreted exhaustively or not, the key sentence is the (b) sentence of the co-ordination test. Moreover, it was shown that Greek preverbal object foci are not exhaustive. Taking this into account, I discuss briefly Hungarian (p.c. A.Lipták, V.Hegedüs). (For a detailed discussion about focus in Hungarian see Horvath (1986), Brody (1990), Kiss (1987), Liptak (2001), Szendrői (2001).)

The co-ordination test is applied to Hungarian in examples (30)-(32). Example (30a) contains a coordinated focused DP in preverbal position and is interpreted distributively. In (30b) the focused object is in preverbal position, while in (30c), the focused object appears in postverbal position. Hungarian has a specific

requirement, namely, postverbal object focus is only possible when the preverbal position is filled with an element that can carry stress (cf. Szendrői (2001).

(30) a. Tegnap [Jánosnak és [Marinak]$_{Foc}$ fizette ki Béla
yesterday John.DAT and Mary.DAT paid prt Bela
a fizetését.
the salary.POSS
'Yesterday, it was to John and Mary that Bela paid the salary.'
—/→
b. Tegnap [Jánosnak]$_{Foc}$ fizette ki Béla a fizetését.
yesterday John.DAT paid prt Bela the salary.POSS
'It was to John that Bela paid the salary.'
c. [Tegnap]$_{Foc}$ fizette ki Béla a fizetését [Jánosnak]$_{Foc}$.
yesterday paid prt Béla the salary.POSS John.DAT
'It was yesterday that Béla paid the salary to John.'

[Hungarian]

As indicated by the entailment, (30b) is not among the entailments of (30a). This means that the preverbal object focus in (30b) is interpreted exhaustively. The entailment also shows that (30c) is not among the logical entailments of (30a) either. This suggests that the postverbal focused object in (30c) is interpreted exhaustively as well. It is worth noting that (30c) is degraded compared to (30b). (30c) seems to require a pair-list reading, (p.c. A.Lipták).

Similarly to the interpretation of (30a), (31a) is interpreted distributively. Example (31a) differs from (30a) with respect to the position of the coordinated focused DP. In (31a) the coordinated focused DP appears in postverbal position.

(31) a. [Tegnap]$_{Foc}$ fizette ki Béla a fizetését [Jánosnak
yesterday paid prt Béla the salary.POSS John.DAT
és Marinak]$_{Foc}$.
and Mary.DAT
'It was yesterday that Béla paid the salary to John and Mary.'
—/→
b. Tegnap [Jánosnak]$_{Foc}$ fizette ki Béla a fizetését.
yesterday John.DAT paid prt Bela the salary.POSS
'It was to John that Bela paid the salary.'

Example (31b) is identical to (30b), the example is repeated for the ease of exposition. In (31b), the focused object is in preverbal position and (31b) is not among the entailments of (31a).

Example (32a) is identical to (31a); (32a) is interpreted distributively and the coordinated focused DP appears in postverbal position. In example (32b), the focused object appears in postverbal position. As shown by the entailment

judgement in (32), (32b) is among the logical entailments of (32a). This means that the postverbal object focus in (32b) is not interpreted exhaustively.

(32) a. [Tegnap]$_{Foc}$ fizette ki Béla a fizetését [Jánosnak és [Marinak]$_{Foc}$.
yesterday paid prt Béla the salary.POSS John.DAT and Mary.DAT
'It was yesterday that Béla paid the salary to John and Mary.'
→
b. [Tegnap]$_{Foc}$ fizette ki Béla a fizetését [Jánosnak]$_{Foc}$.
yesterday paid prt Béla the salary.POSS John.DAT
'It was yesterday that Béla paid the salary to John.'
[Hungarian]

This finding seems at first sight contradictory to example (30). As already noted, (30c) that contains a postverbal object focus is not among the logical entailments of (30a), which suggests that the postverbal object focus in (30c) is interpreted exhaustively.

Given that (30a) as well as (31a) is interpreted distributively, the failure of the entailment in (30c) cannot be attributed to the collective interpretation of sentence (a) of the co-ordination test. I tend rather to attribute the failure of the entailment in (30c) to the pair-list reading effect of (30c). Why this is a plausible explanation, becomes clearer, if we consider again example (12) that is repeated here as example (33), for the ease of exposition.

(33) a. Mari kinézett magának egy kalapot és egy kabátot]$_{Foc}$.
Mary out-picked herself.ACC a hat.ACC and a coat.ACC
'Mary picked [a hat]$_{Foc}$ and [a coat]$_{Foc}$ herself.'
—/→
b. Mari kinézett magának egy kalapot]$_{Foc}$.
Mary out-picked herself.ACC a hat.ACC
'Mary picked [a hat]$_{Foc}$ for herself.'
[Hungarian]

Example (33a) contains a coordinated focused DP that appears in postverbal position. As already noted Hungarian has a specific requirement. In example (32a), this requirement is fulfilled by attaching to the verb the verbal particle *ki*, 'out'; the verbal particle can carry stress (see Szendröi (2001)). Example (33b) contains a focused DP in postverbal position and does not require a pair-list reading. As shown by the entailment judgement, (33b) is among the logical entailments of (33a). This means that the postverbal object focus in (33b) is not interpreted exhaustively.

Summarizing, the above findings show that in Hungarian preverbal object foci are interpreted exhaustively, while postverbal object foci are not. They also suggest that there is a correlation between exhaustive interpretation and pair-list readings. It can be concluded that Hungarian preverbal object foci differ from their Greek

counterparts; the former are exhaustive, whereas, the latter function as new information foci.

## 2.5 Conclusions

The main question that was addressed in this chapter is whether postverbal and preverbal object foci in Greek differ with respect to exhaustivity. To tackle this question, I employed two tests, the *wh*-question/answer pair test and the co-ordination test. With respect to the *wh*-question/answer pair test, it was observed that *wh*-questions may be interpreted as asking for an exhaustive answer. Based on this observation, it was suggested that one should control for this rather pragmatic effect, when using the *wh*-question/answer pair test for identifying new information focus. This was done by inserting a mention-some expression like *metaksi alon* 'among others' in the *wh*-question. As far as the co-ordination test is concerned, it was observed that this test interacts with the collective interpretation of the (a) sentence. Based on this observation, it was suggested that one should control for the interpretation of the (a) sentence, by imposing a distributive interpretation.

Both tests were applied to Greek and their results show that Greek postverbal and preverbal object foci are not interpreted exhaustively. They also indicate that both are interpreted as new information foci.

In this respect, Greek preverbal object foci differ from their Hungarian counterparts; the latter are interpreted exhaustively. In the next chapter, I will investigate whether preverbal object foci in Greek differ from their postverbal counterparts with respect to contrast.

# 3 Contrast

## 3. Introduction

In chapter two, I showed that preverbal ([O]$_{Foc}$VS) and postverbal (SV[O]$_{Foc}$) object foci in Greek do not differ with respect to exhaustivity. Moreover, it was demonstrated that preverbal as well as postverbal object foci in Greek can be interpreted as new information foci. These findings call for further investigation given the claims in the literature. In particular, it is argued (see Rizzi (1997), Kiss (1998) among many others) that there are two distinct types of focus, namely, (i) new information focus that does not display any quantificational properties, and (ii) contrastive/identificational focus that displays quantificational properties, and that preverbal object foci are associated either with exhaustive and/or contrastive interpretation (± exhaustive, ± contrastive), (see Kiss 1998: 245, among others). As already noted, Greek preverbal object foci are not exhaustive. In this respect, it is important to further investigate the semantic properties of preverbal object foci in Greek and in particular, to examine whether they are obligatorily interpreted contrastively.

With respect to contrastive interpretation there is something more to be taken into consideration. In the literature, there is an ongoing debate about the status of contrast in grammar. Specifically, it is debatable whether contrast should be treated as an independent notion of information structure. In this case, there would be three independent notions of information structure, namely, focus, topic and contrast (see Molnár 2002, Beyssade et al. 2004 among others). Alternatively, contrast could be treated as a sub-feature of focus and topic. In this latter case, there would be only two independent notions of information structure, focus and topic. Given this debate, it is necessary to clarify the notion of contrast itself, before investigating whether preverbal object foci in Greek are obligatorily interpreted contrastively. In this respect, this chapter has two interconnected aims; first, it aims at clarifying the status of contrast in grammar, and secondly, it aims at scrutinizing the relation between preverbal object foci and contrast.

The chapter is organized as follows. Section 3.1 presents the notion of contrast, looking at both syntactic and semantic approaches. This section also discusses contexts that trigger contrast and aims at finding tests for identifying contrast. In section 3.2 the relevant tests are applied to Greek. In this section, I show that in Greek preverbal objects do not differ from their postverbal counterparts with respect to contrast. Section 3.3 discusses the relation between contrast and

exhaustivity. I examine data from Italian and I show that contrastive preverbal object foci in Italian are not exhaustive. Section 3.4 discusses the status of contrast in grammar.

## 3.1 Approaches to contrast

The status of contrast in grammar is debatable; some researchers treat contrast as a dependent notion of information structure, while others argue that contrast is an independent notion. Contrast has also been associated with focus and topic; in the literature one finds the terms contrastive focus and contrastive topic. To clarify the status of contrast in grammar, we need to examine contrast and focus, as well as contrast and topic. This section aims at clarifying the notion of contrast. In addition, it aims at bringing together tests that identify contrast. The section is organized as follows. I first present syntactic and semantic approaches that treat contrast as a dependent notion of information structure. Then, I present a syntactic and a semantic approach that treat contrast as an independent notion of information structure.

Rizzi (1997), Cinque (1999), Poletto (2000), Benincà (2001), Belletti (2004), Benincà & Poletto (2004) within the so-called cartographic approach, argue for a syntactic approach to contrast. They assume a one-to-one relation between syntactic position and interpretation. An example from Rizzi (1997) is given in (1). The subscript C-Foc indicates contrastive focus.

(1) a. [Il tuo libro]$_{\text{C-Foc}}$ ho letto (non il suo).
the your book I read not the his
'[Your book]$_{\text{C-Foc}}$, I have read (not his).'
b. Ho letto [il tuo libro]$_{\text{C-Foc}}$ (non il suo).
I read the your book not the his
'I have read [your book]$_{\text{C-Foc}}$ (not his).'

[Italian]

In (1a) the focused object appears in preverbal position, while in (1b) the focused object appears in postverbal positions. Both (1a) and (1b) are instances of contrastive focus. They share the same presuppositions; they presuppose that the hearer believes that the speaker has read something different from the hearer's book, and the utterance contrasts this belief. Rizzi (1997) argues that Italian marks contrastive focus structurally by moving the focal element to a designated position in the left periphery of the clause. This movement is either overt as in (1a), or it takes place at LF as in (1b) (see Rizzi 1997: 287).

According to Rizzi, neither (1a) nor (1b) can answer a question that triggers new information focus. In particular, (1a) and (1b) are infelicitous as answers to the *wh*-question *Cosa hai letto durante le vacanze di Natale?* 'What did you read during

Christmas holidays?'. This is so, as according to Rizzi, new information focus cannot combine with contrast. The compatibility of a *wh*-question with a contrastive answer will be discussed further when examining example (23) below. For now, it is sufficient to say that the *wh*-question *Cosa hai letto durante le vacanze di Natale?* 'What did you read during Christmas holidays?' when uttered out of the blue does not presuppose a contrast set and in this sense does not allow for an answer that contains contrastive focus. In this respect, example (1) provides us with a test for identifying contrastive focus; I will call this test the "*wh*-question/ *contrastive answer test". The "*wh*-question/*contrastive answer test" is given in (2).

(2) *Wh*-question/*contrastive answer test
A contrastive answer is incompatible with an ordinary *wh*-question.

Kiss (1998) also assumes a direct mapping between syntax and interpretation and argues that contrastive foci move to SpecFP to check their feature and receive contrastive interpretation. However, Kiss puts a further restriction on contrastive foci. She considers (1998: 267) "an identificational focus (+contrastive) if it operates on a closed set of entities whose members are known to the participants in the discourse". Kiss' definition for contrastive foci has generated a lot of discussion. Some researchers conclude that Kiss assumes that contrastive foci must be interpreted exhaustively (see Molnár (2002), Umbach (2004) among others), while other researchers conclude that Kiss assumes that contrastive foci can be interpreted exhaustively (see Cohan (2002), Lahousse (2003) among others). From Kiss' definition, I conclude that she assumes that contrastive foci are necessarily interpreted exhaustively. I will further discuss this issue in section 3.4. Examples (3) and (5) are from Kiss and illustrate her definition of contrastive focus.

(3) *Question*
a. L' ha rotto Giorgio, il vaso?
it has broken Giorgio the vase
'Has Giorgio broken the vase?'
*Answer*
b. [Maria]$_{\text{C-Foc}}$ ha rotto il vaso.
Maria has broken the vase
'It is Maria who has broken the vase.'

[Italian]

The question in (3a) is a yes-no question, it presupposes that the vase is broken and asks whether *Giorgio* broke the vase. Example (3b) answers (3a) saying that *Maria* broke the vase. In this sense, *Maria* is contrasted to *Giorgio* and (3b) contains a corrective focus. Example (3) is an instance of contrast under correction and is to a certain extent similar to example (1). Example (3) provides us with a test for

identifying contrastive focus; I will call this test "correction test". The "correction test" is defined in (4).

(4) Correction test
A contrastive focus can be used to answer a yes-no question, correcting part of the predicate information of the question.

Another example of contrastive focus is given in (5). (5a) is an alternative question; in (5a) there is a two-member set as indicated by *chi di voi* 'which of you two', and the members of the set are known to the discourse participants. (5b) answers the question in (5a) selecting one of the two members of the set, and contrasting it to the other. In this sense, in (5b) *Maria* is contrastively focused.

(5) *Question*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a. | Chi | di | voi | due | ha | rotto | il | vaso? |
| | which | of | you | two | has | broken | the | vase |

'Which of you two has broken the vase?'

*Answer*

| | | | | | |
|---|---|---|---|---|---|
| b. | [Maria]$_{\text{C-Foc}}$ | ha | rotto | il | vaso. |
| | Maria | has | broken | the | vase |

'It is Maria who has broken the vase.'

[Italian]

Example (5) is an instance of contrast under choice and provides us with a third test for identifying contrastive focus; I will call this test the "choice-test". The "choice-test" is defined in (6).

(6) Choice-test
When answering an alternative question, one alternate is contrasted to the other.

Besides syntactic approaches to contrastive focus, there are syntactic approaches to contrastive topics. Below, I present the cartographic approach towards contrastive topics. Benincà and Poletto (2004) discuss contrastive topics and argue that there is a specific projection in the left periphery of the clause (SpecList Interpretation), where contrastive topics move to, and receive their interpretation. Benincà and Poletto do not use the term 'contrastive topic', they rather prefer to use the term 'List interpretation' (LI); they note "This class of Topics possibly corresponds to what has been named contrastive topics by some linguists" (Benincà and Poletto 2004: 74 fn16). LI is defined as a contrast within a given set. In more detail, LI describes the case in which two elements that belong to the same list of already known items are contrasted. An example from Benincà and Poletto (2004) is given in (7). The subscript $_{\text{C-Top}}$ indicates contrastive topic.

(7) Context: a farm producing a set of goods that are known to the people involved in the conversation.

a. [La frutta]$_{C\text{-}Top}$ la regaliamo, [la verdure]$_{C\text{-}Top}$ la vendiamo.
the fruit it give the vegetables it sell
'We give the fruit for free, while we sell the vegetables.'

[Italian]

In example (7), the discourse participants know that there exists a farm that produces fruit and vegetables. In (7a), the fruits are contrasted to the vegetables, and the action of giving for free is contrasted to the action of selling. Benincà and Poletto propose two tests for the identification of LI, namely the substitution test and the right dislocation test. The substitution test is exemplified in (8), while the right dislocation test is illustrated in (10).

(8) Substitution test for contrastive topics
If two terms are interpreted with a 'List interpretation', then they can be substituted with 'the former' and 'the latter'.

A demonstration of the substitution test is given in example (9). According to the substitution test, if two terms are interpreted with a 'List interpretation', then it should be possible to substitute them with 'the former' and 'the latter'. This is confirmed in (9). In example (9), *la frutta* 'the fruit' is substituted with *la prima* 'the former' and *la verdure* 'the vegetables' is substituted with *la seconda* 'the latter'.

(9) La prima la regaliamo, la seconda la vendiamo.
the first it give the second it sell
'We give the former for free, we sell the latter.'

[Italian]

Benincà and Poletto (2004) also observe that LI is incompatible with right dislocation. In more general terms, this test could be stated as in (10).

(10) Right dislocation test
Contrast is incompatible with right dislocation.

Example (11) illustrates the right dislocation test. The ungrammaticality of (11) shows that right dislocation is incompatible with contrast.

(11) *La regaliamo, la frutta e la vendiamo, la verdure.
it give the fruit and it sell the vegetables
'The fruit, we give it for free, the vegetables, we sell them.'

[Italian]

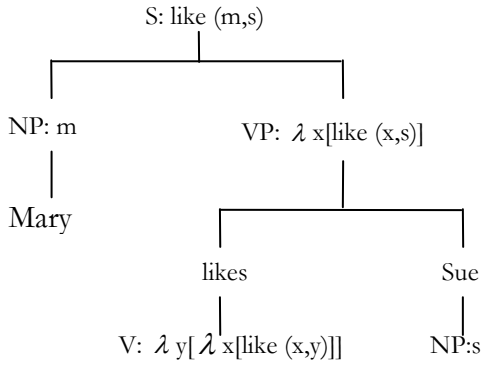
Generally, syntactic approaches to contrast make a rather drastic distinction between contrastive focus and contrastive topic and argue for two different syntactic positions. In these approaches contrast is encoded in grammar in the form of contrastive focus and contrastive topic. It should also be noted that they argue for a distinction between new information focus and contrastive focus, and between ordinary topics and contrastive topics.

Besides syntactic approaches, there are also semantic approaches to contrast that treat contrast as a dependent notion of information structure. I first present the approaches that examine the relation between focus and contrast. Then, I present the approaches that examine the relation between topic and contrast.

A central claim of the semantic approaches that discuss the relation between focus and contrast is that focus indicates the presence of alternatives. I will discuss two approaches, namely, the Alternative Semantics approach (Rooth 1985, 1992) and the Structured Meaning approach (von Stechow 1989, Krifka 1993).

Alternative Semantics (AS) (Rooth 1985, 1992) assumes that focus and contrast are intuitively related notions. AS argues that contrast does not belong to the semantics of focus; contrast is rather treated as a pragmatic use of focus. AS does not make a distinction between new information focus and contrastive focus. In this respect, AS differs from the syntactic approaches that were discussed above. Focus is viewed as an interpretation operator that can adjoin to any constituent and which introduces a variable into an LF representation; this variable is linked up with something else in the representation by means of indexing (see Rooth 1996). To account for focus, AS uses two semantic values, namely, an ordinary semantic value, $[\![\,]\!]^{o}$, and a focus semantic value, $[\![\,]\!]^{f}$, (Rooth's formalization). Let me briefly indicate how this works. The semantic component of grammar associates semantic values with phrases of a syntactic description. The semantic value of a sentence is assumed to be a proposition, while the semantic value of a proper name is assumed to be an element of a domain of individuals $E$. An example is given in (12).

(12)



In (12), each phrase is annotated with a semantic value; [like(m,s)] is a proposition and m and s are individuals. The semantic values of the non-terminal nodes are derived compositionally, by assuming that ⟦like⟧ is a two-place function from individuals to propositions, and by having a semantic rule of function application for the VP and S nodes.

Informally, the focus semantic value for a phrase of category S is the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the focused phrase. For example, the focus semantic value for [$_S$ Mary likes [Sue]$_F$] is the set of propositions of the form 'Mary likes y'. In set abstraction terms, this is $⟦[_S \text{ Mary likes } [\text{Sue}]_F]⟧^f = \{\text{like(m,y)} \mid y \in E\}$, where $E$ is the domain of individuals.[1] Summarizing, AS does not distinguish between new information focus and contrastive focus. AS accounts for contrastive focus in the same way, as it accounts for focus by making use of two semantic values. In this respect, AS does not provide us with a test for identifying contrastive focus.

Krifka (1993, 2006) also argues that focus induces alternatives. Krifka (2006) makes a distinction between pragmatic and semantic uses of focus.[2] In particular, Krifka (2006: 24) discusses the example in (13) as an instance of a pragmatic use of focus.

(13) a. Mary stole the cookie.
b. (No,) [Peter]$_{Foc}$ stole the cookie!

In example (13), *Peter* is contrasted to *Mary*. Note that example (13) resembles the example from Rizzi that was discussed in (1).

An instance of a semantic use of focus is given in (14). Krifka treats example (14) as an instance of contrastive focus.

(14) a. John wants coffee.
b. MAry wants coffee, TOO.

As shown in (14), (14b) contains the focus sensitive operator *too*. For Krifka focus sensitive operators belong to the semantic uses of focus. It should be noted that

[1] Blok (1993) criticized Rooth (1985) for not placing enough restrictions on the alternative set (see also de Hoop 1995). In later versions of Alternative Semantics, this point of criticism is taken into account. In Rooth (1996) the focus operator annotates the level at which focus is interpreted and places a constraint on the variable.

[2] Krifka (2006) makes a distinction between the common ground (CG) management and the common ground content. The distinction between pragmatic and semantic uses of focus is related with the distinction between common ground management and common ground content. As Krifka puts it (2006: 21) "So-called pragmatic uses of focus relate to the common communicative goals of the participants, the CG management, whereas so-called semantic uses of focus relate to the factual information, the CG content."

example (14) that is considered by Krifka as an instance of contrastive focus, is treated as contrastive topic by other researchers.

In the same paper, Krifka (2006: 32) discusses the example in (15) stating that this is not an instance of contrastive focus.

(15) *Question*
a. What do you want to drink, tea or coffee?
*Answer*
b. I want [tea]$_{Foc}$.

(15a) is an alternative question and contains a two-member set. (15b) answers the question in (15b) selecting one of the two members of the set. Example (15) resembles example (5) from Kiss. As already noted Kiss treats example (5) as an instance of contrastive focus, whereas Krifka states that example (15) is not an instance of contrastive focus. At this point, I will follow Kiss and assume that examples like the one in (5) and in (15) are instances of contrastive focus.

In short, Krifka does not make a distinction between new information focus and contrastive focus. He rather distinguishes between semantic and pragmatic uses of focus.

Krifka accounts for focus within the Structured Meaning approach. Specifically, the focus-induced interpretation of a sentence is an ordered sequence, the structured meaning, whose members are the property obtained by $\lambda$-abstracting on the focus and the ordinary semantic interpretation of the focus. An example is given in (16).

(16) John introduced [Bill]$_{Foc}$ to Sue.
<[$\lambda$ x[introduce(john, x, sue`)]], bill>

Krifka (1991, 2006) argues that sentences are split into topic and comment. This initial split may be further split into focus and background. In this respect, Krifka allows for a topic to contain a focus and according to Krifka a comment needs not be identical to focus. An example from Krifka (2006) is given in (17). The notation in (17) is Krifka's.

(17) *Question*
a. When did [Aristotle Onassis]$_{Topic}$ marry Jacqueline Kennedy?
*Answer*
b. [He]$_{Topic}$ [married her [in 1968]$_{Focus}$]$_{Comment}$.

Krifka also examines the relation between contrast and topic. Allowing topics to contain a focus and assuming that focus induces alternatives, Krifka (2006) accounts for what is named by other researchers contrastive topics (see Büring 1997 among others). So for Krifka contrastive topics are topics that contain a focus.

Recall that for Krifka an utterance with a focus sensitive operator (example 14) is an instance of contrastive focus, while others treat it as an instance of contrastive topic. An example where a topic contains a focus is given in (18). The example is from Krifka.

(18) *Question*
a. What do your siblings do?
*Answer*
b. My [SISter]$_{\text{Focus}}$]$_{\text{Topic}}$ [studies MEDicine]$_{\text{Focus}}$,
and[My [BROther]$_{\text{Focus}}$]$_{\text{Topic}}$ [is working on a FREIGHT ship]$_{\text{Focus}}$.

Example (18a) contains a general *wh*-question that can be interpreted as containing two sub-questions, namely, 'what does your sister do?' and 'what does your brother do?'. Example (18b) answers the question in (18a), and the answer in (18b) is organized per sub-question. Krifka (2006: 44) notes that in (18b) "focus on *sister* indicates an alternative to the topic 'my sister', namely, 'my brother' ".

Example (18) provides us with a test for identifying contrastive topics. I will call this test, the "implicit sub-question test". The "implicit sub-question test" has two conditions and is defined in (19). The second condition of the test will become in the discussion example (21) below.

(19) Implicit sub-question test
(i) When a *wh*-question can be split into sub-questions and the answer is organized per sub-question, then, there is a contrastive topic in the answer.
(ii) When a question can be interpreted as containing more than one implicit sub-question, and the answer addresses only one of these sub-questions, rather than the general question, then, this answer contains a contrastive topic.

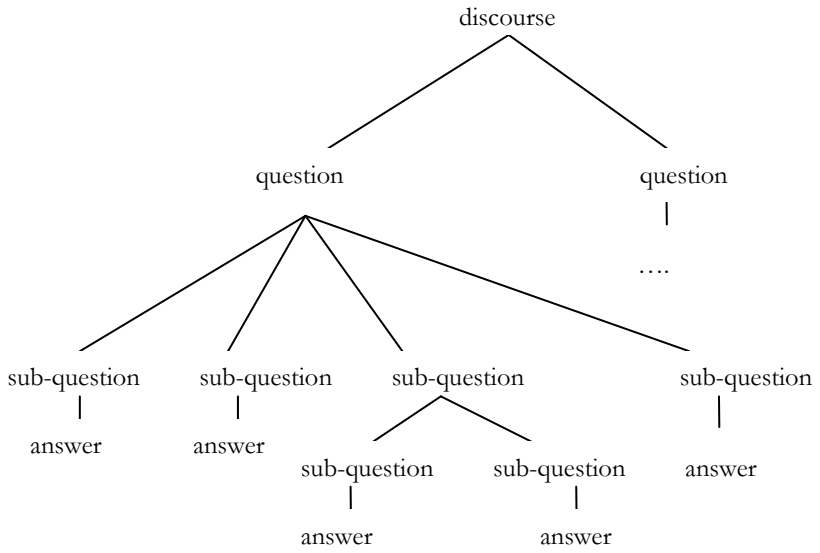
Another semantic approach to contrast is the one that was developed by Büring (1997, 2003). Büring also works within the alternative semantics approach, but differs from both Rooth and Krifka, as he is interested in the relation between accent patterns and information structure categories. He proposes a theory which predicts the (non)-occurrence of the accent patterns associated with focus and contrastive topic.

Specifically, Büring assumes two information structure categories, namely, focus and contrastive topics. He uses the term focus to refer to a constituent marked by an A-accent. It should be noted that he does not make a distinction between new information focus and contrastive focus. Büring uses the term contrastive topic to refer to a constituent marked by a B-accent.[3]

[3] Büring (2003) examines English data. In this respect, the A-accent and the B-accent hold for English.

Moreover, Büring proposes a hierarchical model of discourse structure. As a way to represent this model, he introduces a new notational device, namely, the d(iscourse)-tree. An example is given in (20).

(20)




Each node in such a discourse tree is called a Move and discourse-trees consist of implicit and explicit Moves.

With respect to contrastive topics, Büring argues that contrastive-topic marking is obligatory with implicit sub-questions, while it is optional with explicit sub-questions. An illustration of this is given in examples (21) and (22). The notation is Büring's.

(21) *Question*
a. What did the pop stars wear?
*Answer*1
b. #The female pop stars wore [caftans]$_{F}$.
*Answer*2
c. The [female]$_{CT}$ pop stars wore [caftans]$_{F}$.

In example (21a), there is a general question, namely, 'what did the pop stars wear?'. This general question can be interpreted as containing two implicit sub-questions: (i) 'what did the female pop stars wear?' and (ii) 'what did the male pop stars wear?'. Examples (21b) and (21c) answer the question in (21a), addressing only one of the sub-questions (second condition of the "implicit sub-question test", (19ii)). Example (21b) is an infelicitous answer to (21a), while example (21b) is a felicitous one. The difference between (21b) and (21c) is the marking of contrastive

topic. In (21b) contrastive topic is not marked and this results into an infelicitous answer. As shown by the contrast between (21b) and (21c), it is not possible to answer an implicit sub-question, without marking contrastive topic.

As noted already Büring argues that contrastive topics are optionally marked in the case of explicit sub-questions. This is shown in example (22).

(22) *Question*
a. What did the female pop stars wear?
*Answer*1
b. The $[\text{female}]_{CT}$ pop stars wore $[\text{caftans}]_{F}$.
*Answer*2
c. The female pop stars wore $[\text{caftans}]_{F}$.
*Answer*3
d. They wore $[\text{caftans}]_{F}$.

Contrary to the question in (21a) that contained an implicit sub-question, example (22a) contains an explicit sub-question. Examples (22b), (22c) and (22d) are felicitous answers to the question in (22a). As shown in (22), contrastive topic marking is optional.

Recapitulating, Büring does not distinguish new information focus from contrastive focus. He proposes a hierarchical model of discourse structure and develops a theory that predicts the (non-)occurrence of the accent patterns associated with focus and contrastive topic. He concludes that contrastive-topic marking is obligatory only with implicit sub-questions.

So far we have seen syntactic and semantic approaches to contrast that treat contrast as a dependent notion of information structure. In the remainder of this section, I will present two different approaches to contrast, Beyssade et al. (2004) and Molnár (2002). They both argue that contrast is an independent notion of information structure that can combine with both focus and topic; so for them, there are three independent notions in information structure: focus, topic and contrast. I first present Beyssade et al.'s (2004) approach.

Beyssade et al. (2004) examine the prosodic realization of French contrastive foci and topics with respect to their semantic properties.[4] They conclude that there exists a special accent in French, the C-accent, which can co-occur with focus and topic. Investigating the semantic properties of contrastive foci and topics, Beyssade et al. conclude that both contrastive foci and contrastive topics are instances of complex discourse strategies. Hence, they should be accounted for in a unified way.

Let me briefly demonstrate this. Building on Büring (1997), Beyssade et al. consider Question-Answer pairs as a model of discourse and they make a distinction between simple- and layered-discourse topics. They argue for two types of discourse strategies; a simple- and a complex- discourse strategy. An example of

[4] It should be noted that Beyssade et al. (2004) do not use the term contrast.

contrastive focus is given in (23). As Beyssade et al. treat contrast as an independent notion of information structure that can combine with focus, contrastive focus will be marked with the subscript $_{C+Foc}$.

(23) *Question*
a. (Qui est venu?)
who is come
'Who came?'
*Answer*
b. Bernard]$_{C+Foc}$ est venu, (pas Marie).
Bernard is come not Marie
'[Bernard]$_{C+Foc}$ came, not Marie.'

[French]

Example (23a) contains a *wh*-question and requires the accommodation of two questions, namely, 'who came?' and 'who did not come?'. (23b) answers both questions; *Bernard* who came is contrasted to *Marie* who did not come. Beyssade et al. argue that (24) is an instance of a complex strategy that involves the shifting from a simple- to a layered-discourse topic.

At first sight, example (23) may seem to contradict example (1) from Rizzi and the "*wh*-question/*contrastive answer test" that was stated in (2). Recall that the test in (2) says that a contrastive answer is incompatible with an ordinary *wh*-question. In example (23) we are not dealing with an ordinary *wh*-question; in (23) the *wh*-question can be interpreted as containing a positive and a negative question.

Example (23) is not contradictory to example (1) and the explanation lies in the possibility of discourse accommodation. If the discourse is accommodated in such a way that the *wh*-question can be interpreted as containing a positive and a negative question, then a contrastive focus can be used as an answer to a *wh*-question. This is exactly the case in (23).

Example (23) provides us with a test for identifying contrastive focus. I will call this test the "accommodation focus test". The "accommodation-focus test" is defined in (24).

(24) Accommodation focus test
When the discourse is accommodated in such a way that the initial *wh*-question can be interpreted as containing a positive and a negative question (eg. Who came? who did not come?), then the focus in the answer is contrastive.

An example of a contrastive topic is given in (25). Beyssade et al. treat contrast as an independent notion of information structure that can combine with topic, so contrastive topic will be marked with the subscript $_{C+Top}$.

(25) *Question*

a. Que fumaient les chanteurs de rock?
what smoke the singers of rock
'What did Rock singers smoke?'

*Answer*

b. [Les Anglais]$_{C+Top}$ de la marijuana, et [les Français]$_{C+Top}$
the English of the marijuana and the French
des gitanes.
of gitanes
'[The English ones]$_{C+Top}$ marijuana and [the French ones]$_{C+Top}$ gitanes.'

[French]

In the question in (25a), the discourse topic is layered. In example (25b), the discourse topic that was shaped in the question is split; we first learn what smoked the English rock singers, and then we learn what smoked the French rock singers. Example (25) is similar to example (18), in this sense (25) does not provides us with a new test for identifying contrastive topic. Example (25) is another illustration of the "split-answer test". Summarizing, Beyssade et al. account for contrastive foci and topics in a unified way. They argue that contrast is an independent notion that can combine with focus and topic.

Finally, I present Molnár's approach to contrast. Molnár (2002) also argues that contrast should be treated as an independent notion of information structure that can be superimposed on topic and focus. Molnár claims that there are phonological and syntactic instances of contrast. Specifically, she claims that the fall-rise accent in English is a phonological instance of contrast. To illustrate her claim about syntactic instances of contrast, Molnár discusses Finnish; she argues that contrast in Finnish is related with a specific syntactic position, namely the sentence initial position.

An example of contrastive focus from Molnár is given in (26). In example (26b) the contrastively focused element appears in sentence initial position. (26b) corrects the information given in (26a); *Reykjavik* is contrasted to *Stockholm*.

(26) a. Pekka lensi Tukholmaan.
Pekka flew to Stockholm
'Pekka flew to Stockholm.'

b. [Reykjavikiin]$_{C+Foc}$ Pekka Lensi.
Reykjavik Pekka flew
'Pekka flew [to Reykjavik]$_{C+Foc}$.'

[Finnish]

It is tempting to assume that example (26) provides us with another test for contrastive focus. However, presumably, this case can be subsumed under the correction test.

An example of contrastive topic is given in (27). In example (27), contrastive topics appear in sentence initial position. Given (26) and (27), Molnár argues that in Finnish contrast is associated with a sentential position.

(27) [Tukholmaan]$_{C+Top}$ Pekka lensi [Finnairilla]$_{Foc}$,
to Stockholm Pekka flew by Finnair
[Reykjavikiin]$_{C+Top}$ Pekka lensi [Icelandairilla]$_{Foc}$.
to Reykjavik Pekka flew by Icelandair
'[To Stockholm]$_{C+Top}$, flew Pekka [by Finnair]$_{Foc}$, [to Reykjavik]$_{C+Top}$ flew Pekka by Icelandair.'

[Finnish]

Summarizing, there are various approaches to contrast. Some researchers treat contrast as a dependent notion of information structure. Specifically, Rizzi (1997), Belletti (2004), Benincà and Poletto (2004), and Kiss (1998) make a distinction between new information focus and contrastive focus, and between topics and contrastive topics. Rooth (1992), Krifka (2006) and Büring (1997, 2003) do not distinguish between new information focus and contrastive focus. For Krifka, contrastive topics are foci within topics. Büring proposes a hierarchical model of discourse structure, where discourse is structured with implicit and explicit sub-questions. Only in the case of implicit sub-questions is the marking of contrastive topics obligatory. Beyssade et al (2004) as well as Molnár (2002) have a different approach to contrast. They argue that contrast is an independent notion of information structure that can combine with both focus and topic.

In this section, we have also seen a number of tests for identifying contrastive foci and contrastive topics. In particular, the tests for identifying contrastive foci are: the "wh-question/*contrastive answer test", the "correction test", "the choice-test" and "the accommodation focus test". The tests for identifying contrastive topics are: the "substitution test for contrastive topics", the "right dislocation test" and the "implicit sub-question test". The tests for identifying contrastive foci and topics are summarized in table 3.1.

Table 3.1 Tests for identifying contrastive foci and contrastive topics

| Test name | Ex. nº | Definition |
|---|---|---|
| **Contrast and focus** | | |
| *Wh*-question / *contrastive answer test | ex.(1) | A contrastive answer is incompatible with an ordinary *wh*-question. |
| Correction test | ex.(3) | A contrastive focus can be used to answer a yes-no question correcting part of the predicate information of the question. |

| | | |
|---|---|---|
| Choice-test | ex.(5) | When answering an alternative question, one alternate is contrasted to the other. |
| Accommodation focus test | ex.(23) | When the discourse is accommodated in such a way that the initial *wh*-question can be interpreted as containing a positive and a negative question ( eg. who came?who did not come?), then the focus in the answer is contrastive. |
| **Contrast and topic** | | |
| Substitution test for contrastive topics | ex.(9) | If two terms are interpreted with a 'List interpretation', then they can be substituted with 'the former' and 'the latter'. |
| Right dislocation test | ex.(11) | Contrast is incompatible with right dislocation. |
| Implicit sub-question test | ex.(18)<br>ex.(21) | (i)When a *wh*-question can be split into sub-questions and the answer is organized per sub-question, then, there is a contrastive topic in the answer.<br>(ii)When a question can be interpreted as containing more than one implicit sub-question, and the answer addresses only one of these sub-questions, rather than the general question, then, this answer contains a contrastive topic. |

In the following section, I apply the relevant tests to Greek examining contrastive foci and topics.

## 3.2 Contrast in Greek: preverbal and postverbal objects

In this section, I scrutinize Greek preverbal and postverbal objects with respect to contrast. I argue that preverbal objects do not differ from their postverbal counterparts with respect to contrast; preverbal and postverbal objects can be interpreted as contrastive foci or as non-contrastive foci. Preverbal and postverbal objects can also be interpreted as contrastive topics. Evidence for this claim comes from the results of the tests that identify contrastive foci and contrastive topics. This section begins with tests that identify contrastive foci.

The "correction test" is applied to the data in (28). The question in (28a) is a yes-no question. (28a) can be answered with example (28b) or (28c). (28b) and (28c) differ with respect to the position of the object. In (28b), the object is in focus and appears in postverbal position, while in (28c) the focused object appears in preverbal position.

(28) *Question*
a. Thelis tsai?
want.2SG tea.ACC
'Would you like tea?'
*Answer*1
b. Ohi, thelo [kafe]$_{C\text{-}Foc}$.
no want.1SG coffee.ACC
'No, I would like [coffee]$_{C\text{-}Foc}$.'
*Answer*2
c. Ohi, [kafe]$_{C\text{-}Foc}$ thelo.
no coffee.ACC want.1SG
'No, [coffee]$_{C\text{-}Foc}$ I would like.'

As indicated by the felicity of (28b) and (28c) as answers to (28a), both postverbal and preverbal object foci can be interpreted contrastively. This shows that postverbal object foci do not differ from their preverbal counterparts with respect to contrast.

Further support for the claim that preverbal and postverbal object foci do not differ with respect to contrast comes from the results of the "choice-test". The "choice-test" is applied to Greek in example (29).

(29) *Question*
a. Thelis kafe i tsai?
want.2SG coffee.ACC or tea.ACC
'Would you like coffee or tea?'
*Answer*1
b. Thelo [kafe]$_{C\text{-}Foc}$.
want.1SG coffee.ACC
'I would like [coffee]$_{C\text{-}Foc}$.'
*Answer*2
c. [Kafe]$_{C\text{-}Foc}$ thelo.
coffee.ACC want.1SG
'[Coffee]$_{C\text{-}Foc}$, I would like.'

The question in (29a) can be interpreted in two ways, (i) as a yes-no question and (ii) as an alternative question that contains two alternates coffee and tea (this observation is not new see von Stechow 1989). [5][6] The "choice-test" holds only for

[5] The availability of a yes-no question reading and an alternative question reading becomes clearer when we look at Dutch. An example from Dutch is given in (i).

(i) *Question*
a. Wil je koffie of thee?
want.2SG you coffee or tea
'Would you like coffee or tea"
*Answer*1

the second reading. In example (29b) the focused object appears in postverbal position, while example (29c) contains a preverbal object focus. As shown in (29), both (29b) and (29c) are felicitous as answers to the question in (29a). This means that the postverbal object focus in (29b) as well as the preverbal object focus in (29c) are interpreted contrastively. This shows that preverbal object foci do not differ from their postverbal counterparts with respect to contrast. In this respect the results of the "choice-test" confirming the findings of the "correction test".

So far, we have seen that preverbal and postverbal object foci in Greek do not differ with respect to contrast and that they can both be interpreted contrastively.

---

b. Ja graag, doe maar koffie.
yes please do coffee
'Yes, do coffee please.'
*Answer*2
c. Koffie graag
coffee please
'Coffee please'

[Dutch]

Condition: (ia) is uttered with a rising intonation on *thee*.

The question in (ia) is uttered with a rising intonation and is interpreted as a yes-no question. The answer in (ib) answers directly the general question in (ia). The question in (ia) can also be interpreted as containing two implicit sub-questions (do you want coffee?, and do you want tea?). The answer selects one of the alternates.

The question in (ia) can also be realized with two pitch movements, a rise on *koffie* 'coffee', followed by a fall on *thee* 'tea'. With such an intonation pattern the question can only be interpreted as an alternative question that contains two alternates *coffee* and *tea* and it can only be answered by selecting one of the two alternates. This is shown in (ii).

(ii) *Question*
a. Wil je koffie of thee?
want.2SG you coffee or tea
'Would you like coffee or tea"
*Answer*1
b. #Ja graag, doe maar koffie.
yes please do coffee
'Yes, do coffee please.'
*Answer*2
c. Koffie graag
coffee please
'Coffee please'

Condition: There are two pitch movements in (iia).

[5] A number of 20 Greek speakers were asked to give their interpretation judgements for (29). Specifically, they were asked to note whether (29) meant 'would you like any of the two, coffee or tea', 'which one of the two would you like, coffee or tea' or both. If speakers could get both interpretations, then they were asked to note which of the two is the most prominent. 12 speakers interpreted (29) unambiguously; for these speakers the only available interpretation for (29) was 'which one of the two would you like, coffee or tea'. 8 speakers interpreted (29) ambiguously and noted that the second reading is the most prominent one.

A question that emerges is whether preverbal object foci must be interpreted contrastively. The results of the "accommodation focus test" show that Greek preverbal and postverbal object foci can be interpreted contrastively, but they do not need to be interpreted contrastively. An illustration of the "accommodation focus test" is given in example (30).

(30) Context
*Question*

a. Imaste apo tin ekpompi "I Simera"
be.1PL from the.ACC program.ACC the.NOM Today
ke thelume na mathume ti agorasate.
and want.1PL to know.1PL what buy.2PL
"We are from the program "Literature today" and we would like to know what you bought.

*Answer*1

b. Agorasa [ena leksiko]$_{C\text{-}Foc}$ ohi ena mithistorima.
buy.1SG a.ACC dictionary.ACC not a.ACC novel.ACC
'I bought [a dictionary]$_{C\text{-}Foc}$ not a novel.'

*Answer*2

c. Ena leksiko]$_{C\text{-}Foc}$ agorasa ohi ena mithistorima.
a.ACC dictionary.ACC buy.1SG not a.ACC novel.ACC
'[A dictionary]$_{C\text{-}Foc}$, I bought not a novel.'

*Answer*3

d. #Agorasa [to Polemos ke Irini]$_{C\text{-}Foc}$, ohi
buy.1SG the.ACC war.NOM and peace.NOM the.ACC
ti Farma ton zoon.
animal.NOM farm.ACC of.GEN animals.GEN
'I bought [War and Peace]$_{C\text{-}Foc}$, not Animal's Farm.'

*Answer*4

e. #[To Polemos ke Irini]$_{C\text{-}Foc}$ agorasa ohi
the.ACC war.NOM and peace.NOM buy.1SG not
ti Farma ton zoon.
the.NOM farm.ACC of.GEN animals.GEN
'[War and Peace]$_{C\text{-}Foc}$, I bought, not Animal's Farm.'

*Answer*5

f. Agorasa [ena leksiko]$_{Foc}$.
buy.1SG a.ACC dictionary.ACC
'I bought [a dictionary]$_{Foc}$.'

*Answer*6

g. Ena leksiko]$_{Foc}$ agorasa.
a.ACC dictionary.ACC buy.1SG
'[A dictionary]$_{Foc}$, I bought.'

Example (30) provides us with a context, in which the question in (30a) is uttered. The context is the following, in front of a bookshop there is a man from a tv show, somebody exits the bookshop and the tv man says ,we are from the tv and we would like to know what you bought. Given this context, the question in (30a) presupposes that the man who exits the bookshop bought a novel. Given that the man did not buy a novel, he can respond, answering the following layered question, 'what type of book did you buy?, and what type of book did you not buy?'. As shown in (30), (30b) and (30c) are felicitous answers to the question. Example (30b) contains a postverbal object focus, while example (30c) contains a preverbal object focus. Both in (30b) and in (30c) the object foci are interpreted contrastively. In particular, in (30b) and in (30c), there is a contrast between two types of books; a dictionary is contrasted with a novel. This shows that both postverbal and preverbal object foci can be interpreted contrastively.

However, there is a restriction. Given the context in (30), the question in (30a) cannot be felicitously answered with (30d) and/or (30e). Example (30d) contains a postverbal object focus, whereas example (30e) contains a preverbal object focus. Both in (30d) as well in (30e), there is a contrast between books; between *War and Peace* and *Animal's Farm*. This is the reason for the infelicity of (30d) and (30e). Given the context in (30), the question in (30a) cannot be re-analyzed in 'which book did you buy?' and 'which book did you not buy?'. In this sense, in (30), contrast is not available for referential non-type readings.

Besides (30b) and (30c), examples (30f) and (30g) are felicitous answers to the question in (30a). (30f) contains a postverbal object focus, while (30g) contains a preverbal object focus. Both in (30f) as well as in (30g), there is no contrast. This shows that both postverbal and preverbal object foci can receive a non-contrastive interpretation. In this sense, postverbal and preverbal object foci do not differ with respect to contrast.

Recapitulating, the results of the "correction test", the "choice-test" and the "focus accommodation test" lead to the conclusion that preverbal and postverbal object foci in Greek do not differ with respect to contrast. Both can be interpreted contrastively. Moreover, neither of them needs to be interpreted contrastively: both preverbal and postverbal object foci can receive a non-contrastive interpretation.

In the remainder of this section, I discuss contrastive topics, applying the relevant tests. As already mentioned, there are three tests that we can use for identifying contrastive topics. However, one of them does not serve the purposes of this chapter. In particular, I am not going to use the "Right dislocation test".

I first discuss the "substitution test" for contrastive topics. The relevant examples are given in (31) and (32). In example (31b), *stus proptihiakus fitites* 'the undergraduate students' appears in preverbal position and is contrasted with *stus metaptihiakus fitites* 'the postgraduate students'. According to the "substitution test" for contrastive topics, it should be possible to substitute the two terms, namely, *stus proptihiakus fitites* 'the undergraduate students' and *stus metaptihiakus fitites* 'the

postgraduate students', with *stus protus* 'the former' and *stus defterus* 'the latter'. This is confirmed in (31c).

(31) a. (Ti didaski i Maria afto to eksamino?)
what teach.3SG the.NOM Mary.NOM this.ACC the.ACC semester.ACC
"What is Mary teaching this semester?"

b. [Stus proptihiakus fitites]$_{C\text{-}Top}$ didaski [Omiro]$_{Foc}$,
to.the.ACC undergraduate.ACC students.ACC teach.3SG Homer.ACC
'[To the undergraduate students]$_{C\text{-}Top}$, she teaches [Homer]$_{Foc}$,
[stus metaptihiakus fitites]$_{C\text{-}Top}$ didaski [Aristoteli]$_{Foc}$.
to.the.ACC postgraduate.ACC students.ACC teach.3SG Aristotle.ACC
[to the postgraduate students]$_{C\text{-}Top}$, she teaches [Aristotle]$_{Foc}$.

c. Stus protus didaski Omiro,
to.the.ACC first.ACC teach.3SG Homer.ACC
'To the first ones, she teaches Homer,
stus defterus didaski Aristoteli.
to.the.ACC second.ACC teach.3SG Aristotle.ACC
to the second ones, she teaches Aristotle.'

In example (31c), *stus proptihiakus fitites* 'to the undergraduate students' is substituted with *stus protus* 'the first ones' and *stus metaptihiakus fitites* 'to the postgraduate students' is substituted with *stus defterus* 'the second ones'.

In example (32b), *stus proptihiakus fitites* 'the undergraduate students' appears in postverbal position and is contrasted with the *stus metaptihiakus fitites* 'the postgraduate students'. According to the substitution test for contrastive topics, it should be possible to substitute the two terms, namely, the undergraduate students and the postgraduate students, with *stus protus* 'the former' and *stus defterus* 'the latter'. This is confirmed in (32c).

(32) a. (Ti didaski i Maria afto
what teach.3SG the.NOM Mary.NOM this.ACC
to eksamino?)
the.ACC semester.ACC
"What is Mary teaching this semester?"

b. [Omiro]$_{Foc}$ didaski [stus proptihiakus fitites]$_{C\text{-}Top}$,
Homer.ACC teach.3SG to.the.ACC undergraduate.ACC students.ACC
'Homer, she teaches to the undergraduate students,
[Aristoteli]$_{Foc}$ didaski [stus metaptihiakus fitites]$_{C\text{-}Top}$.
Aristotle.ACC teach.3SG to.the.ACC postgraduate.ACC students.ACC
'Aristotle, she teaches to the postgraduate students.'

c. Omiro didaski stus protus,
Homer.ACC teach.3SG to.the.ACC first.ACC
'Homer, she teaches to the first ones,

Aristoteli didaski stus defterus.
Aristotle.ACC teach.3SG to.the.ACC second.ACC
Aristotle, she teaches to the second ones.'

In example (32c), stus proptihiakus fitites 'the undergraduate students' is substituted with stus protus 'the former' and stus metaptihiakus fitites 'the postgraduate students' is substituted with stus defterus 'the latter'. Examples (31) and (32) show that preverbal objects do not differ from their postverbal counterparts with respect to contrast. They can both be interpreted as contrastive topics.

The last test that I am going to use for identifying contrastive topics is the "implicit sub-question test". This test is illustrated in examples (33) to (35).

(33) *Question*
a. Ti edoses sta pedja?
what give.2SG to.the.ACC children.ACC
'What did you give to the children?'
*Answer*1
b. [Stin Eleni]$_{C\text{-}Top}$ edosa [ena vivlio]$_{Foc}$,
to.the.ACC Helen.ACC give.1SG a.ACC book.ACC
'[To Helen]$_{C\text{-}Top}$, I gave [a book]$_{Foc}$.
[sti Maria]$_{C\text{-}Top}$ edosa [ena stilo]$_{Foc}$.
to.the.ACC Mary.ACC give.1SG a.ACC pen.ACC
[to Mary]$_{C\text{-}Top}$, I gave [a pen]$_{Foc}$.

The question in (33a) can be interpreted as containing two implicit sub-questions, namely, 'what did you give to Helen?' and 'what did you give to Mary?'. Example (33b) answers the question in (33a), addressing first the first sub-question and then addressing the second sub-question. In this sense, in (35b) *Helen* is contrasted to *Mary*.

In (35b), contrastive topics appear in preverbal position, whilst foci appear in postverbal position. The reverse ordering is also possible, as shown in example (34).

(34) *Question*
a. Ti edoses sta peðja?
what give.2SG to.the.ACC children.ACC
'What did you give to the children?'
*Answer*1
b. [Ena vivlio]$_{Foc}$ edosa [stin Eleni]$_{C\text{-}Top,}$
a.ACC book.ACC give.1SG to.the.ACC Helen.ACC
[ena stilo]$_{Foc}$ edosa [sti Maria]$_{C\text{-}Top}$.
a.ACC pen.ACC give.1SG to.the.ACC Mary.ACC
'[A book]$_{Foc}$, I gave [to Helen]$_{C\text{-}Top}$, [a pen]$_{Foc}$, I gave [to Mary]$_{C\text{-}Top}$.'

The question in (34a) is identical to the question in (33a). Example (34b) felicitously answers the question in (34), addressing first the first sub-question and then addressing the second sub-question. In this respect *Helen* is contrasted to *Mary*.

However, there is a difference between example (33b) and (34b). In (34b) contrary to (33b), the foci appear in preverbal position and the contrastive topics appear in postverbal position. Examples (33) and (34) illustrate that preverbal objects do not differ from postverbal objects with respect to contrast; they can both be interpreted as contrastive topics.

The second condition of the "implicit sub-question test" is illustrated in example (35). The question in (35a) can be interpreted as containing two implicit sub-questions, namely, 'what does she teach the undergraduate students?' and 'what does she teach the postgraduate students?'.

(35) *Question*

a. Ti didaski stus fitites?
what teach.3SG to.the.ACC students.ACC
'What does she teach the students?'
*Answer*1

b. [Stus proptihiakus fitites]$_{\text{C-Top}}$ didaski [Omiro]$_{\text{Foc}}$.
to.the.ACC undergraduate.ACC students.ACC teach.3SG Homer.ACC
'[To the undergraduate students]$_{\text{C-Top}}$, she teaches [Homer]$_{\text{Foc}}$.'
*Answer*2

c. [Omiro]$_{\text{Foc}}$ didaski [stus proptihiakus fitites]$_{\text{C-Topic}}$.
Homer.ACC teach.3SG to.the.ACC undergraduate.ACC students.ACC
'[Homer]$_{\text{Foc}}$, she teaches [to the undergraduates students]$_{\text{C-Top}}$.

Example (35b) answers only the first implicit sub-question. In (35b), the undergraduate students are marked as contrastive topic, while Homer is the focus of (35b). As shown in (35b), the contrastive topic appears in preverbal position, while the focus appears in postverbal position.

Example (35c) is similar to (35b), in the sense that it answers the question in (35a) addressing only the first implicit sub-question. However, there is a difference between (35b) and (35c). In (35c) the focus appears in preverbal position, while the contrastive topic appears in postverbal position.

Example (35) shows that preverbal objects do not differ from their postverbal counterparts with respect to contrast. As indicated by examples (35b) and (35c), contrastive topics can appear in preverbal or postverbal position.

Summarizing, in this section, I applied to Greek the tests that we can use for identifying contrastive foci and contrastive topics. The results of the tests for contrastive foci indicate that preverbal object foci do not differ from postverbal object foci with respect to contrast. They can both be interpreted contrastively and they can both be interpreted non-contrastively. The results of the tests for contrastive topics show that preverbal objects do not differ from their postverbal

counterparts with respect to contrast. Contrastive topics can appear in preverbal or postverbal position. In this respect, Greek is different from Finnish, where sentence initial position indicates contrast.

A question that emerges from the findings of this section is whether contrastive foci and contrastive topics in Greek are phonetically realized in a similar way; in particular, whether the phonetic properties of contrastive foci are similar to the phonetic properties of contrastive topics. This question will be tackled in chapter six.

## 3.3 Contrast and exhaustivity: data from Italian

In the introduction of this chapter, it was noted that the association of preverbal object foci with exhaustive and/or contrastive interpretation (± exhaustive, ± contrastive) has generated a lot of discussion. In particular, it is debatable whether contrastive object foci must be interpreted exhaustively (see Kiss (1998) among others), or whether they can be interpreted exhaustively (see Cohan (2002), Umbach (2004), among others). In this respect, it is important to examine the relation between exhaustivity and contrast. The aim of this section is to shed light on this relation, using Italian as a case study.

The reason for selecting Italian is that for this language it has been argued that preverbal object foci must be interpreted contrastively (see Rizzi 1997 among others). In this section, I will argue that contrast does not necessarily entail exhaustivity. The section is organized as follows. I first present Calabrese's (1982) and Benincá and Poletto's (2004) view on the relation between exhaustivity and contrast. Then, the co-ordination test is applied to Italian. The results of the test show that contrast does not entail exhaustivity in Italian.

Calabrese (1982) argues that contrastive focus is not exhaustive. For Calabrese, a sentence with contrastive focus asserts a proposition, where the set represented by contrastive focus holds for the predicate phrase and, at the same time, it denies that the same predicate phrase holds for a different set. Benincà and Poletto (2004) do not discuss in detail the relation between contrastive and exhaustive interpretation. Nevertheless, on page 71, they state that "Contrastive focus selects an element inside a given set and excludes all others". Recall that exhaustivity is defined in exactly the same way. In this respect, Benincà and Poletto define contrastive focus as a special case of exhaustivity.

As already discussed in chapter two, the co-ordination test was constructed by Kiss (1998). For the ease of discussion, the co-ordination test is repeated in (36).

(36) "Szabolcsi's test involves a pair of sentences in which the first sentence contains a focus consisting of two coordinate DPs and the second sentence differs from the first one only in that one of the two coordinate DPs has been dropped. If the

> second sentence is not among the logical consequences of the first one, the focus expresses exhaustive identification."
>
> (Kiss, 1998: 250)

In the coordination test, as already noted in chapter two, the key sentence is the (b) sentence. It is the exhaustivity of the focus phrase in the (b) sentence that causes the failure of the implication. Recall also from chapter two, that the interpretation of the predicate influences the results of the coordination test. Taking this into consideration, the co-ordination test is applied to Italian.

12 native speakers of Italian were asked to report on the collective or distributive interpretation of the (a) sentences and to give their entailment judgements.[7] An illustration of the co-ordination test is given in examples (37) and (38).

Example (37a) contains a coordinated DP phrase *a Gianni e a Maria* 'for John and for Mary' that is interpreted as contrastive focus and appears in postverbal position. The predicate in (37a) is interpreted distributively by all speakers. Example (37b) contains only one of the two conjuncts. Specifically, in (37b) the contrastively focused conjunct appears in preverbal position. All speakers agree that (37b) is entailed by (37a).

(37) Hai comprato un paio di pantaloni a Bill e Stella?
have.2SG bought a pair of trousers to Bill and Stella
'Have you bought a pair of trousers for Bill and Stella?'

a. Ho comprato un paio di pantaloni
have.1SG bought a pair of trousers
[a Gianni e a Maria]$_{C\text{-}Foc}$.
to John and to Mary
'I have bough a pair of trousers [for John and Mary]$_{C\text{-}Foc}$.

→

b. [A Gianni]$_{C\text{-}Foc}$ ho comprato un paio di pantaloni.
to John have.1SG bought a pair of trousers
'[For John]$_{C\text{-}Foc}$, I bought a pair of trousers.'

Example (38) is similar to (37); the only difference between the two is the (b) example. In particular, in (38b) the contrastively focused conjunct appears in postverbal position. All speakers agree that (38a) entails (38b).

(38) Hai comprato un paio di pantaloni a Bill e Stella?
have.2SG bought a pair of trousers to Bill and Stella
'Did you buy a pair of trousers for Bill and Stella?'

[7] All speakers belong to the same age group (age range 28-40) and have a university education.

a. Ho comprato un paio di pantaloni [a Gianni
have.1SG bought a pair of trousers to John
e a Maria]$_{C\text{-}Foc}$.
and to Mary
'I have bough a pair of trousers [for John and Mary]$_{C\text{-}Foc}$.

→

b. Ho comprato un paio di pantaloni [a Gianni]$_{C\text{-}Foc}$.
have.1SG bought a pair of trousers to John
'I bought a pair of trousers [for John]$_{C\text{-}Foc}$.'

Summarizing the entailment judgements, (37a) entails (37b), and (38a) entails (38b). This shows that contrastively focused objects in Italian are not exhaustive. This is a first indication for arguing that contrast in Italian does not entail exhaustivity.

Another illustration of the coordination test is given in example (39). Example (39a) contains a coordinated DP phrase a Gianni e a Maria 'for John and for Mary' which appears in preverbal position and is interpreted as contrastive focus. Examples (39b) and (39c) contain only one of the two conjuncts. Specifically, in (39b) the contrastively focused conjunct appears in preverbal position, while in (39c) the contrastively focused conjunct appears in postverbal position.

(39) Hai comprato un paio di pantaloni a Bill e Stella ?
have.2SG bought a pair of trousers to Bill and Stella
'Did you buy a pair of trousers for Bill and Stella?'

a. [A Gianni e a Maria]$_{C\text{-}Foc}$ ho comprato un
to John and to Mary have.1SG bought a
paio di pantaloni.
pair of trousers
'For John and for Mary, I bought a pair of trousers.'

b. [A Gianni]$_{C\text{-}Foc}$ ho comprato un paio di pantaloni.
to John have.1SG bought a pair of trousers
'For John, I bought a pair of trousers.'

c. Ho comprato un paio di pantaloni [a Gianni]$_{C\text{-}Foc}$.
have.1SG bought a pair of trousers to John
'I bought a pair of trousers for John.'

[Italian]

With respect to the collective or distributive interpretation interpretation of (39a) and the entailment judgments, there was a split in the group of speakers. In particular, 8 speakers interpreted (39a) unambiguously. I collectively designate this set of speakers as Group A. For speakers of Group A, the only available interpretation for (39a) is the collective one. For speakers of Group A, (39b) is not among the entailments of (39a), and the same holds for (39c); (39c) is not entailed by (39a). 4 speakers interpreted (39a) ambiguously. I collectively designate this set of speakers as Group B. For speakers of Group B, (39a) can be interpreted either

collectively or distributively. When speakers of Group B interpret (39a) collectively, their entailment judgments pattern with the entailment judgments of speakers of Group A, namely, the entailment does not go through. When speakers of Group B interpret (39a) distributively, then their judgments differ from the judgments of Group A, and the entailment goes through; in this case, (39b) is an entailment of (39a) and the same holds for (39c).

Example (39) confirms the observation that was made in chapter two, namely, that the co-ordination test interacts with the collective interpretation of the (a) sentence. As noted in chapter two, one can control for collectivity, by forcing a distributive interpretation onto the (a) sentence. This can be done in a straightforward way with the insertion of the quantificational element *ciascuno* 'each'. The relevant example is given in (40).

(40) Hai comprato un paio di pantaloni a Bill e Stella ?
have.2SG bought a pair of trousers to Bill and Stella
'Did you buy a pair of trousers for Bill and Stella?'

a. [A Gianni e a Maria]$_{C\text{-}Foc}$ ho comprato
to John and to Mary have.1SG bought
un paio di pantaloni ciascuno.
a pair of trousers each
'For John and for Mary, I bought a pair of trousers each.'

b. [A Gianni]$_{C\text{-}Foc}$ ho comprato un paio di pantaloni.
to John have.1SG bought a pair of trousers
'For John, I bought a pair of trousers.'

c. Ho comprato un paio di pantaloni [a Gianni]$_{C\text{-}Foc}$.
have.1SG bought a pair of trousers to John
'I bought a pair of trousers for John.'

[Italian]

Example (40a) is only interpreted distributively, because of the presence of the quantificational element *ciascuno* 'each'. As expected, (40b) is among the logical entailments of (40a), and the same holds for (40c). As shown by the results of the test, the preverbal focused direct object in (40b) is not interpreted exhaustively. It can, thus, be concluded that in Italian, contrastively focused preverbal objects are not interpreted exhaustively. Furthermore, it can be concluded that contrast does not entail exhaustivity in Italian.

Considering exhaustivity and to the extent that we can compare Italian with Greek, we can say that Italian object foci are similar to Greek object foci, in the sense that in both languages object foci are not interpreted exhaustively.

Recapitulating, in this section, I discussed the relation between exhaustivity and contrast, examining data from Italian. It was shown that contrastively focused objects in Italian are not exhaustive. Evidence for this came from the results of the coordination test. This finding is in accordance to Calabrese but in contrast to Benincà and Poletto. Furthermore, it can be concluded that Italian preverbal object

foci are similar to Greek preverbal object foci with respect to exhaustivity; neither of the two are exhaustive.

## 3.4 Conclusions and further questions

In this chapter, I presented syntactic and semantic approaches to the notion of contrast and discussed some tests for identifying contrastive foci and contrastive topics. I examined preverbal and postverbal object foci in Greek with respect to contrast, applying the relevant tests. The results of the tests indicated that Greek preverbal object do not differ from their postverbal counterparts with respect to contrast. Preverbal object foci as well as postverbal object foci can be interpreted contrastively, but they do not necessarily need to; they can also receive a non-contrastive interpretation. Contrastive topics can appear in preverbal or postverbal position. I also investigated the relation between exhaustivity and contrast looking at data from Italian. It was shown that in Italian preverbal object foci are not interpreted exhaustively. Moreover, it was concluded that contrast does not necessarily entail exhaustivity.

There are two pending questions. The first question concerns the properties of preverbal object foci. In chapter two, it was shown that preverbal object foci do not differ from their postverbal counterparts with respect to exhaustivity. In this chapter, it was demonstrated that the two do not differ with respect to contrast. So, the pending question is: what is the difference between Greek preverbal and postverbal object foci? This question will be addressed in the following chapter. I will argue that preverbal object foci differ from their postverbal counterparts with respect to discourse topichood. The second question concerns the status of contrast in grammar. As noted in this chapter, the status of contrast is debatable. Some researchers treat contrast as a sub-feature of focus and topic, while other researchers treat contrast as an independent notion of information structure that can combine with focus and topic. The discussion in this chapter has not provided us with compelling evidence with respect to the status of contrast. Trying to solve this issue, I will examine the phonetic properties of contrast. If the phonetic realization of Greek contrastive foci and topics is similar, then this can be used as an argument for claiming that contrast is an independent notion of information structure that combines with topic and focus. This question will be discussed in detail in chapters six and seven.

# 4 Fronted Discourse Topics

## 4. Introduction

In chapter two and three, I argued that preverbal ([O]$_{Foc}$V) and postverbal (V[O]$_{Foc}$) object foci in Greek do not differ with respect to exhaustivity and contrast. In particular, in chapter two, it was shown that neither of the two is exhaustive, and that both can be interpreted as new information foci, while in chapter three, I demonstrated that both can be interpreted contrastively, but that neither of the two has to be interpreted as such. These findings lead us back to the central question of this thesis, namely, the difference between preverbal and postverbal object foci.

There are two possible approaches to this question. The first one is to claim that object foci in Greek appear either in preverbal or postverbal position, and that movement occurs freely. This line of argumentation suggests optional movement of the focused object to a preverbal position. The second approach is to argue that Greek preverbal object foci differ from their postverbal counterparts. In this chapter, I follow the second approach and claim that preverbal object foci in Greek differ from their postverbal counterparts, and that this difference has nothing to do with focus.

Before presenting the difference between Greek preverbal and postverbal object foci, I want to introduce a general observation about Greek. When examining Greek newspaper texts, one observes that topics are very frequent at the beginning of newspaper articles and that these topics usually function as "discourse topics", in the sense that they express what the following article is about. An example is given in (1). Example (1) consists of two sentences; the first sentence of (1) is also the first sentence of the text.[1] Brackets and the subscript $_{Top}$ indicate topics.

(1) [Peripolies enstolon astinomikon me motopodilata]$_{Top}$
patrols.ACC uniformed.GEN policemen.GEN with motorbikes.ACC
programatizi i astinomiki diefthinsi Thesalonikis.
plan.3SG the.NOM police.NOM station.NOM Thessaloniki.GEN

[1] Note that the first sentence of example (1) is also the first sentence of the text. It is not the title of the text. The title of the text is: *I kinigi tu egklimatos tora ke me …papakia* 'the hunters of crime now and with … motorbikes'.

Prokite gia ena pilotiko programa, to opio
be.3SG about a.ACC pilot.ACC program.ACC the.NOM which.NOM

anamenete na epektathi ke se ales megalupolis
expected to expanded and in other.ACC big-cities.ACC

ke ehi os stoho tin egkeri ke
and have.3SG as target.ACC the.ACC in-time.ACC and

apotelesmatikoteri epemvasi ton organon
more efficient intervention.ACC the.GEN officers.GEN

tis taksis stis klisis ton
the.GEN order.GEN to.the.ACC calls.ACC the.GEN

politon gia parohi voithias.
citizens.GEN for provision help.GEN

'[Patrols of uniformed policemen with motorbikes]$_{Top}$, the police station of Thessaloniki is planning. This is a pilot program, which is expected to be expanded in other big cities and has as goal the in-time and more effective intervention of the peace officers in the calls of citizens for help.'

(Data from *Kathimerini*, 1-12-2004)

In example (1), the object (*peripolies enstolon astinomikon me motopodilata* 'patrols of uniformed policemen with motorbikes') is a topic and is marked syntactically as such by its sentence initial position. Interestingly, its topic function is not limited to a single sentence, as it appears to function as the topic of the following discourse. In this chapter, I will argue that such "discourse topics" may be syntactically marked in Greek.

Returning to the question about the difference between preverbal and postverbal object foci in Greek, in this chapter, I argue that the two differ with respect to discourse topichood. Specifically, I argue that preverbal object foci in Greek are fronted discourse topics. First, I show that there is no reason to assume that focus and topic are by definition incompatible. Secondly, I demonstrate that Greek preverbal object foci show properties of discourse topichood. Evidence for my claim is provided by backward anaphora resolution and the results of a continuation test that was implemented by means of a questionnaire.

The chapter is organized as follows. In section 4.1, I present Rizzi's (1997) arguments for claiming that focus and topic should be set apart. I will show that his arguments are valid for topics at sentence level, but not for topics at the discourse level. In section 4.2, I examine data from Greek and show that focus can combine with discourse level topics. Section 4.3 discusses what I will call the continuation test. The results of the continuation test show that preverbal object foci differ from their postverbal counterparts with respect to discourse topichood. They also provide robust evidence in favour of my claim that preverbal object foci in Greek are obligatorily discourse topics. The results of the continuation test were further investigated by means of a questionnaire. The questionnaire and its results are

presented in the appendix of this chapter. In section 4.4, I provide extra evidence for the claim that Greek preverbal object foci are discourse topics based on backward anaphora resolution. Section 4.5 concludes that in Greek "discourse topics" may be syntactically marked and that preverbal object foci in Greek are fronted discourse topics.

## 4.1 Differences between Topic and Focus Projections

It is usually assumed that focus and topic are incompatible, in the sense that an element cannot be a focus and a topic at the same time. In this section, I present Rizzi's (1997) arguments for setting focus and topic apart. Rizzi assumes that the mapping between syntax and semantics involves a one-to-one correspondence. He argues that each functional projection encodes different semantic properties and that a particular interpretation is obtained via Spec-Head agreement.

It should be noted that Rizzi bases his arguments for setting focus and topic apart on two main differences between the two. The first difference concerns the quantificational nature of focus as opposed to the non-quantificational nature of topic (cf. Rizzi 1997: 251). There are three phenomena that are related to this first difference, namely, Weak Crossover effects, the distribution of resumptive clitics and the distribution of bare quantificational elements. The second difference refers to the semantics of focus and topic. There are two phenomena related to this second difference, in particular, the recursion of topics and the compatibility of topics with *wh*-elements.

As for Weak Crossover effects (WCO), Rizzi, following Postal (1970) and Lasnik & Stowell (1991), employs WCO effects as a diagnostic for A' relations that involve quantification. The rationale behind this is that there are two types of A' binding, (i) quantificational A' binding where a quantifier binds a variable and (ii) non-quantificational A' binding where a null pronoun or an epithet is bound. The former is sensitive to WCO effects. From this, Rizzi concludes that focus is quantificational, as it induces WCO effects, while topic is not. An example is given in (2). Brackets and the subscripts $_{\text{Top/Foc}}$ indicate topic and focus respectively.

(2) *Focus construction*

a. ??[Gianni$_i$]$_{\text{Foc}}$ sua$_i$ madre ha sempre apprezzato t$_i$ (non Piero)
Gianni.ACC his mother.NOM have.3SG always appreciated (not Piero)
'[Gianni]$_{\text{Foc}}$ his mother always appreciated, (not Piero).'

*Topic construction*

b. [Gianni$_i$]$_{\text{Top}}$, sua$_i$ madre lo$_i$ ha sempre apprezzato.
Gianni.ACC his mother.NOM CL have.3SG always appreciated
'[Gianni]$_{\text{Top}}$, his mother always appreciated him.'

[Italian]

Example (2a) lacks a clitic, while (2b) contains a resumptive clitic. (2a) is an instance of a focus construction, while (2b) is an example of a topic construction.

Focus and topic constructions also differ with respect to their phonetic realization (see Frascarelli (2000), Frascarelli and Hinterhölzl (2007)). In (2a) the trace is bound by focus and WCO arises, while this is not the case in (2b); in (2b) a null pronoun is bound.

The second phenomenon that Rizzi correlates with the quantificational properties of focus and topic is the distribution of resumptive clitics. An example is given in (3) and (4).

(3) *Topic Construction*

a. [Il tuo libro]$_{\text{Top}}$, lo ho comprato.
the.ACC your book.ACC CL have.1SG bought.
'[Your book]$_{\text{Top}}$, I bought it.'

b. *[Il tuo libro]$_{\text{Top}}$, ho comprato.
the.ACC your book.ACC have.1SG bought
'[Your book]$_{\text{Top}}$, I bought it.'

(4) *Focus Construction*

a. *[Il tuo libro]$_{\text{Top}}$, lo ho comprato.
the.ACC your book.ACC CL have.1SG bought
'[Your book]$_{\text{Top}}$, I bought it.'

b. [Il tuo libro]$_{\text{Foc}}$, ho comprato.
the.ACC your book.ACC have.1SG bought
'[Your book]$_{\text{Top}}$, I bought it.'

[Italian]

Specifically, Rizzi shows that in Italian the presence of a resumptive clitic is obligatory in topic constructions, while its presence in focus constructions leads to ungrammaticality.

Examples (3a) and (4a) contain a resumptive clitic *lo* 'it'. As indicated by the contrast between (3a) and (4a), a resumptive clitic is fine in a topic construction, while it is not in a focus construction. Examples (3b) and (4b) lack the clitic; as shown, this is compatible with a focus interpretation, but it is not with a topic interpretation. The compatibility and incompatibility of resumptive clitics with focus and topic respectively is related to the quantificational nature of focus and to the non-quantificational nature of topic. A quantificational element cannot be taken up by a resumptive clitic.

Finally, the distribution of bare quantificational elements is correlated with the quantificational properties of focus and topic. In particular, bare quantificational elements can serve as foci, while their presence in topic constructions leads to ungrammaticality. An example is given in (5).

In (5a) the quantificational element *nessuno* 'no one' functions as the focus of the sentence; the bare quantifier binds the variable.

(5) *Focus construction*

a. [Nessuno]$_{Foc}$ ho visto.
no one have.1SG seen
'[No one]$_{Foc}$ I saw.'

*Topic construction*

b. *[Nessuno]$_{Top}$, lo ho visto.
no one CL have.1SG seen
'*[No one]$_{Top}$, I saw him.'

[Italian]

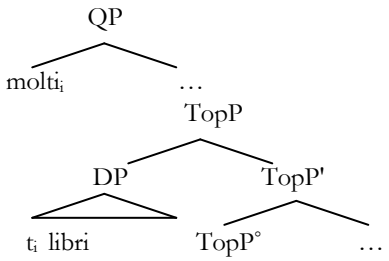
Example (5b) is ungrammatical, as there is no variable to be bound by the quantifier *nessuno* 'no one'. Rizzi appears to assume that clitics are heads that leave $X^{o}$-traces. Given that only traces of maximal projections can serve as variables, (5b) is ungrammatical as neither the resumptive clitic nor its trace can serve as variables. The contrast between (5a) and (5b) seems to suggest that quantificational elements are not compatible with topic constructions. However, the data are more complex. Rizzi acknowledges that quantificational elements can appear in topic constructions, if they are lexically restricted. An illustration of this is given in example (5c).

c. [Molti libri]$_{Top}$, li ho buttati via.
many books CL have.1SG thrown away
'[Many books]$_{Top}$, I threw them away.'

[Italian]

Rizzi accounts for cases like the ones given in (5c) by assuming Quantifier Raising (QR). Rizzi assumes that the DP *molti libri* 'many books' appears in SpecTopP. He also assumes that *molti* 'many' is the real quantifier that undergoes QR out of the DP, leaving behind a trace. This trace serves then as a proper variable that is bound by *molti* 'many'. This is depicted in structure (6).

(6)

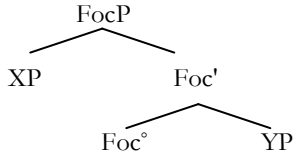



Summarizing, bare quantificational elements can serve as foci, while they cannot serve as topics.

As already noted, the second main difference between focus and topic concerns their semantics. According to Rizzi, it is possible to have multiple topics per

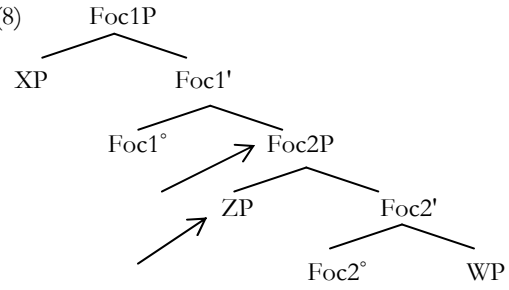
sentence, while it is not possible to have multiple foci per sentence. He argues that the interpretational requirements on focus ban multiple foci. Let me present Rizzi's argument. The starting point is that FocP is responsible for splitting the sentence into focus and presupposition. Specifically, the specifier of the focus phrase hosts the focus, whereas its complement hosts the presupposition. This is depicted in (7).

(7)




Why it is not possible to have multiple focus projections becomes clearer, if, for a moment, we assume that it is possible to have multiple focus projections. If we assume multiple focus projections, say Foc1P and Foc2P, then, the structure would look like the one in (8). In (8), Foc1 takes Foc2P as its complement, so Foc2P must be interpreted as presupposition. However, at the same time, the specifier of Foc2P has to be interpreted as the focus of Foc2P. Thus, an incompatibility arises: ZP cannot be interpreted simultaneously as presupposition and focus. Consequently, the derivation crashes.

(8)




Rizzi concludes that only one focus is available per clause, while topics can be recursive. An example is given in (9).

Example (9a) contains three topics and is grammatical, while (9b) contains two foci and is ungrammatical.

(9) *Topic construction*

a. [Il libro]$_{Top}$, [a Gianni]$_{Top}$, [domani]$_{Top}$, glielo darò senz' altro
the book to John tomorrow to.him.CL give.1SG for sure
'[The book]$_{Top}$, [to John]$_{Top}$, [tomorrow]$_{Top}$, I will give it to him for sure.'

*Focus construction*

b. *[A Gianni]$_{Foc}$ [il libro]$_{Foc}$ darò.
to John the book give.1SG
'*[To John]$_{Foc}$ [this book]$_{Foc}$ I'll give.'

[Italian]

It should be noted that it is the semantics of focus that ban focus recursion, and that this is independent of the focus and topic projections that are proposed by Rizzi.

A last phenomenon that is related to the semantics of focus and topic concerns the compatibility of focus and topic with *wh*-elements. Topics are compatible with *wh*-elements, while foci are not. An example is given in (10).

(10) *Topic construction*

a. [A Gianni]$_{Top}$, che cosa gli hai detto?
to John that what CL have.2SG told
'[To John]$_{Top}$, what did you tell him?'

b. *Che cosa, [a Gianni]$_{Top}$, gli hai detto?
that what to John CL have.2SG tell
'*What, [to John]$_{Top}$ did you tell him?'

*Focus construction*

c. *[A Gianni]$_{Foc}$ che cosa hai detto?
to Gianni that what have.2SG told
'*[To John]$_{Foc}$ what did you tell?'

d. *Che cosa [a Gianni]$_{Foc}$ hai detto?
that what to John have.2SG told
'*What [to John]$_{Foc}$ did you tell?'

[Italian]

(10a) and (10b) are examples of topic constructions. In (10a) the topic phrase precedes the *wh*-expression, whereas in (10b) the topic phrase follows the *wh*-expression. As shown by the contrast between (10a) and (10b), topics are compatible with *wh*-elements, when the topic phrase precedes the *wh*-element. (10c) and (10d) are instances of foci. As indicated by their ungrammaticality, focus is incompatible with *wh*-elements. Rizzi (1997) argues that *wh*-elements in main questions move to SpecFocP. In this way, he explains the complementary distribution of the two. In this respect, the co-occurrence of a focus and a *wh*-element is impossible.

Recapitulating, Rizzi sets focus and topic apart based on the quantificational nature of the former and on the interpretational constraints on the two. In this respect, for Rizzi, an element cannot be a focus and a topic at the same time. This is in accordance with his assumption about the syntax-semantics mapping, namely, one projection for each interpretation. It should be noted that Rizzi discusses focus and topic at the sentence level; he does not examine topics at the discourse level.

This is important given my observations for example (1). As already noted, in example (1), the topic function of the fronted object is not limited to the sentence level, as it appears to extend its function to the discourse level, functioning as the topic of the following discourse. The notions of sentence level topic and discourse level topic will be discussed in detail in section 4.3. Given Rizzi's arguments for the incompatibility of focus and topic, it is worth examining whether an element can function as focus and discourse level topic at the same time.

## 4.2 On the compatibility of focus and topic in Greek

In this section, I go through Rizzi's arguments for setting apart focus and topic, discussing data from Greek. I closely examine the properties of focus and topic as discussed in Rizzi, investigating whether it is possible for an element to combine two incompatible at first sight functions, namely, the function of being a focus and a topic at the same time. This is important, as in section 4.3 I make a distinction between sentence level topics and discourse level topics and claim that an element can function as a focus and a discourse level topic at the same time, and that under this double function, this element shares properties with both focus and topic.

As discussed in section 4.1, Rizzi sets focus and sentence topic apart based on two main differences between the two, namely, the quantificational force of focus, and the semantic restrictions on them. As already mentioned, there are three phenomena that are related with the first difference, in particular, WCO effects, the distribution of resumptive clitics and the distribution of bare quantificational elements. I start this section by looking at WCO effects in Greek.

In section 4.1, I presented Rizzi's claim that the quantificational nature of focus induces WCO effects, while the non-quantificational nature of topic does not. There are three remarks that I want to make with respect to WCO effects and quantification. First, in Greek WCO effects are not clear-cut. Specifically, speakers do not have unanimous judgments. An example is given in (11).

(11a) is an example of preverbal object focus, while (11b) is an instance of postverbal object focus.

(11) *Focus construction*

a. ok/?/* [Ton Yani$_i$]$_{Foc}$ agapai i mitera tu$_i$.
the.ACC John.ACC love.3SG the.NOM mother.NOM his
'? [John$_i$]$_{Foc}$, his$_i$ mother loves t$_i$.'

b. ok/?/* I mitera tu$_i$ agapai [ton Yani$_i$]$_{Foc}$.
the.NOM mother.NOM his love.3SG the.ACC John.ACC
'? His$_i$ mother loves [John$_i$]$_{Foc}$.'

*Topic construction*

c. ok/? [Ton Yani$_i$]$_{Top}$ agapai i mitera tu$_i$.
the.ACC John.ACC love.3SG the.NOM mother.NOM his
'[John$_i$]$_{Top}$ his$_i$ mother loves t$_i$.'

d. [Ton Yani$_i$]$_{Top}$ ton agapai i mitera tu$_i$.
the.ACC John.ACC CL love.3SG the.NOM mother.NOM his
'[John$_i$]$_{Top}$ his$_i$ mother loves him.'

As indicated, there is variation among speakers. For some, focus does not induce WCO effects, while for others it does. (11c) contains an object in preverbal position and it is a topic construction. For some speakers, (11c) is fine, whereas others find it degraded, but not sharply ungrammatical. (11d) contains a clitic and is fine for all speakers.

My second remark concerns focus sensitive operators. If one uses WCO effects for setting focus and topic apart, then I assume that one would expect to find WCO effects in constructions with focus sensitive operators, such as *only*. However, this expectation is not borne out by the data.[2] An example is given in (12).

(12) a. [Mono ton Yani$_i$]$_{Foc}$ agapise i mitera tu$_i$.
only the.ACC John.ACC love.3SG the.NOM mother.NOM his
'[Only John]$_{iFoc}$, his$_i$ mother loved.'

b. I mitera tu$_i$ agapise [mono ton Yani$_i$]$_{Foc}$.
the.NOM mother.NOM his love.3SG only the.ACC John.ACC
'His$_i$ mother loved [only John$_i$]$_{Foc}$.'

In (12a) the focused object appears in preverbal position, whereas in (12b) the focused object appears in postverbal position. (12a) and (12b) can have a bound variable reading as well as a coreference reading. As shown in (12), (12a) and (12b) are grammatical and there is no speakers' variation. In this respect, the focus sensitive operator *mono* 'only' does not induce any WCO effects. It is not clear why this is the case, namely why a focus sensitive operator like *only* nullifies WCO effects; further research is required. However, what can be concluded from (12) is that WCO effects do not constitute a strong argument for setting apart topic and focus.

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[2] The fact that focus sensitive operators do not induce WCO effects is not restricted to Greek. Postal (1993: 543) notes for English that *even*, *only* or *own* cancel weak crossover effects. An example from Postal is given in (ia)-(id).

(i) a. the lawyer who$_i$ his$_i$ clients hate t$_i$
b. the lawyer who$_i$ even his$_i$ clients hate t$_i$
c. the lawyer$_s$ who$_i$ only his$_i$ older clients hate t$_i$
d. the lawyer who$_i$ his$_i$ own$_i$ clients hate t$_i$

My last remark concerns preverbal and postverbal object foci. As shown in (11a) and (11b) above, there is no difference between preverbal and postverbal object foci with respect to WCO effects. This means that whatever the reason is for WCO effects, the surface position does not play a role. In other words, the WCO effect is not triggered by a preverbal-surface position, but by focushood.

In Italian, the presence of a resumptive clitic is obligatory in topic constructions, whereas the opposite holds for focus constructions. Greek differs from Italian, as in Greek topic constructions the presence of a resumptive clitic is not compulsory. An illustration of the non-obligatory presence of a resumptive clitic in Greek topic constructions is given in example (13).

(13) a. To kratiko theatro ksekinise ti ximerini
the.NOM state.NOM theatre.NOM begin.3SG the.ACC winter.ACC
sezon me tin Erofili tu Xortatsi
season with the.ACC Erofili.ACC of.GEN Xortatsis.GEN
'The State Theatre began its winter season with Erofili by Hortatsis.'

b. [Tin parastasi]$_{Top}$ skinothetise o Kun.
the.ACC performance.ACC direct.3SG the.NOM Kun.NOM
'[The performance]$_{Top}$, Kun directed.'
(Data Alexopoulou and Kolliakou, 2002)

c. [Tin parastasi]$_{Top}$ tin skinothetise o Kun.
the.ACC performance.ACC CL direct.3SG the.NOM Kun.NOM
'[The performance]$_{Top}$, Kun directed it.'

Example (13b) lacks a resumptive clitic, while (13c) has a clitic; in both (13b) and (13c) the fronted object *tin parastasi* 'the performance' is interpreted as a topic. With this observation, I do not mean to imply that there are no semantic differences between (13b) and (13c). I only want to illustrate that the presence of a clitic is not obligatory in topic constructions in Greek. There is something more to be noted. In (13b) the fronted object has an additional interpretation; it can be interpreted as a topic at discourse level. This additional interpretation is not available for the fronted object in (13c). I will come back to this in section 4.3. The conclusion to be drawn here is that the presence vs. absence of a resumptive clitic is a valid argument for setting apart focus and topic at a sentence level. However, the presence vs. absence of a resumptive clitic is not a valid argument for setting apart topic at a discourse level, and focus.

With respect to focus constructions, Greek patterns with Italian in the majority of cases. In particular, the presence of a resumptive clitic in focus constructions leads to infelicity. This holds for preverbal as well as postverbal focus, as shown in example (14). (14a) and (14b) are instances of preverbal object foci. The only difference between the two is the absence versus the presence of the resumptive clitic *to* 'it'.

(14) *Question*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ti | agorases | metaksi | alon? | | | |
| | what | buy.3SG | among | others | | | |
| | 'What did you buy among other things?' | | | | | | |
| | *Answer*1 | | | | | | |
| a. | [To | kenurjo | vivlio | tu | Eco]$_{Foc}$ | agorasa. | OV |
| | the.ACC | new.ACC | book.ACC | of.GEN | Eco | buy.1SG | |
| | '[Eco's new book]$_{Foc}$, I bought.' | | | | | | |
| | *Answer*2 | | | | | | |
| b. | *[To | kenurjo | vivlio | tu | Eco]$_{Foc}$ | to | agorasa |
| | the.ACC | new.ACC | book.ACC | of.GEN | Eco | CL | buy.1SG |
| | '*[Eco's new book]$_{Foc}$, I bought it.' | | | | | | |
| | *Answer*3 | | | | | | |
| c. | Agorasa | [to | kenurjo | vivlio | tu | Eco]$_{Foc}$. | VO |
| | buy.1SG | the.ACC | new.ACC | book.ACC | of.GEN | Eco | |
| | 'I bought [Eco's new book]$_{Foc}$.' | | | | | | |
| | *Answer*4 | | | | | | |
| d. | *To | agorasa | [to | kenurjo | vivlio | tu | Eco]$_{Foc}$. |
| | CL | buy.1SG | the.ACC | new.ACC | book.ACC | of.GEN | Eco |
| | '*I bought it [Eco's new book]$_{Foc}$.' | | | | | | |

(14c) and (14d) are examples of postverbal object foci. The only difference between the two is the absence versus the presence of the clitic. As already noted the presence of a clitic in focus constructions leads to infelicity. [3]

[3] There is, however, a particular case, where a resumptive clitic is allowed in a focus construction. An example is given in (ii).

(ii) *Question*

| | | | | | | |
|---|---|---|---|---|---|---|
| | Ti | tha | itheles | na | pjs? | |
| | what | will | like.2SG | to | drink.2SG | |
| | 'What would you like to drink?' | | | | | |
| | *Answer*1 | | | | | |
| a. | [Ena | uzaki]$_{Foc}$ | θa | to | pina. | OV |
| | a.ACC | ouzo.ACC | will | CL | drink.1SG | |
| | '[An ouzo]$_{Foc}$, I would drink it.' | | | | | |
| | *Answer*2 | | | | | |
| b. | *Tha | to | pina | [ena | uzaki]$_{Foc}$. | VO |
| | will | CL | drink.1SG | a.ACC | ouzo.ACC | |
| | '*'I would drink it, [an uzo]$_{Foc}$' | | | | | |

As far as the distribution of bare quantificational elements is concerned, Greek does not differ from Italian. As shown in example (15), bare quantificational elements can serve as foci, while they generally cannot serve as topics. Greek also patterns with Italian with respect to an exemption to the aforementioned observation.

If there is a domain restriction, then it is possible for bare quantifiers to serve as topics. This is demonstrated in (15c) and (15d); the domain restriction is *gia poli ora* 'for a long time'. Note that examples (15c) and (15d) cannot be uttered out of the blue. However, (15c) and (15d) are fine in a context where we are talking about a party, and speaker A says that there were so many people that she knew in the party that she did not spend much time with any of them. (15c) lacks a clitic, while example (15d) has one. The domain restriction has been explained in terms of fulfillment of the referentiality condition (Anagnostopoulou and Giannakidou, 1995). According to Anagnostopoulou and Giannakidou, various kinds of DPs may appear in CLLD structures, as long as they satisfy the referentiality condition (see also Giannakidou, 2000). [4]

(15) *Focus construction*

a. [Kanenan]$_{Foc}$ den ida.
no one.ACC not see.1SG
'[No one]$_{Foc}$, I saw. / I didn't see [anyone]$_{Foc}$ .'

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(iia) is an instance of preverbal object focus, and the indefinite object precedes the clitic. (Philippaki-Warburton 1985 and Anagnostopoulou 1994 when examining the semantic restrictions on clitic doubling, discuus similar examples to (iia) and (iib).) It should be noted that the focus in (iia) does not have a prototypical focus intonation. The prototypical focus intonation will be discussed in detail in chapter five. Here, I briefly note that prototypically when a preverbal object is in focus, there is a single pitch movement, namely there is a rise-fall, and the phonological boundary of the focused element is low, while the rest of the utterance is completely flat. (iia) as already noted does not have a prototypical focus intonation, as the boundary of the focused element is high. (iib) is an example of postverbal object focus, and the clitic precedes the indefinite object. As shown in (i), (ia) is a felicitous answer to the question in (ii), while (iib) is not. What the contrast between (iia) and (iib) shows is that a clitic is allowed in a focus construction, only if it is preceded by an indefinite object. This is further confirmed by (iic).

(ii) c. *[To uzaki]$_{Foc}$ tha to pina OV
the.ACC ouzo.ACC will CL drink..1SG
'*[The ouzo]$_{Foc}$, I would drink it.'

In (iic), the clitic is preceded by a definite object. As shown in (iic), (iic) is not a felicitous answer to the question in (ii). Given that (iia) has a different intonational realization from prototypical foci, I assume that it is different. In this sense, I remain agnostic about its discourse properties and its ability to be a focus, and a topic at the discourse level at the same time.

[4] This observation is not restricted to Greek. It has been noted for several languages that various kinds of DPs can appear in CLLD, as long as they are interpreted as specific. (cf. Obenauer, 1992).

*Topic constructions*

b. *[Kanenan]$_{Top}$ den ida.
no one.ACC not see.1SG
'[No one]$_{Top}$, I saw / [Anyone]$_{Top}$, I didn't see him.'

c. [Kanenan]$_{Top}$ den ida gia poli ora.
no one.ACC not see.1SG for much time
'[None of them]$_{Top}$, I saw him for much time. /
[Anyone]$_{Top}$, I didn't see him for much time.

d. [Kanenan]$_{Top}$ den ton ida gia poli ora.
no one.ACC not CL see.1SG for much time
'[None of them]$_{Top}$, I saw him for much time. /
[Anyone]$_{Top}$, I didn't see him for much time.'

Example (15) shows that Greek patterns with Italian with respect to the distribution of bare quantificational elements. In general, bare quantificational elements can serve as foci, while they cannot serve as topics, unless they satisfy the referentiality condition. In the next section, I will come back to this issue.

Summarizing, WCO effects is not a strong argument for setting apart focus and topic. The distribution of resumptive clitics is also not an argument for setting apart topic at discourse level and focus. As shown in (13), preverbal object foci as well as preverbal objects that are interpreted as topics at the discourse level lack resumptive clitics. The distribution of bare quantifiers is an argument for setting apart focus and sentence topics, but, as I will argue later, it is not an argument for setting apart topic at discourse level, and focus. Thus, there is no reason to assume that focus and topic at discourse level are incompatible. In the following section, I will that the two are indeed compatible.

## 4.3 Sentence level topic and discourse level topic

In section 4.2, example (13) suggested that besides sentence level topic, there is another type of topic that is relevant, namely, discourse level topic. In this section, I first discuss sentence level topics and discourse level topics. Through the discussion it will become clear why the distinction between the two is relevant. The presence of a clitic proves to be a useful tool for distinguishing sentence level topics and discourse level topics. Another outcome of the discussion is the term "fronted discourse topics" that refers to a syntactically marked discourse level topic. Then, I show that an element can be interpreted as a focus and at the same time as a discourse level topic. Furthermore, I argue that preverbal object foci in Greek are fronted discourse topics. Evidence for this claim comes from the results of a test that I apply to Greek data and that I name the "continuation test".

From this point on, I will be marking sentence level topics with brackets and the subscript $_{S\text{-}Top}$, whereas discourse level topics will be marked with brackets and

the subscript D-Top. Please note that up to this point I have been marking topics with Top, independently of whether they were sentence level topics or discourse level topics.

As a starting point, it is important to define the following notions: sentence level topics, discourse level topics and fronted discourse topics.

Sentence level topics (sentence topics) have been associated with 'old information', 'givenness', 'aboutness' (see Kuno 1972, van Dijk 1977, Reinhart 1981, Prince 1981, Lambrecht 1994 among many others). Here, I follow Reinhart's (1981, 2004) definition of sentence topics, which is given in (16).

(16) Sentence topics are defined as the expressions whose referent the sentence is about.

An example of a sentence level topic is given in (17). Example (17a) can be followed by (17b).

(17) a. To 1899 o Thios Vanias tu
the.ACC 1899 the.NOM Uncle Vania of.GEN
Anton Tsehof ekane premiera sti Mosha.
Anton Chekhov make.3SG premier Moscow.ACC
'In 1899, Uncle Vania was performed for the first time in Moscow.'
b. [Tin parastasi]$_{S\text{-}Top}$ tin skinothetise o Stanislavski.
the.ACC performance.ACC CL direct.3SG the.NOM Stanislavski
'[The performance]$_{S\text{-}Top}$, Stanislavski directed it.'

In example (17b), the preverbal object is interpreted as a sentence level topic. Sentence (17b) is partitioned into focus and ground. I assume that sentence level topics are part of the ground.

Let us now examine discourse level topics. An example is given in (18).

(18) a. [O Stanislavski]$_{S\text{-}Top}$ skinothetise [tin parastasi]$_{D\text{-}Top}$.
the.NOM Stanislavski direct.3SG the.ACC performance.ACC
'Stanislavski directed the performance.'
b. Afti gnorise megali epitihia.
she.NOM know.3SG big.ACC success.ACC
'It was a great success.'

Example (18) consists of a sequence of two sentences, sentence (18a) and sentence (18b). Sentence (18b) is a discourse continuation of sentence (a). In (18a) the preverbal subject is interpreted as a sentence topic of (18a), while the discourse topic of the discourse formed by the sequence of (18a) and (18b) is the postverbal object *tin parastasi* 'the performance'. Example (18) shows two things. First, it illustrates that sentence level topics and discourse level topics do not need to

coincide. Secondly, it demonstrates that a discourse topic can appear in postverbal position.

A definition of discourse level topics is given in example (19) (see also Reinhart 1981, van Dijk 1977).

(19) A discourse level topic involves a sequence of at least two sentences, e.g. sentence (a) and sentence (b) in (18), and is defined as the expression whose referent this particular stretch of discourse is about.

There is something more to be noted about discourse level topics, namely, that they may coincide with sentence topics. I give an example to illustrate this point. See also example (1) in the beginning of this chapter.

(20) a. [[Tin parastasi]$_{\text{S-Top}}$]$_{\text{D-Top}}$ skinothetise o Stanislavski.
the.ACC performance.ACC direct.3SG the.NOM Stanislavski
'The performance, Stanislavski directed.'
b. Gnorise megali epitihia.
know.3SG big.ACC success.ACC
'It was a great success.'

Example (20) consists of a sequence of two sentences, sentence (a) and sentence (b). Sentence (b) is a discourse continuation of sentence (a). In (20a) the preverbal object is interpreted as a sentence topic of (20a), at the same time it is the discourse topic of (20a) and (20b). What example (20) shows is that sentence- and discourse-topic may coincide. Example (20) provides initial evidence for claiming that in Greek discourse topics can be syntactically marked by fronting.

Summarizing, we have seen that a preverbal object can receive various interpretations. Specifically, a preverbal object can be interpreted as new information focus, (example (14a)). It can also be interpreted as a sentence level topic (example (17b)). We have also seen that a preverbal object may function as a sentence level topic and as a discourse level topic at the same time, (example (20a)). Another observation was that topics at discourse level do not need to be syntactically marked, (example (18)). In this sense, anything may function as the topic of the following discourse. However, in light of the example in (20), I suggested that Greek can syntactically mark topics at discourse level by fronting.

Given that discourse level topics in Greek can, but they do not need to be syntactically marked and to avoid terminological confusion, I introduce the term "fronted discourse topic" to refer to a syntactically marked discourse level topic. In this respect, the term fronted discourse topic is a syntactic term that describes a specific position, namely a preverbal position, and a specific interpretation, namely discourse topichood. An example of a fronted discourse topic is given in (21).

(21) a. [[Tin parastasi]$_{D\text{-}Top}$ skinothetise o Stanislavski.
the.ACC performance.ACC direct.3SG the.NOM Stanislavski
'The performance, Stanislavski directed.'
b. Gnorise megali epitihia.
know.3SG big.ACC success.ACC
'It was a great success.'

Example (21) consists of a sequence of two sentences, sentence (a) and sentence (b). Sentence (b) is a discourse continuation of sentence (a). In (21a) the preverbal object is interpreted as the topic of (21a) and (21b). The preverbal object is a syntactically marked discourse topic, hence a fronted discourse topic.

Having defined fronted discourse topics, it is time to return to an observation that I made about the presence vs. absence of clitics in example (13) and to further clarify the distinction between sentence level topics and discourse level topics. In a nutshell, the idea is that the presence of a clitic can be used as a tool for distinguishing sentence level topics from discourse level topics. For the ease of exposition, example (13) is repeated in (22).

(22) a. To kratiko theatro ksekinise ti ximerini
the.NOM state.NOM theatre.NOM begin.3SG the.ACC winter.ACC
sezon me tin Erofili tu Xortatsi.
season with the.ACC Erofili.ACC of.GEN Xortatsis.GEN
'The State Theatre began its winter season with Erofili by Hortatsis.'
b. [Tin parastasi]$_{S\text{-}Top}$]$_{D\text{-}Top}$ skinothetise o Kun.
the.ACC performance.ACC direct.3SG the.NOM Kun.NOM
'[The performance]$_{Top}$, Kun directed.'
(Data Alexopoulou and Kolliakou, 2002)
c. [Tin parastasi]$_{S\text{-}Top}$ tin skinothetise o Kun.
the.ACC performance.ACC CL direct.3SG the.NOM Kun.NOM
'[The performance]$_{Top}$, Kun directed it.'

Example (22b) differs from (22c) with respect to the presence of a clitic; (22b) lacks a clitic, while (22c) has one. In both (22b) and (22c) the preverbal object *tin parastasi* 'the performance' is interpreted as a sentence level topic. Crucially, the preverbal object in (22c) can only be interpreted as a sentence level topic, while for the preverbal object, in (22b) there is another interpretation that is available. The preverbal object in (22b) can function as a sentence topic and as a discourse topic at the same time.

What example (22) suggests is that while a preverbal object can function as a sentence level topic and as a discourse level topic at the same time (ex. (22b), this preverbal object has to be taken up by a clitic in cases where it cannot be interpreted as a discourse topic. This is further illustrated in examples (23) and (24).

(23) a. I Maria potise tis triantafilies ke
the.NOM Mary.NOM water.3SG the.ACC roses.ACC and
tis petunies.
the.ACC petunias.ACC
'Mary watered the roses and the petunias.'

b. [Tis triantafilies]$_{S\text{-}Top}$ tis kladepse kiolas.
the.ACC roses.ACC CL prune.3SG also
'The roses, she pruned them as well.'

c. Meta pige gia kafe me to Yani.
afterwards go.3SG for coffee with the.ACC John.ACC
'Afterwards, she went for coffee with John.'

Example (23) consists of a sequence of three sentences. Example (23b) contains a preverbal object that is taken up by a clitic. The preverbal object in (23b) is interpreted as a sentence level topic. This is actually the only available interpretation for the preverbal object in (23b); the preverbal object in (23b) cannot function as a discourse level topic, as in (23c) the discussion is not any more about the roses. As shown in (23), the discourse is felicitous. Moreover, it can be shown that the presence of the clitic in (23b) is necessary for a felicitous interpretation of *tis triantafilies* 'the roses' as a sentence level topic. This is shown in example (24).

Example (24) differs minimally from example (23); the only difference between the two is located in (24b). In contrast to (23b), example (24b) lacks a clitic. # marks discourse infelicity. In (24b) the object appears in preverbal position. The fronted object in (24b) can only be interpreted as a sentence level topic. This is ensured by the example that precedes (24b), namely, by the example in (24a) as well as by the examples that follows (24b), namely, by the example in (24c).

(24) a. I Maria potize tis triantafilies ke
the.NOM Mary.NOM water.3SG the.ACC roses.ACC and
tis petunies.
the.ACC petunias.ACC
'Mary watered the roses and the petunias.'

b. #[Tis triantafilies]$_{S\text{-}Top}$ kladepse kiolas.
the.ACC roses.ACC prune.3SG also
'[The roses]$_{S\text{-}Top}$, she pruned also.'

c. ##Meta pige gia kafe me to Yani.
afterwards go.3SG for coffee with the.ACC John.ACC
'Afterwards, she went for coffee with John.'

There are two observations to be made about example (24). First, after uttering (24a), it is infelicitous to continue with (24b), as the fronted object in (24b) is not picked up by a clitic in order to be interpreted as a sentence level topic. Second, the discourse felicity worsens after uttering (24c), as (24c) shifts the discussion from the roses, which means that the fronted object in (24b) cannot be interpreted as a

discourse level topic. The contrast between examples (23) and (24) shows that when the preverbal object is interpreted only as a sentence level topic, it has to be taken up by a clitic.[5]

Summarizing, so far we have seen that a preverbal object may function as new information focus. We have also seen that a preverbal object may have a double function, being at the same time a sentence level topic and a discourse level topic, (example 22). In this respect, a sentence level topic can combine with a discourse level topic.

Given these observations, one may wonder what other combinations are available, whether new information focus can combine with sentence level topic, or whether new information focus can combine with discourse level topic. The option of combining new information focus and sentence level topic is excluded by definition, as sentence level topics are part of the ground, and the sentence partition is focus ground. So, it is impossible for an element to function as a focus and a sentence level topic at the same time. The option of combining new information focus and discourse level topic may seem surprising at first sight. However, I will argue that such a combination is possible and I will show that Greek data offer strong evidence for this claim. In fact, I will push this idea even further by making the claim in (25).

(25) Preverbal object foci in Greek are fronted discourse topics.

The claim in (25) implies that when a focused object appears in a preverbal position, it does so, not because it is a focus, but because it is a topic. If a focused object appears in topic position, it can only be interpreted as a fronted discourse topic, not as a sentence topic. This also means that the following sentence must be about the referent that was introduced by the preverbal object of the first sentence. If the fronted object does not function as a fronted discourse topic, then the discourse becomes infelicitous. To test the claim in (25) as well as its consequences, a continuation test was constructed.

This continuation test is based on the definition of discourse topics (see ex.(19)) and on the observation that while postverbal objects can function as discourse topics (see ex. (18)), preverbal objects must be discourse topics. The test consists of a *wh*-question that triggers focus on the object and a follow-up. The follow-up consists of two sentences, sentence (a) and sentence (b). In all cases, sentence (a) is an answer to the *wh*-question, while sentence (b) is a continuation sentence. As I am interested in comparing preverbal with postverbal object foci, I prepared two types of sentence (a); the focused object appeared in postverbal or preverbal position. I also prepared two types of sentence (b); sentence (b) was either a

[5] For a discussion of the properties of clitics see Anagnostopoulou (1994, 1999), Anagnostopoulou & Giannakidou (1995), Anagnostopoulou and Alexiadou (2000) among many others.

discourse continuation of the first sentence or sentence (b) was shifting the discussion to a different topic. The continuation test is applied to Greek below. An example is given in (26).

(26) *Question*
Ti potizi i Maria?
what water.3SG the.NOM Mary.NOM
'What does Mary water?'
*Answer*1
a. [[Tis triantafilies]$_{Foc}$]$_{D\text{-}Top}$ potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
'[[The roses]$_{Foc}$]$_{D\text{-}Top}$, Mary waters.'
b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the spring
'She will prune them in spring.'

Example (26) contains a *wh*-question and a follow-up that consists of a sequence of two sentences, sentence (26a) and sentence (26b). Sentence (26b) is a discourse continuation of sentence (26a). In (26a) the object appears in preverbal position and is in focus. At the same time the preverbal object in (26a) is a syntactically marked discourse topic, namely a fronted discourse topic.

It should be noted that it is also possible to have (26a) with the object in sentence final position. An example is given in (27).

Example (27) contains a *wh*-question and a follow-up that consists of a sequence of two sentences, (27a) and (27b).

(27) *Question*
Ti potizi i Maria?
what water.3SG the.NOM Mary.NOM
'What does Mary water?'
*Answer*1
a. I Maria potizi [tis triantafilies]$_{Foc}$.
the.NOM Mary.NOM water.3SG the.ACC roses.ACC
'Mary waters[the roses]$_{Foc}$.'
b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the spring
'She will prune them in spring.'

Sentence (27b) is a discourse continuation of sentence (27a). In (27a) the object appears in postverbal position and is in focus. The discourse topic of (27a) and (27b) is the postverbal object. Obviously, the postverbal object focus is not a syntactically marked discourse topic.

Comparing (26a) with (27a), we observe a similarity and a contrast. The similarity is that in both examples the objects function as the topic of discourse in

the (a) and (b) sentence (cf. ex. 18). The contrast is that in (26a) the object focus is a fronted discoure topic, while in (27a) it is not.

Furthermore, the claim in (25) makes a precise prediction about possible continuations in the (b) sentence. The prediction is that if sentence (b) changes from a discourse continuation sentence into a sentence that shifts the discussion then infelicity arises, as the focused object is a fronted discourse topic. This prediction is verified by the data, as illustrated by the example in (28).

(28) *Question*
Ti potizi i Maria?
what water.3SG the.NOM Mary.NOM
'What does Mary water?'
*Answer*1
a. [Tis triantafilies]$_{Foc}$ potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
'[The roses]$_{Foc}$, Mary waters.'
b. #Meta tha sinantisi to Yani.
then will meet.3SG the.ACC John.ACC
'Afterwards, she will meet John.'

Example (28) contains a *wh*-question and (28a) contains a preverbal object that is in focus. Sentence (b) is a sentence that shifts the discussion. The topic of the discussion is shifted from the roses to Mary. This implies that the preverbal object focus in (28a) cannot function as a discourse topic. This causes discourse infelicity, as indicated in (28b). Example (28) offers evidence in support of the claim in (25) that preverbal object foci in Greek are obligatorily fronted discourse topics.

To complete the picture, let's compare examples (26) and (28). Examples (26) and (28) are identical apart from the (b) sentence; (26b) is a discourse continuation sentence, while (28b) is a sentence that shifts the discussion. The discourse in (26) is felicitous, while the one in (28) is not. What the contrast between (26) and (28) demonstrates is that preverbal object foci in Greek are obligatorily fronted discourse topics.

An issue that remains open concerns the status of postverbal object foci with respect to discourse topichood. In the remainder of this section, I show that postverbal object foci are compatible with both continuation types, namely discourse continuation and shifting the discussion.

Let us examine example (29). In (29a) the object appears in postverbal position and is in focus. Sentence (29b) is a discourse continuation sentence. As expected the discourse is judged as felicitous.

(29) *Question*
Ti potizi i Maria?
what water.3SG the.NOM Mary.NOM
'What does Mary water?'
*Answer*1
a. I Maria potizi [tis triantafilies]$_{Foc}$.
the.NOM Mary.NOM water.3SG the.ACC roses.ACC
'Mary waters [the roses]$_{Foc}$.'
b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the.ACC spring.ACC
'She will prune them in spring.'

Let us now change the discourse continuation. Example (30) is identical to (29), apart from the (b) sentence. The sentence in (30b) is a sentence that shifts the discussion. As shown in (30), the discourse is judged felicitous.

(30) *Question*
Ti potizi i Maria?
what water.3SG the.NOM Mary.NOM
'What does Mary water?'
*Answer*1
a. I Maria potizi [tis triantafilies]$_{Foc}$.
the.NOM Mary.NOM water.3SG the.ACC roses.ACC
'Mary waters [the roses]$_{Foc}$.'
b. Meta tha sinantisi to Yani.
then will meet.3SG the.ACC John.ACC
'Afterwards, she will meet John.'

Examples (29) and (30) show that postverbal object foci are compatible with both types of discourse continuation. This means that postverbal foci are different from their preverbal counterparts with respect to the types of discourse continuations that they allow for. This point is further illustrated by the contrast between examples (28) and (30). Examples (28) and (30) are identical apart from sentence (a); in particular (28a) contains a preverbal object focus, while (30a) contains a postverbal object focus, in both examples, sentence (b) is a shifting the discussion sentence. The discourse in (28) is judged infelicitous, while the discourse in (30) is felicitous.

The contrast between (28) and (30) shows that preverbal object foci differ from their postverbal counterparts with respect to discourse topichood. Preverbal object foci in Greek have to function as fronted discourse topics.

My claim that preverbal object foci in Greek need to be fronted discourse topics is further verified by bare quantifiers. Let me briefly repeat Rizzi's argument with respect to bare quantificational elements. As already noted, Rizzi argues that bare quantificational elements can serve as foci, while they cannot serve as topics

(cf. ex.(5)). In this sense, it is interesting to explore the behaviour of bare quantifiers in Greek with respect to discourse topichood and apply to them the continuation test. An example is given in (31).

(31) *Question*
Pjon vrikes stin platia metaksi alon?
who.ACC find.2SG to.the.ACC square.ACC among others.GEN
'Who did you meet at the square?'
*Answer*1
a. [[Kanenan]$_{Foc}$]$_{D\text{-}Top}$ den vrika.
no one.ACC not find.1SG
'[[No one]$_{Foc}$]$_{D\text{-}Top}$, I found / I didn't find anyone.'
b. Ola ta kafenia itan klista.
all.NOM the.NOM cafes.NOM were.3PL closed
'All the cafes were shut.'

In (31a) the bare quantificational element appears in preverbal position and is in focus. At the same time the bare quantificational element is the discourse topic of (31a)-(31b), namely, it functions as a fronted discourse topic. Example (32) provides further support for this.

(32) *Question*
Pjon vrikes stin platia metaksi alon?
who.ACC find.2SG to.the.ACC square.ACC among others.GEN
'Who did you meet at the square?'
*Answer*1
a. [Kanenan]$_{Foc}$ den vrika.
no one.ACC not find.1SG
'[No one]$_{Foc}$, I found / I didn't find anyone.'
b. #Diavases to kefaleo tria tu vivliu mu?
read.2SG the.ACC chapter.ACC three of.GEN book.GEN mine.GEN
'Have you read chapter three of my book?'

In (32a) the bare quantificational element appears in preverbal position and is focused. The bare quantificational element does not function as the discourse topic of (32a)-(32b), and as shown in (32b), the discourse is infelicitous. Example (32) confirms my claim that preverbal object foci need to function as fronted discourse topics and that a focus can combine with a discourse level topic. It is not entirely clear why bare quantificational elements cannot serve as sentence level topics, unless lexically restricted. In this sense, more research is needed with respect to bare quantifiers and their discourse properties.

Summarizing, in this section, I have shown that there is a distinction between sentence level topics and discourse level topics. I also argued that Greek can syntactically mark discourse topics. To refer to syntactically marked discourse

topics, I introduced the term fronted discourse topics. I argued that preverbal object foci in Greek are fronted discourse topics. To test my claim, I constructed a continuation test. This continuation test was applied to Greek data, and its results demonstrated that preverbal object foci differ from their postverbal counterparts with respect to discourse topichood. In other words, what forces object foci to appear in preverbal position is discourse topichood. I took this as support for my claim that preverbal object foci are fronted discourse topics.

The results of the continuation test are very solid; I further tested them by means of a questionnaire. The questionnaire is presented in the appendix of this chapter. Section 4.4 provides independent evidence for the claim that preverbal object foci are fronted discourse topics.

## 4.4 Backward anaphora resolution

In this section, I provide further evidence for the claim that preverbal object foci are fronted discourse topics. In a nutshell, the argument is the following. If preverbal object foci are indeed fronted discourse topics, then the prediction is that they should display certain properties of topichood. To check whether this is the case, I use backward anaphora resolution as a test for topichood. The results of the test confirm my claim.

The section is organized as follows. I first present backward anaphora resolution as a test for topichood. I make no distinction between sentence level topics ($_{S\text{-}Top}$) and discourse level topics ($_{D\text{-}Top}$), as everything applies to both as long as they are fronted. In this respect, in this section, I mark topics with brackets and the subscript $_{Top}$. Then, I apply the test to Greek preverbal objects. Finally, the test is applied to Greek object foci, and it shows that preverbal object foci display properties of topichood and that they are fronted discourse topics.

There are several tests for topichood (see Gundel 1974, Reinhart 1981). [6] Reinhart (2004, 2006) argues that the most decisive test is provided by accessibility theory (Ariel 1990) and is backward anaphora resolution. An illustration of backward anaphora resolution as a test of topichood is given below. The test is based on the three assumptions: (i) topics are always highly accessible, (ii) there are accessibility markers and (iii) they are ranked. The prediction that follows from these assumptions is given in (33).

(33) "If our hypotheses define a certain NP as a topic of a given sentence in a given context, the prediction is that it should not be possible to refer back to this NP with a low accessibility marker like a demonstrative."

(Reinhart 1995: 87)

A list of accessibility markers is given in (34), (see Ariel 1990).

Accessibility of Discourse-antecedent

i. High accessibility: anaphors > clitic and 0 pronouns > pronouns
ii. Intermediate accessibility: stressed pronouns > demonstratives
iii. Low accessibility: definite description > names

Reinhart applies the backward anaphora resolution test to English and Dutch. An example from English is given in (35).

(35) $[\text{Max}]_{\text{Top}}$ was walking down from school, pondering about the meaning of life. Soon he ran into Felix and **he** suggested that they stop at the bar. (Did Max or Felix suggest the bar?)

In example (35) *Max* is the topic. The bolded pronoun *he* can refer to either of the given discourse entities Max or Felix. Reinhart (2004: 299) notes that "most

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[6] For instance, two standard tests for topichood are the "say about" and the "as for" test. An illustration of the "say about" test is given in (iii).

(iii) a. Rosa is going out with Felix
b. He said about Rosa that she is going out with Felix Right paraphrase
c. He said about Felix that Rosa is going out with him Wrong paraphrase

(iiia) is the sentence that is to be tested, (iiib) and (iiic) are two possible paraphrases of (iiia). However, only one of the two, namely (iiib) is the right paraphrase. The topic of (iiia) is identified by (iiib) and is *Rosa*. The "as for" test works in a similar way and is given in (iv).

(iv) a. As for Rosa, she is going out with Felix Right paraphrase
b. As for Felix, Rosa is going out with him Wrong paraphrase

speakers identified *he* as referring to Max". If the pronoun is stressed, then in accordance to the prediction in (33) and the list of accessibility markers in (34), it should not be possible to refer back to Max. The prediction is borne out by the data. If the pronoun is stressed, then it can only refer back to Felix. An example from Dutch is given in (36); the context is the same as in (35).

(36) [Max]$_{Top}$ was al wandelend terug van school de betekenis van het leven aan het overpeinzen. Al snel kwam hij Felix tegen en **hij**/ **deze** stelde voor naar de bar te gaan. (Stelde Felix of Max voor om naar de bar te gaan ?)

[Dutch]

In example (36) Max is the topic. The pronoun hij 'he' can refer to either Max or Felix. Reinhart (2004: 299) observes that "hij refers for most speakers to Max". According to the prediction in (33) and the list of accessibility markers in (34), it is not possible to refer back to Max with the demonstrative deze 'this'. This prediction was borne out, too. According to Reinhart (2004) the demonstrative deze 'this' refers unequivocally to Felix. Reinhart notes that deze 'this' is used for less accessible antecedents and never refers back to the current discourse topic.[7]

In the remainder of this section, backward anaphora resolution is applied to Greek. Greek differs from both English and Dutch, as Greek is a pro-drop language. Moreover, Greek does not have a proper third person pronoun and it uses instead a demonstrative-like element. This demonstrative-like element can be unstressed or stressed.[8] So, it can be assumed that this demonstrative-like element behaves in the same way as the pronoun of the accessibility markers list in (34). In this respect, the unstressed demonstrative-like element is expected to pattern with the pronoun, whereas the stressed demonstrative-like element is expected to pattern with the stressed pronoun. The prediction for Greek is that, if an object has been topicalized, it is not possible to refer back to it with an intermediate or low accessibility marker. The prediction is confirmed by the data, as examples (37) to (42) show.

(37) a. [Ton Yani]$_{Top}$ zileve o Petros.
the.ACC John.ACC be jealous.3SG the.NOM Peter.NOM
'[John]$_{Top}$, Peter was jealous of.'

b. Emene tote ston trito.
live.3SG then in.the.ACC third
'He lived on the third floor at that time.'

[7] The fact that deze 'this' is used for less accessible antecedents and never refers back to the discourse topic was also observed earlier by Kirsner & van Heuven (1980, 1986) and by Kirsner, van Heuven & Vermeulen (1987).

[8] The term unstressed and stressed is an informal way of referring to the properties of the phonetic realization of the demonstrative-like element.

In example (37a), the object appears in preverbal position. In example (37b), the overt subject has been dropped and there is a null pronoun. The preverbal object in (37a) functions as a sentence topic, and the null pronoun in (37b) can refer back to either the preverbal object or to the subject. As expected, for some speakers the null pronoun refers back to the object *ton Yani* 'John', while for others the null pronoun refers back to the subject *o Petros* 'Peter'. The same holds, when the position of the arguments is reversed, namely, when the object appears in postverbal position and the subject appears in preverbal position.[9] An example is given in (38).

(38) a. [O Petros]$_{Top}$ zileve ton Yani.
the.NOM Peter.NOM be jealous.3SG the.ACC John.ACC
'[Peter]$_{Top}$ was jealous of John.'
b. Emene tote ston trito.
live.3SG then in.the.ACC third
'He lived on the third floor at that time.'

In example (38a), the subject appears in preverbal position, and the object appears in postverbal position. Example (38b) contains a null pronoun. As predicted, the null pronoun can refer back to either the preverbal subject or the object. For most speakers, the null pronoun refers back to the subject.

As already mentioned, the unstressed demonstrative-like element is expected to behave like the unstressed pronoun in (34). This expectation is confirmed by the data in (39) and (40).[10]

(39) a. [Ton Yani]$_{Top}$ zileve o Petros.
the.ACC John.ACC be jealous.3SG the.NOM Peter.NOM
'[John]$_{Top}$, Peter was jealous of.'
b. Aftos emene tote ston trito.
he/that one.NOM live.3SG then in.the.ACC third
'He lived on the third floor at that time.'

In example (39a), the object appears in preverbal position, while example (39b) contains the unstressed demonstrative-like element *aftos* 'he/that one'. As expected, the unstressed demonstrative-like element can refer back to either the preverbal object or to the subject. The same holds if the position of the object and the subject is reversed, as in (40a).

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[9] For a discussion on anaphora resolution see Miltsakaki (2002), Tsimpli and Sorace (2006) among others.

[10] According to the hierarchy in (33), one would expect the unstressed demonstrative-like element to behave differently from the stressed one. In this sense, when asking informants to resolve backward anaphora, it is important to control the phonetic realization of the demonstrative-like element. So, for examples (38)-(41), I recorded a male speaker (34 years old) and asked informants to give their judgements after having listened to the recordings.

(40) a. [O Petros]$_{Top}$ zileve ton Yani.
the.NOM Peter.NOM be jealous.3SG the.ACC John.ACC
'Peter was jealous of John.'
b. Aftos emene tote ston trito.
he/that one.NOM live.3SG then in-the.ACC third
'He lived on the third floor at that time.'

Unsurprisingly, the unstressed demonstrative-like element *aftos* 'he/that one' can refer back either to the preverbal subject or to the object.

As already stated, the stressed demonstrative-like element is expected to behave like the stressed pronoun in (34). The demonstrative-like element, as an intermediate accessibility marker should not be able to refer back to the topic of (41a). This is confirmed by the data in (41) and (42). Small caps and bold indicate the stressed version of the demonstrative like element.

(41) a. [Ton Yani]$_{Top}$ zileve o Petros.
the.ACC John.ACC be jealous.3SG the.NOM Peter.NOM
'[John]$_{Top}$, Peter was jealous of.'
b. **AFTOS** emene tote ston trito.
he.NOM live.3SG then in.the.ACC third
'He lived on the third floor at that time.'

In example (41a), the object appears in preverbal position, while example (40b) contains the stressed demonstrative-like element *aftos* 'he/that one'. As predicted, *aftos* 'he/that one' cannot refer back to the preverbal object in (41a) that functions as a sentence topic; *aftos* 'he/that one' refers unequivocally to *Peter*.[11]

The prediction is also confirmed if the ordering of the object and the subject is reversed, as shown in example (42).

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[11] Another way to make the same point is to use different genders. Note that the context becomes infelicitous, if the subject *Petros* 'Peter' that is marked for masculine gender is replaced by *Maria* 'Mary' which is marked for feminine gender. This happens because the stressed demonstrative-like element that is marked for masculine gender cannot refer back to the topic of the sentence and cannot find any other properly marked antecedent. Example (v) illustrates this.

(v) a. [Ton Yani]$_{Top}$ zileve i Maria.
the.ACC John.ACC be jealous of the.NOM Mary.NOM
'[John]$_{Top}$, Mary was jealous of.'
b. #Aftos emene tote ston trito.
he.NOM live.3SG then in.the third
'He lived on the third floor at that time.'

(42) a. [O Petros]$_{Top}$ zileve ton Yani.
the.NOM Peter.NOM be jealous.3SG the.ACC John.ACC
'[Peter]$_{Top}$ was jealous of John.'
b. **AFTOS** emene tote ston trito.
he.NOM live.3SG then in.the.ACC third
'He lived on the third floor at that time.'

In example (42a), the subject appears in preverbal position. Example (42b) contains the stressed demonstrative-like element *aftos* 'he/that one'. According to the prediction, it is not possible to refer back to the topic of (42a) with the stressed demonstrative like-element *aftos* 'he/that one'. As predicted, *aftos* 'he/that one' refers unequivocally to *Yani* 'John'.

The preceding examples show that the stressed ***aftos*** 'he/that one' as opposed to the null pronoun and the unstressed *aftos* 'he/that one' provides us with a solid test for topichood. In the remainder of this section, this test is applied to focused objects. The results of the test show that preverbal object foci display properties of topichood.

Given my claim in (25), according to which preverbal object foci are discourse topics, and given the properties of the stressed *aftos* 'he/that one', I make the following prediction.

(43) a. If a focused object is a topicalized discourse topic, then it is not possible to refer back to it with the stressed **AFTOS** , while it is possible to refer back to it with the unstressed aftos or with a null pronoun.
b. If a focused object appears in postverbal position, then it is possible to refer back to it with stressed **AFTOS**.

An example of preverbal object focus is given in (44), while example (45) is an instance of postverbal object focus. Example (44) contains a *wh*-question with a mention-some expression.

(44) *Question*
Ti ekselekse xthes i vuli
what elect.3SG yesterday the.NOM parliament.NOM
metaksi alon?
among others.GEN
'What did the parliament elect yesterday among other things?'
*Answer*1
a. [Tin epitropi dimosion ipotheseon]$_{Foc}$ ekselekse
the.ACC committee.ACC public.GEN affairs.GEN elect.3SG
xthes i vuli
yesterday the.NOM parliament.NOM
'[The public affairs committee]$_{Foc}$ the parliament elected yesterday.'

b. Perilamvani vuleftes olon ton komaton.
include.3SG parliament members.ACC all.GEN the.GEN parties.GEN
'It includes parliament members of all parties.'

In (44a), the preverbal object *tin epitropi dimosion ipotheseon* 'public affairs committee' is the focus of sentence (44a), while example (44b) contains a null pronoun.

As example (44) shows a first part of the prediction in (44) is borne out. In example (44), the null pronoun refers back either to the preverbal object or to the postverbal subject. Example (45) is an instance of postverbal focus.

(45) *Question*
Ti ekselekse xthes i vuli
what elect.3SG yesterday the.NOM parliament.NOM
metaksi alon?
among others.GEN
'What did the parliament elect yesterday among other things?'
*Answer*1
a. Xthes i vuli ekselekse [tin
yesterday the.NOM parliament.NOM elect.3SG the.ACC
epitropi dimosion ipotheseon]$_{Foc}$.
committee.ACC public.GEN affairs.GEN
'The parliament elected yesterday [the public affairs committee]$_{Foc}$.'
b. Perilamvani vuleftes olon
include.3SG parliament members.ACC all.GEN
ton komaton.
the.GEN parties.GEN
'It includes parliament members of all parties.'

In (45a), the focused object appears in postverbal position, while example (45b) contains a null pronoun. As predicted, the null pronoun refers back to the preverbal subject or to the postverbal object.

The more interesting cases are illustrated in examples (46) and (47). In these examples the (b) sentence contains the stressed ***aftos*** 'he/that one', and as stated in (43) and repeated here, the prediction is that it is not possible to refer back to a topicalized discourse topic with the stressed ***aftos*** 'he/that one'.

(46) *Question*
Ti eklelekse xthes i vuli
what elect.3SG yesterday the.NOM parliament.NOM
metaksi alon?
among others.GEN
'What did the parliament elected yesterday among other things?'

*Answer*1

a. [[Tin epitropi dimosion ipotheseon]$_{Foc}$]$_{D\text{-}Top}$
the.ACC committee.ACC public.GEN affairs.GEN
ekselekse xthes i vuli
elect.3SG yesterday the.NOM parliament.NOM
'[[The public affairs committee]$_{Foc}$]$_{D\text{-}Top}$ the parliament elected for yesterday.'

b. **AFTI** perilamvani vuleftes olon
she.NOM include.3SG parliament members all.GEN
ton komaton
the.GEN parties.GEN
'It includes parliament members of all parties.'

Example (46) contains a *wh*-question with a mention-some expression. Example (46a) contains a preverbal object focus, while (46b) contains the stressed demonstrative like element ***afti*** 'she'. As predicted, *afti* 'she' refers unequivocally to *i vuli* 'the parliament' and not to the preverbal object focus *tin epitropi dimosion ipotheseon* 'the public affairs committee'. This is in accordance to my claim that preverbal object foci in Greek topicalized discourse topics.

Postverbal object foci prove the prediction in (43) true. An example with postverbal object focus is given in (47).

(47) *Question*
Ti ekselekse xthes i vuli
what elect.3SG yesterday the.NOM parliament.NOM
metaksi alon?
among others.GEN
'What did the parliament elect yesterday among other things?'

*Answer*1

a. Xthes i vuli ekselekse [tin
yesterday the.NOM parliament.NOM elect.3SG the.ACC
epitropi dimosion ipotheseon]$_{Foc}$.
committee.ACC public.GEN affairs.GEN
'The parliament elected yesterday [the public affairs committee]$_{Foc}$.'

b. **AFTI** perilamvani vuleftes olon
she.NOM include.3SG parliament members all
ton komaton
the.GEN parties.GEN
'It includes parliament members of all parties.'

Example (47) is similar to (46), it contains the same question and (47b) is identical to (46b). The only difference between (46) and (47) is the (a) sentence. In example

(47a) the object focus appears in prevebal position. As predicted, the stressed ***afti*** 'she' refers back to the postverbal object focus.[12]

Summarizing, the results of the backward anaphora resolution test confirm the claim that preverbal object foci are fronted discourse topics.

## 4.5 Conclusions

In this chapter, I discussed topichood at sentence and discourse level. It was shown that Greek preverbal objects may function at the same time as sentence and discourse level topics. Moreover, the presence of a clitic proved to be a useful tool for distinguishing sentence level topics and discourse level topics. Specifically, when a preverbal object is taken up by a clitic, it can only be interpreted as sentence topic. It was also shown that Greek may syntactically mark discourse topics. The term fronted discourse topic was introduced to describe syntactically marked discourse topics.

Furthermore, I examined preverbal object foci and postverbal object foci with respect to topichood. It was shown that discourse topichood differentiates preverbal object foci from their postverbal counterparts. In particular, only preverbal object foci have to obligatorily function as discourse topics and are in this sense, fronted discourse topics. Evidence for this claim came from the results of the continuation test and the test of backward anaphora resolution. In this respect, what forces object foci to move to a preverbal position is discourse topichood. Object foci do not move to a preverbal position because they are foci, but because they are topics.

Finally, the finding that preverbal object foci in Greek are fronted discourse topics shows that it is possible for focus to combine with discourse level topic. As already noted, focus cannot combine with sentence level topic, as the two are by definition incompatible; sentence topic is part of the ground, and the sentence partition is focus-ground.

## 4.6 Appendix – The results of the questionnaire

The results of this questionnaire show that the effects that were discussed above are very robust indeed. Let me repeat my claim in (1).

(1) Preverbal object foci are fronted discourse topics.

Let me also repeat the continuation test. The continuation test consisted of a *wh*-question that triggered focus on the object and a follow-up sequence of two

[12] The stressed *afti* 'she' in (46b) may refer back to the subject in (46a) if in a different context the subject is part of the focus.

sentences. The follow-up consisted of two sentences, sentence (a) and (b). Sentence (a) was an answer to the *wh*-question, while sentence (b) was a continuation sentence. I prepared two types of sentence (a); the focused object appeared in postverbal or preverbal position. I also prepared two types of sentence (b); sentence (b) was either a discourse continuation of the first sentence, or sentence (b) was shifting the discussion to a different topic. So, a 2 × 2 design was obtained. An example is given in (2).

(2) *Wh*-question triggering an answer with focus on the object
Sentence (a): SV[O]$_{Foc}$. Sentence (b): Discourse continuation sentence.
Sentence (a): [O]$_{Foc}$VS. Sentence (b): Discourse continuation sentence.
Sentence (a): SV[O]$_{Foc}$. Sentence (b): Shifting the discussion to a different topic.
Sentence (a): [O]$_{Foc}$VS. Sentence (b): Shifting the discussion to a different topic.

The continuation test was applied by means of a questionnaire, which was carried out in four phases. The goal of phase one was to investigate the robustness of the results of the continuation test that were discussed in section 4.3, and to investigate whether there are other factors (another factor could be object type) besides the position of the object and discourse topichood that might be involved. Phase two and three were complementary and were carried out to further test the results of phase one. The goal of phase four was to investigate the results of the continuation test when applied to contrastively focused objects.

**Questionnaire**
Phase 1
**Stimuli**. A total number of 72 stimuli were prepared, 24 questions and 48 follow-ups. Each follow-up consisted of a sequence of two sentences, (a) and (b). The question was kept constant; it was always a *wh*-question that triggered focus on the object. The follow-ups varied. Sentence (a) varied with respect to (i) the position of the focused object, and with respect to (ii) the type of object. The reason for including different types of object was that besides the position of the object, other factors such as object type, number and definiteness may be involved. Specifically, the design crossed the following factors: (i) position of the focused object (preverbal or postverbal), schematically [O]$_{Foc}$VS or SV[O]$_{Foc}$, (ii) object type (direct or indirect), (iii) number (plural or singular) and (iv) definiteness (definite, indefinite or bare). This resulted in 24 combinations (position of the focused object × object type × number × definiteness = 2 × 2 × 2 × 3 = 24). These 24 combinations are given in table 1.

Table A.1 Combinations of sentence (a).

| Position of the focused object | Object type | Number | Definiteness |
|---|---|---|---|
| preverbal | direct object | singular | definite |
| | | | indefinite |
| | | | bare |
| | | plural | definite |
| | | | indefinite |
| | | | bare |
| | indirect object | singular | definite |
| | | | indefinite |
| | | | bare |
| | | plural | definite |
| | | | indefinite |
| | | | bare |
| postverbal | direct object | singular | definite |
| | | | indefinite |
| | | | bare |
| | | plural | definite |
| | | | indefinite |
| | | | bare |
| | indirect object | singular | definite |
| | | | indefinite |
| | | | bare |
| | | plural | definite |
| | | | indefinite |
| | | | bare |

Sentence (b) varied with respect to discourse continuation. Specifically, sentence (b) was either a discourse continuation of the first sentence or it shifted the discussion to a different topic. Having 24 combinations of sentence (a) and two combinations of sentence (b), I obtained a total number of 48 follow-ups. A sample with a plural definite direct object is given in (3).

(3) *Question*

| Imaste | se | ena | kipo. | Ti | potizi | i | Maria? |
|---|---|---|---|---|---|---|---|
| be.1PL | in | a | garden | what | water.3SG | the.NOM | Mary.NOM |

'We are in a garden. What is Mary watering?'

*Follow-up*1 (F.up1)

a. Tis triantafilies potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the spring
'The roses, Mary is watering. She will prune them in spring.'

*Follow-up*2 (F.up2)

a. I Maria potizi tis triantafilies.
the.NOM Mary.NOM water.3SG the.ACC roses.ACC
'Mary is watering the roses. She will prune them in spring.'
b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the spring
'The roses, Mary is watering. She will prune them in spring.'

*Follow-up*3 (F.up3)

a. Tis triantafilies potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
'The roses, Mary is watering.
b. Meta tha sinantisi to Yani.
then will meet the.ACC John.ACC
Afterwards, she will meet John.'

*Follow-up*4 (F.up4)

a. I Maria potizi tis triantafilies.
the.NOM Mary.NOM water.3SG the.ACC roses.ACC
'Mary is watering the roses. She will prune them in spring.'
b. Meta tha sinantisi to Yani.
then will meet the.ACC John.ACC
Afterwards, she will meet John.'

(3) is a *wh*-question that triggers focus on the object. In sentence (a) in (F.up1)) the focused object appears in preverbal position, whereas in sentence (a) in (F.up2) the focused object appears in postverbal position. The same holds for the focused object in sentence (a) in (F.up3) and (F.up4). The (b) sentence in (F.up1) continues the topic, which was introduced in sentence (a). The same is true for (b) sentence in (F.up2). The preverbal object in sentence (a) in (F.up1) can be analyzed as a fronted discourse topic. In contrast to sentence (b) in (F.up1) and (F.up2), sentence (b) in (F.up3) and (F.up4) shifts the discussion to another topic. The discussion is not any more about *the roses*.

The stimulus set was divided into 24 subsets. Each subset consisted of a question and two follow-ups. In half of the 24 subsets sentence (b) was a discourse continuation sentence and in the other half sentence (b) was shifting the discussion to a different topic. A schematic illustration is given in (4).

(4) *Question*
*Follow-up*1
$[O]_{Foc}$VS. Discourse continuation sentence.
*Follow-up*2
SV$[O]_{Foc}$. Discourse continuation sentence.
*Question*
*Follow-up*3
$[O]_{Foc}$VS. Shifting the discussion to a different topic.
*Follow-up*4
SV$[O]_{Foc}$. Shifting the discussion to a different topic.

The subsets as well as the follow-ups were randomized to avoid bias. The complete set of materials can be found in appendix 4.

**Procedure**. A self-paced stimulus presentation was used. One by one question-follow-ups (F.up1-F.up2/F.up3–F.up4) pairs were presented on the computer screen. Taking into consideration the goal of this phase, question – F.up1 and F.up2 appeared simultaneously on the screen. The same holds for F.up3 and F.up4. Participants were instructed to read aloud the question and the first answer (F.up1 or F.up2/F.up3 or F.up4), depending on which of the two appeared first) and then the question and the second answer (F.up1 or F.up2/F.up3 or F.up4, depending on which of the two appeared second). The participants' task was twofold. Firstly, they were asked to judge the discourse felicity. Specifically, participants were asked to judge (i) the discourse felicity of the question and answer F.up1 and (ii) the discourse felicity of the question and answer F.up2 and note their answers on a two point scale, '0' stood for 'infelicitous' and '1' stood for 'felicitous'. Secondly, participants were asked to indicate which of the answers F.up1, F.up2 or both(F.up3 or F.up4 or both) they would choose as an answer to the question Q and note their answer.

**Participants**. Fourteen native speakers of Greek were asked to participate in the experiment, seven females and seven males. Participants belonged to the same age group (age range 25-35). They all spoke Standard Athenian Greek and shared the same educational level, namely university education.

**Results**. All the responses were analyzed. The data were stored in a database for off-line statistical processing. The results of the felicity judgements (672 in total, 48 × 14 speakers) are summarized in table 2. Table 2 cross-tabulates the position of the focused object and the type of discourse continuation by the felicity judgements.

Table A.2 Felicity judgements

| | $[O]_{Foc}VS$ | | $SV[O]_{Foc}$ | |
|---|---|---|---|---|
| | Discourse continuation sentence | Shifting the discussion | Discourse continuation sentence | Shifting the discussion |
| Felicitous | 168 (100%) | 12 (7.1%) | 168 (100%) | 168 (100%) |
| Infelicitous | 0 | 156 (92.9%) | 0 | 0 |

As shown in table 2, when the focused object appears in postverbal position, both continuations are judged as felicitous (100%). When the focused object appears in preverbal position, the discourse is judged as felicitous at 100% only when the continuation is the continuation of the topic, which was introduced in sentence (a) .When the continuation is shifting the discussion and the focused object is in preverbal position, then the discourse is judged as infelicitous at 93%. Table 3 cross-tabulates the felicity judgements by the participants. As indicated in table 3, it is only one speaker (participant 14) who judged all the discourses as felicitous. Judging all the discourses as felicitous could be considered as an indication of failing to perform the experimental task and thus as a reason for exclusion. I decided, however, to include this subject in the analysis based on the results of the second experimental task.

Table A.3 Cross-tabulation felicity judgements by speakers.

| | | Felicity judgements | |
|---|---|---|---|
| | | Felicitous | infelicitous |
| Speaker id | 1 | 36 | 12 |
| | 2 | 36 | 12 |
| | 3 | 36 | 12 |
| | 4 | 36 | 12 |
| | 5 | 36 | 12 |
| | 6 | 36 | 12 |
| | 7 | 36 | 12 |
| | 8 | 36 | 12 |
| | 9 | 36 | 12 |
| | 10 | 36 | 12 |
| | 11 | 36 | 12 |
| | 12 | 36 | 12 |
| | 13 | 36 | 12 |
| | 14 | 48 | 0 |

The results of the second experimental task (336 in total, 24 questions × 14 speakers) are summarized in table 4. Table 4 cross-tabulates participants' choice by sentence b.

Table A.4 Participants' choice.

| | Discourse continuation sentence | Shifting the discussion |
|---|---|---|
| $SV[O]_{Foc}$ | 103 (61.3%) | 156 (92.9%) |
| $[O]_{Foc}VS$ | 57 (33.9%) | 12 (7.1%) |
| Both | 8 (4.8%) | 0 |
| Total | 168 (100%) | 168 (100%) |
| Pearson Chi-square: 48.1 (prob. 0.000) | | |

Table 4 shows that participants' choice for $SV[O]_{Foc}$, $[O]_{Foc}VS$ or both differs according to sentence (b), i.e. whether sentence (b) is a discourse continuation sentence, or sentence (b) shifts the discussion. As shown in table 4, when sentence (b) is a discourse continuation sentence, then participants' choice for $SV[O]_{Foc}$ or $[O]_{Foc}VS$ is more evenly distributed than when sentence (b) shifts the discussion. When sentence (b) shifts the discussion to a different topic, then $SV[O]_{Foc}$ is almost exclusively selected as the answer. The Pearson chi-square test indicates that there is a significant association between participants choice for $SV[O]_{Foc}$, $[O]_{Foc}VS$ or both and sentence (b). The factors object type, number and definiteness are not significant. The results were very robust, but I wanted to test them further. The details for phase 2 and phase 3 are given below.

**Phase 2**

Phase 2 is complementary to phase 1; in phase 2, I tested further preverbal object foci and their discourse continuation. In phase 2 participants have only one task, namely to judge discourse felicity. A total number of 24 stimuli were prepared, 12 questions and 12 answers. The question was kept constant; it was a *wh*-question that triggered focus on the object. Each answer consisted of two sentences, sentence (a) and (b). Sentence (a) always contained a preverbal object focus and varied with respect to the type of object. Specifically, the design crossed the following factors: (i) object type (direct or indirect), (ii) number (plural or singular) and (iii) definiteness (definite, indefinite or bare). Sentence (b) always shifted the discussion to another topic. A sample is given in (5).

(5) *Question*

Imaste se ena kipo. Ti potizi i Maria?
be.1PL in a garden what water.3SG the.NOM Mary.NOM
'We are in a garden. What is Mary watering?'

*Answer*

a. Tis triantafilies potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
'The roses, Mary is watering.

b. Meta tha sinantisi to Yani.
then will meet the.ACC John.ACC
Afterwards, she will meet John.'

In sentence (a) in (5A$_1$) the focused object appears in preverbal position. Sentence (b) does not continue the discussion about *the roses*; it rather shifts the discussion to another topic.

**Procedure**. A self-paced stimulus presentation was used. Each time a question-answer pair was presented in the computer screen. Participants were instructed to read aloud the question-answer pair. The participants were asked to judge the discourse felicity and note their answers on a two point scale, '0' stood for 'infelicitous' and '1' stood for 'felicitous'.

**Participants**. The same 14 individuals who participated in phase 1.

**Results**. All the responses were analyzed. The results of the felicity judgments, 168 in total (12 question/answer pairs × 14 speakers) are summarized in table 5. As indicated in table 5, the participants judged all question/answer pairs as infelicitous.

Table A.5 Felicity judgements.

| | [O]$_{Foc}$VS |
|---|---|
| | Shifting the discussion |
| felicitous | 0 |
| infelicitous | 168 (100%) |

**Phase 3**

The purpose of phase 3 was to further test the results of phase 1. Phase 3 tested preverbal object foci and their discourse continuations. Phase 3 is in a sense the reverse of phase 2. In phase 2, I tested preverbal object foci and a continuation that shifted the discussion, while phase 3 tests preverbal object foci and a continuation of the topic that was introduced in the first sentence. A total number of 24 stimuli were prepared, 12 questions and 12 answers. The question was kept constant; it was a *wh*-question that triggered focus on the object. Each answer consisted of two sentences, sentence (a) and sentence (b). Sentence (a) contained always a preverbal object focus and varied with respect to the type of object. Specifically, the design crossed the following factors: (i) object type (direct or indirect), (ii) number (plural or singular) and (iii) definiteness (definite, indefinite or bare). Sentence (b) was always a continuation of the topic that was introduced in the first sentence. A sample is given in (6).

(6) *Question*

Imaste se ena kipo. Ti potizi i Maria?
be.1PL in a garden what water.3SG the.NOM Mary.NOM
'We are in a garden. What is Mary watering?'

*Answer*

a. Tis triantafilies potizi i Maria.
the.ACC roses.ACC water.3SG the.NOM Mary.NOM
'The roses, Mary is watering.

b. Tha tis kladepsi tin aniksi.
will CL prune.3SG the spring
'She will prune them in spring.'

In sentence (a) in (6A$_1$) the focused object appears in preverbal position. Sentence (b) continues the discussion about *the roses*. In this respect, the preverbal object in (6A$_1$) has a double function; it is a focus and a topicalized discourse topic.

**Procedure**. A self-paced stimulus presentation was used. Each time a question-answer pair was presented in the computer screen. Participants were instructed to read aloud the question-answer pair. The participants were asked to judge the discourse felicity and note their answers on a two point scale, '0' stood for 'infelicitous' and '1' stood for 'felicitous'.
**Participants**. The same 14 individuals who participated in phase 1 and 2.
**Results**. All the responses were analyzed. The results of the felicity judgments, 168 in total (12 question/answer pairs × 14 speakers) are summarized in table 6. As indicated in table 6, the participants judged all question/answer pairs as felicitous.

Table A.6 Felicity judgements.

| | [O]$_{Foc}$VS |
|---|---|
| | Discourse continuation sentence |
| felicitous | 168 (100%) |
| infelicitous | 0 |

**Phase 4**
The aim of phase 4 was to examine the results of the continuation test when applied to contrastively focused objects. In a sense, phase 4 is similar to phase 1; the only difference between the two concerns contrast. In phase 1, I examined the results of the continuation test when applied to objects that are interpreted as new information foci, while phase 4 investigates the results of the continuation test when applied to objects that are interpreted as contrastive foci.
**Stimuli**. A total number of 48 stimuli were prepared, 16 questions and 32 follow-ups. There were two types of questions, type (a) and type (b). Type (a) was a yes-no question, while type (b) was an alternative question. Each follow-up consisted of a sequence of two sentences, sentence (a) and sentence (b). The follow-ups varied. Sentence (a) varied with respect to the position of the contrastively focused object and with respect to the type of object. Specifically, the design crossed the following factors: (i) position of the focused object (preverbal or postverbal), schematically [O]$_{C\text{-}Foc}$VS or SV[O]$_{C\text{-}Foc}$, (ii) object type (direct or indirect), (iii) number (plural or singular) and (iv) definiteness (definite or bare). This resulted in 16 combinations (position of the focused object × object type × number × bareness = 2 × 2 × 2 × 2 = 16). These 16 combinations are given in table 7.

Table A.7 Combinations of sentence (a).

| Position of the focused object | Definiteness | Object type | Number |
|---|---|---|---|
| Preverbal | definite | direct object | singular |
| | | | plural |
| | | indirect object | singular |
| | | | plural |
| | bare | direct object | singular |
| | | | plural |
| | | indirect object | singular |
| | | | plural |
| postverbal | definite | direct object | singular |
| | | | plural |
| | | indirect object | singular |
| | | | plural |
| | bare | direct object | singular |
| | | | plural |
| | | indirect object | singular |
| | | | plural |

Sentence (b) varied with respect to discourse continuation. Specifically, sentence (b) was either a discourse continuation of the first sentence or it shifted the discussion to a different topic. Having 16 combinations of sentence (a) and two combinations of sentence (b), I obtained a total number of 32 follow-ups. A sample with an alternative question and a bare singular direct object in the answer is given in (7).

(7) *Question*
Thelis kafe i tsai?
want.2SG coffee.ACC or tea.ACC
'Would you like coffee or tea?'
*Follow-up*1
a. Thelo kafe.
want.1SG coffee.ACC
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'I would like coffee. I like coffee very much.'
*Follow-up*2
a. Kafe thelo.
coffee.ACC want.1SG
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'Coffee, I would like. I like coffee very much.'

*Follow-up*3

a. Thelo kafe.
want.1SG coffee.ACC

b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'I would like coffee. I bought Karistiani's last book.'

*Follow-up*4

a. Kafe thelo.
koffee.ACC want.1SG

b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'Coffee, I would like. I bought Karistiani's last book.'

(7) is an alternative question that triggers contrastive focus on the object. Sentence (a) answers the question in (7). In (7i), in sentence (a) the contrastively focused object appears in postverbal position, whereas in (7ii) ), in sentence (a), the contrastively focused object appears in preverbal position. Sentence (a) in (7iii) and (7iv) is identical to sentence (a) in (7i) and (7ii). Sentence (b) in (7i) is a continuation of the topic of discourse, which was introduced in sentence (a); the discussion about *coffee* is continued. Sentence (b) in (7ii) is identical to sentence (b) in (7i). Sentence (b) in (7iii) and (7iv) shifts the discussion to another topic. The discussion is not any more about *coffee*.

There were 32 subsets. Each subset consisted of a question and two follow-ups. In half of the 32 subsets the question was of type (a) and in the other half the question was of type (b). Moreover, in half of the 32 subsets sentence (b) was a discourse continuation sentence and in the other half sentence (b) was shifting the discussion to a different topic. A schematic illustration is given in (8) and (9).

(8) *Yes-no question*
*Follow-up*1
SV[O]$_{\text{C-Foc}}$. Discourse continuation sentence.
*Follow-up*2
[O]$_{\text{C-Foc}}$VS. Discourse continuation sentence.
*Yes-no question*
*Follow-up*3
SV[O]$_{\text{C-Foc}}$. Shifting the discussion to a different topic.
*Follow-up*4
[O]$_{\text{C-Foc}}$VS. Shifting the discussion to a different topic.

(9) *Alternative question*
*Follow-up*1
SV[O]$_{\text{C-Foc}}$. Topic of discourse continued.
*Follow-up*2
[O]$_{\text{C-Foc}}$VS. Topic of discourse continued.

*Alternative question*
*Follow-up*3
SV[O]$_{C\text{-}Foc}$. Shifting the discussion to a different topic.
*Follow-up*4
[O]$_{C\text{-}Foc}$VS. Shifting the discussion to a different topic.

The ordering of the subsets was randomized to avoid bias. The complete set of materials can be found in appendix 4.1.

**Procedure**. A self-paced stimulus presentation was used. One by one question/follow-ups was presented on the computer screen. Taking into consideration the goal of this phase, question/follow-ups appeared simultaneously on the screen. Participants were instructed to read aloud the question and the first follow-up (*Follow-up*1 or *Follow-up*2/( *Follow-up*3 or *Follow-up*4), depending on which of the two appeared first) and then the question and the second follow-up (*Follow-up*1 or *Follow-up*2/( *Follow-up*3 or *Follow-up*4), depending on which of the two appeared second). The participants' task was to judge the discourse felicity. Specifically, participants were asked to judge (i) the discourse felicity of the question and *Follow-up*1(*Follow-up*3) and (ii) the discourse felicity of the question and *Follow-up*2(*Follow-up*4), and note their answers on a two point scale, '0' stood for 'infelicitous' and '1' stood for 'felicitous'.
**Participants**. The same 14 individuals who participated in phase 1.
**Results**. All the responses were analyzed. The data were stored in a database for off-line statistical processing. The results of the felicity judgements (896 in total, 64 × 14 speakers) are summarized in table 8. Table 8 cross-tabulates the position of the focused object and the type of discourse continuation by the felicity judgements.

Table A.8 Felicity judgements.

| | [O]$_{C\text{-}Foc}$VS | | SV[O]$_{C\text{-}Foc}$ | |
|---|---|---|---|---|
| | Discourse continuation sentence | Shifting the discussion | Discourse continuation sentence | Shifting the discussion |
| felicitous | 224 (100%) | | 224 (100%) | 160 (71.4%) |
| infelicitous | | 224 (100%) | | 64 (28.6%) |
| Chi-squared: Position of the contrastively focused object 130.9 (prob. 0.000) | | | | |
| Chi-squared: Type of discourse continuation 424.4 (prob. 0.000) | | | | |

As shown in table 8, when the contrastively focused object appears in preverbal position, the discourse is judged as felicitous at 100% only when the discourse continuation is the continuation of the topic, which was introduced in sentence (a). When the discourse continuation is shifting the discussion and the contrastively focused object is in preverbal position, the discourse is judged as infelicitous at 100%. When the contrastively focused object appears in postverbal position and

the discourse continuation is the continuation of the topic, which was introduced in sentence (a), the discourse is judged as felicitous at 100%. When the contrastively focused object appears in postverbal position and the discourse continuation is shifting the discussion, then the discourse is judged as felicitous at 71.4%. The Pearson chi-square test indicates that there is a significant association between participants' choice for felicitous, infelicitous and the position of the contrastively focussed object. The Pearson chi-square test also indicates that there is a significant association between participants' choice for felicitous, infelicitous and sentence (b).

Table 9 cross-tabulates the felicity judgements by the participants. As shown in table 9, there is a split with respect to felicity judgements within the speakers.

Table A.9 Cross-tabulation felicity judgements by speakers.

| | | Felicity judgements | |
|---|---|---|---|
| | | Felicitous | infelicitous |
| Speaker id | 1 | 48 | 16 |
| | 2 | 48 | 16 |
| | 3 | 48 | 16 |
| | 4 | 48 | 16 |
| | 5 | 48 | 16 |
| | 6 | 48 | 16 |
| | 7 | 48 | 16 |
| | 8 | 48 | 16 |
| | 9 | 48 | 16 |
| | 10 | 48 | 16 |
| | 11 | 32 | 32 |
| | 12 | 32 | 32 |
| | 13 | 32 | 32 |
| | 14 | 32 | 32 |

**Discussion, a note on Italian and an issue for further research**

Summarizing, the results of the first three phases of the questionnaire show that when sentence (b) is a discourse continuation sentence, the focused object in sentence (a) can appear either in preverbal or postverbal position. They also indicated that when sentence (b) shifts the discussion, then the focused object in sentence (a) obligatorily appears in postverbal position. Stated differently, if a preverbal object focus does not function as a fronted discourse topic, then infelicity arises. From the results of the questionnaire, it can be concluded that preverbal object foci obligatorily have a double function. They function as foci and as fronted discourse topics at the same time.

Phase four examined contrastively focused objects. The results of phase four showed that when a contrastively focused object appears in preverbal position, then sentence (b) must be a discourse continuation sentence; otherwise the discourse becomes infelicitous. They also indicated that when a contrastively focused object appears in postverbal position, then sentence (b) can be a discourse continuation sentence. This is in full accordance with the findings of the first three phases. Moreover, it was shown that when a contrastively focused object appears in postverbal position and sentence (b) shifts the discussion, then the discourse is felicitous at 71.4%, while it is infelicitous at 28.6%.

This last finding suggests that contrast may impose certain constraints on discourse continuation. However, more research is required to further investigate this issue. The results of phase four should not lead us to reinterpret the results of the first three phases with respect to discourse topichood and to claim that it is contrast that matters. For Greek the relevant factor is discourse topichood.

This becomes clear when we briefly examine Italian. As already noted in chapter three, Italian attests preverbal and postverbal object foci that can be interpreted contrastively. As phase four investigated the results of the continuation test when applied to contrastively focused objects, I decided to apply the continuation test to Italian data as well. As Italian is not the main of focus of this dissertation, I only tested the patterns in (10) and (11).

(10) *Yes-no question*
*Follow-up*1
SV[O]$_{\text{C-Foc}}$. Discourse continuation sentence.
*Follow-up*2
[O]$_{\text{C-Foc}}$VS. Discourse continuation sentence.
*Yes-no question*
*Follow-up*3
SV[O]$_{\text{C-Foc}}$. Shifting the discussion to a different topic.
*Follow-up*4
[O]$_{\text{C-Foc}}$VS. Shifting the discussion to a different topic.

(11) *Alternative question*
*Follow-up*1
SV[O]$_{\text{C-Foc}}$. Topic of discourse continued.
*Follow-up*2
[O]$_{\text{C-Foc}}$VS. Topic of discourse continued.
Alternative question
*Follow-up*3
SV[O]$_{\text{C-Foc}}$. Shifting the discussion to a different topic.
*Follow-up*4
[O]$_{\text{C-Foc}}$VS. Shifting the discussion to a different topic.

The relevant material can be found in appendix 4.2. Twelve native speakers of Italian, six females and six males, who shared the same educational level, namely

university education, were asked to judge the discourse felicity. Specifically, participants were asked to judge (i) the discourse felicity of the question and the following *Follow-up*, and to note their answers, felicitous vs. infelicitous. The results of the felicity judgements (96 in total, 8 × 12 speakers) are summarized in table (10).

Table A.10 Italian: felicity judgements

| | $[O]_{C\text{-}Foc}VS$ | | $SV[O]_{C\text{-}Foc}$ | |
|---|---|---|---|---|
| | Discourse continuation sentence | Shifting the discussion | Discourse continuation sentence | Shifting the discussion |
| felicitous | 11 (45.8%) | 11 (45.8%) | 24 (100%) | 24 (100%) |
| infelicitous | 13 (54.1%) | 13 (54.1%) | | |

Table 10 shows that when the contrastively focused object appears in postverbal position, both continuations are judged as felicitous (100%). It also shows that when the contrastively focused object appears in preverbal position and sentence (b) continues the topic that was introduced in sentence (a), the discourse is judged felicitous at 45.8%, while it is judged infelicitous at 54.1%. Moreover, when the contrastively focused object appears in preverbal position and sentence (b) shifts the discussion, the discourse is judged felicitous at 45.8%, while it is judged infelicitous at 54.1%. The results in table 10 indicate that when contrast is syntactically marked, then continuation of both types is more difficult than when contrast is not syntactically marked. However, it is not entirely clear why this is the case.

The results in table 10 suggest that discourse topichood is not a relevant factor for Italian. In this sense, preverbal object foci in Italian do not differ from their postverbal counterparts with respect to discourse topichood. Moreover, in chapter three, it was shown that Italian preverbal object foci are not interpreted exhaustively. In this respect, neither discourse topichood nor exhaustivity is a relevant factor for differentiating preverbal and postverbal object foci in Italian.[13]

To the extent that we can compare table 9 with table 11, we can conclude that discourse topichood is a relevant factor for Greek, while it is not for Italian. In Greek, if a preverbal object focus does not function as a fronted discourse topic, then infelicity arises. It can also be concluded that Greek preverbal object foci have obligatorily a double function. They function as foci and fronted discourse topics at the same time.

[13] Given the existing literature, one could argue that the relevant factor for differentiating preverbal and postverbal object foci in Italian is new information focus, in the sense that it is argued that postverbal object foci in Italian can be interpreted as new information focus, while preverbal object foci cannot. However, in my sample of Italian speakers, there were speakers (6 out of 12) that allowed Italian preverbal object foci to be interpreted as new information foci. This suggests that further research is required for this topic.

# 5 The Phonetic Properties of Object Foci

## 5. Introduction

In the first part of this thesis, I investigated the semantic properties of object foci in Greek. In this chapter, I will examine the phonetic properties of preverbal and postverbal object foci. An example of preverbal and postverbal object focus is given in (1). Brackets and the subscript $_{Foc}$ indicate focus.

(1) *Question*
Ti kerdise o Yanis?
what win.3SG the.NOM John.NOM
'What did John win?'
*Answer*1
a. O Yanis kerdise [to lahio]$_{Foc}$. SV[O]$_{Foc}$
the.NOM John.NOM win.3SG the.ACC lottery.ACC
'John won [the lottery]$_{Foc}$.'
*Answer*2
b. [To lahio]$_{Foc}$ kerdise o Yanis. [O]$_{Foc}$VS
the.ACC lottery.ACC win.3SG the.NOM John.NOM
'[The lottery]$_{Foc}$, John won.'

In example (1a), the focused object appers in postverbal position, while in (1b), the focused object appears in preverbal position. In the first part of this thesis it was shown that preverbal and postverbal object foci do not differ with respect to exhaustivity and contrast. It was also demonstrated that preverbal and postverbal object foci differ with respect to discourse topichood; preverbal object foci in Greek function obligatorily as discourse topics. Besides this difference between the two, there is another difference between (1a) and (1b), namely, SVO is multiply ambiguous, while OVS is not. In particular, OVS can only answer a question that triggers object focus. OVS cannot answer a question that triggers sentence focus or verb-phrase focus. An illustration of this is given in (2). # marks infelicity, while the subscript next to the left bracket denotes the focus domain, $_{S}$ marks sentence focus and $_{VP}$ marks verb-phrase focus.

(2) *Question*1

a. Ti egine?
what happen.3SG
'What happened?'
*Answer*1

b. #[$_S$To lahio kerdise o Yanis]$_{Foc}$. #[$_S$OVS]$_{Foc}$
the.ACC lottery.ACC win.3SG the.NOM John.NOM
#'[$_S$The lottery John won.]$_{Foc}$'
*Question*2

c. Ti ekane o Yanis?
what do.3SG the.NOM John.NOM
'What did John do?'
*Answer*2

d. #[$_{VP}$To lahio kerdise]$_{Foc}$ o Yanis. #[$_{VP}$OV]$_{Foc}$S
the.ACC lottery.ACC win.3SG the.NOM John.NOM
#'The lottery John won.'

Example (2a) contains a question that triggers sentence focus, in (2b) the object appears in preverbal position, and the word order is OVS. As shown in (2b), OVS is not a felicitous answer to a question that triggers sentence focus. Example (2c) contains a question that triggers focus on the verb-phrase. In (2d), the word order is OVS, and as indicated by the infelicity marker, OVS cannot answer a question that triggers focus on the verb-phrase.

In contradistinction to OVS, the word order SVO is a felicitous answer to a question that triggers sentence focus and to a question that triggers focus on the verb-phrase. This is shown in example (3).

(3) *Question*1

a. Ti egine?
what happen.3SG
'What happened?'
*Answer*1

b. [$_S$ O Yanis kerdise to lahio]$_{Foc}$. [$_S$SVO]$_{Foc}$
the.NOM John.NOM win.3SG the.ACC lottery.ACC
'[$_S$ John won the lottery]$_{Foc}$.'
*Question*2

c. Ti ekane o Yanis?
what do.3SG the.NOM John.NOM
'What did John do?'
*Answer*2

d. O Yanis [$_{VP}$ kerdise to lahio]$_{Foc}$. S[$_{VP}$VO]$_{Foc}$
the.NOM John.NOM win.3SG the.ACC lottery.ACC
'John [$_{VP}$ won the lottery]$_{Foc}$.'

The *wh*-question in (3a) triggers focus on the sentence, while the *wh*-question in (3c) triggers focus on the verb-phrase. Examples (3b) and (3d) felicitously answer the questions in (3a) and (3c); in (3b) and (3d), the word order is SVO. As shown in (3), the word order SVO can be used to answer a question that triggers sentence focus and a question that triggers verb-phrase focus. In this respect, SVO allows ambiguity and its focus domain varies.

The focus domain in (3b) can be described as broad, whereas the focus domain in (1a-b) can be described as narrow. It should be noted that the terms broad and narrow focus are relative. For instance, verb phrase-focus is broad compared to object focus and narrow compared to sentence focus. In the literature, narrow focus has been associated with contrastive interpretation. However, in this chapter, following Cohan (2000), the terms broad and narrow focus are taken to refer to the domain of focus. A question that emerges from the data in (1)-(3) is whether the domain of focus is reflected in the phonetic realization of the utterances. More specifically, in this chapter, I address the questions given in (4).

(4) a. Do speakers produce a difference among sentence focus, verb-phrase focus, postverbal object focus and preverbal object focus?
b. Do listeners perceive a difference among sentence focus, verb-phrase focus and postverbal object focus?

To tackle the above questions, a production and two perception experiments were performed. The two perception experiments differed with respect to the type of stimuli that were used, natural stimuli in the first, manipulated stimuli in the second experiment. The production experiment intended to answer question (4a), while the perception experiments intended to answer question (4b).

The chapter is organized as follows. In section 5.1, the results of the production experiment are presented. Section 5.2 discusses the perception experiment that used natural stimuli. Finally, in section 5.3, I present the perception experiment that used manipulated stimuli.

## 5.1 Production experiment

The aim of the production experiment is to investigate whether speakers produce a difference among sentence focus, verb-phrase focus and object focus. Baltazani (2003) reports that H* signals broad focus, while Arvaniti et al. (2006) report that a L+H* nuclear accent signals narrow or contrastive focus.

### 5.1.1 Methods

**Stimuli**. A list of 12 sets of four question-answer pairs (Q/A pairs) was constructed. The question is the trigger sentence that determines the focus domain of the corresponding answer, the target sentence. For the first three Q/A pairs the word order of the target sentence was kept constant, it was SVO, whereas the trigger sentence varied. There were three types of trigger sentences: (i) a question that triggered sentence focus (ex. 5a), (ii) a question that triggered verb-phrase focus (ex. 5b) and (iii) a question that triggered object focus (ex. 5c). In the fourth Q/A pair, the trigger sentence was a question that triggered object focus (ex. 5d) and the word order of the target sentence was OVS.[1] A sample is given in (5).

(5) *Question*1

a. Ti ginete?
what happen.3SG
'What is happening?'
*Answer*1
[S I Eleni Meloni mila]Foc.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'[S Helen is smearing honey on apples]Foc.'

*Question*2

b. Ti kanei i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*2
I Eleni [VP meloni mila]Foc.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'Helen [VP is smearing honey on apples]Foc.'

*Question*3

c. Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'
*Answer*3
I Eleni meloni [NP mila]Foc.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'Helen is smearing honey [NP on apples]Foc.'

[1] One may wonder about the interpretation of the preverbal object in (4d). In chapter four, I showed that preverbal object foci in Greek function obligatorily as discourse topics. With respect to the preverbal object in (4d), I am assuming that it is interpreted as a focus and a discourse topic at the same time and that the speakers who participated in the experiment are doing a sort of accommodation. It would be interesting to repeat this experiment including a continuation sentence after *Answer*4.

*Question*4
d. Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what does Helen smear honey?'
*Answer*4
[NP Mila]Foc meloni i Eleni.
apples.ACC smear.honey.on.3SG the.NOM Helen.NOM
'On apples, Helen is smearing honey.'

The complete set of materials is given in appendix 5. To be able to clearly measure fundamental frequency (F0), the acoustic correlate of vocal pitch, specific requirements were made on the segmental composition of the materials. Thus, voiceless segments were avoided and sonorants were used instead. Each speaker produced 48 Q/A pairs.[2]

**Procedure**. Subjects were recorded individually in a quiet room, using a head-mounted close-taking microphone (Shure SM10A). They were seated at a table with a computer screen (laptop) in front of them. Specific written instructions were presented to them on the computer screen. In particular, subjects were asked to imagine that they were performing two roles, the role of a person who asks a question, and the role of a person who answers the question. Verbatim instructions are included in appendix 5.1. Subjects were allowed to change the angle and distance of the screen for optimal legibility of the stimulus text presented to them. A self-paced stimulus presentation was used. A Q/A pair was presented on the computer screen and subjects had to press the spacebar to move to the next Q/A pair. A set of three Q/A pairs was used as a try out. The utterances were directly recorded on computer disk (16 bits, 44.1 KHz) using Adobe Audition software.

**Speakers**. Forty native speakers of Greek participated in the experiment, twenty females and twenty males. The experimental subjects belonged to two age groups: group A (age range from 25 to 30) and group B (age range from 46 to 51). They all spoke standard Athenian Greek. Thirty-six speakers were linguistically naive, whereas four speakers were linguistically trained, but they were not involved in experimental linguistics.

### 5.1.2 Analysis

After informal scanning of the raw data, I decided to analyze four sets out of the total 12. As I am interested in the acoustical make-up of the target sentences, only the answers were digitally excised from the recordings and analyzed using Praat

[2] The program E-prime (Poelmans 2002) was used to present written questions and answers on a computer screen for the speakers to read out. I wish to acknowledge Jos Pacilly for his help.

speech processing software (Boersma and Weenink, 2005). The productions of all 40 participants were analyzed; this resulted to a total of 640 utterances (40 speakers × 4 groups × 4 utterances per group).

Measurements of F0, duration and intensity were obtained. The first step in the analysis was a manual labeling and segmentation of each target utterance into vowels and consonants. Segment boundaries were determined by eye, looking at the oscillogram and consulting the spectrogram when needed. Conventional segmentation guidelines were followed (Peterson & Lehiste, 1960), supplemented by additional criteria for Greek (Arvaniti & Baltazani 2000). Then, F0 was automatically extracted using Praat's autocorrelation method (Boersma 1993).[3] The third step in the analysis was to stylize the F0 curves in terms of a set of straight lines. An illustration is given in figure 5.1. Figure 5.1 contains a raw F0 curve and its perceptually equivalent stylized F0 curve.

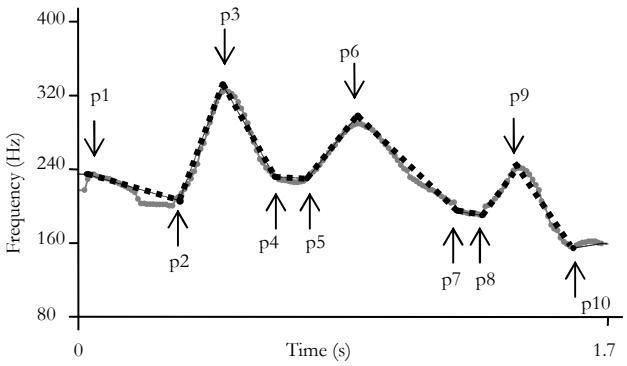


Figure 5.1 Raw F0 curve of a female recording intending sentence focus and its equivalent stylized F0 curve containing ten pivot points.

The fourth step in the analysis was to determine F0 measuring points. Based on the stylized F0 curves, pivot points were defined. For each utterance, 10 pairs of time points and their correspondent pitch (t1, p1 ... t10, p10) were obtained. Specifically, p2 corresponds to the beginning of the rise of the accented vowel of the first content word, p3 corresponds to the end of the rise of the accented vowel of the first content word, p5 corresponds to the beginning of the rise of the accented vowel of the second content word, p6 corresponds to the end of the rise of the accented vowel of the second content word, p9 corresponds to the beginning of the fall of the accented vowel of the third content word and p10 corresponds to the end of the fall of the accented vowel of the third content word. p1 corresponds to the first syllable of the first content word, p4 corresponds to the

[3] This is an implemented in Praat method that determines the fundamental frequency (F0) as the primary correlate of the vocal pitch.

first syllable of the second content word. p7 corresponds to the last syllable of the second content word and p8 corresponds to the first syllable of the third content word. The time-frequency coordinates of the pivot points were automatically extracted with the help of a Praat script and stored in a database for off-line statistical processing. A repeated measures analysis of variance (RM-ANOVA) was judged as the appropriate statistical method, as there are 40 speakers, each of whom utters 4 lexically different exemplars of a sentence in 4 focus conditions. The data were analyzed with the GLM Repeated Measures procedure of SPSS. There were two within-subject factors: 'focus type' (4 levels) and 'sentence type' (4 levels).

The fifth step in the analysis was to obtain intensity measurements. Maximum intensity (in dB) of the stressed vowel of each content word was automatically extracted, using a Praat script and stored in the database. All measurements were analyzed using RM-ANOVA procedure of SPSS. There were two within-subject factors: 'focus type' (4 levels) and 'sentence type' (4 levels). The final step in the analysis was to obtain duration measurements (measured in seconds). For each utterance, seven duration measurements (d1 ... d7) were obtained. Table 5.1 presents the duration measurements. The durations were automatically extracted (after manual segmentation, see above) using a Praat script and stored in the database for statistical analysis. The duration measurements also were analyzed using the RM-ANOVA procedure of SPSS.

Table 5.1 Duration measurement d1…d7.

| Duration measurements | |
|---|---|
| d1 | accented vowel of first content word |
| d2 | accented vowel of second content word |
| d3 | accented vowel of third content word |
| d4 | first content word |
| d5 | second content word |
| d6 | third content word |
| d7 | total duration of utterance |

### 5.1.3 Results

**Frequency**. Figure 5.2 presents the mean frequency (Hz) at ten measuring points (p1…p10) for the four focus types. In this figure the pitch points are time normalized such that the ten pivot points are equidistant.

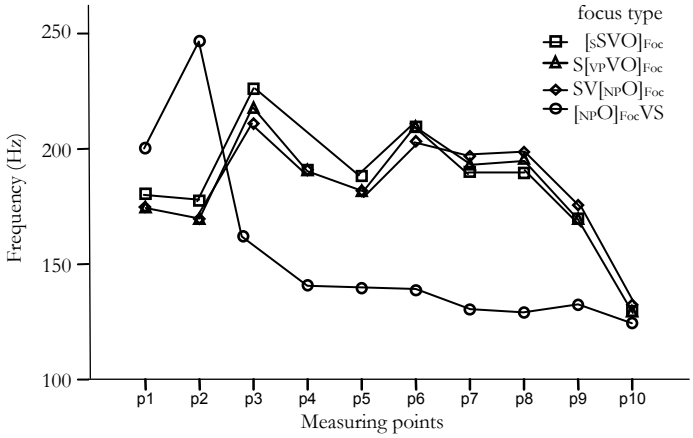


Figure 5.2 Stylized pitch patterns averaged over 40 speakers for each focus type.

As shown in figure 5.2, preverbal object focus [NPO]FocVS differs significantly from the other three focus' types. In [NPO]FocVS, there is a single movement, a rise followed by a fall, and the rest of the contour remains flat. In contradistinction to this the other three focus types are realized with a rise fall rise plateau fall contour. At first sight, sentence focus [SSVO]Foc, verb-phrase focus S[VPVO]Foc and postverbal object focus SV[NPO]Foc do not differ significantly. However, at a closer inspection, there are some differences among the three focus types. In particular, sentence focus [SSVO]Foc at p3 is higher than the other two focus types. To get a better insight into this, I established the difference Δ between p2 and p3; this difference can be seen as a rise. According to an RM-ANOVA on the Δ-values, verb-phrase focus differs significantly from postverbal object focus ($F_{1,39}$= 5,401, p=0.025, $\eta^2_{partial}$= 0.122), the former performing a larger rise than the latter (48.24Hz vs. 40.74Hz).[4] However, the post-hoc Scheffé test showed that the difference between verb-phrase focus and postverbal object focus is not significant (Mean Difference= 75000, p= 0.583).[5]

I also established the difference Δ between p5 and p6; this difference can be seen as a second rise. According to an RM-ANOVA, sentence focus differs significantly from verb-phrase focus ($F_{1,39}$= 13.146, p= 0.001, $\eta^2_{partial}$= 0.252), the latter performing a larger rise than the former (21.37Hz vs. 29.36Hz). However, the Scheffé test showed that the difference between the two is not significant (Mean difference= 7.9875, p= 0.065). Moreover, according to an RM-ANOVA, verb-phrase focus differs from postverbal object focus ($F_{1,39}$= 13.146, p= 0.001, $\eta^2_{partial}$

[4] As already noted, I used SPSS for the statistical analysis. Partial eta squared ($\eta^2_{partial}$) is the default index for effect size in SPSS. $\eta^2_{partial}$ = Sum of Squares factor/ Sum of Squares factor + Sum of Squares Error.

[5] The post-hoc Scheffé test is a conservative test and its results should be interpreted with caution.

= 0.252), the former performing a larger rise than the latter (29.36Hz vs. 20.6Hz). The Scheffé test showed that the difference between verb-phrase focus and postverbal object focus is statistically significant (Mean Difference= 8.7625, p= 0.034).

Furthermore, the difference Δ between p3 and p6 was established. $P_3$ corresponds to the peak on the first content word, while p6 corresponds to the peak on the second content word. Δ corresponds to the accentual downstep in pitch between p3 and p6. Figure 5.3 presents the mean accentual downsteps for all focus types.

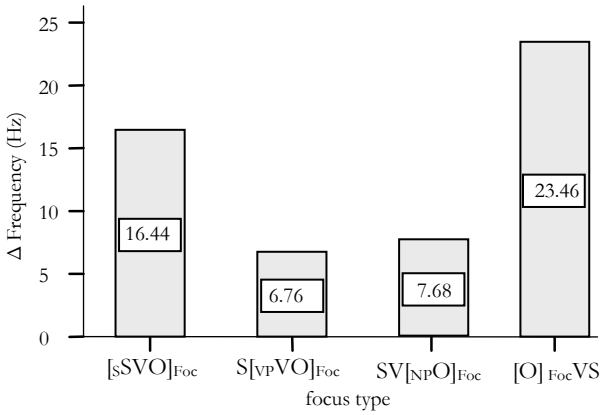


Figure 5.3 Mean downstep per focus type.

As shown in figure 5.3, the downstep in sentence focus $[_{S}SVO]_{Foc}$ is larger than the downstep in verb-phrase focus $S[_{VP}VO]_{Foc}$ and in postverbal object focus $SV[_{NP}O]_{Foc}$. According to RM-ANOVA, the downstep in sentence focus is statistically significantly larger than the downstep in verb-phrase focus ($F_{1,39}$=7.490, p= 0.009, $\eta^2_{partial}$= 0.161). The downstep in verb-phrase focus is also significantly shorter than the downstep in sentence focus according to RM-ANOVA ($F_{1,39}$=7.490, p= 0.009, $\eta^2_{partial}$= 0.161). Figure 5.3 also shows that the downstep in verb phrase focus is shorter (by 0.92Hz) than the downstep in postverbal object focus. The difference between the two is not significant according to RM-ANOVA ($F_{1,39}$= 0.42, p= 0.839, $\eta^2_{partial}$= 0.001). None of the reported differences were found significant by the conservative Scheffé test.

The size of the accentual downstep was also analyzed as a function of the four focus types per gender. As shown in figure 5.4, the accentual downstep in preverbal object focus $[_{NP}O]_{Foc}$ VS is large, namely 22 Hz by females and 25 Hz by males. The accentual downstep in verb-phrase focus $S[_{VP}VO]_{Foc}$ is small. Specifically, the female speakers downstep by 6 Hz, whereas the male speakers' downstep is 7 Hz. Female and male speakers differ with respect to the accentual downstep in sentence focus $[_{S}SVO]_{Foc}$ and postverbal object focus $SV[_{NP}O]_{Foc}$. In sentence focus the

female speakers downstep by 26 Hz, whereas the male speakers downstep by 7 Hz. In postverbal object focus the female speakers downstep by 15 Hz, whereas the male speakers' downstep is 0 Hz.

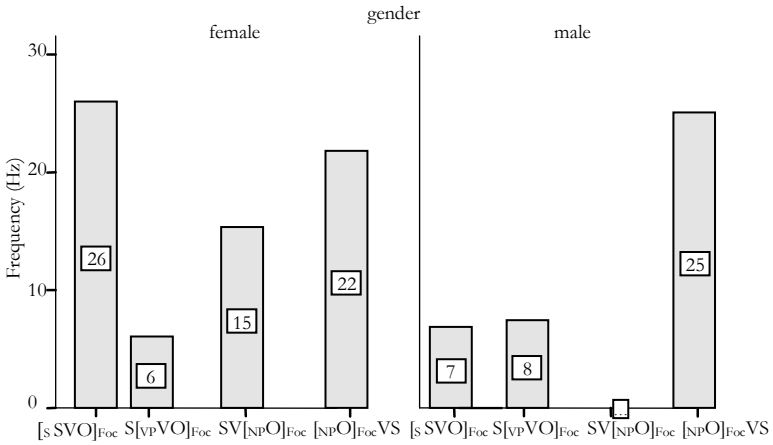


Figure 5.4 Mean downstep in Hz per gender.

RM-ANOVAs were performed to evaluate the differences between male and female speakers. Gender was the between-subject factor. The results of RM-ANOVA show that female and male speakers differ significantly with respect to the accentual downstep in sentence focus, ($F_{1,38}$= 10.408, p= 0.003, $\eta^2_{partial}$= 0.215).

**Intensity**. In figure 5.5 the mean maximum intensity (dB) of the stressed vowels of the three content words is presented.

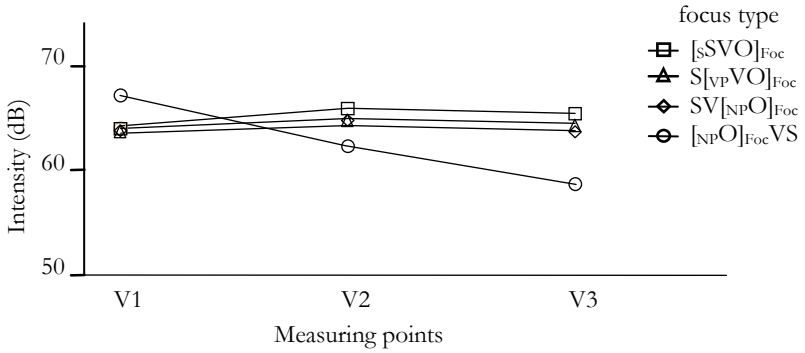


Figure 5.5 Peak intensity (dB) of stressed vowels per focus type.

As shown in figure 5.5, the intensity of the stressed vowels of $[_{NP}O]_{Foc}VS$ differs from the other three types of focus. Figure 5.6 also shows that the intensity of the stressed vowel of the verb (V2) in $[_{S}SVO]_{Foc}$ is higher than the intensity of the

stressed vowel of the verb in S[VPVO]Foc and SV[NPO]Foc, (65.9dB vs. 64.85dB). According to an RM-ANOVA, the difference is statistically significant. Moreover, the intensity of the stressed vowel of the object (V3) in [SSVO]Foc is higher than that in S[VPVO]Foc and SV[NPO]Foc, (65.46dB vs. 64.40dB and 64.38dB). The difference is statistically significant according to the RM-ANOVA. S[VPVO]Foc and SV[NPO]Foc do not differ at any of the measuring points. The results of the RM-ANOVA are summarized in table 5.2.

Table 5.2 RM-ANOVA Intensity measurements.

| Stressed vowels | focus pairs | $df_{1,2}$ | F | p | $\eta^2_{partial}$ |
|---|---|---|---|---|---|
| V2 | [SSVO]Foc - SV[NPO]Foc | 1, 39 | 34.686 | 0.000 | 0.471 |
| | [SSVO]Foc - S[VPVO]Foc | 1, 39 | 34.686 | 0.000 | 0.471 |
| V3 | [SSVO]Foc - SV[NPO]Foc | 1, 39 | 23.830 | 0.000 | 0.379 |
| | [SSVO]Foc - S[VPVO]Foc | 1, 39 | 23.830 | 0.000 | 0.379 |

**Duration**. Figure 5.6 presents the mean duration of subject, verb and object in the four focus types. As indicated in figure 5.6, the duration of the subject in sentence focus [SSVO]Foc is longer than the duration of subject in the other three focus types. However, the difference is not statistically significant. The same observation holds for the duration of the verb. The duration of the object in preverbal object focus [NPO]FocVS is longer than the duration of the object in the other three focus types. According to an RM-ANOVA, the duration of object in [NPO]FocVS is significantly longer than the duration of object in postverbal object focus SV[NPO]Foc, ($F_{1,39}$= 27.751, p= 0.000, $\eta^2_{partial}$= 0.416).

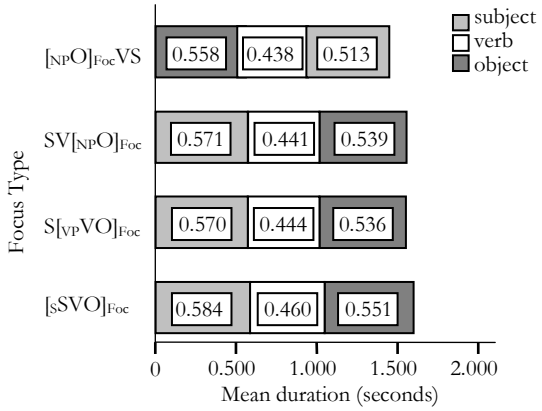


Figure 5.6 Mean duration in seconds of subject, verb, and object in four focus type.

Figure 5.7 shows the mean stressed vowel duration of the three content words for all four focus types. As indicated in figure 5.7, the duration of the first stressed vowel in verb phrase focus $S[_{VP}VO]_{Foc}$ is longer than the duration of the first stressed vowel in the other three focus types.

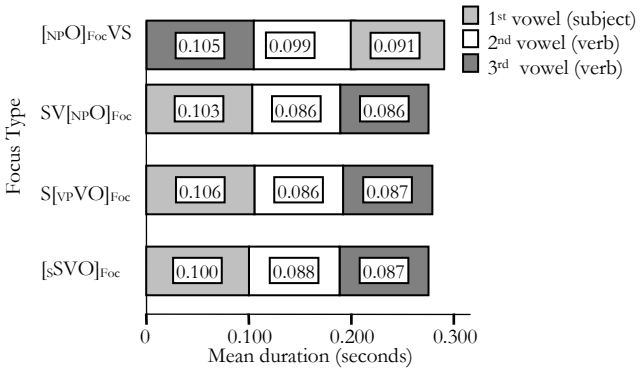


Figure 5.7 Mean duration in seconds of three stressed vowels for four focus' type.

Moreover, the duration of the first stressed vowel in postverbal focus $SV[_{NP}O]_{Foc}$ is significantly longer than that in preverbal object focus $[_{NP}O]_{Foc}VS$, ($F_{1,39}$=95.847, p= 0.000, $\eta^2_{partial}$= 0.711). As illustrated in figure 5.7, sentence focus, verb-phrase focus and postverbal object focus do not differ with respect to the duration of the second stressed vowel. Postverbal object focus differs significantly from preverbal object focus at the second stressed vowel ($F_{1,39}$= 42.453, p= 0.000, $\eta^2_{partial}$= 0.521); the former having a longer duration than the latter. Finally, the duration of the third stressed vowel (object) is longer in the case of preverbal object focus. There is a significant difference between duration of the third stressed vowel of preverbal object focus and the duration of the third stressed vowel of the postverbal object focus, ($F_{1,39}$ = 12.346, p= 0.001, $\eta^2_{partial}$= 0.240).

## 5.1.4 Conclusions

The production experiment aimed to answer question (4a) as expounded in the introduction. Preverbal object focus $[_{NP}O]_{Foc}VS$ and postverbal object focus $SV[_{NP}O]_{Foc}$ present significant differences with respect to frequency, intensity and duration. In particular, in $[_{NP}O]_{Foc}VS$ there is a single pitch movement, a rise followed by a fall, and the rest of the contour remains flat, while $SV[_{NP}O]_{Foc}$ is realized with a rise fall rise plateau fall contour. In $[_{NP}O]_{Foc}VS$ the intensity of the stressed vowel of $[O]_{Foc}$ is relatively high, and the intensity of the stressed vowel of the verb and of the subject is compressed, whereas the intensity of the stressed vowels in $SV[_{NP}O]_{Foc}$ does not present flactuations. The duration of object in

$[_{NP}O]_{Foc}VS$ is significantly longer than the duration of object in postverbal object focus $SV[_{NP}O]_{Foc}$.

At first sight, sentence focus, verb-phrase focus and postverbal object focus do not present radical differences. However, at a closer inspection, there are some differences among them. Specifically, verb-phrase focus and postverbal object focus differ with respect to the first and second pitch rise. In both cases, verb-phrase focus is marked by a larger rise than postverbal object focus. Verb-phrase focus differs also from sentence focus with respect to the second rise; verb-phrase focus showing a larger second rise. Moreover, sentence focus and verb-phrase focus differ significantly with respect to the size of their downstep; the downstep in sentence focus being larger. The downstep in verb-phrase focus is also significantly shorter than the downstep in sentence focus.

Verb-phrase and postverbal object focus do not differ with respect to intensity. Sentence focus is different from verb-phrase and postverbal object focus with respect to intensity. In particular, the intensity of the second and third stressed vowel of sentence focus is higher than that of verb-phrase and postverbal object focus. With respect to duration, the duration of the subject, the verb and the object in sentence focus $[_{S}SVO]_{Foc}$ is longer than the duration of the subject, the verb and the object in verb-phrase focus and postverbal obejct focus. However, the differences are not statistically significant.

## 5.2 Perception experiment one – natural stimuli

A question that emerges from the results of the production experiment concerns the perception focus by listeners. The question is given in (6).

(6) Do listeners perceive any difference among sentence focus $[_{S}SVO]_{Foc}$, verb-phrase focus $S[_{VP}VO]_{Foc}$ and postverbal object focus $SV[_{NP}O]_{Foc}$?

To tackle the question in (6) a perception experiment that used natural stimuli was set up. The case of preverbal object focus was not included, as $[_{NP}O]_{Foc}VS$ unambiguously signals narrow object focus.[6]

[6] One may object to the exclusion of preverbal object focus from the experiment, stating that this is a hypothesis nevertheless and that this condition should have been included. The only thing I can say against this objection is, that as $[_{NP}O]_{Foc}VS$ is judged as an infelicitous answer to a *wh*-question that triggers sentence focus and to a *wh*-question that triggers verb-phrase focus, I decided not to include the condition in the experiment.

### 5.2.1 Methods

**Stimuli**. A total of 24 stimuli produced by two speakers, a male and a female, who participated in the production experiment, were used. Half of the 24 stimuli were produced by the male and half by the female speaker. The set of twelve stimuli was the same for the male and female speaker. These twelve stimuli consisted of four sets of three sentences featuring increasing narrowness of focus: $[_{S}SVO]_{Foc}$, $S[_{VP}VO]_{Foc}$, $SV[_{NP}O]_{Foc}$. A sample is given in (8).

(8) a. $[_{S}$I Eleni meloni mila$]_{Foc.}$
the.NOM Eleni.NOM smear.3SG honey on apples.ACC
'$[_{S}$ Helen smears honey on apples.$]_{Foc}$

b. I Eleni $[_{VP}$ meloni mila$]_{Foc.}$
the.NOM Eleni.NOM smear.3SG honey on apples.ACC
'Helen $[_{VP}$ smears honey on apples.$]_{Foc}$

c. I Eleni meloni $[_{NP}$ mila$]_{Foc.}$
the.NOM Eleni.NOM smear.3SG honey on apples.ACC
'Helen smears honey on $[_{NP}$ apples$]_{Foc.}$

A list of all the materials can be found in appendix 5.2. The stimuli were randomized and saved in a single file.

**Procedure**. The 24 stimuli were made audible with a fixed inter-stimulus interval of 0.3 sec (offset-to-onset). The list of 24 stimuli was played by a portable computer through loudspeakers (Audio Codecs) in a quiet room. Listeners were supplied with an answer sheet containing a list of questions, in sets of three. Each set contained a question that triggered sentence focus (see question in example (5a)), a question that triggered verb phrase focus (see question in example (5b)) and a question that triggered object focus (see question in example (5c)). To avoid response bias by the ordering of the questions, two different types of answer sheets, type (a) and type (b), were prepared. In type (a), the questions were consistently ordered in the sequence (question triggering sentence focus, question triggering verb-phrase focus, question triggering object focus). In type (b), the order was reversed. The answer sheet type (a) is given in appendix 5.3. Listeners were instructed to tick the question which according to them corresponded best to the declarative sentence they were listening to. The verbatim instruction text is given in appendix 5.3.1. The subjects were tested as a group.

**Listeners**. Forty native speakers of Greek participated in the experiment, twenty females and twenty males. All native speakers belonged to the same age group (age range from 25 to 30). None of them reported hearing disorders. They all had a university educational level and spoke standard Athenian Greek.[7] These forty speakers had not participated in the production experiment.

[7] No regional effects have been reported on focus marking in Greek intonation.

### 5.2.2 Results

In total 960 responses (24 stimuli × 40 listeners) were analyzed. Table 5.3 cross-tabulates the intended against the perceived focus distributions. Listeners seem to perceive some differences among the types of focus. As indicated in table 5.3, sentence focus is perceived below chance level, verb phrase focus is perceived just above chance level, while postverbal object focus is perceived well above chance level.

Table 5.3 Perceived focus (%) as a function of intended focus.

| | Responses (across) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | $[_{S}SVO]_{Foc}$ | | | $S[_{VP}VO]_{Foc}$ | | | $SV[_{NP}O]_{Foc}$ | | |
| Intended focus (down) | Total | Fem. | Male | Total | Fem. | Male | Total | Fem. | Male |
| $[_{S}SVO]_{Foc}$ | **14.1** | **8.8** | **19.4** | 31.3 | 40.0 | 22.5 | 54.6 | 51.2 | 58.1 |
| $S[_{VP}VO]_{Foc}$ | 7.2 | 5.6 | 8.8 | **42.2** | **45.6** | **38.8** | 50.6 | 48.8 | 52.4 |
| $SV[_{NP}O]_{Foc}$ | 3.7 | 1.3 | 6.3 | 21.6 | 18.7 | 24.3 | **74.7** | **80.0** | **69.4** |

In particular, when the focus intended by the speakers (recall that there were two speakers) was sentence focus, then, it was perceived as such in 14.1% of the cases. When the intended focus was verb-phrase focus, it was correctly perceived in 42.2% of the cases. When the intended focus was postverbal object focus, then, it was correctly perceived in 74.7% of the cases.

The distribution of responses differs significantly across focus types also in terms of incorrect responses. Specifically, when the intended focus type is postverbal object focus, then, sentence focus is hardly ever chosen as a response (3.8%). When the intended focus type is verb-phrase focus, then the distribution of responses is much more balanced.

Moreover, out of 960 utterances, sentence focus was chosen as a response 80 times, i.e. 8.3%, while verb phrase focus was chosen as a response 304 times, i.e. 31.7% and postverbal object focus was chosen as a response 576 times, i.e. 60%. These results show that there is a preference for choosing postverbal object focus as an answer, and that listeners avoid choosing sentence focus as an answer. This might be interpreted as a response bias towards postverbal object focus. It should be noted that the preference for postverbal object focus and the avoidance of sentence focus may not be related to the acoustic properties of the stimuli. There are two factors that may be involved here. First, Crain et al. (1994) have experimentally shown that adults follow a least-effort strategy during ambiguity resolution, reducing the risk of making commitments that will need to be changed later. In this sense, the avoidance of sentence focus as a response may be related to the least-effort strategy. Second, it has been argued that the word order VSO in Greek can answer a question that triggers sentence focus (see Philippaki-Warburton 1982, Alexiadou 2006, Roussou-Tsimpli 2006, among many others).

The availability of another word order, namely, VSO for answering a question that triggers sentence focus may be related to the avoidance of sentence focus as a response. More research is required to clarify this point.

Table 5.3 should also be read vertically. When sentence focus is selected as a response, then, it coincides with the focus intended by the speaker in 14.1%. This percentage is almost double the incorrect response 'verb-phrase focus' (7.2%). When verb-phrase focus is selected as a response, it coincides with the focus intended by the speaker in 42.2%. This is 10.9% higher than the incorrect response 'sentence focus'. When postverbal object focus is selected as a response, it coincides with the focus intended by the speaker in 74.7%. This is 20.1% higher than the incorrect response 'sentence focus'.

As shown in table 5.3, female listeners are more proficient in perceiving focus. When the focus intended by the speakers was postverbal object focus, then, 80% of the female listeners perceived it correctly, as opposed to 69% of the male listeners. When the focus intended by the speakers was verb phrase focus, then female listeners were 7% better at perceiving it correctly. However, male listeners are better at the perception of sentence focus. When the focus intended by the speaker was sentence focus, then, male listeners exceeded female listeners in perceiving sentence focus correctly by a ratio of roughly 2:1. Nineteen % of the male listeners perceived sentence focus correctly, as opposed to 9% of the female listeners.

Table 5.4 shows the perceived focus as a function of intended focus per speaker. As indicated in table 5.4, the male speaker is more efficient in communicating focus. When the intended focus was sentence focus, then, the male speaker was almost twice as successful as the female speaker. In particular, the male speaker was perceived correctly in 20% of the cases, while the femaly speaker was perceived correctly only in 9% of the cases. When the intended focus was verb phrase focus, the difference between the two genders was smaller. In 44% of the cases, the listeners perceived correctly the male speaker, while in 41% of the cases, the listeners perceived correctly the female speaker. Finally, when the intended focus was postverbal object focus, then in 76% of the cases, the male speaker was perceived correctly, whereas the female speaker was perceived correctly in 73% of the cases.

Table 5.4 Speakers per gender & responses

| | | Responses (across) | | |
|---|---|---|---|---|
| Intended focus (down) | | $[_{S}SVO]_{Foc}$ | $S[_{VP}VO]_{Foc}$ | $SV[_{NP}O]_{Foc}$ |
| male speaker | $[_{S}SVO]_{Foc}$ | **19.5** | 32.1 | 48.4 |
| | $S[_{VP}VO]_{Foc}$ | 9.4 | **43.8** | 46.8 |
| | $SV[_{NP}O]_{Foc}$ | 1.9 | 21.7 | **76.4** |
| female speaker | $[_{S}SVO]_{Foc}$ | **8.7** | 30.4 | 60.9 |
| | $S[_{VP}VO]_{Foc}$ | 5.0 | **40.6** | 54.4 |
| | $SV[_{NP}O]_{Foc}$ | 5.6 | 21.4 | **73.0** |

Table 5.5 presents the distribution of listeners' performance in terms of mean correct responses. The mean correct responses per listener range between 33.3% and 54.1%. As can be seen in table 5.5, there are 15 listeners with a mean correct response rate of 41.6%. This is actually the most populated group.

Table 5.5 Listeners' distribution

| Number of Listeners | Mean % correct responses |
|---|---|
| 1 | 33.3 |
| 7 | 37.5 |
| 15 | 41.6 |
| 7 | 45.8 |
| 9 | 50.0 |
| 1 | 54.1 |

The 10 listeners with best performance in terms of mean correct responses were selected and the analysis was run again. Table 5.6 shows the results of the analysis. As indicated in table 5.6, sentence focus is still perceived below chance level, 21.3%. It should, however, be noted that in the case of sentence focus the ten best listeners performed 7.2% better than the group as a whole. When the focus intended by the speakers was verb phrase focus, then it was correctly perceived by 53.1% of the ten best listeners. This percentage is 10.9 lower, when referring to the listeners as a whole. When the focus intended by the speakers was postverbal object focus, then, the ten best listeners performed only slightly better. They performed only 1.6% better than the whole group.

Table 5.6 Responses of ten best listeners

| | Responses (across) | | |
|---|---|---|---|
| Intended focus (down) | $[_{S}SVO]_{Foc}$ | $S[_{VP}VO]_{Foc}$ | $SV[_{NP}O]_{Foc}$ |
| $[_{S}SVO]_{Foc}$ | **21.3** | 33.7 | 45.0 |
| $S[_{VP}VO]_{Foc}$ | 7.4 | **53.1** | 39.5 |
| $SV[_{NP}O]_{Foc}$ | 6.3 | 17.4 | **76.3** |

The sensitivity of responses with respect to the sets was also investigated. On average most correct answers were given to stimulus set 1, i.e. 54.2%, while most wrong responses were given to set 5, i.e. 39.2%. Ironically, the only difference between set 1 and set 5 is the gender of speaker.

### 5.2.3 Conclusions

In this perception experiment, natural stimuli were used. This experiment aimed at investigating whether listeners perceive a difference among sentence focus, verb-phrase focus and postverbal object focus. The results of the experiment show that listeners perceive postverbal object focus SV[$_{NP}$O]$_{Foc}$ well above chance level (74.7%) and verb-phrase focus S[$_{VP}$VO]$_{Foc}$ above chance level (42.2%). Sentence focus [$_{S}$SVO]$_{Foc}$ is perceived below chance level (14.1%). Taking into consideration the perception scores and the observation below table 5.6, a general question emerges, namely, which are the acoustic cues that are used by listeners to perceive focus? To tackle this question, the acoustic properties of the stimuli that were used in this perception experiment were examined and a supplementary perception experiment was performed.

## 5.3 Perception experiment two - manipulated stimuli

In sections 5.1 and 5.2, I discussed a production and a perception experiment on focus. The results of the production experiment were not conclusive with respect to the role of the accentual downstep and its possible association with a specific focus type.[8] Recall that speakers produced a downstep between the pitch peak of the first content word and that of the second content word. The downstep varied among the four focus types, i.e. among sentence focus, verb-phrase focus, postverbal object focus and preverbal object focus. The downstep produced in preverbal object focus was significantly larger than in the other three focus types. The downstep produced in sentence focus, [$_{S}$SVO]$_{Foc}$, was significantly larger than that produced in verb-phrase focus, S[$_{VP}$VO]$_{Foc}$, and in postverbal object focus, SV[$_{NP}$O]$_{Foc}$. As already noted in section 5.1, the downstep in verb-phrase focus does not differ significantly from the downstep in postverbal focus. The results of the perception experiment that used natural stimuli showed that the various types of focus are not transmitted equally well. On the one hand, postverbal object focus SV[$_{NP}$O]$_{Foc}$ and verb-phrase focus S[$_{VP}$VO]$_{Foc}$ were identified above chance level(=33%). Listeners identified correctly postverbal object focus at 74.7% and verb-phrase focus at 42.2%. On the other hand, sentence focus [$_{S}$SVO]$_{Foc}$ was perceived below chance level (14.1%). On the strength of these results, it was decided to investigate the role of the accentual downstep as an acoustic cue for focus. Therefore, I decided to examine (i) the effect of break between the first and the second content word, i.e. between the subject and the verb, (ii) the effect of

[8] The term focus type is to be understood here as referring to the focus domain as well as its position in the sentence. In this respect there are four focus types, namely, sentence focus, verb-phrase focus, postverbal object focus and preverbal object focus.

accent on the verb and (iii) the effect of accent on the object on focus perception. The experiment aimed at tackling the question in (7).

(7) What is the relative importance of (i) break, (ii) accent on the verb and (iii) accent on the object on the perception of focus?

To answer this question, a perception experiment that used manipulated stimuli was performed.

### 5.3.1 Methods

**Stimuli**. A number of 48 manipulated stimuli was used. These 48 stimuli were generated from six original stimuli. The six stimuli originated from the production experiment (see section 5.1), and were produced by a male speaker.[9] The six base stimuli consisted of two lexical sets, (i) lexical set A and (ii) lexical set B. Each lexical set had identical word order, namely, Subject – Verb – Object. Both lexical sets contained only sonorants. Sonorants were used to elicit continuous F0 contours. The two lexical sets are exemplified in (8) and (9).

(8) Lexical set A

| | | | |
|---|---|---|---|
| I | Marina | anameni | 'minima |
| the.NOM | Marina.NOM | await.3SG | message.ACC |

'Marina is waiting for a message.'

(9) Lexical set B

| | | | |
|---|---|---|---|
| I | ioni | miniun | nine'mia. |
| the.NOM | omens.NOM | foretell.3PL | tranquility.ACC |

'The omens are foretelling tranquility.'

As shown in examples (8) and (9), there is a difference between the two lexical sets. In lexical set A, the object is stressed on the antepenultimate, whereas in lexical set B, the object is stressed on the penultimate. This difference in stress is reflected in the pitch contour in terms of alignment and steepness of the fall. An illustration of the difference is given in figure 5.8.

[9] The male speaker was preferred over the female speaker, as in the perception experiment it was found that the male speaker is more efficient in communicating focus.

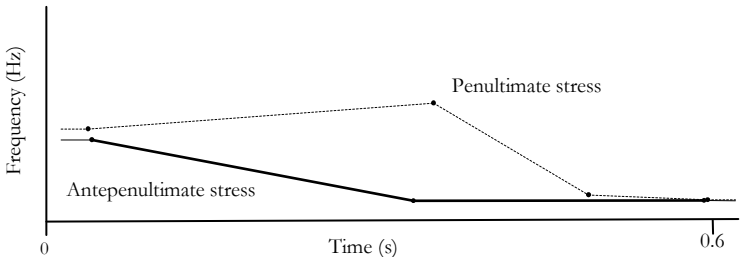


Figure 5.8 Stylized pitch contours of base stimuli with an object with penultimate stress (dotted line), and with antepenultimate stress (solid line).

Each lexical set had identical wording but was produced aiming at three different focus conditions; namely, a sentence focus, $[_{S}SVO]_{Foc}$, a verb-phrase focus, $S[_{VP}VO]_{Foc}$, and a postverbal object focus, $SV[_{NP}O]_{Foc}$. An example is given in (10).

(10) a. $[_{S}$I Marina anameni minima$]_{Foc}$.
b. I Marina $[_{VP}$ anameni minima$]_{Foc}$.
c. I Marina anameni $[_{NP}$ minima$]_{Foc}$.
'Marina is waiting for a message.'

Starting from two lexical sets and three focus conditions, the stimuli were manipulated with respect to (i) break after the subject, (ii) accent on the verb and (iii) high accent on the object, using the Praat speech processing software (Boersma & Weenink 2003). When manipulating the presence versus absence of the break, the initial make-up of the stimuli was taken into account. In lexical set A, the stimulus was shortened by 0.150s, which is the duration of the physical silence that was eliminated from the original stimulus. In lexical set B, a 0.100s pause was eliminated from the original the stimulus. An illustration is given in figure 5.9.

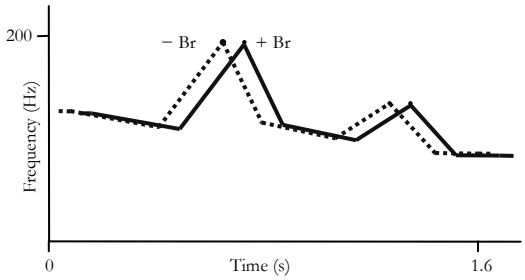


Figure 5.9 Stylized pitch patterns. The two patterns differ only with respect to the break after the subject. The pitch pattern that is depicted by the plain line has a break after the subject (S) and it is shifted by 0.150s, whereas the pitch pattern depicted by the dashed line lacks the break.

Stimuli were also modified with respect to the accent on the verb. Specifically, the accent on the verb was modified in three ways, namely, (i) no accent on the verb (V0), (ii) normal accent on the verb (V1) and (iii) high accent on the verb (V2). In modifying the accent on the verb, the initial make-up of the stimuli was taken into account. The verb phrase in these stimuli contained a simple rise on the verb followed by a simple fall on the object. The stylized F0 contour of base stimulus was used as V1. V0 was derived from V1 by deleting the F0 peak on the verb, such that the original rise was replaced by a stretch of declination. V2 was generated by raising the F0 peak in V1 such that the interval between V2 and V0 was twice the interval V1–V0. In the case of V2 the onset of the fall on the subsequent fall was also doubled relative to the baseline. In lexical set A, the pitch values were 107 Hz for V0, 147Hz for V1 and 191Hz for V2, while in lexical set B, the pitch values were 115, 180, and 220Hz, respectively. An example is given in figure 5.10.

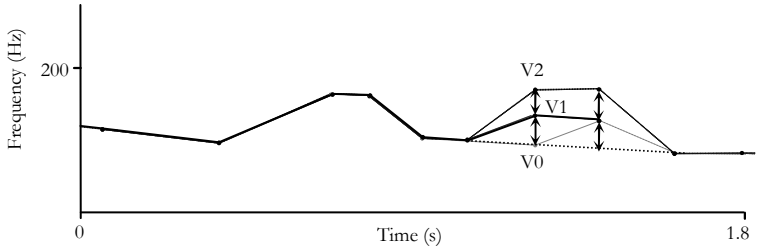


Figure 5.10 Manipulations of verb accent. The accent on the verb was manipulated in three ways; (i) no accent on the verb (V0), (ii) accent on the verb (V1) and (iii) higher accent on the verb (V2).

Finally, stimuli were modified with respect to the high accent on the object (± O). In lexical set A, the pitch values for the object were 141Hz and 192Hz, while in lexical set B, the pitch values were 182Hz and 250Hz. The −O version was copied from the base stimulus, whilst the +O version was given twice the pitch interval in Hz (re. the baseline) of the −O version. An illustration is given in figure 5.11.

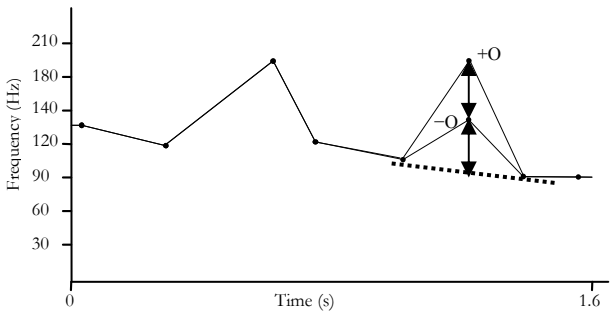


Figure 5.11. Stylized pitch patterns. The two patterns differ only with respect to the high accent on the object. The pitch pattern that is depicted by the dotted line features a high accent on the object, whereas the pitch pattern that is represented by the plain line lacks it.

All possible combinations of break after the subject, accent on the verb and high accent on the object were considered. This resulted in twelve combinations. Four combinations, however, were excluded on the basis of the results of the production experiment. The reason for this exclusion was that such combinations were never produced by the speakers in the production experiment. All possible combinations are given in table 5.7; the combinations that were eliminated from the design are indicated in shaded rows.

Table 5.7 Possible combinations of break, accent on the verb and accent on the object. (V0=no accent on the verb, V1=accent on the verb, V2=higher accent on the verb)

| Break | Accent on V. | High Accent on O. |
|---|---|---|
| + | V2 | + |
| + | V2 | − |
| + | V0 | − |
| + | V1 | + |
| + | V1 | − |
| + | V0 | + |
| − | V2 | + |
| − | V2 | − |
| − | V0 | − |
| − | V1 | + |
| − | V1 | − |
| − | V0 | + |

Note: The excluded combinations are marked with grey-shading.

An example illustration of four combinations included is given in figure 5.12.

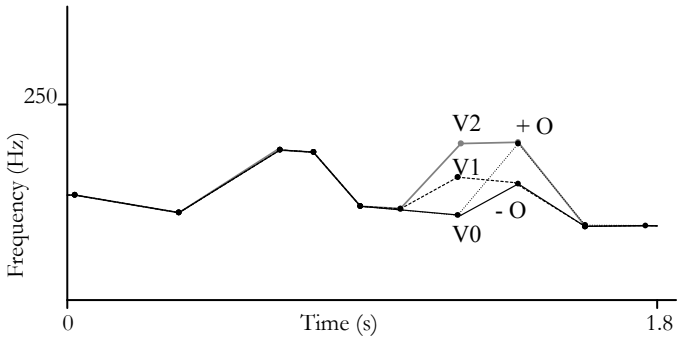


Figure 5.8. Selected manipulated pitch patterns. The four patterns are identical with respect to break; they differ wrt. to the accent on the verb and the accent on the object.

Having two lexical sets, three focus types and eight combinations (2 × 3 × 8), we obtained a total of 48 manipulated stimuli. These stimuli were randomized. A list of the materials can be found in appendix 5.4.

**Procedure**. The experiment was conducted over the internet using an html interface.[10] A sound icon, a set of three questions and a confidence scale appeared on the screen each time a new stimulus was presented (i.e. 48 times). The set of three questions consisted of a question that triggered sentence focus, a question that triggered verb phrase focus and a question that triggered object focus. The confidence scale was a horizontal 11-point scale (where 0 = 'totally uncertain' and 10 = 'totally certain'). Listeners were asked to play the stimulus by clicking the sound icon. They could listen to each stimulus only once and were not allowed to go back to earlier stimuli. The listeners' task was twofold. Firstly, listeners were to tick the question which according to them corresponded best to the declarative sentence they had listened to. Secondly, listeners were asked to indicate their degree of confidence by ticking the value of their choice on the 11-point scale. The verbatim text of the instructions is given in appendix 5.4.1. There were no practice items and no feedback on the results was given to the subjects. The experiment was self-paced, and lasted approximately 18 minutes.

**Listeners**. Forty-nine native speakers of Greek participated in the experiment, thirty-two females and seventeen males. All listeners belonged to the same age group (age range from 25 to 30). All listeners were acquaintances of the experimenter (i.e. the present author, S.G.), who knew that they were native speakers, with native-Greek speaking parents. None of the forty-nine speakers reported any hearing disorders, when responding to the invitation to take part in

[10] The internet application was programmed by Ing. Jos J.A. Pacilly, systems manager at the LUCL Phonetics Laboratory.

the experiment. All subjects had a university educational level and spoke standard Athenian Greek.[11] They had neither participated in the production experiment nor in the previous perception experiment.

### 5.3.2 Results

In total, 2352 responses (48 stimuli × 49 listeners) were analyzed. Listeners were cross-tabulated against the responses. Two listeners were excluded from further analysis on the basis of their responses: these listeners selected only the question that triggered focus on the object as an answer. This was taken as an indication that they were not sensitive to the experimental task.

The confidence ratings with which the listeners gave their choices were generally very high, i.e. close to 10 on the 11-point scale. This would imply that the choices were easy and clear-cut for individual listeners. As a result of the lack of discrimination in terms of confidence, I decided not to use any confidence scores in the remaining analysis.

The results of the experiment are summarized in table 5.8. This table lists the percentage with which the stimuli were identified as $S[_{VP}VO]_{Foc}$, $[_{S}SVO]_{Foc}$ and $SV[_{NP}O]_{Foc}$, as a function of the five factors, and their combinations, in the design of the experiment.

Table. 5.8 Percentage with which the stimuli were identified as $S[_{VP}VO]_{Foc}$, $[_{S}SVO]_{Foc}$ and $SV[_{NP}O]_{Foc}$, as a function of the five factors, and their combinations. NoAccV= no accent on the verb, AccV= accent on the verb, H.AccV= high accent on the verb, AccO= accent on the object, H.AccO= high accent on the object. Percentages add per column

| | | Lexical A | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Base $S[_{VP}VO]_{Foc}$ | | | | | | | |
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **$S[_{VP}VO]_{Foc}$** | 36.2 | 46.8 | 34.0 | 31.9 | 59.6 | 57.4 | 57.4 | 63.8 |
| | **$[_{S}SVO]_{Foc}$** | 23.4 | 27.7 | 34.0 | 34.0 | 17.0 | 19.1 | 14.9 | 17.0 |
| | **$SV[_{NP}O]_{Foc}$** | 40.4 | 25.5 | 31.9 | 34.0 | 23.4 | 23.4 | 27.7 | 19.1 |

[11] No regional effects have ever been reported on focus marking in Greek intonation.

| | | [SSVO]Foc | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **S[VPVO]Foc** | 36.2 | 34.0 | 29.8 | 29.8 | 51.1 | 59.6 | 51.1 | 61.7 |
| | **[SSVO]Foc** | 29.8 | 27.7 | 46.8 | 17.0 | 25.5 | 12.8 | 21.3 | 10.6 |
| | **SV[NPO]Foc** | 34.0 | 38.3 | 23.4 | 53.2 | 23.4 | 27.7 | 27.7 | 27.7 |

| | | SV[NPO]Foc | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **S[VPVO]Foc** | 36.2 | 44.7 | 31.9 | 25.5 | 63.8 | 57.4 | 48.9 | 55.3 |
| | **[SSVO]Foc** | 36.2 | 27.7 | 34.0 | 27.7 | 6.4 | 10.6 | 21.3 | 12.8 |
| | **SV[NPO]Foc** | 27.7 | 27.7 | 34.0 | 46.8 | 29.8 | 31.9 | 29.8 | 31.9 |

| | | Lexical B | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | S[VPVO]Foc | | | | | | | |
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **S[VPVO]Foc** | 38.3 | 21.3 | 36.2 | 23.4 | 48.9 | 46.8 | 53.2 | 46.8 |
| | **[SSVO]Foc** | 14.9 | 6.4 | 17.0 | 6.4 | 19.1 | 8.5 | 12.8 | 8.5 |
| | **SV[NPO]Foc** | 46.8 | 72.3 | 46.8 | 70.2 | 31.9 | 44.7 | 34.0 | 44.7 |

| | | [SSVO]Foc | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **S[VPVO]Foc** | 23.4 | 19.1 | 31.9 | 6.4 | 34.0 | 48.9 | 48.9 | 21.3 |
| | **[SSVO]Foc** | 17.0 | 6.4 | 14.9 | 10.6 | 14.9 | 10.6 | 23.4 | 2.1 |
| | **SV[NPO]Foc** | 59.6 | 74.5 | 53.2 | 83.0 | 51.1 | 40.4 | 27.7 | 76.6 |

| | | $SV[_{NP}O]_{Foc}$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | No Break | | | | Break | | | |
| | | NoAccV | | AccV | H.AccV | NoAccV | | AccV | H.AccV |
| | | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO | AccO | H.AccO |
| Responses | **$S[_{VP}VO]_{Foc}$** | 40.4 | 36.2 | 44.7 | 19.1 | 40.4 | 29.8 | 42.6 | 31.9 |
| | **$[_{S}SVO]_{Foc}$** | 23.4 | 14.9 | 23.4 | 6.4 | 14.9 | 4.3 | 17.0 | |
| | **$SV[_{NP}O]_{Foc}$** | 36.2 | 48.9 | 31.9 | 74.5 | 44.7 | 66.0 | 40.4 | 68.1 |

The main findings of table 5.8 are the following: (i) Break plays a role in focus perception. More specifically, the presence of break favors verb-phrase focus ($S[_{VP}VO]_{FOC}$), while its absence favors all-sentence focus ($[_{S}SVO]_{Foc}$), (ii) High accent on the object favors object focus ($SV[_{NP}O]_{Foc}$), especially in the case of lexical set B,[12] and (iii) Accent on the verb favors verb-phrase focus.

A multinomial logistic regression model was employed to estimate the probability of selecting a specific focus type. The dependent variable is a 3-category variable, namely the listeners' response. The predicted possible outcomes are i) a question that triggers sentence focu, $[Sent.]_{Foc}Q$, ii) a question that triggers verb phrase focus, $[VP]_{Foc}Q$ and iii) a question that triggers object focus $[O]_{Foc}Q$. There were five independent variables: (i) lexical set, (ii) focus type, (iii) break, (iv) accent on the verb and (v) accent on the object. In the model, besides the main effects, we also included all two and three-way interaction effects. These interactions convey information about whether the effect of each independent variable differs for the various values of the other variables. For example, the two-way interaction of lexical set and break indicates whether the break has a different effect on the listeners' responses in lexical set A than in lexical set B. The model indicated that only the three main effects and the interaction between lexical set and accent on the object are significant. The interaction between lexical set and break was marginally significant (p=.048). [13] The step summary and the model-fitting information are given in tables 5.9 and 5.10, respectively.

Table 5.9 Step Summary

| Model | Effect(s) | Model Fitting Criteria | | | Effect Selection Tests | | |
|---|---|---|---|---|---|---|---|
| | | AIC | BIC | -2 Log Likelihood | Chi-Square (a,b) | df | Sig. |
| Step 0 | Intercept | 745.283 | 756.726 | 741.283 | . | | |
| Step 1 | Lexical (L) | 628.511 | 651.396 | 620.511 | 120.772 | 2 | .000 |

[12] I assume that this is related with the stress difference between lexical set A and B.
[13] This was done by applying the forward stepwise inclusion of main effects and interaction terms.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Step 2 | Break (B) | 554.148 | 588.476 | 542.148 | 78.363 | 2 | .000 |
| Step 3 | Accent_O (A_O) | 512.234 | 558.004 | 496.234 | 45.914 | 2 | .000 |
| Step 4 | L* A_O | 495.485 | 552.699 | 475.485 | 20.748 | 2 | .000 |
| Step 5 | Accent_V | 490.792 | 570.890 | 462.792 | 12.694 | 4 | .013 |
| Step 6 | L*B | 488.726 | 580.268 | 456.726 | 6.066 | 2 | .048 |

Stepwise Method: Forward Stepwise

a. The chi-square for entry is based on the likelihood ratio test.

b. The chi-square for removal is based on the likelihood ratio test.

Table 5.10 Model Fitting Information

| Model | Model Fitting Criteria | | | Likelihood Ratio Tests | | |
|---|---|---|---|---|---|---|
| | AIC | BIC | -2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept Only | 745.283 | 756.726 | 741.283 | | | |
| Final | 488.726 | 580.268 | 456.726 | 284.557 | 14 | .000 |

The results of the logistic regression analysis are summarized in tables 5.11, 5.12 and 5.13. Each table presents the results of two response categories relative to those of a third, reference category. Table 5.11 presents the results for response categories $[VP]_{Foc}Q$ and $[Sent.]_{Foc}Q$ relative to $[O]_{Foc}Q$, table 5.12 presents the results for $[Sent.]_{Foc}Q$ and $[O]_{Foc}Q$ relative to $[VP]_{Foc}Q$, and table 5.13 for $[VP]_{Foc}Q$ and $[O]_{Foc}Q$ relative to $[Sent.]_{Foc}Q$. Within each table, all main effects and two-way interactions are specified with a B-coefficient, which is the value with which a stimulus category parameter should be multiplied in order to optimally contribute to the prediction of the response category. The B-value cannot be taken at face value, as its range depends on the nominal values of the categories on the factor. The second statistic (Wald value) is an appropriate indication of the relative importance of a particular parameter in the prediction of the response category. The significance of the Wald statistics co-depends on the number of degrees of freedom in the categories distinguished along a factor (N categories –1). Each table begins with the specification of the intercept, which is not a specific effect of a factor or category along a factor, but establishes the degree of overall bias favoring the response category at issue. The bias will not be considered as such; it merely functions as a baseline against which the effects of factors and interactions are visible.

Table 5.11 Parameters Estimates. Response categories [VP]$_{FOC}$Q and [Sent.] $_{FOC}$Q relative to [O] $_{FOC}$Q

| Answer | Effect / Interaction | B | Wald | Df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| [VP]$_{FOC}$Q | Intercept | -.715 | 28.772 | 1 | .000 | |
| | Lexical Set 1 | 1.255 | 58.108 | 1 | .000 | 3.509 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | -.589 | 19.322 | 1 | .000 | .555 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | .418 | 9.407 | 1 | .002 | 1.519 |
| | Accent_V 1 | .518 | 7.167 | 1 | .007 | 1.679 |
| | Accent_V 2 | 0(b) | . | 0 | . | . |
| | Accent_O 0 | .492 | 9.137 | 1 | .003 | 1.636 |
| | Accent_O 1 | 0(b) | . | 0 | . | . |
| | L*B 1, 0 | -.166 | .731 | 1 | .393 | .847 |
| | L*B 1,1 | 0(b) | . | 0 | . | . |
| | L *B 2,0 | 0(b) | . | 0 | . | . |
| | L*B 2, 1 | 0(b) | . | 0 | . | . |
| | L*A_O 1,0 | -.731 | 14.131 | 1 | .000 | .482 |
| | L*A_O 1,1 | 0(b) | . | 0 | . | . |
| | L*A_O 2,0 | 0(b) | . | 0 | . | . |
| | L*A_O 2, 1 | 0(b) | . | 0 | . | . |
| [Sent.] $_{FOC}$Q | Intercept | -2.359 | 113.352 | 1 | .000 | |
| | Lexical Set 1 | 1.467 | 33.500 | 1 | .000 | 4.335 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | -.055 | .081 | 1 | .776 | .947 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | .380 | 3.961 | 1 | .047 | 1.462 |
| | Accent_V 1 | .627 | 6.196 | 1 | .013 | 1.871 |
| | Accent_V 2 | 0(b) | . | 0 | . | . |
| | Accent_O 0 | 1.021 | 18.288 | 1 | .000 | 2.776 |
| | Accent_O 1 | 0(b) | . | 0 | . | . |
| | L*B 1 0 | .462 | 3.221 | 1 | .073 | 1.587 |
| | L*B 1 1 | 0(b) | . | 0 | . | . |
| | L*B 2 0 | 0(b) | . | 0 | . | . |
| | L*B 2 1 | 0(b) | . | 0 | . | . |

| | | | | | |
|---|---|---|---|---|---|
| L*A_O 1 0 | -1.008 | 14.611 | 1 | .000 | .365 |
| L*A_O 1 1 | 0(b) | . | 0 | . | . |
| L*A_O 2 0 | 0(b) | . | 0 | . | . |
| L*A_O 2 1 | 0(b) | . | 0 | . | . |

a. The reference category is: [O] FOCQ.
b. This parameter is set to zero because it is redundant.

Table 5.12 Parameters Estimates. Response categories [Sent.] FOCQ and [O] FOCQ relative to [VP]FOCQ

| Answer | Effect / Interaction | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| [Sent.]FocQ | Intercept | -1.644 | 51.359 | 1 | .000 | |
| | Lexical Set 1 | .211 | .709 | 1 | .400 | 1.235 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | .534 | 7.202 | 1 | .007 | 1.706 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | -.038 | .040 | 1 | .842 | .962 |
| | Accent_V 1 | .108 | .188 | 1 | .665 | 1.114 |
| | Accent_V 2 | 0(b) | . | 0 | . | . |
| | Accent_O 0 | .529 | 4.652 | 1 | .031 | 1.696 |
| | Accent_O 1 | 0(b) | . | 0 | . | . |
| | L*B 1 0 | .628 | 6.068 | 1 | .014 | 1.874 |
| | L*B 1 1 | 0(b) | . | 0 | . | . |
| | L*B 2 0 | 0(b) | . | 0 | . | . |
| | L*B 2 1 | 0(b) | . | 0 | . | . |
| | L*A_O 1 0 | -.277 | 1.091 | 1 | .296 | .758 |
| | L*A_O 1 1 | 0(b) | . | 0 | . | . |
| | L*A_O 2 0 | 0(b) | . | 0 | . | . |
| | L*A_O 2 1 | 0(b) | . | 0 | . | . |
| [O] FOCQ | Intercept | .715 | 28.772 | 1 | .000 | |
| | Lexical Set 1 | -1.255 | 58.108 | 1 | .000 | .285 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | .589 | 19.322 | 1 | .000 | 1.802 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | -.418 | 9.407 | 1 | .002 | .658 |
| | Accent_V 1 | -.518 | 7.167 | 1 | .007 | .596 |

| | | | | | |
|---|---|---|---|---|---|
| Accent_V 2 | 0(b) | . | 0 | . | . |
| Accent_O 0 | -.492 | 9.137 | 1 | .003 | .611 |
| Accent_O 1 | 0(b) | . | 0 | . | . |
| L*B 1 0 | .166 | .731 | 1 | .393 | 1.181 |
| L*B 1 1 | 0(b) | . | 0 | . | . |
| L*B 2 0 | 0(b) | . | 0 | . | . |
| L*B 2 1 | 0(b) | . | 0 | . | . |
| L*A_O 1 0 | .731 | 14.131 | 1 | .000 | 2.077 |
| L*A_O 1 1 | 0(b) | . | 0 | . | . |
| L*A_O 2 0 | 0(b) | . | 0 | . | . |
| L*A_O 2 1 | 0(b) | . | 0 | . | . |

a. The reference category is: $[VP]_{FOC}Q$.
b. This parameter is set to zero because it is redundant.

Table 5.13 Parameters Estimates. Response Categories $[VP]_{Foc}Q$ and $[O]_{Foc}$ relative to $[Sent.]_{Foc}$.

| Answer | Effect / Interaction | Wald | B | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| $[VP]_{Foc}Q$ | Intercept | 1.644 | 51.359 | 1 | .000 | |
| | Lexical Set 1 | -.211 | .709 | 1 | .400 | .810 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | -.534 | 7.202 | 1 | .007 | .586 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | .038 | .040 | 1 | .842 | 1.039 |
| | Accent_V 1 | -.108 | .188 | 1 | .665 | .897 |
| | Accent_V 2 | 0(b) | . | 0 | . | . |
| | Accent_O 0 | -.529 | 4.652 | 1 | .031 | .589 |
| | Accent_O 1 | 0(b) | . | 0 | . | . |
| | L*B 1 0 | -.628 | 6.068 | 1 | .014 | .534 |
| | L*B 1 1 | 0(b) | . | 0 | . | . |
| | L*B 2 0 | 0(b) | . | 0 | . | . |
| | L*B 2 1 | 0(b) | . | 0 | . | . |
| | L*A_O 1 0 | .277 | 1.091 | 1 | .296 | 1.319 |
| | L*A_O 1 1 | 0(b) | . | 0 | . | . |
| | L*A_O 2 0 | 0(b) | . | 0 | . | . |
| | L*A_O 2 1 | 0(b) | . | 0 | . | . |

| | | | | | | |
|---|---|---|---|---|---|---|
| $[O]_{Foc}Q$ | Intercept | 2.359 | 113.352 | 1 | .000 | |
| | Lexical Set 1 | -1.467 | 33.500 | 1 | .000 | .231 |
| | Lexical Set 2 | 0(b) | . | 0 | . | . |
| | Break 0 | .055 | .081 | 1 | .776 | 1.056 |
| | Break 1 | 0(b) | . | 0 | . | . |
| | Accent_V 0 | -.380 | 3.961 | 1 | .047 | .684 |
| | Accent_V 1 | -.627 | 6.196 | 1 | .013 | .534 |
| | Accent_V 2 | 0(b) | . | 0 | . | . |
| | Accent_O 0 | -1.021 | 18.288 | 1 | .000 | .360 |
| | Accent_O 1 | 0(b) | . | 0 | . | . |
| | L*B 1 0 | -.462 | 3.221 | 1 | .073 | .630 |
| | L*B 1 1 | 0(b) | . | 0 | . | . |
| | L*B 2 0 | 0(b) | . | 0 | . | . |
| | L*B 2 1 | 0(b) | . | 0 | . | . |
| | L*A_O 1 0 | 1.008 | 14.611 | 1 | .000 | 2.740 |
| | L*A_O 1 1 | 0(b) | . | 0 | . | . |
| | L*A_O 2 0 | 0(b) | . | 0 | . | . |
| | L*A_O 2 1 | 0(b) | . | 0 | . | . |

a. The reference category is: $[Sent.]_{Foc}Q$.

b. This parameter is set to zero because it is redundant.

Let us first consider table 5.11. Comparing the probability of getting $[VP]_{Foc}Q$ to the probability of getting $[O]_{Foc}Q$, we see that when there is no break, the probability of getting $[VP]_{Foc}Q$ is lower than getting $[O]_{Foc}Q$. When there is no accent on the verb, or when the verb has accent V1, there is a higher probability of getting $[VP]_{Foc}Q$ than $[O]_{Foc}Q$ than when the verb accent is V2. The effect of accent on the object differs between the two lexical sets. The main effect of accent on the object is valid for lexical set 2. The main effect shows that when there is no high accent on the object, there is a higher probability of getting $[VP]_{Foc}Q$ than $[O]_{Foc}Q$. To see the effect of accent on the object on lexical set 1, we need to add the main effect of accent on the object and the interaction effect between the accent on the object and lexical set 1. This gives −0.239. This result implies that the accent on the object has an opposite effect in the case of lexical set 1. To further investigate this finding, we ran the same logistic regression as above changing the reference category for the lexical set. The results of the regression showed that the main effect of accent on the object in the case of lexical set 1 is not significant. In this respect, accent on the object is not a significant predictor of the probability of getting $[VP]_{Foc}Q$ instead of $[O]_{Foc}Q$ in the case of lexical set 1.

Comparing the probability of getting [Sent.]$_{Foc}$Q instead of [O]$_{Foc}$Q, we see that the break is not a significant predictor. When there is no accent on the verb, or when the verb has accent V1, there is a higher probability of getting [Sent.]$_{Foc}$Q than [O]$_{Foc}$Q, compared to the verb having an accent V2. The main effect of accent on the object is valid for the lexical set 2. When there is no high accent on the object, there is a higher probability of getting [Sent.]$_{Foc}$Q than [O]$_{Foc}$Q. To examine the effect of accent on the object on lexical set 1, we need to add the main effect of accent on the object and the interaction effect between the accent on the object and the lexical set 1. This gives a number close to zero and it means that the accent on the object is not a significant predictor in the case of lexical set 1.

Comparing the probability of getting [Sent.]$_{Foc}$Q to [VP]$_{Foc}$Q, we see that the main effect of break is valid for lexical set 2. When there is no break, then the probability of getting [Sent.]$_{Foc}$Q is higher than getting [VP]$_{Foc}$Q. To examine the effect of break on lexical set 1, we need to add the main effect of break and the interaction effect between the break and the lexical set 1. This gives 1.162 and it means that break is also a significant predictor in the case of lexical set 1. Accent on the verb is not a significant predictor of the probability of getting [Sent.]$_{Foc}$Q than getting [VP]$_{Foc}$Q. Accent on the object is a significant predictor. When there is no high accent on the object, then there is higher probability of getting [Sent.]$_{Foc}$Q than getting [VP]$_{Foc}$Q.

### 5.3.3 Conclusions

The aim of this experiment that used manipulated stimuli was to examine the relative importance of (i) break, (ii) accent on the verb and (iii) accent on the object on focus perception. All three are important. The most important variable is break, since it has the highest chi-square among the three. Next in importance comes accent on the object, while accent on the verb comes last in importance. The version that optimally cues for sentence focus ([$_{S}$SVO]$_{Foc}$) lacks a break and has an accent on the verb and an accent on the object. There are two versions that are equally successful at cuing verb-phrase focus(S[$_{VP}$VO]$_{Foc}$); both versions have a break, version one has no accent on the verb and an accent on the object, while version two carries an accent on the verb and a high accent on the object. The version that optimally cues for postverbal object focus (SV[$_{NP}$O]$_{Foc}$) lacks a break and carries a high accent on the verb and on the object. The variable break can be associated with the accentual downstep in verb-phrase focus that was reported in the production experiment.

## 5.4 Concluding Remarks

In this chapter, I discussed one production and two perception experiments. The aim of the production experiment was to investigate whether speakers produce a difference among sentence focus, verb-phrase focus and object focus. Preverbal object focus $[_{NP}O]_{Foc}VS$ and postverbal object focus $SV[_{NP}O]_{Foc}$ differ significantly. This finding is in accordance with earlier findings of Baltazani & Jun (1999) and Arvaniti & Baltazani (2000). Sentence focus, verb-phrase focus and postverbal object focus do not present radical differences. However, there are some differences among them. Specifically, verb-phrase focus is marked by a larger first rise than postverbal object focus. The two also differ at the second rise, verb-phrase focus showing a larger rise. The second rise of verb-phrase focus is also larger than the second rise of sentence focus.

With respect to the accentual downstep, there is a split between female and male speakers. In sentence focus and postverbal object focus female and male speakers choose different strategies. In verb-phrase focus and preverbal object focus female and male speakers employ the same strategy. If we assume that there is an association between the accentual downstep and break, and if we take into consideration the results of the perception experiment that used manipulated stimuli, then we can conclude that the accentual downstep does not have a unique function, and that it is only in the case of verb-phrase focus (when comparing sentence focus, verb-phrase focus and postverbal object focus) that functions as a cue for focus perception.

The perception experiment that used natural stimuli aimed at investigating whether listeners perceive any differences among sentence focus, verb-phrase focus and postverbal object focus. Listeners perceive postverbal object focus $SV[_{NP}O]_{Foc}$ well above chance level (74.7%) and verb-phrase focus $S[_{VP}VO]_{Foc}$ above chance level (42.2%). Sentence focus $[_{S}SVO]_{Foc}$ is perceived below chance level (14.1%). The aim of the second perception experiment that used manipulated stimuli was to examine the relative importance of (i) break, (ii) accent on the verb and (iii) accent on the object on focus perception. The most important variable among the three is break. The versions that optimally cue for verb-phrase focus have a break, while the versions that optimally cue for sentence focus and postverbal object focus lack a break. Next in importance comes accent on the object. The version that optimally cues for sentence focus has an accent on the object, while the version that optimally cues for postverbal object focus has a high accent on the object. Accent on the verb comes last in importance.

In this chapter, I examined the phonetic properties of sentence focus, verb-phrase focus, postverbal object focus and preverbal object focus in Greek. In the following two chapters, I will examine the phonetic properties of contrastive foci and contrastive topics in Greek.

# 6 Producing contrast

## 6. Introduction

In chapter three, I presented syntactic and semantic approaches to the notion of contrast and discussed a number of tests for identifying contrastive foci and contrastive topics. In this chapter, I will investigate the phonetic properties of contrast in Greek, examining contrastive foci and contrastive topics. An example of contrastive focus is given in (1).

The question in (1a) contains a two-member set, example (1b) answers the question in (1a), selecting one of the two members of the set. In this respect, *Paul* is contrasted to *Peter*.

(1) a. Did you invite Peter or Paul?
b. I invited [Paul]$_{\text{C-Foc}}$.

Examples (2) and (3) are instances of contrastive topics. The question in (2a) can be interpreted as containing more than one implicit sub-questions, such as '*What did you give to Helen?*', '*What did you give you to Peter?* ... The answer in (2b) addresses only the first one of the implicit sub-questions. At the same time, (2b) signals the existence of other implicit sub-questions that are not addressed. (2b) can be described as an instance of a complex discourse move.

(2) a. What did you give to the children?
b. [To Helen]$_{\text{C-Top}}$ I gave a book.

The question in (3a) contains two explicit sub-questions, namely '*What did you give to Helen?*' and '*What did you give to Mary?*'.

(3) a. What did you give to Helen and to Mary?
b. [To Helen]$_{\text{C-Top}}$ I gave a book, [to Mary]$_{\text{C-Top}}$ I gave a cd.

Example (3b) answers the question in (3a), and the answer is organized per sub-question. We first learn what was given to Helen, and then what was given to Mary. In contradistinction to (2b), (3b) can be described as an instance of simple discourse move.

Examples (1)-(3) show that contrast can combine with focus and topic. As already noted in chapter three, the possibility of contrast to combine with focus and topic generates a question with respect to the status of contrast in grammar. In particular, the question that emerges is the following: Should contrast be treated as a sub-feature of focus and topic, or should it be treated as a separate notion of information structure? The answer to this question is controversial. However, I think that the examination of the phonetic realization of contrast can contribute to resolving this controversy. The rationale is the following. If contrastive focus and contrastive topic have the same phonetic realization, and if focus and topic have different phonetic realizations, then one can conclude that contrast is marked with a particular tune, and argue that contrast should be treated as a separate notion of information structure.

The aim of this chapter as well as of the following chapter is to investigate the phonetic realization of contrastive focus and contrastive topic in Greek, taking into consideration the fact that in Greek contrastive foci and topics can appear in preverbal or postverbal position. In particular, this chapter aims at examining the production of contrastive focus and topic in Greek, while chapter seven aims at examining the perception of contrastive focus and topic in Greek. Specifically, the main question of this chapter is given in (4).

(4) Do speakers produce a difference between contrastive focus and contrastive topic?

To answer the question in (4), one needs first to answer the questions in (4i) and (4ii).

(4i) Do speakers produce a difference between new-information and contrastive focus?[1]

(4ii) If we assume that contrastive topics like the one in (2b) (example (2b) address one of the implicit sub-questions of (2a)) can be described as instances of complex discourse moves and that contrastive topics like the one in (3b) (example (3b) answers the explicit sub-questions of (3a), addressing them per sub-question) can be described as instances of simple discourse moves, do speakers produce a difference between complex and simple discourse moves?

In order to tackle the aforementioned questions, a production experiment was performed.

[1] In chapter four it was shown that when object foci appear in preverbal position, they obligatorily function as discourse topics. This finding is taken for granted throughout this chapter.

## 6.1 Methods

**Stimuli**. A list of 17 stimulus types was constructed. This list consists of two parts, part A and part B. Part A targets contrast and focus, and consists of twelve stimulus types, while part B targets contrast and topic, and consists of five stimulus types. Each stimulus type is represented by five instantiations – lexically different, but otherwise perfectly matched exemplars of a type. Each stimulus type consists of a question/answer pair (Q/A pair). The question (Q) is the context sentence that determines the information structure of the corresponding answer (A), the target sentence. Each target sentence consists of three content words and one function word; namely a verb, a direct object and an indirect object and its preposition, and has eleven syllables. The direct object carries ultimate stress, while the verb and the indirect object carry penultimate stress.

**Part A**. In part A, questions were varied in two ways: (i) with respect to the focus type they triggered and (ii) with respect to the type of object they targeted. There were three focus types, namely, (i) new-information focus, (ii) corrective /contrastive focus and (iii) closed-set/contrastive focus, and two types of object, in particular, (i) direct object (O) and (ii) indirect object (IO)[2]. Answers in part A varied with respect to word order: (i) IO V O and (ii) O V IO. Having three focus types, two types of object and two word orders ($3 \times 2 \times 2 = 12$), I obtained a total of twelve Q/A pairs in part A. The twelve target sentences of part A are listed in table 6.1.

Table 6.1 Target sentences part A: focus

| Word order | |
|---|---|
| Preverbal: [X] V Y[3] | Postverbal: Y V [X] |
| [IO]$_{\text{New information focus}}$ V O | O V [IO] $_{\text{New information focus}}$ |
| [IO]$_{\text{Corrective/contrastive focus}}$ V O | O V [IO] $_{\text{Corrective/contrastive focus}}$ |
| [IO]$_{\text{Closed-set/contrastive focus}}$ V O | O V [IO] $_{\text{Closed-set/contrastive focus}}$ |
| [O] $_{\text{New information focus}}$ V IO | IO V [O] $_{\text{New information focus}}$ |
| [O] $_{\text{Corrective/contrastive focus}}$ V IO | IO V [O] $_{\text{Corrective/contrastive focus}}$ |
| [O] $_{\text{Closed-set/contrastive focus}}$ V IO | IO V [O] $_{\text{Closed-set/contrastive focus}}$ |

[2] The reason for including both direct and indirect objects in the experiment is related to contrastive topics. As shown in example (2), contrastive topics appear in sentences that contain also a focus; a schematic representation of example (2b) is [IO]$_{\text{C-Top}}$V [O]$_{\text{Foc}}$. Thus, I included both object types in order to be able to make all possible comparisons.

[3] Recall that in chapter four I showed that preverbal object foci in Greek that must obligatorily function as discourse topics. Apparently, this holds also here.

A sample of three Q/A pairs part A from the upper left part of table 6.1 ([IO]VO) is given in (5).

(5) [IO]$_{\text{New information Foc}}$VO

a. *Question*

| | | | | | |
|---|---|---|---|---|---|
| Se | pjon | matheni | i | Melina | Elinika? |
| To | who.ACC | teach.3SG | the.NOM | Melina.NOM | Greek.ACC |

'To whom is Melina teaching Greek?'

b. *Answer*

| | | | |
|---|---|---|---|
| [Stin | Eleni]$_{\text{Foc}}$ | matheni | Elinika. |
| to.the.ACC | Eleni.ACC | teach.3SG | Greek.ACC |

'She is teaching Greek to Helen.'

[IO]$_{\text{Corrective/contrastive Foc}}$VO

a. *Question*

| | | | | | |
|---|---|---|---|---|---|
| I | Melina | matheni | Elinika | stin | Elena? |
| the.NOM | Melina.NOM | teach.3SG | Greek.ACC | to.the.ACC | Elena.ACC |

'Is Melina teaching Greek to Elena?'

b. *Answer*

| | | | | |
|---|---|---|---|---|
| Ohi, | [stin | Eleni]$_{\text{C-Foc}}$ | matheni | Elinika. |
| No | to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC |

'No, she is teaching Greek to Helen.'

[IO]$_{\text{Closed-set/contrastive Foc}}$VO

a. *Question*

| | | | | | |
|---|---|---|---|---|---|
| I | Melina | matheni | Elinika | stin | Elena |
| the.NOM | Melina.NOM | teach.3SG | Greek.ACC | to.the.ACC | Elena.ACC |
| I | stin | Eleni[4]? | | | |
| Or | to.the.ACC | Helen.ACC | | | |

'Is Melina teaching Greek to Elena or to Helen?'

b. *Answer*

| | | | |
|---|---|---|---|
| [Stin | Eleni] | matheni | Elinika. |
| to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC |

'She is teaching Greek to Helen.'

**Part B**. In part B, questions were varied with respect to whether they contained (i) explicit or (ii) implicit sub-questions, and to whether they triggered focus on (i) the direct object or (ii) on the verb and the direct object. In this sense, Q/A pairs in part B varied with respect the type of discourse move, complex discourse move vs. simple discourse move. Because of the nature of complex-discourse moves, it was necessary to include two types of objects, specifically, (i) direct object (O) and (ii)

4The stress in E'leni is on the second syllable, that in 'Elena on the first. Greek does not employ the marking of contrastive focus below the level of the word so that there is no possibility of a contrastive accentuation ele[NI] ~ ele[NA], as exists in languages such as English and Dutch (cf. van Heuven 1994).

indirect object (IO). Answers in part B varied with respect to word order: (i) IO V O and (ii) O V IO. Having two types of sub-questions, two focus domains and two word orders ($2 \times 2 \times 2 = 8$), I obtained a total of 8 Q/A pairs.[5] All eight possible combinations are given in table 6.2. Two combinations were judged to be ungrammatical, and one combination was judged to be infelicitous, these combinations are indicated in shaded row in table 6.2.

One could exclude the ungrammatical combinations. However, this would result in a non-orthogonal experimental design, which would be incompatible with the kind of statistical analysis (repeated measures analysis of variance) that I adopted. I decided to rescue the orthogonal experimental design and at the same time to respect the ungrammaticality and the infelicity judgments by defining the infelicitous combination [IO]$_{\text{C-Top/Complex D-move (implicit sub-question)}}$ [VO]$_{\text{Foc}}$ as the mean of (i) [IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$V[O]$_{\text{Foc}}$, (ii) [IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$[VO]$_{\text{Foc}}$ and (iii) [IO]$_{\text{C-Top/Complex D-move (implicit sub-question)}}$V[O]$_{\text{Foc}}$. The ungrammatical combinations [OV]$_{\text{Foc}}$[IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$ and [OV]$_{\text{Foc}}$[IO]$_{\text{C-Top/Complex D-move (implicit sub-question)}}$ were defined as the mean of [O]$_{\text{Foc}}$V[IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$ and [O]$_{\text{Foc}}$V[IO]$_{\text{C-Top/Complex D-move (implicit sub-question)}}$. Speakers were never asked to produce the infelicitous and ungrammatical structures. The imputed values are meaningless, and will not be discussed in later analyses.

Table 6.2 Target sentences part B: discourse moves

| Preverbal: [IO]VO | Postverbal: OV[IO] |
|---|---|
| [IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$V[O]$_{\text{Foc}}$ | [O]$_{\text{Foc}}$V[IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$ |
| [IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$[VO]$_{\text{Foc}}$ | [OV]$_{\text{Foc}}$[IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$ |
| [IO]$_{\text{C-Top/Simple D-move (implicit sub-question)}}$V[O]$_{\text{Foc}}$ | [O]$_{\text{Foc}}$V[IO]$_{\text{C-Top/Simple D-move (implicit sub-question)}}$ |
| [IO]$_{\text{C-Top/Simple D-move (implicit sub-question)}}$[VO]$_{\text{Foc}}$ | [OV]$_{\text{Foc}}$[IO]$_{\text{C-Top/Simple D-move (implicit sub-question)}}$ |

A sample of three Q/A pairs part B from the left column of table 6.2 is given in (6).

(6) [IO]$_{\text{C-Top/Simple D-move (explicit sub-question)}}$V[O]$_{\text{Foc}}$

a. *Question*

| | | | | | |
|---|---|---|---|---|---|
| Ti | matheni | i | Melina | stin | Eleni |
| what | teach.3SG | the.NOM | Melina.NOM | to.the.ACC | Helen.ACC |
| ke | stin | Elena? | | | |
| and | to.the.ACC | Elena.ACC | | | |

'What is Melina teaching to Helen and to Elena?'

[5] The term "focus domain" is used descriptively to refer to width of the focus domain and to make a distinction between focus on the object, and focus on the verb and the direct object.

b. *Answer*
[Stin Eleni] matheni Elinika [stin Elena]
to.the.ACC Helen.ACC teach.3SG Greek.ACC to.the.ACC Elena.ACC
matheni magiriki.
teach.3SG cooking.ACC
'To Helen, she is teaching Greek, to Elena she is teaching how to cook.'

[IO]C-Top/Simple D-move (explicit sub-question)[VO]Foc
a. *Question*
Ti ginete me tin Eleni ke
what happen.3SG with the.ACC Helen.ACC and
me tin Elena?
with the.ACC Elena.ACC
'What about Helen and Elena?'
b. *Answer*
[Stin Eleni] matheni Elinika [stin Elena]
to.the.ACC Helen.ACC teach.3SG Greek.ACC to.the.ACC Elena.ACC
matheni magiriki.
teach.3SG cooking.ACC
'To Helen she is teaching Greek, to Elena she teaching how to cook.'

[IO]C-Top/Complex D-move (implicit sub-question)
a. *Question*
Ti matheni i Melina sta pedja?
what teach.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina teaching the children?'
b. *Answer*
[Stin Eleni] matheni Elinika.
to.the.ACC Helen.ACC teach.3SG Greek.ACC
'To Helen she is teaching Greek.'

The complete set of materials is given in appendix 6. To be able to clearly measure fundamental frequency, specific requirements were made on the segmental composition of the materials. Thus, voiceless segments were avoided as much as possible. To prevent bias, the Q/A pairs were randomized, and two different orderings were prepared. Each speaker produced 85 {17 stimulus types (12 part A + 5 part B) × 5 instantiations of a type = 85} Q/A pairs.[6]

**Procedure**. Subjects were recorded individually in a quiet room, using a head-mounted close-talking microphone (Shure SM10A). They were seated at a table with a computer screen (laptop) in front of them. Specific written instructions were

[6] The experimentation programme E-prime (http://www.pstnet.com/products/e-prime) was used to present written questions and answers on a computer screen for the speakers to read out (for an appraisal of this software see Poelmans 2002). I wish to acknowledge Jos Pacilly for his help.

presented to them on the computer screen. In particular, subjects were asked to imagine that they were performing two roles, the role of a person who asks, and the role of a person who answers. Verbatim instructions are included in appendix 6.1. Subjects were allowed to change the angle and distance of the screen for optimal legibility of the stimulus text presented to them. A self-paced stimulus presentation was used. A Q/A pair was presented on the computer screen and subjects had to press the spacebar to move to the next Q/A pair. A set of three Q/A pairs was used as a try out. The utterances were directly recorded on computer disk (16 bits, 44.1 KHz) using Abode Audition software.

**Speakers**. Four native speakers of Greek participated in the experiment, two females and two males. The experimental subjects belonged to the same age group (range from 28 to 33). They all spoke standard Athenian Greek and were linguistically naive. None of the speakers had participated in earlier experiments reported in this thesis. Speakers participated voluntarily and were not remunerated for their service.

## 6.2 Analysis

As I am interested in the acoustical make-up of the target sentences, only the answers were digitally excised from the recordings and analyzed using Praat speech processing software (Boersma and Weenink, 2005). The productions of all participants were analyzed. These were 340 utterances in total (4 speakers × 17 stimulus types × 5 instantiations per type).

Measurements of F0, duration, stressed vowel onset time and intensity were obtained. The first step in the analysis was a manual labeling and segmentation of each target utterance in vowels and consonants. Segment boundaries were determined by eye, looking at the oscillogram and consulting the spectrogram when needed. Conventional segmentation guidelines were followed (Peterson & Lehiste, 1960), supplemented by additional criteria for Greek (Arvaniti & Baltazani 2000). Then, F0 was automatically extracted using the autocorrelation method implemented in Praat (Boersma 1993).[7] The third step in the analysis was to determine F0 measuring points. For determining F0 measuring points, I used two methods. I first present the first one, and then the second one. As already noted, each target sentence has eleven syllables and each syllable contains a vowel; the mean F0 was determined for each of the eleven vowels, as indicated in table 6.3.

[7] Fundamental frequency (F0) is the primary acoustic correlate of vocal pitch.

Table 6.3 Definition of measuring points for F0 analysis

| Interval # | | |
|---|---|---|
| P01 | Vowel | first functional word |
| P02 | first vowel of | first content word |
| P03 | (stressed) second vowel of | |
| P04 | final vowel of | |
| P05 | first vowel of | second content word |
| P06 | (stressed) second vowel of | |
| P07 | final vowel of | |
| P08 | first vowel of | third content word |
| P09 | second vowel of | |
| P10 | third vowel of | |
| P11 | (stressed) final vowel of | |

Each time interval was represented as a time-frequency coordinate pair, where the frequency value was equal to the mean F0 measured for the interval and the time coordinate was equal to its temporal midpoint. This reduced the raw pitch curve of the utterance to eleven time-frequency coordinate pairs. This is a highly reproducible stylization of the original F0 curve, which yields a somewhat smoothed copy of the raw curve. It allows adequate comparison of the 17 versions of a stimulus sentence. Figure 6.1 illustrates the relationship between a raw F0 curve and its stylized equivalent in terms of ten straight lines. Panel 6.1A contains a typical example. In panel 6.1B, I have presented the worst approximation of the original curve by the semi-automatic straight-line stylization procedure applied. The curve fit in 6.1A is almost perfect, while panel 6.1B shows a slight underestimation of the size of the accent-lending pitch movement. I argue that proper comparison between versions is still possible on the grounds that the effect of underestimation will equally affect all versions.

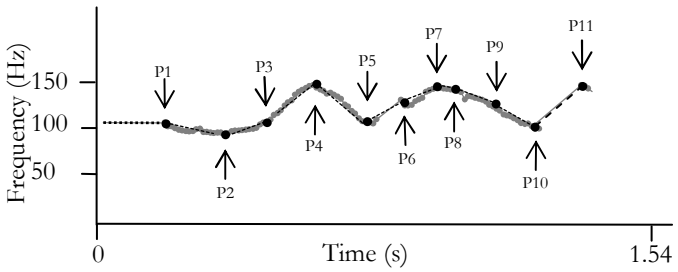


Figure 6.1 Panel A. Raw F0 curve of a male recording intending [IO]$_{\text{C-Topc/Complex D-move (implicit sub-question)}}$VO and its equivalent stylized F0 curve containing 11 measuring points. The stylization is drawn with a dashed line on top of (or through) the raw curve for the sake of legibility. Arrows indicate the position of the pivot points.

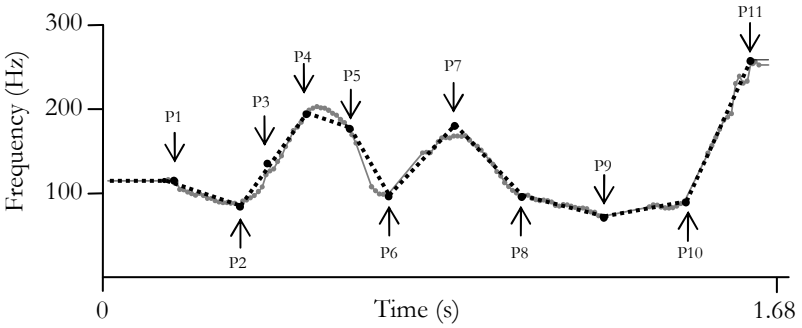


Figure 6.1 Panel B. Raw F0 curve of a male recording intending [IO]C-Top/Complex D-move (implicit sub-question)VO and its equivalent stylized F0 curve containing 11 measuring points. The stylization is drawn with a dashed line on top of the raw curve for the sake of legibility. Arrows indicate the position of the pivot points.

The frequency of the measurement points was measured in Hertz (Hz). The time-frequency coordinates at the measurement points were automatically extracted with the help of a Praat script and stored in a database for off-line statistical processing.[8]

After an informal inspection of the time-frequency coordinates and the stylized F0 curves, it was clear that within each stylized curve there were certain measuring points that required further examination, in the sense that these points were the beginning or the end point of a pitch movement. Thus, I decided to examine also certain differences Δ between various frequency (F0) points. Specifically, the following differences Δ were obtained.

Table 6.4 Differences Δ between frequency measurement points

| Differences Δ |
|---|
| $\Delta_1$(p3-p2) |
| $\Delta_2$(p4-p3) |
| $\Delta_3$(p4-p2) |
| $\Delta_4$(p5-p4) |
| $\Delta_5$(p6-p5) |
| $\Delta_6$(p7-p6) |
| $\Delta_7$(p11-p10) |

A partial illustration is given in figure 6.2.

[8] I wish to acknowledge the help of Jos Pacilly, engineer of the LUCL Phonetics Laboratory.

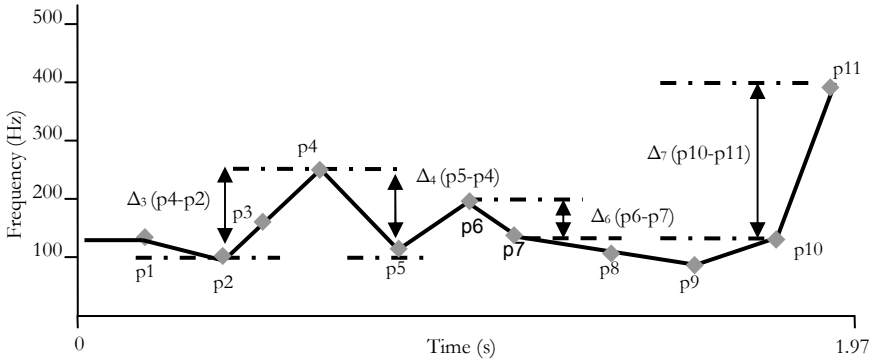


Figure 6.2. Stylized F0 curve of a female recording intending [IO]$_{\text{C-Top/Complex D-move (implicit sub-question)}}$VO with 11 measurement points. Arrows indicate the differences Δ between the frequency measuring points. Specifically, the following differences are demonstrated: $\Delta_3$(p4-p2), $\Delta_4$(p5-p4), $\Delta_6$ (p6−p7), $\Delta_7$(p10−p11).

As already noted, two methods were used in determining F0 measuring points. The second method is described below. Recall that each target sentence contains four words, each of which contains a stressed vowel. In this second method, for each stressed vowel there were four measurement points. This resulted in 16 measuring points per utterance (4 stressed vowels × 4 measuring points). The four measuring points were defined in terms of pitch movements and in particular in terms of rises and falls. In particular, the measuring points were defined in the following way.

Table 6.5 Four measuring points for each stressed vowel

| Measuring points |
|---|
| R1.V1 beginning of rise stressed vowel functional word |
| R2.V1 end of rise |
| F1.V1 beginning of fall |
| F2.V1 end of fall |
| R1.V2 beginning of rise stressed vowel first content word |
| R2.V2 end of rise |
| F1.V2 beginning of fall |
| F2.V2 end of fall |
| R1.V3 beginning of rise stressed vowel second content word |
| R2.V3 end of rise |
| F1.V3 beginning of fall |
| F2.V3 end of fall |
| R1.V4 beginning of rise stressed vowel third content word |
| R2.V4 end of rise |
| F1.V4 beginning of fall |
| F2.V4 end of fall |

For each measurement point, a time-frequency coordinate pair was obtained, where the frequency value was equal to the F0 (in Hz) measured at the point and the time value was equal to the temporal distance of the point from the beginning of the utterance, where the beginning of the utterance equals 0. The time-frequency coordinates of the measurement points were automatically extracted and stored in the database for off-line statistical processing. A repeated measures analysis of variance (RM-ANOVA) was judged as the appropriate statistical method, as there are four speakers, each of whom utters five lexically different but otherwise matched exemplars of a sentence in 17 information structure conditions. The data were analyzed with the GLM Repeated Measures procedure of SPSS. There were two within-subject factors: 'stimulus type' (20 levels, three of which is meaningless) and 'sentence type' (5 levels).

The fourth step in the analysis was to obtain duration measurements. The durations of all segments (measured in seconds) were automatically extracted utilizing a Praat script. On the basis of the durations of all segments, I computed the syllable durations, the duration of the three prosodic words as well as the total sentence duration. Thus, I obtained eleven syllable durations and three prosodic word durations, as shown in table 6.6. The data were stored in the database for off-line statistical processing. All the duration measurements were analyzed using descriptive statistics, the RM-ANOVA procedure of SPSS and linear regression.

Table 6.6 Duration measurements in seconds for 11 syllables (σ)

| Duration measurements | | | |
|---|---|---|---|
| d1 | first syllable | functional word | first prosodic word |
| d2 | first syllable | first content word | |
| d3 | second syllable | | |
| d4 | third syllable | | |
| d5 | first syllable | second content word | second prosodic word |
| d6 | second syllable | | |
| d7 | third syllable | | |
| d8 | first syllable | third content word | third prosodic word |
| d9 | second syllable | | |
| d10 | third syllable | | |
| d11 | fourth syllable | | |

The fifth step in the analysis was to obtain measurements for the onset time of the stressed vowels. Thus, four measurements were obtained for each utterance. The

data were automatically extracted with the help of a Praat script and stored in the database for statistical processing.

The final step in the analysis was to obtain intensity measurements. Maximum intensity (in dB) of each segment was automatically extracted utilizing a Praat script and stored in the database. The intensity measurements were further computed, and I obtained the maximum intensity value of each syllable. As already mentioned there are eleven syllables per stimulus, so I obtained eleven maximum intensity values per stimulus. All measurements were stored in the database and were analyzed using descriptive statistics and RM-ANOVA procedure of SPSS.

## 6.3 Results

**Frequency**. Figure 6.3 presents the mean frequency (Hz) at eleven measuring points (P01…P11) for all 17 stimulus types.

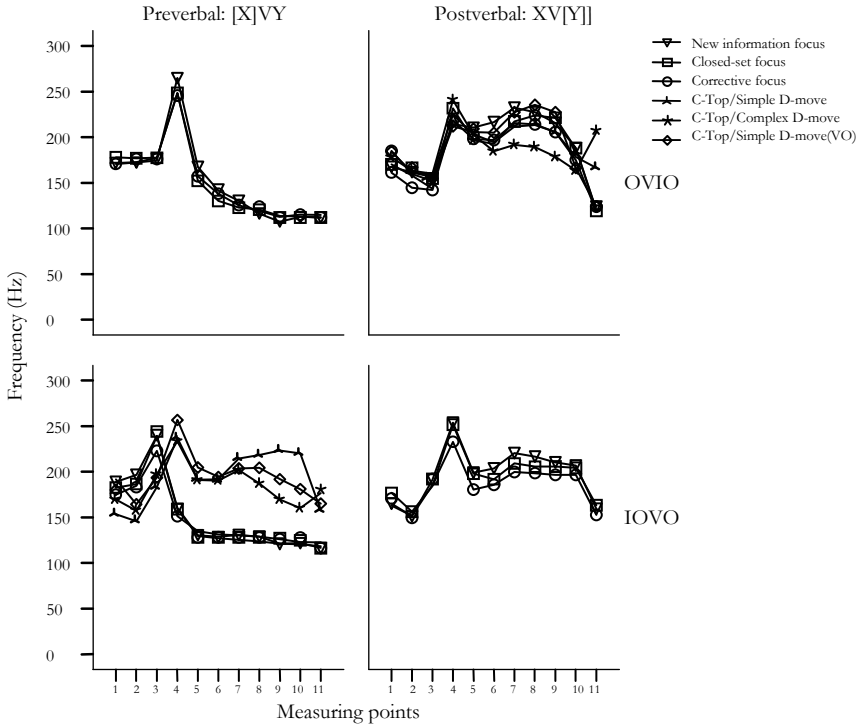


Figure 6.3 Mean frequency (Hz) at eleven measuring points for 17 stimulus types.

For ease of discussion, I first present the relevant facts for question (4i), then for (4ii), and finally for (4). Figure 6.3 shows that the mean frequency at the eleven

measurement points in the case of corrective/contrastive focus is lower than in the case of new-information or closed-set/contrastive focus. However, according to RM-ANOVA, the difference is not statistically significant. The only exception is P4, specifically, P4 in IOV[O]$_{\text{Corrective/contrastive Foc}}$ is significantly lower than in IOV[O]$_{\text{Closed-set/contrastive Foc}}$ ($F_{1,3}$=24,006, p=0.016, $\eta^2_{\text{partial}}$=0.889).[9]

Figure 6.3 also shows that the mean frequency of measuring points P7 till P10 in the case of C-Top/complex discourse move is lower than in the case of C-Top/simple discourse move. However, the difference is not statistically significant. Furthermore, figure 6.3 indicates that in the case of IOVO, contrastive focus has a lower frequency than C-Top/complex discourse move at P4 till P11. According to RM-ANOVA, the difference between the two is not statistically significant.

Figure 6.4 presents the mean frequency (Hz) of seven differences (Δ) for all 17 stimulus types. Positive values indicate a pitch rise, while negative values represent a pitch fall.

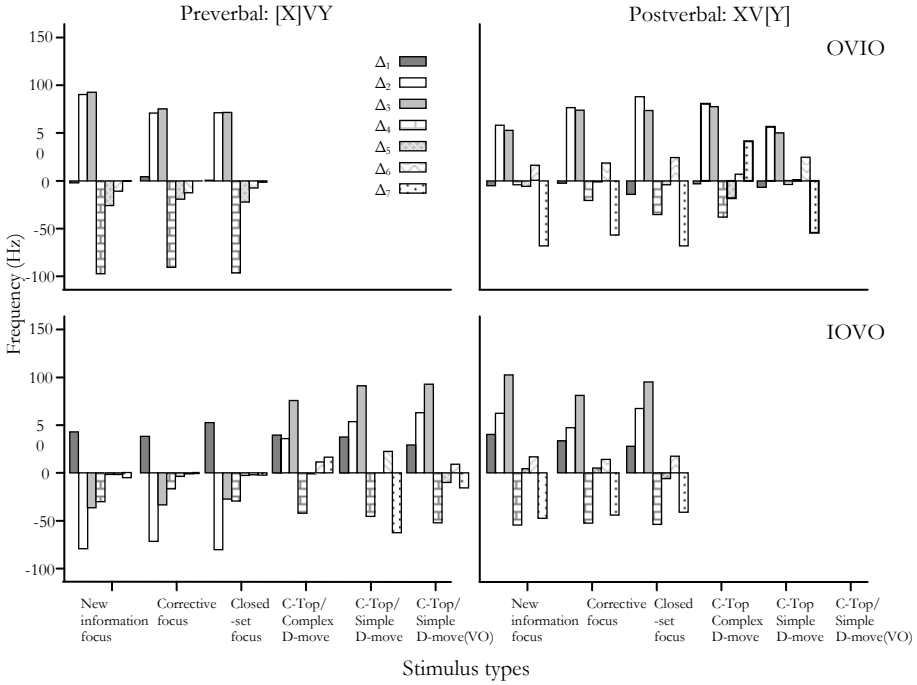


Figure 6.4 Mean frequency (Hz) of seven differences (Δ) for 17 stimuli types.

As illustrated in figure 6.4, the seven differences (Δ) do not generally differ in the three focus conditions. However, there is one exception. Specifically, $\Delta_2$ in

[9] Partial eta squared ($\eta^2_{\text{partial}}$) is the default index for effect size in SPSS. $\eta^2_{\text{partial}}$ = Sum of Squares factor/ Sum of Squares factor + Sum of Squares Error

$[IO]_{Corrective/contrastive\ Foc}VO$ is significantly smaller than $\Delta_2$ in $[IO]_{Closed\text{-}set/contrastive\ Foc}VO$ ($F_{1,3}$=41,993, p=0.007, $\eta^2_{partial}$ =0.933). Figure 6.4 also shows that there is a difference between C-Top complex and C-Top simple discourse moves in IOVO. In particular, $\Delta_7$ is a rise in the case of complex discourse move, while it is a fall in the case of C-Top simple discourse move. Moreover, $\Delta_3$ in $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ is significantly smaller than $\Delta_3$ in $[IO]_{C\text{-}Top/Simple\ D\text{-}move}VO$, ($F_{1,3}$=10,396, p=0.048, $\eta^2_{partial}$ =0.776). Finally, as indicated in figure 6.4, $[IO]_{Corrective/contrastive\ Foc}VO$ differs from $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ at $\Delta_2$, $\Delta_3$ and $\Delta_7$; however, according to RM-ANOVA, the differences are not statistically significant. The difference between $OV[IO]_{Corrective/contrastive\ Foc}$ and $OV[IO]_{C\text{-}Top/Complex\ D\text{-}move}$ at $\Delta_7$ is statistically significant ($F_{1,3}$=10.352, p=0.049, $\eta^2_{partial}$ =0.775); as illustrated in figure 6.4, $\Delta_7$ is a fall in the case of corrective focus, while it is a rise in the case of complex discourse move.

Figure 6.5 presents an aggregated scatter plot of frequency measured in Hz (Y axis) versus time (X axis) for all 16 measuring points (R1.V1…F2.V4) in the 17 stimuli types.

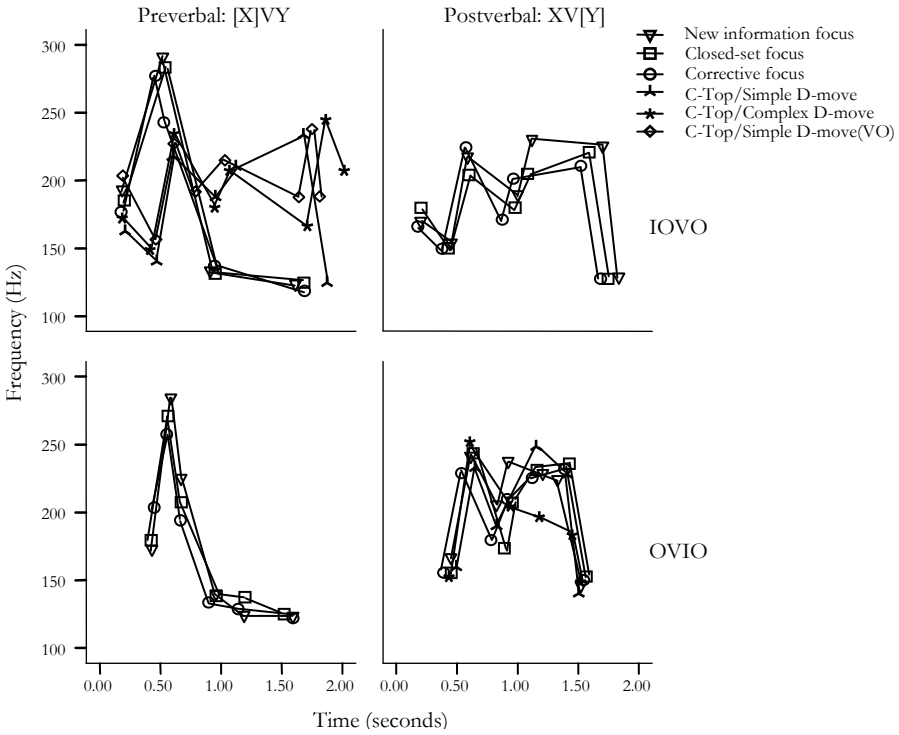


Figure 6.5 Aggregated scatter plot of frequency measured in Hz (Y axis) versus time (X axis) for all 16 measuring points (R1.V1…F2.V4) for 17 stimulus types.

As shown in figure 6.5, in the preverbal cases, corrective/contrastive focus has a smaller pitch rise than new-information and closed-set/ contrastive focus. In the postverbal cases, corrective/contrastive focus has a smaller last pitch fall than new-information and closed-set/contrastive focus. According to RM-ANOVA, the differences are not statistically significant.

As indicated in figure 6.5, in IOVO, there is a difference between C-Top/complex and C-Top/simple discourse moves. Specifically, the pitch movement of the last stressed vowel in $[IO]_{\text{C-Top/Complex D-move}}VO$ is a rise (74Hz) followed by a fall (31Hz), while the pitch movement of the last stressed vowel in $[IO]_{\text{C-Top/Simple D-move}}VO$ is a single fall (108Hz), its rise is 0Hz. The difference between the two rises is statistically significant, ($F_{1,3}$= 12,352, p= 0.039, $\eta^2_{\text{partial}}$ = 0.805). In OVIO, there is no statistically significant difference between C-Top complex and C-Top simple discourse moves. Descriptively, in $OV[IO]_{\text{C-Top/Complex D-move}}$, the rise of the second stressed vowel (15Hz) is smaller than the rise of the second stressed vowel (32Hz) in $OV[IO]_{\text{C-Top/Simple D-move}}$. Furthermore, $[IO]_{\text{C-Top/Complex D-move}}$ VO differs significantly from $[IO]_{\text{Corrective/contrastive Foc}}VO$ ($F_{1,3}$= 12,352, p= 0.039, $\eta^2_{\text{partial}}$= 0.805) at the final pitch movement. As shown in figure 6.5, in $[IO]_{\text{C-Top/Complex D-move}}$ VO, there is a final rise (74Hz), whereas $[IO]_{\text{Corrective/contrastive Foc}}VO$ is flat. The two differ also significantly ($F_{1,3}$= 11,527, p= 0.043, $\eta^2_{\text{partial}}$= 0.793) with respect to alignment at F3.V4, the first one having a later alignment than the second one. Furthermore, $OV[IO]_{\text{C-Top/Complex D-move}}$ differs significantly ($F_{1,3}$= 12,949, p= 0.037, $\eta^2_{\text{partial}}$= 0.812) from $OV[IO]_{\text{Corrective/contrastive Foc}}$ with respect to the first pitch rise; the first pitch rise of $OV[IO]_{\text{C-Top/Complex D-move}}$ (102Hz) is larger than the first pitch rise of $OV[IO]_{\text{Corrective/contrastive Foc}}$ (73Hz). The two differ also at R1.V2, in particular, in $OV[IO]_{\text{Corrective/contrastive Foc}}$, there is a larger rise than in $OV[IO]_{\text{C-Top/Complex D-move}}$. The difference is significant ($F_{1,3}$= 16,646, p= 0.027, $\eta^2_{\text{partial}}$= 0.847). Finally, the two differ significantly with respect to alignment at R1.V4, the second one having a later alignment ($F_{1,3}$= 39,188, p= 0.008, $\eta^2_{\text{partial}}$= 0.929).

**Duration**. Figure 6.6 presents the mean sentence duration of all 17 stimulus types. As shown in figure 6.6, the mean sentence duration of stimuli that contain corrective/contrastive focus is shorter than the mean sentence duration of stimuli that contain new-information or closed-set/contrastive focus. The RM-ANOVA indicated that the mean sentence duration of $[IO]_{\text{Closed-set/contrastive Foc}}VO$ and the mean sentence duration of $[IO]_{\text{Corrective/contrastive Foc}}VO$ differ significantly ($F_{1,3}$= 11,853, p= 0.041, $\eta^2_{\text{partial}}$= 0.798). The RM-ANOVA also showed that the difference between $IOV[O]_{\text{Closed-set/contrastive Foc}}$ and $IOV[O]_{\text{Corrective/contrastive Foc}}$ is significant, ($F_{1,3}$= 69,601, p= 0.004, $\eta^2_{\text{partial}}$= 0.959).

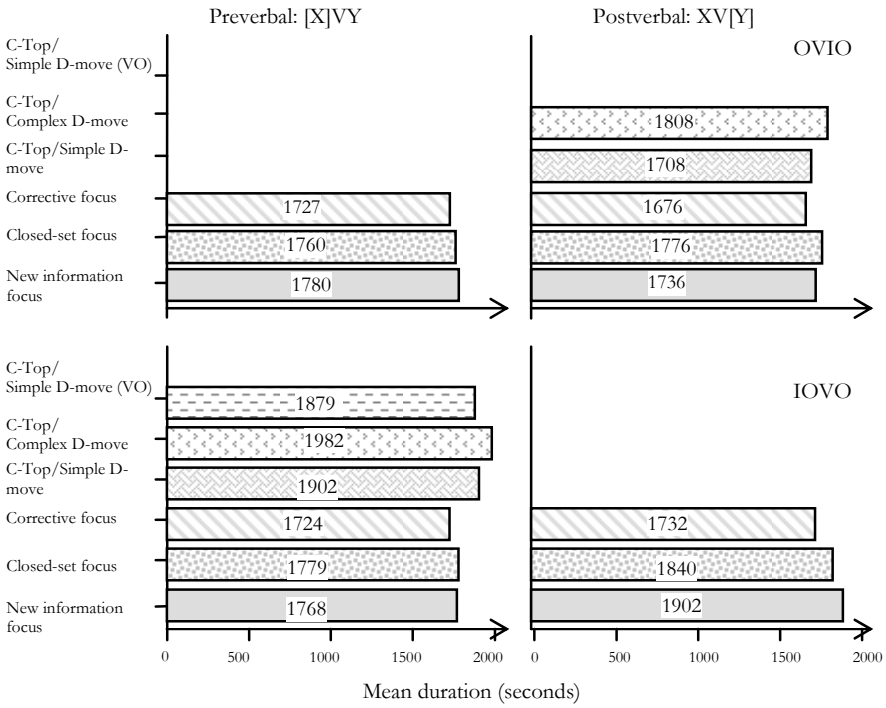


Figure 6.6 Mean sentence duration for 17 stimulus types.

Figure 6.6 also shows that the mean sentence duration of stimuli that denote a C-Top/simple discourse move is shorter than the mean sentence duration of stimuli that denote a C-Top/complex discourse move. However, the difference between the two is not statistically significant, according to the RM-ANOVA. With respect to the question in (4), figure 6.6 shows that stimuli containing corrective focus differ from stimuli that denote a C-Top/complex discourse move; the latter having a longer duration. The difference between $[IO]_{\text{Corrective/contrastive Foc}}VO$ and $[IO]_{\text{C-Top/Complex D-move}}VO$ is significant ($F_{1,3}$= 12,940, p= 0.037, $\eta^2_{\text{partial}}$= 0.812).

Figure 6.7 presents the mean prosodic-word duration of all 17 stimulus types. With respect to question (4i), figure 7 shows that the mean duration of the word that has been assigned corrective focus is shorter than the mean duration of the word that has been assigned new-information or closed-set/contrastive focus.

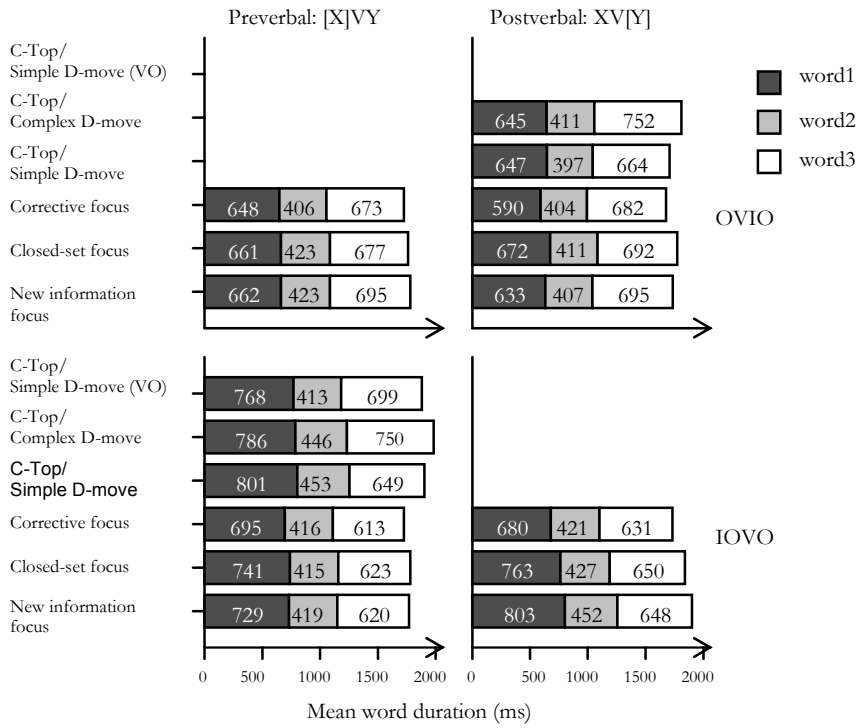


Figure 6.7 Mean prosodic-word duration for 17 stimulus types.

In certain cases, the difference between corrective focus and new-information or closed-set/contrastive focus is statistically significant. Specifically, IO in $[IO]_{\text{Corrective/contrastive Foc}}VO$ is significantly shorter than IO in $[IO]_{\text{Closed-set/contrastive Foc}}VO$, ($F_{1,3}$= 21,341, p= 0.019, $\eta^2_{\text{partial}}$= 0.877). Similarly, IO in $OV[IO]_{\text{Corrective /contrastive Foc}}$ is significantly shorter than IO in $OV[IO]_{\text{New information Foc}}$, ($F_{1,3}$= 27,538, p= 0.013, $\eta^2_{\text{partial}}$= 0.902). As far as question (4ii) is concerned, figure 7 shows that O in $[IO]_{\text{C-Top/Complex D-move}}VO$ is longer than O in $[IO]_{\text{C-Top/Simple D-move}}VO$; however, the difference between the two is not statistically significant(p= 0.062). With respect to question (4), figure 7 shows that IO, V and O in $[IO]_{\text{Corrective/contrastive Foc}}VO$ are shorter than IO, V and O in $[IO]_{\text{C-Top/Complex D-move}}VO$. The same holds for O, V and IO in $OV[IO]_{\text{Corrective/contrastive Foc}}$ and $OV[IO]_{\text{C-Top/Complex D-move}}$. However, the differences are not statistically significant.

Figure 6.8 shows the mean stressed vowel duration of the three content words for all 17 stimuli type. With respect to question (4i), figure 8 indicates that the stressed vowel of the word that carries corrective/contrastive focus is shorter than the stressed vowel of the word carrying closed-set/contrastive focus. The stressed vowel of IO in $OV[IO]_{\text{Corrective/contrastive Foc}}$ is significantly shorter than the stressed vowel of IO in $OV[IO]_{\text{New information Foc}}$, ($F_{1,3}$= 16,516, p= 0.027, $\eta^2_{\text{partial}}$= 0.846).

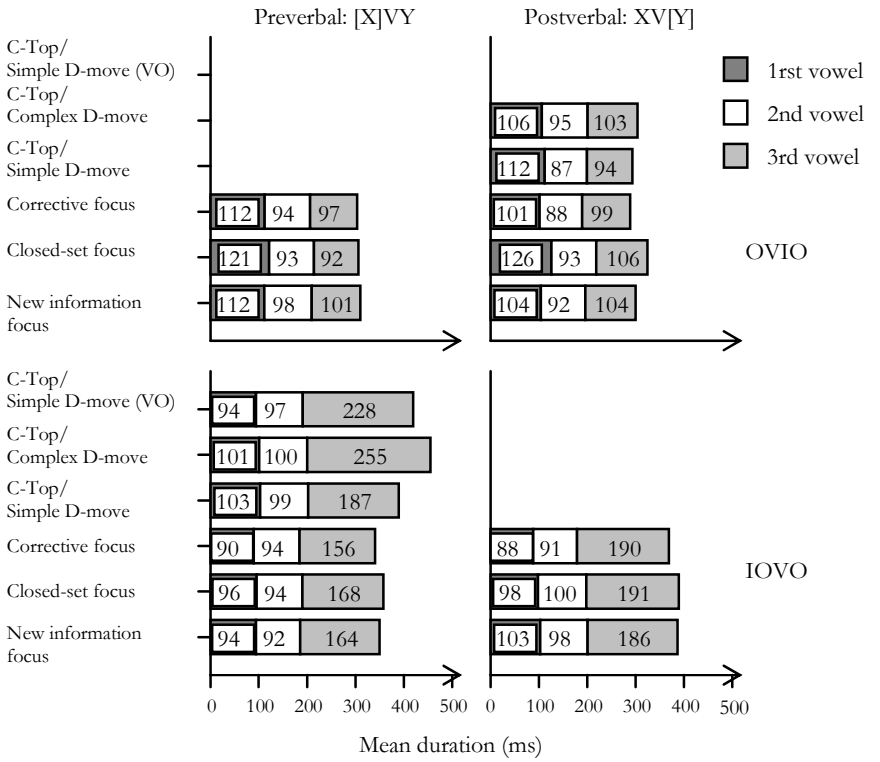


Figure 6.8 Mean stressed vowel duration of three content words for 17 stimulus types.

In the cases of postverbal focus, as shown in the right column of figure 6.8, the stressed vowel of the verb (2nd vowel) has the shortest duration in corrective focus. The duration of the stressed vowel of the verb in IOV[O]$_{\text{Closed-set/contrastive Foc}}$ is significantly shorter than the duration of the stressed vowel of the verb in IOV[O]$_{\text{Corrective/contrastive Foc}}$, ($F_{1,3}$= 12,687, p= 0.038, $\eta^2_{\text{partial}}$= 0.809). As far question (4ii) is concerned, the duration of the third stressed vowel in stimuli that denote a C-Top/complex discourse move is longer than the duration of the third stressed vowel in stimuli that denote a C-Top/simple discourse move. In particular, the difference between the third stressed vowel in [IO]$_{\text{C-Top/Complex D-move}}$VO and [IO]$_{\text{C-Top/Simple D-move}}$VO is statistically significant, ($F_{1,3}$= 46,319, p= 0.006, $\eta^2_{\text{partial}}$= 0.939). Moreover, the third stressed vowel in OV[IO]$_{\text{C-Top/Complex D-move}}$ differs significantly from the third stressed vowel in OV[IO]$_{\text{C-Top/Simple D-move}}$, ($F_{1,3}$= 308,827, p= 0.000, $\eta^2_{\text{partial}}$= 0.990). With respect to the question in (4), all three stressed vowels of stimuli that denote a C-Top/complex discourse move, are longer than the three stressed vowels of stimuli that contain corrective/contrastive focus. The third stressed vowel in [IO]$_{\text{C-Top/Complex D-move}}$VO is significantly longer than the third stressed vowel in [IO]$_{\text{Corrective/contrastive Foc}}$VO, ($F_{1,3}$= 40,077, p= 0.008, $\eta^2_{\text{partial}}$ = 0.930).

**Intensity**. In figure 6.9, the mean peak intensities (dB) of eleven syllables of 17 stimulus types are presented. With respect to the question in (4i), figure 6.9 shows that in the case of $[O]_{\text{Corrective/contrastive Foc}}$VIO the mean peak intensity of eleven syllables is lower than the mean intensity of the eleven syllables in $[O]_{\text{New information Foc}}$VIO and $[O]_{\text{Closed-set/contrastive Foc}}$VIO.

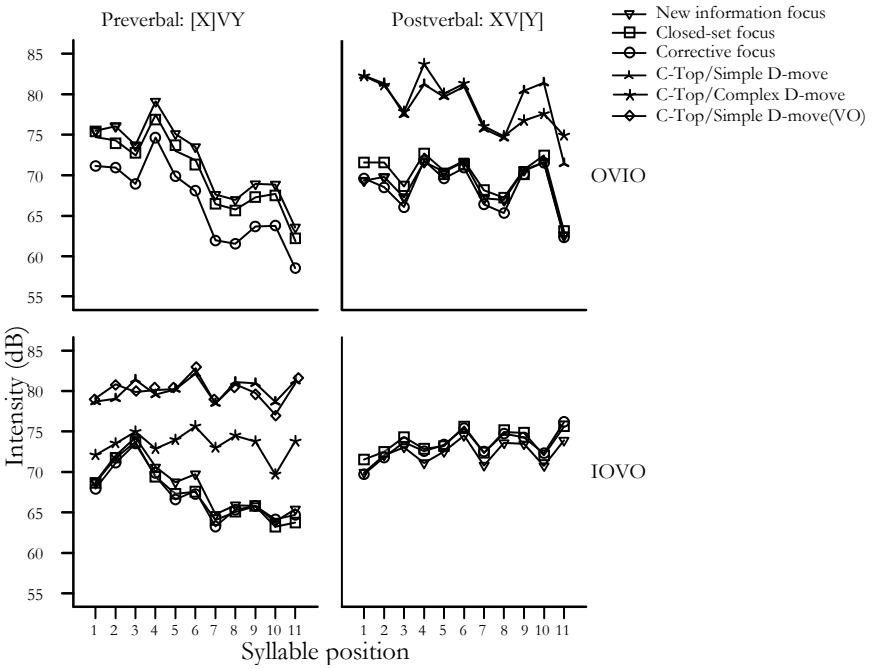


Figure 6.9 Mean maximum intensity (dB) of eleven syllables of 17 stimuli type.

According to the RM-ANOVA, the difference between $[O]_{\text{Corrective/contrastive Foc}}$VIO and $[O]_{\text{New information Foc}}$VIO is statistically significant for syllables 2, 3 and 8 ($F_{1,3}$= 18,071, p= 0.024, $\eta^2_{\text{partial}}$= 0.858, $F_{1,3}$= 11,856, p= 0.041, $\eta^2_{\text{partial}}$= 0.798, and $F_{1,3}$= 165,769, p= 0.001, $\eta^2_{\text{partial}}$= 0.982, respectively). Moreover, as shown in figure 6.9, the mean peak intensity of syllable 6 in the case of $[IO]_{\text{New information Foc}}$VO is higher than the mean peak intensity of syllable 6 in $[IO]_{\text{Closed-set/contrastive Foc}}$VO; the difference between the two is statistically significant ($F_{1,3}$= 11,671, p= 0.042, $\eta^2_{\text{partial}}$= 0.796). As far as question (4ii) is concerned, in the case of $[IO]_{\text{C-Top/Complex D-move}}$VO the mean peak intensity of eleven syllables is lower than the corresponding values for $[IO]_{\text{C-Top/Simple D-move}}$VO and $[IO]_{\text{C-Top/Simple D-move}}$(VO)VO. In particular, the mean peak intensity of syllables 3, 4 and 6 in $[IO]_{\text{C-Top/Complex D-move}}$VO is significantly lower than the corresponding values in $[IO]_{\text{C-Top/Simple D-move}}$VO, ($F_{1,3}$= 31,070, p= 0.011, $\eta^2_{\text{partial}}$= 0.912, $F_{1,3}$= 16,329, p= 0.027, $\eta^2_{\text{partial}}$=0.845, $F_{1,3}$=10,684, p=0.047, $\eta^2_{\text{partial}}$=0.781 respectively).

Moreover, the mean peak intensity of all syllables except syllable 3 in $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ is significantly lower than the corresponding values in $[IO]_{C\text{-}Top/Simple\ D\text{-}move(VO)}VO$, according to RM-ANOVA. The results are summarized in table 6.7.

Table 6.7. $IO_{C\text{-}Top/Complex\ D\text{-}move}VO$ - $IO_{C\text{-}Top/Simple\ D\text{-}move}VO$: RM-ANOVA on peak intensities (dB) in ten syllables

| Syllables | df | F | p | $\eta^2_{partial}$ |
|---|---|---|---|---|
| σ1 | 1, 3 | 22,976 | 0.017 | 0.885 |
| σ2 | 1, 3 | 121,986 | 0.002 | 0.976 |
| σ3 | 1, 3 | 95,962 | 0.082 | 0.688 |
| σ4 | 1, 3 | 30,624 | 0.012 | 0.911 |
| σ5 | 1, 3 | 11,752 | 0.042 | 0.797 |
| σ6 | 1, 3 | 20,425 | 0.020 | 0.872 |
| σ7 | 1, 3 | 17,175 | 0.026 | 0.851 |
| σ8 | 1, 3 | 15,686 | 0.029 | 0.839 |
| σ9 | 1, 3 | 26,690 | 0.014 | 0.899 |
| σ10 | 1, 3 | 30,119 | 0.012 | 0.909 |
| σ11 | 1, 3 | 28,112 | 0.013 | 0.904 |

With respect to the main question that was stated in (4), figure 6.9 shows that the mean maximum syllable intensity of eleven syllables in corrective/contrastive focus cases is lower than in c-top/complex discourse move cases. In particular, the peak intensity of syllables 5, 6, 7, and 8 in $[IO]_{Corrective/contrastive\ Foc}VO$ is significantly lower than the corresponding values in $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$, according to RM-ANOVA. The results of the RM-ANOVA are given in table 6.8. Furthermore, the mean maximum syllable intensity of syllables 2, 3, 6, 8 and 11 in $OV[IO]_{Corrective/contrastive\ Foc}$ is significantly lower than the corresponding values for $OV[IO]_{C\text{-}Top/Complex\ D\text{-}move}$ according to RM-ANOVA. The results of the RM-ANOVA are also presented in table 6.8.

Table 6.8. Results of RM-ANOVA on peak intensities (dB) broken down by stimulus conditions.

| Syllables | Stimuli pairs | | | df | F | p | $\eta^2_{partial}$ |
|---|---|---|---|---|---|---|---|
| σ5 | $IO_{Corrective/contrastive\ Foc}VO$ | - | $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ | 1, 3 | 13,822 | 0.034 | 0.822 |
| σ6 | | | | 1, 3 | 19,891 | 0.021 | 0.869 |
| σ7 | | | | 1, 3 | 25,697 | 0.015 | 0.895 |
| σ8 | | | | 1, 3 | 15,436 | 0.029 | 0.837 |
| σ2 | $OV[IO]_{Correct./contrastive\ Foc}$ | - | $OV[IO]_{C\text{-}Top/Complex\ D\text{-}move}$ | 1, 3 | 17,429 | 0.025 | 0.853 |
| σ3 | | | | 1, 3 | 16,383 | 0.027 | 0.845 |
| σ6 | | | | 1, 3 | 11,544 | 0.043 | 0.794 |
| σ8 | | | | 1, 3 | 10,469 | 0.048 | 0.777 |
| σ11 | | | | 1, 3 | 10,752 | 0.046 | 0.782 |

## 6.4 Conclusions

The aim of this chapter was to contribute to the debate about the status of contrast in grammar, by investigating whether speakers produce a difference between contrastive focus and contrastive topic. To answer the question in (4), one needed to address also the questions in (4i) and (4ii); in particular, one needed to examine whether speakers produce a difference between new-information and contrastive focus, and whether speakers produce a difference between C-top/complex and simple discourse moves. The results of this production experiment do not provide substantial evidence for treating contrast as an independent notion of information structure. The phonetic realization of contrastive foci and contrastive topics differs significantly.

With respect to the question in (4i), the mean frequency at the eleven measurement points in the case of corrective/contrastive focus is lower than in the case of new-information or closed-set/contrastive focus. In the preverbal cases, corrective/contrastive focus has a smaller pitch rise than new-information and closed-set/contrastive focus, while in the postverbal cases, corrective/contrastive focus has a smaller last pitch fall than new-information and closed-set/contrastive focus. As far as duration is concerned, the mean sentence duration of stimuli that contain corrective/contrastive focus is shorter than the mean sentence duration of stimuli that contain new-information focus and significantly shorter than the mean sentence duration of stimuli that contain closed-set/contrastive focus. Finally with respect to intensity, the mean peak intensity of eleven syllables in $[O]_{\text{Corrective/contrastive Foc}}$VIO is lower than the mean peak intensity of the eleven syllables in $[O]_{\text{New information Foc}}$VIO and $[O]_{\text{Closed-set/contrastive Foc}}$VIO. In particular, the mean peak intensity of syllables 2, 3 and 8 in $[O]_{\text{Corrective/contrastive Foc}}$VIO is significantly lower than the corresponding values in $[O]_{\text{New information Foc}}$VIO.

As far as the question in (4ii) is concerned, the mean frequency of measuring points P7 till P10 in C-Top/complex discourse move is lower than in the case of C-Top/simple discourse move. Moreover, the pitch movement of the last stressed vowel in $[IO]_{\text{C-Top/Complex D-move}}$ VO is a rise followed by a fall, while the pitch movement of the last stressed vowel in $[IO]_{\text{C-Top/Simple D-move}}$ VO is a single fall. The difference between the two rises is statistically significant. Furthermore, $\Delta_7$ is a rise in the case of C-Top/complex discourse move, while it is a fall in the case of C-Top/simple discourse move. With respect to duration, the mean sentence duration of stimuli that denote a C-Top/complex discourse move is longer than the mean sentence duration of stimuli that denote a C-Top/simple discourse move. As far as intensity is concerned, the mean peak intensity of eleven syllables in $[IO]_{\text{C-Top/Complex D-move}}$VO is lower than the corresponding values for $[IO]_{\text{C-Top/Simple D-move}}$VO. Specifically, the mean peak intensity of syllables 3, 4 and 6 in $[IO]_{\text{C-Top/Complex D-move}}$VO is significantly lower than the corresponding values in $[IO]_{\text{C-Top/Simple D-move}}$VO.

With respect to the question in (4), [IO]$_{\text{Contrastive/corrective Foc}}$VO has lower frequency than [IO]$_{\text{C-Top/Complex D-move}}$ at measuring points P4 till P11. Furthermore, [IO]$_{\text{C-Top/Complex D-move}}$VO differs significantly from [IO]$_{\text{Corrective/contrastive Foc}}$ VO at the final pitch movement; in [IO]$_{\text{C-Top/Complex D-move}}$ VO, there is a final rise, whereas [IO]$_{\text{Corrective/contrastive Foc}}$ VO is flat. The first pitch rise in OV[IO]$_{\text{C-Top/Complex D-move}}$ is significantly larger than the first pitch rise of OV[IO]$_{\text{Corrective/contrastive Foc}}$. The two also differ significantly at $\Delta_7$; $\Delta_7$ is a fall in the case of corrective focus, while it is a rise in the case of C-Top/complex discourse move. As far as duration is concerned, the mean sentence duration of stimuli that contain corrective/contrastive focus is shorter than the mean sentence duration of stimuli that denote a C-Top/complex discourse move. In particular, the mean sentence duration of [IO]$_{\text{Corrective/contrastive Foc}}$ VO is significantly shorter than the mean sentence duration of [IO]$_{\text{C-Top/Complex D-move}}$ VO. With respect to intensity, the results of the production experiment show that the mean maximum syllable intensity of eleven syllables in corrective/contrastive focus cases is lower than in C-Top/complex discourse move cases. Specifically, the peak intensity of syllables 5, 6, 7, and 8 in [IO]$_{\text{Corrective/contrastive Foc}}$VO is significantly lower than the corresponding values in [IO]$_{\text{C-Top/Complex D-move}}$VO, while the mean maximum syllable intensity of syllables 2, 3, 6, 8 and 11 in OV[IO]$_{\text{Corrective/contrastive Foc}}$ is significantly lower than the corresponding values for OV[IO]$_{\text{C-Top/Complex D- move}}$.

Summarizing, the three focus conditions, namely, new-information focus, corrective-contrastive focus and closed-set/contrastive focus, do not present any radical differences among them. Nevertheless, it is worth mentioning that corrective-contrastive focus has lower frequency and intensity as well as shorter duration than the other two. [IO]$_{\text{C-Top/Complex D-move}}$ VO differs significantly from [IO]$_{\text{C-Top/Simple D-move}}$ VO with respect to the pitch movement of the last stressed vowel; the pitch movement of the last stressed vowel in [IO]$_{\text{C-Top/Complex D-move}}$ VO is a rise followed by a fall, while the pitch movement of the last stressed vowel in [IO]$_{\text{C-Top/Simple D-move}}$ VO is a single fall. Moreover, [IO]$_{\text{C-Top/Complex D-move}}$VO has shorter duration and lower intensity than [IO]$_{\text{C-Top/Simple D-move}}$VO. A stimulus that denotes a C-Top complex discourse move has a longer duration and a lower intensity than a stimulus that carries corrective focus. Furthermore, [IO]$_{\text{C-Top/Complex D-move}}$ VO ends with a pitch rise, whereas [IO]$_{\text{Corrective/contrastive Foc}}$ VO is flat. Finally, the first pitch rise in OV[IO]$_{\text{C-Top/Complex D-move}}$ is significantly larger than the first pitch rise in OV[IO]$_{\text{Corrective/contrastive Foc}}$. Concluding, speakers produce some differences among corrective focus, C-Top/simple discourse moves and C-Top/complex discourse moves.

Given the results of this production experiment, two questions emerge. In particular, the first question is whether listeners perceive any differences and the second question is whether the final pitch rise that speakers produced in [IO]$_{\text{C-Top/Complex D-move}}$VO can be associated with complex discourse moves. These questions will be addressed in chapter seven.

# 7 Perceiving Contrast

## 7. Introduction

In chapter six, I discussed a production experiment that investigated the phonetic properties of contrastive focus and contrastive topic in Greek. From the results of this experiment, two questions emerged. In particular, the first question is whether listeners perceive any difference among corrective/contrastive focus, C-Top/complex discourse moves and C-Top/simple discourse moves. The second question is related to the role of the final rise in [IO]$_{\text{C-Top/Complex D-move}}$VO. Specifically, the question that emerges is whether this final rise can be associated with complex discourse moves. These questions are even more intriguing given Büring's (2003) claim that C-Top/complex discourse moves are obligatorily marked, while C-Top/simple discourse moves are optionally marked. To tackle the aforementioned questions, a perception experiment was conducted.

## 7.1 Methods

**Stimuli**. A total number of 48 stimuli produced by two male speakers, male speaker A and male speaker B, who participated in the production experiment were used. Half of the 48 stimuli were produced by speaker A and half by speaker B. The set of 24 stimuli was the same for the two speakers. These 24 stimuli consisted of three lexical sets, namely, lexical set A, lexical set B and lexical set C. The three lexical sets are exemplified in (1) to (3).

(1) *Lexical set A*

| Stin | Eleni | matheni | Elinika. |
|---|---|---|---|
| to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC |

'To Helen, she is teaching Greek.'

(2) *Lexical set B*

| Stin | Eleni | harizi | morudjaka. |
|---|---|---|---|
| to.the.ACC | Helen.ACC | give.for.free.3SG | baby.clothes.ACC |

'To Helen, she is giving for free baby clothes.'

(3) *Lexical set C*

| | | | |
|---|---|---|---|
| Sti | Melina | milai | Aravika. |
| to.the.ACC | Melina.ACC | speak.3SG | Arabic.ACC |

'To Melina, she is speaking Arabic.'

Each lexical set was produced aiming at four different information structure conditions; namely, (i) a C-Top/complex discourse move, (ii) a C-Top/simple discourse move, a corrective-contrastive focus and a new information focus. An example is given in (4a)-(4d).

(4) a. [Stin Eleni]$_{\text{C-Top/Complex D-move}}$ matheni Elinika.
b. [Stin Eleni]$_{\text{C-Top/Simple D-move}}$ matheni Elinika.
c. [Stin Eleni]$_{\text{Corrective/contrastive Foc}}$ matheni Elinika.[1]
d. Stin Eleni matheni [Elinika]$_{\text{New information Foc}}$.

| | | | |
|---|---|---|---|
| to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC |

'To Helen, she is teaching Greek.'

Each lexical set was produced aiming at two different word orders; IOVO and OVIO. An example is given in (5).

(5) a.

| | | | | |
|---|---|---|---|---|
| Stin | Eleni | matheni | Elinika. | IOVO |
| to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC | |

'To Helen, she is teaching Greek.'

b.

| | | | | |
|---|---|---|---|---|
| Elinika | matheni | stin | Eleni. | OVIO |
| Greek.ACC | teach.3SG | to.the.ACC | Helen.ACC | |

'Greek, she is teaching to Helen.'

Having three lexical sets, four information structure conditions and two word orders ($3 \times 4 \times 2 = 24$), a total of 24 stimuli per speaker was included in the experiment. The stimuli were randomized to avoid any bias. A list of all the materials can be found in appendix 7.

**Procedure**. The 48 stimuli were made audible with a fixed inter-stimulus interval of 0.8 sec (offset-to-onset). The list of the 48 stimuli was played by a portable computer through loudspeakers (Audio Codecs) in a quiet room. Listeners were supplied with an answer sheet containing a list of questions, in sets of four. Each set contained (i) a *wh*-question that could be interpreted as containing more than one implicit sub-question and triggered an answer that denoted a C-Top/complex discourse move, (ii) a *wh*-question that was split into two explicit sub-questions and triggered an answer that denoted a C-Top/simple discourse move, (iii) a question that triggered an answer that contained corrective/contrastive focus and (iv) a

[1] As already noted preverbal object foci in Greek are obligatorily discourse topics. In this sense, (4c) looks like [[Stin Eleni]$_{\text{Corrective-contrastive Foc}}$]$_{\text{D-Top}}$ matheni Ellinika.

question that triggered an answer that contained new information focus.[2] An example is given in (6a)-(6d).

(6) a. *Wh*-question-implicit sub-questions(C-Top/Complex D-move)
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching the children?'

b. *Wh*-question-explicit sub-questions(C-Top/Simple D-move)
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'

c. *Wh*-question corrective/contrastive focus
Matheni Elinika sti Melina?
teach.ACC Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

d. *Wh*-question new information focus
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching Helen?'

To avoid response bias by the ordering of the questions, they were randomized. In particular, all possible permutations of the four questions were considered. This resulted in 24 permutations (4! = 4 × 3 × 2 ×1). Each permutation was included twice. The answer sheet is given in appendix 7.1. Listeners were instructed to tick the question which according to them corresponded best to the declarative sentence (answer) they were listening to. The verbatim text is given in appendix 7.2. The subjects were tested as a group.

**Listeners**.Thirteen native speakers of Greek participated in the experiment, six females and seven males. All native speakers belonged to the same age group (age range from 28 to 32). None of the thirteen speakers reported any hearing disorders. All speakers had a university educational level and spoke standard Athenian Greek. These thirteen speakers had not participated in any of the earlier experiments that have been reported in this thesis.

## 7.2 Results

In total 624 responses (48 stimuli × 13 listeners) were analyzed. Table 7.1 cross-tabulates the intended against the perceived information structure distributions. As shown in table 7.1, listeners perceived some differences among the information structure conditions. In particular, corrective/contrastive and new information

[2] See also the discussion in chapter three and in particular table 1, in section 3.1.

focus are perceived well above chance level, the complex discourse move is perceived above chance level, while the simple discourse move is perceived below chance level.

More specifically, when the focus intended by the speakers (recall that there were two speakers) was [IO]$_{\text{Corrective/contrastive Foc}}$VO, then in 83 % of the cases it was perceived as such. When the intended focus was OV[IO]$_{\text{Corrective/contrastive Foc,}}$ it was correctly perceived in 68% of the cases. When the intended focus was new information focus IOV[O]$_{\text{New information Foc}}$, then in 72% of the cases it was perceived correctly. When the focus intended by the speakers was [O]$_{\text{New information Foc}}$VIO, then in 86% of the cases, it was perceived as such. When the intended information structure was [IO]$_{\text{C-Top/Complex D-move}}$VO, it was correctly perceived in 42%. When the intended information structure was OV[IO]$_{\text{C-Top/Complex D- move}}$, 32% perceived it correctly. When the information structure intended by the speakers was [IO]$_{\text{C-Top/Simple D-move}}$VO, then 9% was perceived as such. When the information structure intended by the speakers was OV[IO]$_{\text{C-Top/Simple D-move,}}$ it was correctly perceived at 15%.

Results are also interesting with respect to the distribution of incorrect responses. Specifically, C-Top/complex discourse move is confused with C-Top/simple discourse move. When the information structure intended by the speakers was [IO]$_{\text{C-Top/Complex D-move}}$VO, then 42% of the responses was C-Top/simple discourse move. When the intended information structure was OV[IO]$_{\text{C-Top/Complex D-move}}$, then 56% of the responses was a C-Top/simple discourse move. Interestingly, the incorrect responses with respect to C-Top/simple discourse move do not have the same distribution as the incorrect responses with respect to C-Top/complex discourse move. In particular, when the information structure intended by the speakers was [IO]$_{\text{C-Top/Simple D-move}}$VO, then 82% of the responses was new information focus. When the intended information structure was OV[IO]$_{\text{C-Top/Simple D-move}}$, then it was confused with corrective focus in 53% of the cases.

It should also be noted that listeners do not seem to have an overall strong preference for a response. Specifically, out of 624 utterances, new information focus was chosen as a response 236 times, i.e. 38%, corrective/contrastive focus was chosen 173 times, i.e. 28%, C-Top/simple discourse move 117 times, i.e.19%, and C-Top/complex discourse move 98 times, i.e. 16%.

Table 7.1 Perceived information structure condition (%) as a function of intended information structure condition

| Intended by speaker (down) | Responses (across) | | | |
|---|---|---|---|---|
| | New information focus | Corrective focus | C-Top/ Simple D-move | C-Top/ Complex D-move |
| [IO]$_{\text{Corrective/contrastive Foc}}$VO | 6.4 | **83.3** | 5.1 | 5.1 |
| [IO]$_{\text{C-Top/Complex D-move}}$ VO | 15.4 | 0 | 42.3 | **42.3** |

| | | | | |
|---|---|---|---|---|
| [IO]$_{\text{C-Top/Simple D-move}}$VO | 82.1 | 2.6 | **9.0** | 6.4 |
| IOV[O]$_{\text{New information Foc}}$ | **71.8** | 3.8 | 11.5 | 12.8 |
| OV[IO]$_{\text{Corrective/contrastive Foc}}$ | 17.9 | **67.9** | 5.1 | 9.0 |
| OV[IO]$_{\text{C-Top/Complex D-move}}$ | 6.4 | 5.1 | 56.4 | **32.1** |
| OV[IO]$_{\text{C-Top/Simple D-move}}$ | 16.7 | 52.6 | **15.4** | 15.4 |
| [O]$_{\text{New information Foc}}$VIO | **85.9** | 6.4 | 5.1 | 2.6 |
| Total | 37.8 | 27.7 | 18.8 | 15.7 |
| Note: Cells present row percentages. | | | | |

Table 7.2 cross-tabulates the intended against the perceived information structure distributions split by gender. As shown in table 7.2, male listeners are generally more efficient in perceiving focus. When the information structure intended by the speakers was OV[IO]$_{\text{C-Top/Complex D-move}}$, then male listeners perceived it correctly in 41% of the cases, as opposed to female listeners who perceived it correctly in 22% of the cases. When the focus intended by the speakers was [IO]$_{\text{Corrective/contrastive Foc}}$VO, then male listeners were 10 percentage points better at perceiving it correctly. When the intended by the speakers information structure was IOV[O]$_{\text{New information Foc}}$, then it was perceived correctly by male listeners in 79% of the cases, contrary to female listeners who perceived it correctly in 64 % of the cases. When the information structure was OV[IO]$_{\text{Corrective/contrastive Foc}}$, then in 69% of the cases it was perceived by male listeners as such, while in 67% of the cases for the female listeners. When the intended by the speakers information structure was OV[IO]$_{\text{C-Top/Simple D-move}}$, then male listeners were 3 percentage points better at perceiving it correctly. When the information structure was [O]$_{\text{New information Foc}}$VIO, then the male listeners perceived it correctly in 93% of the cases, as opposed to the female listeners who perceived it correctly in 78% of the cases.

However, there are two instances where female listeners are better. In particular, when the intended by the speakers information structure was [IO]$_{\text{C-Top/Complex D-move}}$VO, then in 50% of the cases the female listeners perceived it correctly, as opposed to male listeners who perceived it correctly in 36% of the cases. When the information structure was [IO]$_{\text{C-Top/Simple D-move}}$VO, then female listeners were 4 percentage points better at perceiving it correctly.

Table 7.2 Perceived information structure condition (%) split by gender as a function of intended information structure condition

| | Responses (across) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | New information focus | | Corrective focus | | C-Top/ Simple D-move | | C-Top/ Complex D-move | |
| Intended stimuli (down) | Fem. | Male | Fem. | Male | Fem. | Male | Fem. | Male |
| [IO]$_{\text{Corrective/contrastive Foc}}$VO | 11.1 | 2.4 | **77.8** | **88.1** | 2.8 | 7.1 | 8.3 | 2.4 |
| [IO]$_{\text{C-Top/Complex D-move}}$VO | 19.4 | 11.9 | 0 | 0 | 30.6 | 52.4 | **50.0** | **35.7** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| [IO]$_{\text{C-Top/Simple D-move}}$VO | 77.8 | 85.7 | 2.8 | 2.4 | **11.1** | **7.1** | 8.3 | 4.8 |
| IOV[O]$_{\text{New information Foc}}$ | **63.9** | **78.6** | 2.8 | 4.8 | 19.4 | 4.8 | 13.9 | 11.9 |
| OV[IO]$_{\text{Corrective/contrastive Foc}}$ | 19.4 | 16.7 | **66.7** | **69.0** | 8.3 | 2.4 | 5.6 | 11.9 |
| OV[IO]$_{\text{C-Top/Complex D-move}}$ | 13.9 | 0 | 8.3 | 2.4 | 55.6 | 57.1 | **22.2** | **40.5** |
| OV[IO]$_{\text{C-Top/Simple D-move}}$ | 27.8 | 7.1 | 41.7 | 61.9 | **13.9** | **16.7** | 16.7 | 14.3 |
| [O]$_{\text{New information Foc}}$VIO | **77.8** | **92.9** | 11.1 | 2.4 | 11.1 | 0 | 0 | 4.8 |

Note: Cells present row percentages.

Table 7.3 shows the perceived focus as a function of intended information structure per speaker. As indicated in table 7.3, speaker B is slightly better at communicating the information structure condition. In particular, speaker B is a better communicator than speaker A in four information structure conditions. Specifically, when the intended information structure was [IO]$_{\text{Corrective/contrastive Foc}}$VO, then speaker B was perceived correctly in 87% of the cases, while speaker A was perceived correctly in 80% of the cases. When the intended information structure was [IO]$_{\text{C-Top/Complex D-move}}$VO, then speaker B was perceived correctly in 46% cases, as opposed to speaker A who was perceived correctly in 39% of the cases. When the intended information structure was [IO]$_{\text{C-Top/Simple D- move}}$VO, then speaker B was 8 percentage points better at communicating his intention. When the intended information structure was OV[IO]$_{\text{Corrective/contrastive Foc}}$, then speaker B was perceived correctly in 74% of the cases, as opposed to speaker A, who was perceived correctly at 62 %.

However, there were three conditions where speaker A was a better communicator than speaker B. Specifically, when the intended information structure was IOV[O]$_{\text{New information Foc}}$, then speaker A was perceived correctly in 79.5% of the cases, as opposed to speaker B, who was perceived correctly in 64.1% of the cases. When the intended information structure was OV[IO]$_{\text{C-Top/Complex D-move}}$, then speaker A was perceived correctly in 35.9% of the cases, as opposed to speaker B, who was perceived correctly in 28.2% of the cases. When the intended information structure was [O]$_{\text{New information Foc}}$VIO, then speaker A was 2.6% better at the communication. Finally, there is an information structure condition, where both speaker A and speaker B, were perceived equally, namely, OV[IO]$_{\text{C-Top/Simple D-move}}$. When the intended information structure was OV[IO]$_{\text{C-Top/Simple D-move}}$, then both speakers were perceived correctly in 15.4% of the cases.

Table 7.3 Speakers per responses

| | | Responses (across) | | | |
|---|---|---|---|---|---|
| | Intended stimuli (down) | New information focus | Corrective focus | C-Top/ Simple D-move | C-Top/ Complex D-move |
| Speaker A | [IO]$_{\text{Corrective/contrastive Foc}}$VO | 10.3 | **79.5** | 5.1 | 5.1 |
| | [IO]$_{\text{C-Top/Complex D-move}}$VO | 25.6 | 0 | 35.9 | **38.5** |
| | [IO]$_{\text{C-Top/Simple D-move}}$VO | 89.7 | 0 | **5.1** | 5.1 |

| | | | | | |
|---|---|---|---|---|---|
| | IOV[O]$_{\text{New information Foc}}$ | **79.5** | 2.6 | 12.8 | 5.1 |
| | OV[IO]$_{\text{Corrective focus}}$ | 25.6 | **61.5** | 2.6 | 10.3 |
| | OV[IO]$_{\text{C-Top/Complex D-move}}$ | 2.6 | 2.6 | 59.0 | **35.9** |
| | OV[IO]$_{\text{C-Top/Simple D-move}}$ | 17.9 | 53.8 | **15.4** | 12.8 |
| | [O]$_{\text{New information Foc}}$VIO | **87.2** | 7.7 | 5.1 | 0 |
| Speaker B | [IO]$_{\text{Corrective/contrastive Foc}}$VO | 2.6 | **87.2** | 5.1 | 5.1 |
| | [IO]$_{\text{C-Top/Complex D-move}}$VO | 5.1 | 0 | 48.7 | **46.2** |
| | [IO]$_{\text{C-Top/Simple D-move}}$VO | 74.4 | 5.1 | **12.8** | 7.7 |
| | IOV[O]$_{\text{New information Foc}}$ | **64.1** | 5.1 | 10.3 | 20.5 |
| | OV[IO]$_{\text{Corrective/contrastive Foc}}$ | 10.3 | **74.4** | 7.7 | 7.7 |
| | OV[IO]$_{\text{C-Top/Complex D-move}}$ | 10.3 | 7.7 | 53.8 | **28.2** |
| | OV[IO]$_{\text{C-Top/Simple D-move}}$ | 15.4 | 51.3 | **15.4** | 17.9 |
| | [O]$_{\text{New information Foc}}$VIO | **84.6** | 5.1 | 5.1 | 5.1 |

Note: Cells present row percentages.

Table 7.4 presents the distribution of listeners' performance in terms of mean correct responses. The mean correct responses per listener range between 35 and 69%. As can be seen in table 7.4, there are four listeners with a mean correct response rate above 60%.

Table 7.4 Listeners' performance in terms of mean correct responses

| Listeners' id. | Mean % correct responses |
|---|---|
| 1.00 | **60.4** |
| 2.00 | **68.8** |
| 3.00 | **64.6** |
| 4.00 | 52.1 |
| 5.00 | 37.5 |
| 6.00 | 35.4 |
| 7.00 | 43.8 |
| 8.00 | 52.1 |
| 9.00 | 54.2 |
| 10.00 | **64.6** |
| 11.00 | 45.8 |
| 12.00 | 39.6 |
| 13.00 | 43.8 |

The four listeners with best performance in terms of mean correct responses were selected and the analysis was run again. Table 7.5 presents the results of the analysis. In general, these four speakers perceive information structure conditions better than the group as a whole. This is especially obvious in the case of C-Top/complex discourse move. When the intended information structure was [IO]$_{\text{C-Top/Complex D-}}$

$_{move}$VO, then the four best listeners performed 16 percentage points better than the group mean. When the intended by the speakers information structure was OV[IO]$_{C\text{-}Top/Complex\ D\text{-}move}$, then the four best listeners performed 30 percentage points better than the whole group. In contradistinction to this, confusion remained with respect to the perception of C-Top/simple discourse move. In particular, when the intended by the speakers information structure condition was [IO]$_{C\text{-}Top/Simple\ D\text{-}\ move}$VO, then the four best listeners confused it with new information focus at 83%. This is actually poorer than the mean percentage of the group (82%). When the intended information structure was OV[IO]$_{C\text{-}Top/Simple\ D\text{-}move}$, then the four best listeners performed 10 percentage points better than the group mean. However, their score is still low; only in 25% of the cases it was perceived correctly.

Table 7.5 Responses of four best listeners

| Intended stimuli (down) | Responses (across) | | | |
|---|---|---|---|---|
| | New information focus | Corrective focus | C-Top/ Simple D-move | C-Top/ Complex D-move |
| [IO]$_{Corrective/contrastive\ Foc}$VO | 0 | **100.0** | 0 | 0 |
| [IO]$_{C\text{-}Top/Complex\ D\text{-}move}$VO | 8.3 | 0 | 33.3 | **58.3** |
| [IO]$_{C\text{-}Top/Simple\ D\text{-}move}$VO | 83.3 | 8.3 | **4.2** | 4.2 |
| IOV[O]$_{New\ information\ focus}$ | **87.5** | 4.2 | 4.2 | 4.2 |
| OV[IO]$_{Corrective/contrastive\ Foc}$ | 4.2 | **87.5** | 0 | 8.3 |
| OV[IO]$_{C\text{-}Top/Complex\ D\text{-}move}$ | 0 | 8.3 | 29.2 | **62.5** |
| OV[IO]$_{C\text{-}Top/Simple\ D\text{-}move}$ | 0 | 58.3 | **16.7** | 25.0 |
| [O]$_{New\ information\ focus}$VIO | **100.0** | 0 | 0 | 0 |

Note: Cells present row percentages.

To get further insight into the data a multinomial logistic regression model was employed. In particular a multinomial logistic regression was applied to estimate the probability of selecting a specific information structure condition. The dependent variable is a 4-category variable, namely, the listeners' response. The predicted possible outcomes are new information focus, corrective/contrastive focus, C-Top/simple discourse move and C-Top/complex discourse move. There were eight independent variables: (i) pitch rise in Hz of the first stressed vowel (R1), (ii) pitch fall in Hz of the first stressed vowel (F1), (iii) pitch rise in Hz of the second stressed vowel (R2), (iv) pitch fall in Hz of the second stressed vowel (F2), (v) pitch rise in Hz of the third stressed vowel (R3), (vi) pitch fall in Hz of the third stressed vowel (F3), (vii) pitch rise in Hz of the fourth stressed vowel (R4) and (viii) pitch fall in Hz of the fourth stressed vowel (F4).[3] The model indicated that all

[3] These variables come from the measurements of the production experiment that was discussed in chapter six.

main effects besides the pitch fall of the second stressed vowel (F2) are significant. The likelihood ratio tests and the model-fitting information are given in tables 7.6 and 7.7, respectively.

Table 7.6 Likelihood ratio tests

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Effect(s) | −2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept | 680.169 | 17.543 | 3 | .001 |
| R1 | 679.442 | 16.816 | 3 | .001 |
| F1 | 685.805 | 23.180 | 3 | .000 |
| R2 | 699.990 | 37.365 | 3 | .000 |
| F2 | 667.169 | 4.544 | 3 | .208 |
| R3 | 749.468 | 86.842 | 3 | .000 |
| F3 | 691.456 | 28.830 | 3 | .000 |
| R4 | 695.731 | 33.106 | 3 | .000 |
| F4 | 705.935 | 43.309 | 3 | .000 |

Table 7.7 Model fitting information

| Model | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| | −2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept Only | 947.430 | | | |
| Final | 662.626 | 284.805 | 24 | .000 |

The results of the logistic regression analysis are summarized in tables 7.8, 7.9, 7.10 and 7.11. Each table presents the results of three response categories relative to those of a fourth reference category. Table 7.8 presents the results for response categories new information focus, corrective/contrastive focus and C-Top/simple discourse move relative to C-Top/complex discourse move. Table 7.9 presents the results for new information focus, corrective/contrastive focus and C-Top/complex discourse move relative to C-Top/simple discourse move. Table 7.10 presents corrective/contrastive focus, C-Top/simple discourse move and C-Top/complex discourse move relative to new information focus, and table 7.11 presents new information focus, C-Top/simple discourse move and C-Top/complex discourse move relative to corrective/contrastive focus. Within each table, all main effects are specified with a B-coefficient, which is the value with which a stimulus category parameter should be multiplied in order to optimally contribute to the prediction of the response category. The B-value cannot be taken at face value, as its range depends of the nominal values of the categories on the factor. The second statistic (Wald value) is an appropriate indication of the relative importance of a particular parameter in the prediction of the response category. The significance of the Wald statistics co-depends on the number of degrees of freedom in the categories distinguished along a factor (N categories -1). Each table

begins with the specification of the intercept, which is not a specific effect of a factor or category along a factor, but establishes the degree of overall bias favoring the response category at issue. The bias will not be considered as such; it merely functions as a baseline against which the effects of factors are visible.

Let us first consider table 7.8, comparing the likelihood of getting new information focus to getting C-Top/complex discourse move, we see that as F1 decreases, the likelihood of getting new information focus becomes lower than getting C-Top/complex discourse move. Moreover, as R2 increases, the likelihood of getting new information focus becomes lower than getting C-Top/complex discourse move. With respect to F3, we observe than as F3 increases, the likelihood of getting new information focus becomes larger than getting C-Top/complex discourse move. Finally, as F4 decreases, the likelihood of getting new information focus becomes lower than getting C-Top/complex discourse move.

Comparing the likelihood of getting corrective/contrastive focus to getting C-Top/complex discourse move, we note that as R1 increases, the likelihood of getting corrective/contrastive focus is lower than getting C-Top/complex discourse move. Moreover, as R2 increases the likelihood of getting corrective/contrastive focus becomes larger than getting C-Top/complex discourse move. As far as R3 is concerned, we observe that as R3 decreases the likelihood of getting corrective/contrastive focus becomes lower than getting C-Top/complex discourse move. Finally, as R4 decreases, the likelihood of getting corrective/contrastive focus becomes lower than getting C-Top/complex discourse move.

Comparing the likelihood of getting C-Top/simple discourse to getting C-Top/complex discourse move, table 7.8 indicates that none of the eight variables affects the likelihood of getting C-Top/simple discourse move compared to C-Top/complex discourse move.

Table 7.8 Parameter estimates. Response categories new information focus, corrective/contrastive focus, simple discourse move relative to complex discourse move

| Answer | Effect/ Interaction | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| New information | Intercept | 1.043 | 9.548 | 1 | .002 | |
| focus | R1 | -.008 | 3.573 | 1 | .059 | .992 |
| | F1 | -.018 | 8.874 | 1 | .003 | .982 |
| | R2 | -.011 | 6.065 | 1 | .014 | .989 |
| | F2 | .014 | .165 | 1 | .684 | 1.014 |
| | R3 | .001 | .019 | 1 | .890 | 1.001 |
| | F3 | .032 | 5.673 | 1 | .017 | 1.032 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | R4 | -.004 | 1.348 | 1 | .246 | .996 |
| | F4 | -.014 | 20.683 | 1 | .000 | .986 |
| Corrective/contrastive focus | Intercept | 1.266 | 13.011 | 1 | .000 | |
| | R1 | -.014 | 11.404 | 1 | .001 | .986 |
| | F1 | -.010 | 2.337 | 1 | .126 | .990 |
| | R2 | .009 | 3.967 | 1 | .046 | 1.009 |
| | F2 | -.006 | .030 | 1 | .862 | .994 |
| | R3 | -.055 | 32.946 | 1 | .000 | .947 |
| | F3 | .343 | .000 | 1 | 1.000 | 1.409 |
| | R4 | -.030 | 19.034 | 1 | .000 | .970 |
| | F4 | -.004 | 1.545 | 1 | .214 | .996 |
| C-Top/ Simple D-move | Intercept | .464 | 1.440 | 1 | .230 | |
| | R1 | -.002 | .134 | 1 | .714 | .998 |
| | F1 | -.002 | .092 | 1 | .762 | .998 |
| | R2 | -.003 | .348 | 1 | .555 | .997 |
| | F2 | -.034 | 1.984 | 1 | .159 | .966 |
| | R3 | -.002 | .045 | 1 | .831 | .998 |
| | F3 | .012 | 2.214 | 1 | .137 | 1.013 |
| | R4 | -.001 | .139 | 1 | .709 | .999 |
| | F4 | .001 | .074 | 1 | .785 | 1.001 |

a. The reference category is: C-Top/Complex D-move.
b. This parameter is set to zero because it is redundant.

Let us then consider table 7.9. When comparing the likelihood of getting new information focus to getting C-Top/simple discourse move, we note that as F1 increases, the likelihood of getting new information focus becomes lower than getting C-Top/simple discourse move. Moreover, as F4 increases, the likelihood of getting new information focus becomes lower than getting C-Top/simple discourse move.

Comparing the likelihood of getting corrective/contrastive focus to getting C-Top/simple discourse move, we observe that as R1 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting C-Top/simple discourse move. Moreover, as R2 increases the likelihood of getting corrective/contrastive focus becomes larger to getting C-Top/simple discourse move. As far as R3 is concerned, we note that as R3 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting C-Top/simple discourse move. Finally, as R4 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting C-Top/simple discourse move.

Table 7.9 Parameter estimates. Response categories new information focus, corrective/contrastive focus, complex discourse move relative to simple discourse move

| Answer | | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| New information focus | Intercept | .579 | 3.730 | 1 | .053 | |
| | R1 | -.006 | 2.660 | 1 | .103 | .994 |
| | F1 | -.016 | 10.645 | 1 | .001 | .985 |
| | R2 | -.008 | 3.757 | 1 | .053 | .992 |
| | F2 | .048 | 2.587 | 1 | .108 | 1.049 |
| | R3 | .003 | .151 | 1 | .698 | 1.003 |
| | F3 | .019 | 1.926 | 1 | .165 | 1.020 |
| | R4 | -.002 | .604 | 1 | .437 | .998 |
| | F4 | -.015 | 24.689 | 1 | .000 | .985 |
| Corrective/contrastive focus | Intercept | .802 | 6.461 | 1 | .011 | |
| | R1 | -.012 | 10.486 | 1 | .001 | .988 |
| | F1 | -.008 | 2.047 | 1 | .153 | .992 |
| | R2 | .011 | 8.216 | 1 | .004 | 1.011 |
| | F2 | .028 | .875 | 1 | .350 | 1.029 |
| | R3 | -.053 | 31.931 | 1 | .000 | .948 |
| | F3 | .331 | .000 | 1 | 1.000 | 1.392 |
| | R4 | -.029 | 17.709 | 1 | .000 | .972 |
| | F4 | -.005 | 2.502 | 1 | .114 | .995 |
| C-Top/ Complex D-move | Intercept | -.464 | 1.440 | 1 | .230 | |
| | R1 | .002 | .134 | 1 | .714 | 1.002 |
| | F1 | .002 | .092 | 1 | .762 | 1.002 |
| | R2 | .003 | .348 | 1 | .555 | 1.003 |
| | F2 | .034 | 1.984 | 1 | .159 | 1.035 |
| | R3 | .002 | .045 | 1 | .831 | 1.002 |
| | F3 | -.012 | 2.214 | 1 | .137 | .988 |
| | R4 | .001 | .139 | 1 | .709 | 1.001 |
| | F4 | -.001 | .074 | 1 | .785 | .999 |

a. The reference category is: C-Top/Simple D-move.
b. This parameter is set to zero because it is redundant.

Let us consider table 7.10. Comparing the likelihood of getting corrective/contrastive focus to getting new information focus, we observe that as R1 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting new information focus. We also note that as F1 increases, the likelihood of getting corrective/contrastive focus becomes larger to getting new information focus. The same observation holds for R2. Moreover, as R3 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting new information focus. The same observation holds for R4. Finally, as F4 increases the

likelihood of getting corrective/contrastive focus becomes larger to getting new information focus.

Table 7.10 Parameter estimates. Response categories corrective/contrastive focus, simple discourse move, complex discourse move relative to new information focus.

| Answer | | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Corrective/contrastive | Intercept | .223 | .815 | 1 | .367 | |
| focus | R1 | -.006 | 4.257 | 1 | .039 | .994 |
| | F1 | .008 | 4.924 | 1 | .026 | 1.008 |
| | R2 | .019 | 31.645 | 1 | .000 | 1.020 |
| | F2 | -.020 | .270 | 1 | .603 | .980 |
| | R3 | -.056 | 43.784 | 1 | .000 | .946 |
| | F3 | .311 | .000 | 1 | 1.000 | 1.365 |
| | R4 | -.026 | 14.913 | 1 | .000 | .974 |
| | F4 | .010 | 16.882 | 1 | .000 | 1.010 |
| C-Top/ | Intercept | -.579 | 3.730 | 1 | .053 | |
| Simple D-move | R1 | .006 | 2.660 | 1 | .103 | 1.006 |
| | F1 | .016 | 10.645 | 1 | .001 | 1.016 |
| | R2 | .008 | 3.757 | 1 | .053 | 1.008 |
| | F2 | -.048 | 2.587 | 1 | .108 | .953 |
| | R3 | -.003 | .151 | 1 | .698 | .997 |
| | F3 | -.019 | 1.926 | 1 | .165 | .981 |
| | R4 | .002 | .604 | 1 | .437 | 1.002 |
| | F4 | .015 | 24.689 | 1 | .000 | 1.016 |
| C-Top/ | Intercept | -1.043 | 9.548 | 1 | .002 | |
| Complex D-move | R1 | .008 | 3.573 | 1 | .059 | 1.008 |
| | F1 | .018 | 8.874 | 1 | .003 | 1.018 |
| | R2 | .011 | 6.065 | 1 | .014 | 1.011 |
| | F2 | -.014 | .165 | 1 | .684 | .986 |
| | R3 | -.001 | .019 | 1 | .890 | .999 |
| | F3 | -.032 | 5.673 | 1 | .017 | .969 |
| | R4 | .004 | 1.348 | 1 | .246 | 1.004 |
| | F4 | .014 | 20.683 | 1 | .000 | 1.014 |

a. The reference category is: New information focus.
b. This parameter is set to zero because it is redundant.

Considering table 7.11, the information provided in table 7.11 is redundant and its contents have already been discussed above. However, table 7.11 is provided for reasons of consistency.

Table 7.11 Parameter estimates. Response categories new information focus, simple discourse move, complex discourse move relative to corrective/contrastive focus.

| Answer | | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| New information focus | Intercept | -.223 | .815 | 1 | .367 | |
| | R1 | .006 | 4.257 | 1 | .039 | 1.006 |
| | F1 | -.008 | 4.924 | 1 | .026 | .992 |
| | R2 | -.019 | 31.645 | 1 | .000 | .981 |
| | F2 | .020 | 0.270 | 1 | .603 | 1.020 |
| | R3 | .056 | 43.784 | 1 | .000 | 1.057 |
| | F3 | -.226 | 286.229 | 1 | .000 | .798 |
| | R4 | .026 | 14.913 | 1 | .000 | 1.027 |
| | F4 | -.010 | 16.882 | 1 | .000 | .990 |
| C-Top/Simple D-move | Intercept | -.802 | 6.461 | 1 | .011 | |
| | R1 | .012 | 10.486 | 1 | .001 | 1.012 |
| | F1 | .008 | 2.047 | 1 | .153 | 1.008 |
| | R2 | -.011 | 8.216 | 1 | .004 | .989 |
| | F2 | -.028 | .875 | 1 | .350 | .972 |
| | R3 | .053 | 31.931 | 1 | .000 | 1.055 |
| | F3 | -.246 | 861.940 | 1 | .000 | .782 |
| | R4 | .029 | 17.709 | 1 | .000 | 1.029 |
| | F4 | .005 | 2.502 | 1 | .114 | 1.005 |
| C-Top/Complex D-move | Intercept | -1.266 | 13.011 | 1 | .000 | |
| | R1 | .014 | 11.404 | 1 | .001 | 1.014 |
| | F1 | .010 | 2.337 | 1 | .126 | 1.010 |
| | R2 | -.009 | 3.967 | 1 | .046 | .992 |
| | F2 | .006 | .030 | 1 | .862 | 1.006 |
| | R3 | .055 | 32.946 | 1 | .000 | 1.056 |
| | F3 | -.258 | . | 1 | . | .773 |
| | R4 | .030 | 19.034 | 1 | .000 | 1.030 |
| | F4 | .004 | 1.545 | 1 | .213 | 1.004 |

a. The reference category is corrective/contrastive focus.
b. This parameter is set to zero because it is redundant.

To answer the second question that was raised in the introduction, we ran the analysis again controlling this time only for R4. The likelihood ratio tests and the model-fitting information are given in tables 7.12 and 7.13, respectively.

Table 7.12 Likelihood ratio tests

| | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Effect(s) | −2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept | 230.948 | 87.617 | 3 | .000 |
| R4 | 189.308 | 45.977 | 3 | .000 |

Table 7.13 Model fitting information

| Model | Model Fitting Criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| | −2 Log Likelihood | Chi-Square | df | Sig. |
| Intercept Only | 189.308 | | | |
| Final | 143.331 | 45.997 | 3 | .000 |

The results of the logistic regression analysis are summarized in table 7.14. Comparing the likelihood of getting new information focus to getting C-Top/complex discourse move, we note that as R4 increases, the likelihood of getting new information focus becomes lower to getting C-Top/complex discourse move. Moreover, as R4 increases, the likelihood of getting corrective/contrastive focus becomes lower to getting C-Top/complex discourse move. Comparing the likelihood of getting C-Top/simple discourse to getting C-Top/complex discourse move, table 7.14 indicates that R4 does not affect the likelihood of getting C-Top/simple discourse move compared to C-Top/complex discourse move.

Given the results of the logistic regression, it can be concluded that R4 (the final rise) is associated to a certain extent with C-Top/complex discourse move. However, it should be noted that the final rise does not account for a difference between C-Top/complex discourse move and C-Top/simple discourse move.

Table 7.14 Parameter estimates. Response categories new information focus, corrective/contrastive focus, simple discourse move relative to complex discourse move

| Answer | | B | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| New information focus | Intercept | 1.008 | 55.700 | 1 | .000 | |
| | R4 | -.006 | 5.414 | 1 | .020 | .994 |
| Corrective/contrastive focus | Intercept | .852 | 37.382 | 1 | .000 | |
| | R4 | -.030 | 20.208 | 1 | .000 | .970 |
| C-Top/ Simple D-move | Intercept | .222 | 2.062 | 1 | .151 | |
| | R4 | -.002 | .395 | 1 | .530 | .998 |

a. The reference category is C-Top/complex discourse move.
b. This parameter is set to zero because it is redundant.

## 7.3 Conclusions

The perception experiment aimed at answering the questions expounded in section 7. With respect to the first question, listeners perceive some differences among corrective/contrastive focus, C-Top/simple discourse move and C-Top/complex discourse move. Specifically, corrective/contrastive focus and new information focus are perceived well above chance level, while C-Top/complex discourse move

is perceived above chance level, but listeners confuse it with C-Top/simple discourse move.

In particular, when the intended information structure was [IO]$_{\text{C-Top/Complex D-move}}$VO, then it was perceived correctly in 42% of the relevant cases, while in 42% of the cases, listeners confused it with C-Top/simple discourse move. Moreover, when the intended information structure was OV[IO]$_{\text{C-Top/Complex D-move}}$, then it was perceived correctly in 32.1% of the relevant cases, whereas in 56.4% of the cases it was confused with C-Top/simple discourse move. It is worth to note that C-Top/simple discourse move is not confused with C-Top/complex discourse move. It is rather confused with new information focus or with corrective/contrastive focus. Specifically, when the intended information structure was [IO]$_{\text{C-Top/Simple D-move}}$VO, then in 82.1% of the relevant cases listeners confused it with new information focus. When the intended information structure was OV[IO]$_{\text{C-Top/Simple D-move,}}$ then in 52.6% of the cases, listeners confused it with corrective/contrastive focus.

As far as the second question that was raised in the introduction is concerned, according the results of the logistic regression, it can be concluded that the final rise is associated to a certain extent with C-Top/complex discourse move. However, it should be noted that the final rise does not account for a difference between C-Top/complex discourse move and C-Top/simple discourse move.

Finally, the results of the logistic regression that showed that none of the eight variables account for a difference between C-Top/complex discourse move and C-Top/simple discourse move can be seen as an indirect support of Büring's (2003) claim, which stated that C-Top/simple discourse moves are optionally marked, while C-Top/complex discourse moves are obligatorily marked.

# 8 Conclusions and Issues for Future Research

In this final chapter, I first present the main findings of this dissertation, and then, I briefly summarize the tests that were used. In addition, I point out a number of questions for future research that emerge from the present discussion.

The main research question that I intended to tackle in this dissertation was whether Greek preverbal object foci differ from their postverbal counterparts with respect to their semantic and phonetic properties. An example of preverbal and postverbal object focus is given in (1).

(1) a. [Ton Yani]$_{Foc}$ filise i Maria.
the.ACC John.ACC kiss.3SG the.NOM Mary.NOM
'[John]$_{Foc}$ , Mary kissed.'

b. I Maria filise [ton Yani]$_{Foc}$.
the.NOM Mary.NOM kiss.3SG the.ACC John.ACC
'Mary kissed [John]$_{Foc}$.

Example (1a) and (1b) show that object foci in Greek may appear in preverbal or postverbal position. The semantic properties of Greek object foci were carefully examined in chapters two to four. The phonetic properties of Greek object foci were investigated in chapters five to seven.

Specifically, in chapter two, I compared preverbal and postverbal object foci in Greek with respect to exhaustivity. It was shown that preverbal and postverbal object foci do not differ with respect to exhaustivity. Moreover, it was demonstrated that both preverbal and postverbal object foci in Greek can be interpreted as new information foci.

In chapter three, Greek preverbal objects were compared to their postverbal counterparts with respect to contrast. I showed that preverbal as well as postverbal object foci can be interpreted contrastively or non-contrastively. In this respect, Greek preverbal object foci do not differ from their postverbal counterparts. Furthermore, it was shown that contrastive topics in Greek may appear in preverbal or postverbal position.

In chapter four, Greek preverbal object foci were compared to their postverbal counterparts with respect to discourse topichood. In this chapter, I argued that it is necessary to make a distinction between sentence level topics and discourse level topics. More specifically, it was shown that Greek can syntactically mark discourse topichood, and that focus can combine with discourse topic. Moreover, it was

demonstrated that Greek preverbal object foci display properties of discourse topichood, and that they obligatorily function as discourse topics. The conclusion was that Greek preverbal object foci differ from their postverbal counterparts with respect to discourse topichood.

In chapter five, I examined the phonetic properties of Greek preverbal and postverbal object foci by means of a production and two perception experiments. The two perception experiments differed with respect to the type of stimuli that were used; natural stimuli in the first experiment, manipulated stimuli in the second one. The production experiment aimed at investigating whether speakers produce a phonetic difference among sentence focus, verb-phrase focus and object focus. The results of the production experiment showed that preverbal object foci significantly differ from postverbal object foci with respect to their phonetic realization. Specifically, in preverbal object focus there is a pitch rise followed by a pitch fall. Moreover, the post-focus sequence is flat, whereas in postverbal object focus there are more pitch movements. The results of the production experiment also showed that sentence focus, verb-phrase focus and postverbal object focus present some differences. In particular, the first pitch rise in verb-phrase focus is larger than the first pitch rise in postverbal object focus. The two also differ at the second pitch rise, verb-phrase focus presenting a larger rise. Furthermore, the second pitch rise of verb-phrase focus is larger than the second pitch rise of sentence focus.

The perception experiment that used natural stimuli aimed at investigating whether listeners perceive a difference among sentence focus, verb-phrase focus and object focus. The results of the experiment showed that listeners perceive postverbal object focus well above chance level (74.7%), verb-phrase focus above chance level (42.2%) and sentence focus below chance level (14.1%). The perception experiment that used manipulated stimuli aimed at investigating the relative importance of break, accent on the verb and accent on the object on focus perception. The results of the experiment indicated that among the three variables break is the most important one. Next in importance comes accent on the object, while accent on the verb ranks last.

In chapter six, I investigated the phonetic realization of contrast in Greek by means of a production experiment. The main question addressed in this chapter was whether speakers produce a difference between contrastive focus and contrastive topic. There are also two sub-questions that are related to it. These sub-questions were the following: (i) do speakers produce a difference between new information and contrastive focus? and (ii) do speakers produce a difference between $C_{\text{-Top/Complex}}$ and $C_{\text{-Top/Simple D-moves}}$? Recall that in $C_{\text{-Top/Complex D-moves}}$, only one implicit sub-question is addressed, while in $C_{\text{-Top/Simple D-moves}}$, the sub-questions are explicit and the answer is organized per sub-question. For ease of exposition, an example of $C_{\text{-Top/Complex D-move}}$ is given in (2), while (3) is an instance of $C_{\text{-Top/Simple D- move}}$.

(2) a. Ti edoses sta pedia?
what give.2SG to.the.ACC children.ACC
'What did you give to the children?'
b. Stin Eleni edosa ena vilvio.
to.the.ACC Helen.ACC give.1SG a.ACC book.ACC
'To Helen, I gave a book.'

(3) a. Ti edoses stin Eleni ke sti
what give.2SG to.the.ACC Helen.ACC and to.the.ACC
Maria?
Mary.ACC
'What did you give to Helen and to Mary?'
b. Stin Eleni edosa ena vilvio
to.the.ACC Helen.ACC give.1SG a.ACC book.ACC
stin Maria edosa ena cd.
to.the.ACC Mary.ACC give.1SG a.ACC cd.
'To Helen I gave a book, to Mary I gave a cd.'

With respect to the first sub-question, the results showed that new information focus, corrective-contrastive focus, and closed-set/contrastive focus do not present radical differences among them. However, corrective-contrastive focus was found to have lower frequency and intensity as well as shorter duration than the other two. As far as the second sub-question is concerned [IO]$_{\text{C-Top/Complex D-move}}$VO differs significantly from [IO]$_{\text{C-Top/Simple D-move}}$VO with respect to the pitch movement of the last stressed vowel; the pitch movement of the last stressed vowel in [IO]$_{\text{C-Top/Complex D-move}}$VO is a rise followed by a fall, while the pitch movement of the last stressed in [IO]$_{\text{C-Top/Simple D-move}}$VO is a single fall. Moreover, the results showed that [IO]$_{\text{C-Top/Complex D-move}}$VO has shorter duration and lower intensity than [IO]$_{\text{C-Top/Simple D-move}}$VO.

With respect to the main question of this chapter, the results of the experiment showed that speakers produce a difference between contrastive focus and contrastive topic. In particular, a stimulus that denotes a C$_{\text{-Top/Complex D-move}}$ has a longer duration and a lower intensity than a stimulus that carries corrective focus. Moreover, it was found that [IO]$_{\text{C-Top/Complex D-move}}$VO ends with a pitch rise, whereas [IO]$_{\text{Corrective-contrastive Foc}}$VO has a flat post-focus sequence. It was also found that the first pitch rise in OV[IO]$_{\text{C-Top/Complex D-move}}$ is significantly larger than the first pitch rise in OV[IO]$_{\text{Corrective-contrastive Foc}}$.

Chapter seven built on the findings of chapter six. In particular, I investigated by means of a perception experiment whether (i) listeners perceive any difference among corrective focus, C$_{\text{-Top/Complex}}$ and C$_{\text{-Top/Simple D-moves}}$, and (ii) whether the final rise of [IO]$_{\text{C-Top/Complex D-move}}$VO can be associated with complex discourse moves. The results indicated that listeners perceive some differences among corrective-contrastive focus, C$_{\text{-Top/Simple D-moves}}$, and C$_{\text{-Top/Complex D-moves}}$. Specifically,

corrective-contrastive focus and new information focus are perceived well above chance level. $C_{\text{-Top/Complex D-moves}}$ are also perceived above chance level, but listeners confuse them with $C_{\text{-Top/Simple D-moves}}$. Specifically, the results showed that when the intended information structure was $[IO]_{\text{C-Top/Complex D-move}}VO$, then it was perceived correctly in 42% of the relevant cases, while in 42% of the cases, listeners confused it with $C_{\text{-Top/Simple D-moves}}$. Moreover, when the intended information structure was $OV[IO]_{\text{C-Top/Complex D-move}}$, then it was perceived correctly in 32.1% of the relevant cases, whereas in 56.4% of the cases, it was confused with $C_{\text{-Top/Simple D-moves}}$. The results also indicated that $C_{\text{-Top/Simple D-moves}}$ are not confused with $C_{\text{-Top/Complex D-moves}}$, but rather with new information focus or with corrective-contrastive focus.

With respect to the second question that was addressed in this chapter, the results of the logistic regression showed that the final rise is associated to a certain extent with $C_{\text{-Top/Complex D-moves}}$. In particular, the likelihood of selecting new information focus or corrective-contrastive focus as an answer instead of selecting $C_{\text{-Top/Complex D-moves}}$ decreases with the final rise. The results also indicated that the final rise does not account for a difference between $C_{\text{-Top/Complex D-moves}}$ and $C_{\text{-Top/Simple D-moves}}$.

Summarizing the findings of this thesis, Greek preverbal object foci do not differ from their postverbal counterparts with respect to exhaustivity and contrast. They rather differ with respect to discourse topichood. Preverbal object foci function obligatorily as discourse topics. The phonetic realization of preverbal object focus differs significantly from the phonetic realization of postverbal object focus. Speakers produce a difference between contrastive focus and contrastive topic, in particular, a stimulus that denotes a $C_{\text{-Top/complex discourse move}}$ has a longer duration and a lower intensity than a stimulus that carries corrective focus.

In this dissertation, theoretical and experimental means were combined, and a number of tests were used to thoroughly check the data against theoretical claims. The tests are summarized in table 8.1.

Table 8.1 A list of tests that were used in this dissertation

| | Test name | Ex. no | Definition |
|---|---|---|---|
| Exhaustivity | Slightly modified *wh*-question/answer pair test | Ch.2 ex.(6) | A question with a mention-some expression asks for a non-exhaustive answer. |
| | Co-ordination test | Ch.2 ex.(20) | If $[A \& B]_{Foc}$ does not entail $[A]_{Foc}$, then $[A]_{Foc}$ is interpreted exhaustively.<br>If $[A \& B]_{Foc}$ entaisl $[A]_{Foc}$, then $[A]_{Foc}$ is not interpreted exhaustively.<br>Condition:<br>Sentence (a) of the test should not be interpreted collectively. |

| | | | |
|---|---|---|---|
| Discourse Topichood | Continuation test | Ch.3 ex.(26-28) | *if*<br>*Wh*-question<br>1. (a) SV[O]$_{Foc}$.<br>(b)Discourse continuation of (a)<br>2. (a)SV[O]$_{Foc}$.<br>(b)Sentence that shifts the discussion<br>3. (a)[O]$_{Foc}$VS.<br>(b)Discourse continuation of (a)<br>4. (a)[O]$_{Foc}$VS.<br>#(b)Sentence that shifts the discussion<br>*then*<br>preverbal object focus functions obligatorily as a discourse topic |
| Contrast and focus | *Wh*--question /*contrastive answer test | Ch.4 ex.(1) | A contrastive answer is incompatible with an ordinary *wh*-question. |
| | Correction test | Ch.4 ex.(3) | A contrastive focus can be used to answer a *yes-no* question contrasting its presupposition. |
| | Choice-test | Ch.4 ex.(5) | When answering an alternative question, one alternate is contrasted to the other. |
| | Accommodation focus test | Ch.4 ex.(23) | When the discourse is accommodated in such a way that the initial *wh*-question can be interpreted as containing a positive and a negative question ( eg. who came? who did not come?), then the focus in the answer is contrastive. |
| Contrast and topic | Substitution test for contrastive topics | ch.4 ex.(9) | If two terms are interpreted with a 'List interpretation', then they can be substituted with 'the former' and 'the latter'. |
| | Implicit sub-question test | Ch.4 ex.(18) ex.(21) | i. When a *wh*-question can be split into sub-questions and the answer is organized per sub-question, then, there is a contrastive topic in the answer.<br>ii. When a question can be interpreted as containing more than one implicit sub-question, and the answer addresses only one of these sub-questions, rather than the general question, then, this answer contains a contrastive topic. |

From the findings of this dissertation, a number of questions for future research emerges. The first question concerns the status of contrast in grammar,

while the second question concerns the properties of preverbal object foci in a cross-linguistic perspective.

In the introduction of chapter three, I pointed out that there is an ongoing debate in the literature with respect to the status of contrast in grammar. In particular, it is debatable whether contrast should be treated as an independent notion of information structure that can combine with focus and topic, or whether contrast should be treated as a sub-feature of focus and topic. Comparing preverbal and postverbal objects with respect to contrast and examining the phonetic realization of contrast in Greek, I aimed at answering the question about the status of contrast in grammar. The rationale was that if contrastive foci and contrastive topics had similar phonetic realization, it could be argued that contrast is an independent notion of information structure. The same rationale applied to the comparison of preverbal and postverbal objects with respect to contrast. If preverbal objects differed from their postverbal counterparts with respect to contrast, it could again be argued that contrast should be treated as an independent notion of information structure. In chapter three, it was shown that Greek preverbal objects do not differ from their postverbal counterparts with respect to contrast, and in chapter six and seven, it was demonstrated that contrastive foci and contrastive topics do not have a similar phonetic realization. In this respect, the findings of this dissertation leave us with inconclusive results about the status of contrast in grammar. Further experimental and theoretical research is required to shed light on this issue.

The second question concerns the properties of preverbal object foci and their relation to their postverbal counterparts in a macro-comparative perspective. In particular, the question that arises is to what extent preverbal and postverbal object foci attest similar properties across languages. The findings of this dissertation suggest that using the same tests across languages, and comparing preverbal and postverbal object foci with respect to new information focus, exhaustivity, contrast and discourse topichood will contribute to our understanding of the role of these notions in universal grammar.

In a sense, the findings of this dissertation may be viewed as a sort of appetizer for this line of research. Besides Greek, I briefly examined data from Hungarian and Italian. With respect to the possibility of being interpreted as new information focus, Greek and Hungarian preverbal object foci are similar. In both languages, preverbal foci can be interpreted as new information foci. The picture is slightly more complicated for Italian. Surprisingly, a number of Italian speakers patterns with Greek speakers in allowing preverbal object foci to be interpreted as new information foci. However, other speakers of Italian do not allow preverbal object foci to be interpreted as new information foci. With respect to exhaustivity, Italian patterns with Greek: preverbal object foci in both languages are not exhaustive. In contradistinction to Greek and Italian, Hungarian preverbal object foci are interpreted exhaustively. Moreover, the trigger of this exhaustive interpretation remains unclear. The picture becomes more complicated, when we take into

consideration the degraded status of Hungarian postverbal object foci. Contrary to Hungarian, postverbal object foci are completely fine in Greek and Italian. Preverbal object foci in Hungarian are interpreted contrastively, while preverbal object foci in Greek can be interpreted contrastively or non-contrastively. Some Italian speakers of my sample allow for a non-contrastive interpretation of preverbal object foci, while others do not. Finally, Greek preverbal object foci function obligatorily as discourse topics, while this is not the case for Hungarian and Italian. An overview of the properties of Greek, Hungarian and Italian object foci is given in table 8.2.

Table 8.2 Properties of preverbal object foci in Greek, Hungarian and Italian

| Properties of preverbal object foci | Languages | | |
|---|---|---|---|
| | Greek | Hungarian | Italian |
| New information focus | YES | YES | NO/YES |
| Exhaustive interpretation | NO | YES | NO |
| Contrastive interpretation | YES | YES | YES |
| Non-contrastive interpretation | YES | NO | YES/NO |
| Obligatory discourse topics | YES | NO | NO |

In this dissertation, I shown that a combination of theoretical and experimental methods provides promising new insights into the fine-grained variation of preverbal focus across languages. Further research will contribute in this exciting area in the future.

# Appendix 1 (Chapter 4)

In chapter four, I discussed the continuation test. As already noted, the continuation test was applied by means of a questionnaire. The questionnaire consisted of questions and follow-up pairs. Each follow-up consisted of two sentences, sentence (a) and sentence (b). The ordering of sentence (a) and (b) was kept stable; and always sentence (a) was preceding sentence (b). Sentence (a) varied with respect to the position of the focused object; the focused object appeared in preverbal or postverbal position. Sentence (b) varied with respect to the discourse continuation; sentence (b) either continued the topic that was introduced in sentence (a) or was shifiting the discussion to a new topic. (For a detailed discussion of the questionnaire see the chapter four.) Appendix chapter 4 includes the complete set of the materials that were used in the questionnaire.

**Appendix 4**

1. Question
   Imaste se ena kipo. Ti potizi i Maria?
   be.1PL in a garden what water.3SG the.NOM Mary.NOM
   'We are in a garden. What is Mary watering?'

Follow-up1

a. Tis triantafilies potizi i Maria.
   the.ACC roses.ACC water.3SG the.NOM Mary.NOM
   'The roses, Mary is watering.'
b. Tha tis kladepsi tin aniksi.
   will CL prune.3SG the spring
   'She will prune them in spring.'

Follow-up2

a. I Maria potizi tis triantafilies.
   the.NOM Mary.NOM water.3SG the.ACC roses.ACC
   'Mary is watering the roses.'
b. Tha tis kladepsi tin aniksi.
   Will CL prune.3SG the spring
   'She will prune them in spring.'

Follow-up3

a. Tis triantafilies potizi i Maria.
   the.ACC roses.ACC water.3SG the.NOM Mary.NOM
   'The roses, Mary is watering.'
b. Meta tha sinantisi to Yani.
   then will Meet the.ACC John.ACC
   'Afterwards, she will meet John.'

Follow-up4

a. I Maria potizi tis triantafilies.
   the.NOM Mary.NOM water.3SG the.ACC roses.ACC
   'Mary is watering the roses.'

b. Meta tha sinantisi to Yani.
then will meet the.ACC John.ACC
'Afterwards, she will meet John.'

2. Question
Ti tha foresi i Maria sto parti?
what will wear the.NOM Mary in.the.ACC party
'What will Mary wear at the party?'

Follow-up1
a. To kokino forema tha foresi i Maria.
the.ACC red.ACC dress.ACC will wear the.NOM Mary.NOM
sto parti.
in.the.ACC party
'The red dress, Mary will wear at the party.'
b. Ehi kopsi ta malia tis kare
has cut the.ACC hair.ACC hers bob-cut
ke tis pane poli.
and her suit very
'She has cut her hair bob-cut and it suits her well.'

Follow-up2
a. I Maria tha foresi to
the.NOM Mary.NOM will wear the.ACC
kokino forema sto parti.
red.ACC dress.ACC in.the.ACC party
'The red dress, Mary will wear at the party.'
b. Ehi kopsi ta malia tis kare
has cut the.ACC hair.ACC hers bob-cut
ke tis pane poli.
and her suit very
'She has cut her hair bob-cut and it suits her well.'

Follow-up3
a. To kokino forema tha foresi i Maria sto parti.
the.ACC red.ACC dress.ACC will wear the.NOM Mary.NOM in.the.ACC party
'The red dress, Mary will wear at the party.'
b. To agorase xthes stin Kifisia.
CL buy.3SG yesterday in.the.ACC Kifisia
'She bought it yesterday in Kifissia.'

Follow-up4
a. I Maria tha foresi to kokino forema sto parti.
the.NOM Mary.NOM will wear the.ACC red.ACC dress.ACC in.the.ACC party
'Mary will wear the red dress at the party.'
b. To agorase xthes stin Kifisia.
CL buy.3SG yesterday in.the.ACC Kifisia
'She bought it yesterday in Kifissia.'

3. Question
Se ti apodidi i pirosvestiki ti fotia?
to what attribute.3SG the.NOM fire brigade.NOM the.ACC fire.ACC
'To what does the fire brigade attribute the fire?'

Follow-up1
a. Se diaroi aeriu apodidi i pirosvestiki
to leak.ACC gas.GEN attribute.3SG the.NOM fire brigade.NOM
ti fotia.
the.ACC fire.ACC
'To gas leak, the fire brigade attributes the fire.'
b. I epemvasi tis itan amesi ke i
the.NOM intervention hers be.3SG prompt and the.NOM
pirosvestes apediksan gia ali mia for a tin
firemen.NOM prove.3PL for another one time the.ACC
etimotita tus.
readiness.ACC their
'Its intervention was prompt and the firemen proved once more their readiness.'

Follow-up2
a. I pirosvestiki apodidi ti fotia se diaroi aeriu.
the.NOM fire brigade.NOM attribute.3SG the.ACC fire.ACC to leak.ACC gas.GEN
'The fire brigade attributes the fire to a gas leak.'
b. I epemvasi tis itan amesi ke i pirosvestes
the.NOM intervention hers be.3SG prompt and the.NOM firemen.NOM
apediksan gia ali mia fora tin etimotita tus.
prove.3PL for another one time the.ACC readiness.ACC their
'Its intervention was prompt and the firemen proved once more their readiness.'
Follow-up3
a. Se diaroi aeriu apodidi i pirosvestiki ti fotia.
to leak.ACC gas.GEN attribute.3SG the.NOM fire brigade.NOM the.ACC fire.ACC
'To gas leak, the fire brigade attributes the fire.'
b. I diaroi simiothike xthes to proi.
the.NOM leak.NOM occur.3SG yesterday the.ACC morning.ACC
'The leak occurred yesterday morning.'
Follow-up4
a. I pirosvestiki apodidi ti fotia se diaroi aeriu.
the.NOM fire brigade.NOM attribute.3SG the.ACC fire.ACC to leak.ACC gas.GEN
'The fire brigade attributes the fire to a gas leak.'
b. I diaroi simiothike xthes to proi.
the.NOM leak.NOM occur.3SG yesterday the.ACC morning.ACC
'The leak occurred yesterday morning.'
4. Question
Ti troi o Yanis?
what eat.3SG the.NOM John.NOM
'What is John eating?'
Follow-up1
a. Pagoto troi o Yanis.
ice-cream eat.3SG the.NOM John.NOM
'Ice-cream, John is eating.'
b. Ine harismatiko pedi ke pezi ke violi.
be.3SG talented.NOM child and play.3SG and violin.ACC
'He is a talented kid and even plays the violin.'
Follow-up2
a. O Yanis troi pagoto.
the.NOM John.NOM eat.3SG ice-cream.ACC
'John is eating ice-cream.'
b. Ine harismatiko pedi ke pezi ke violi.
be.3SG talented.NOM child and play.3SG and violin.ACC
'He is a talented kid and even plays the violin.'
Follow-up3
a. Pagoto troi o Yanis.
ice-cream.ACC eat.3SG the.NOM John.NOM
'Ice-cream, John is eating.'
b. To latrevi.
it adore.3SG
'He loves it.'
Follow-up4
a. O Yanis troi pagoto.
the.NOM John.NOM eat.3SG ice-cream.ACC
'John is eating ice-cream.'
b. To latrevi.
it adore.3SG
'He loves it.'
5. Question
Se pjon grafi o Yanis?
to who.ACC write.3SG the.NOM John.NOM
'To whom is John writing?'

Follow-up1
a. Sto dimarho grafi o Yanis.
to.the.ACC mayor.ACC write.3SG the.NOM John.NOM
'To the mayor, John is writing.'
b. Ton psifise stis ekloges ke tora theli na ton sighari.
CL vote.3SG in.the.ACC elections.ACC and now want.3SG to CL congratulate
'He voted for him in the elections and now he would like to congratulate him.'
Follow-up2
a. O Yanis grafi sto dimarho.
the.NOM John.NOM write.3SG to.the.ACC mayor.ACC
'John is writing to the mayor'
b. Ton psifise stis ekloges ke tora theli na ton sighari.
CL vote.3SG in.the.ACC elections.ACC and now want.3SG to CL congratulate
'He voted for him in the elections and now he would like to congratulate him.'
Follow-up3
a. Sto dimarho grafi o Yanis.
to.the.ACC mayor.ACC write.3SG the.NOM John.NOM
'To the mayor, John is writing.'
b. Theli na diamartirithi gia ta skupidia.
want.3SG to complain for the.ACC garbage.ACC
'He wants to complain about the garbage.'
Follow-up4
a. O Yanis grafi sto dimarho.
the.NOM John.NOM write.3SG to.the.ACC mayor.ACC
'John is writing to the mayor'
b Theli na diamartirithi gia ta skupidia.
want.3SG to complain for the.ACC garbage.ACC
'He wants to complain about the garbage.'
6. Question
Ti agorase i Maria?
what.ACC buy.3SG the.NOM Mary.NOM
'What did Mary buy?'
Follow-up1
a. I Maria agorase dio vivlia.
the.NOM Mary.NOM buy.3SG two.ACC books.ACC
'Mary bought two books.'
b. Ine poli harumeni kathos fevgi avrio gia diakopes.
be.3SG very happy as leave.3SG tomorrow for holidays
'She is very happy, as she is leaving tomorrow for holidays.'
Follow-up2
a. Dio vivlia agorase i Maria.
two book.ACC buy.3SG the.NOM Mary.NOM
'Two books, Mary bought.'
b. Ine poli harumeni kathos fevgi avrio gia diakopes.
be.3SG very happy as leave.3SG tomorrow for holidays
'She is very happy, as she is leaving tomorrow for holidays.'
Follow-up3
a. I Maria agorase dio vivlia.
the.NOM Mary.NOM buy.3SG two.ACC books.ACC
'Mary bought two books.'
b. Tha ta harisi sto Niko gia ta genethlia tu.
will CL give.3SG to.the.ACC Nick for the.ACC birthday.ACC his
'She will give them to Nick for his birthday.'
Follow-up4
a. Dio vivlia agorase i Maria.
two book.ACC buy.3SG the.NOM Mary.NOM
'Two books, Mary bought.'
b. Tha ta harisi sto Niko gia ta genethlia tu.
will CL give.3SG to.the.ACC Nick for the.ACC birthday.ACC his
'She will give them to Nick for his birthday.'

7. Question
Imaste se ena sholio. se pjus didaski o diefthintis?
be.1PL in a.ACC school.ACC to.ACC who.ACC teach.3SG the.NOM schoolmaster.NOM
'We are in a school. To whom is the headmaster teaching?'
Follow-up1
a. Stus mathites tis A Gymnasiu didaski o diefthintis.
to.the.ACC pupils.ACC of.GEN high school.GEN teach.3SG the.NOM schoolmaster.NOM
'To the pupils of the first grade high school the schoolmaster is teaching.
b. Ine enas talantuhos fysikos.
be.3SG a.NOM talented.NOM physicist.NOM
He is talented physicist.'
Follow-up2
a. O diefintis didaski stus mathites tis A Gymnasiu.
the.NOM schoolmaster.NOM teach.3SG to.the.ACC pupils.ACC of.GEN high school.GEN
'The schoolmaster is teaching to the pupils of the first grade high school.'
b Ine enas talantuhos fysikos.
be.3SG a.NOM talented.NOM physicist.NOM
He is talented physicist.'
Follow-up3
a. Stus mathites tis A Gymnasiu didaski o diefthintis.
to.the.ACC pupils.ACC of.GEN high school.GEN teach.3SG the.NOM schoolmaster.NOM
'To the pupils of the first grade high school the schoolmaster is teaching.
b. Tus proetimazi gia tis telikes eksetaseis.
CL prepare.3SG for the.ACC final.ACC exams.ACC
'He is preparing them for the final exams.'
Follow-up4
a. O diefintis didaski stus mathites tis A Gymnasiu.
the.NOM schoolmaster.NOM teach.3SG to.the.ACC pupils.ACC of.GEN high school.GEN
'The schoolmaster is teaching to the pupils of the first grade high school.'
b. Tus proetimazi gia tis telikes eksetasis.
CL prepare.3SG for the.ACC final.ACC exams.ACC
'He is preparing them for the final exams.'
8. Question
Ti diavazi i Ana?
what read.3SG the.NOM Ana.NOM
'What is Ana reading?'
Follow-up1
a. Astinomika mithistorimata diavazi i Ana.
crime-stories.ACC novels.ACC read.3SG the.NOM Ana.NOM
'Crime-stories Ana is reading.'
b. Ta agorazi apo ena vivliopolio konta sti dulia tis.
CL buy.3SG from a.ACC bookstore.ACC next to.the.ACC work.ACC hers
'She buys them from a bookstore next to her work.'
Follow-up2
a. I Ana diavazi astinomika mithistorimata.
the.NOM Ana.NOM read.3SG crime-stories.ACC novels.ACC
'Ana is reading crime-stories.'
b. Ta agorazi apo ena vivliopolio konta sti dulia tis.
CL buy.3SG from a.ACC bookstore.ACC next to.the.ACC work.ACC hers
'She buys them from a bookstore next to her work.'
Follow-up3
a. Astinomika mithistorimata diavazi i Ana.
crime-stories.ACC novels.ACC read.3SG the.NOM Ana.NOM
'Crime-stories Ana is reading.'
b. Eho kero na tin do mipos kseris ti kani?
have.1SG time to CL see may be know.2SG what do.2SG
'I haven't seen her for a while, do you know how she doing?'

Follow-up4
a. I Ana diavazi astinomika mithistorimata.
the.NOM Ana.NOM read.3SG crime-stories.ACC novels.ACC
'Ana is reading crime-stories.'
b. Eho kero na tin do mipos kseris ti kani?
have.1SG time to CL see may be know.2SG what do.2SG
'I haven't seen her for a while, do you know how she doing?'

9. Question
Ginete ena anihto parti. o kathenas mpori na
happen.3SG a.ACC open.ACC party.ACC the.NOM everyone.NOM can.3SG to
proskalesi opjon theli. se pjon ipe i Eleni na erthi?
invite whoever.ACC want.3SG to who.ACC tell.3SG the.NOM Helen.NOM to come
'There is an open party. Everybody is allowed to invite whoever he wants. Whom did Helen tell to come?'

Follow-up1
a. Se enan agnosto ipe i Eleni na erthi.
to a.ACC stranger.ACC tell.3SG the.NOM Helen.NOM to come
'A stranger, Helen told to come.'
b. Ton sinantise sti stasi tu leoforiu prin mia edvomada.
CL meet.3SG at.the.ACC stop.ACC of.GEN bus.GEN ago one.ACC week.ACC
'She met him at the bus-stop one week ago.'

Follow-up2
a. I Eleni ipe se enan agnosto na erthi.
the.NOM Helen.NOM tell.3SG to a.ACC stranger.ACC to come
'Helen told a stranger to come.'
b. Ton sinantise sti stasi tu leoforiu prin mia edvomada.
CL meet.3SG at.the.ACC stop.ACC of.GEN bus.GEN ago one.ACC week.ACC
'She met him at the bus-stop one week ago.'

Follow-up3
a. Se enan agnosto ipe i Eleni na erthi.
to a.ACC stranger.ACC tell.3SG the.NOM Helen.NOM to come
'A stranger, Helen told to come.'
b. Ine toso haritomeni me to kenurjo tis kurema.
be.3SG so pretty with the.ACC new.ACC hers hair-cut
'She is so pretty with her new hair-cut.'

Follow-up4
a. I Eleni ipe se enan agnosto na erthi.
the.NOM Helen.NOM tell.3SG to a.ACC stranger.ACC to come
'Helen told a stranger to come.'
b. Ine toso haritomeni me to kenurjo tis kurema.
be.3SG so pretty with the.ACC new.ACC hers hair-cut
'She is so pretty with her new hair-cut.'

10. Question
Me posus ipopsifius sizitise o Yanis?
with how.many.ACC candidate.ACC discuss.3SG the.NOM John.NOM
'With how many candidates did John discuss?'

Follow-up1
a. O Yanis sizitise me dio ipopsifius.
the.NOM John.NOM discuss.3SG with two Candidates.ACC
'John discussed with two candidates.'
b. Tus rotise gia to politiko tus programa.
CL ask.3SG for the.ACC political.ACC theirs programme
'He asked them about their political programme.'

Follow-up2
a. Me dio ipopsifius sizitise o Yanis.
with two candidate.ACC discuss.3SG the.NOM John.NOM
'With two candidates John discussed.'
b. Tus rotise gia to politiko tus programa.
CL ask.3SG for the.ACC political.ACC theirs programme
'He asked them about their political programme.'

Follow-up3
a. O Yanis sizitise me dio ipopsifius.
the.NOM John.NOM discuss.3SG with two candidates.ACC
'John discussed with two candidates.'
b. I kuventa pige kala kathos o Yanis enas
the.NOM discussion.NOM go.3SG well as the.NOM John.3SG a.NOM
pola iposhomenos neos dimosiografos.
much promising.NOM young.NOM journalist.NOM
'The discussion went well, as John is a well promising young journalist.'
Follow-up4
a. Me dio ipopsifius sizitise o Yanis.
with two candidate.ACC discuss.3SG the.NOM John.NOM
'With two candidates John discussed.'
b. I kuventa pige kala kathos
the.NOM discussion.NOM go.3SG well as
o Yanis enas pola iposhomenos neos dimosiografos.
the.NOM John.3SG a.NOM much promising.NOM young.NOM journalist.NOM
'The discussion went well, as John is a well promising young journalist.'
11. Question
Ti zografizi o Nikolas?
what draw.3SG the.NOM Nick.NOM
'What is Nick drawing?'
Follow-up1
a. Mia karta Hristugenon zografizi o Nikolas.
a.ACC card.ACC Christmas.GEN draw.3SG the.NOM Nick.NOM
'A Christmas card Nick is drawing.'
b. Ti gemizi me hrisa asteria.
CL fill.3SG with golden.ACC stars.ACC
'He fills with golden stars'
Follow-up2
a. O Nikolas zografizi mia karta Hristugenon.
the.NOM Nick.NOM draw.3SG a.ACC card.ACC Christmas.GEN
'Nick is drawing a Christmas card.'
b. Ti gemizi me hrisa asteria.
CL fill.3SG with golden.ACC stars.ACC
'He fills with golden stars'
Follow-up3
a. Mia karta Hristugenon zografizi o Nikolas.
a.ACC card.ACC Christmas.GEN draw.3SG the.NOM Nick.NOM
'A Christmas card Nick is drawing.'
b. Ine kalos sto shedio.
be.3SG good.NOM at.the.ACC drawing.ACC
'He is good at drawing.'
Follow-up4
a. O Nikolas zografizi mia karta Hristugenon.
the.NOM Nick.NOM draw.3SG a.ACC card.ACC Christmas. GEN
'Nick is drawing a Christmas card.'
b. Ine kalos sto shedio.
be.3SG good.NOM at.the.ACC drawing.ACC
'He is good at drawing.'
12. Question
Se pjus milise o ipurgos ergasias?
to who.ACC talk.3SG the.NOM minister.NOM labour.GEN
'To whom did the minister of labour talk?'
Follow-up1
a. Se anergus apo to Menidi milise o
to unemployed.ACC from the.ACC Menidi.ACC talk.3SG the.NOM
ipurgos Ergasias.
minister.NOM labour.GEN
'To unemployed from Menidi the minister of labour talked.'

b. Avrio tha sinantithi me ton prothipurgo.
tomorrow will meet.3SG with the.ACC prime-minister.ACC
'Tomorrow he will meet the prime-minister.'

Follow-up2

a. O ipurgos ergasias milise se anergus apo
the.NOM minister.NOM labour.GEN talk.3SG to unemployed.ACC from
to Menidi.
the.ACC Menidi
'The minister of labour talked to the unemployed from Menidi.'

b. Avrio tha sinantithi me ton prothipurgo.
tomorrow will meet.3SG with the.ACC prime-minister.ACC
'Tomorrow he will meet the prime-minister.'

Follow-up3

a. Se anergus apo to Menidi milise o
to unemployed.ACC from the.ACC Menidi.ACC talk.3SG the.NOM
ipurgos ergasias.
minister.NOM labour.GEN
'To unemployed from Menidi the minister of labour talked.'

b. Tus iposhethike na dimiurgisi nees thesis ergasias.
CL promise.3SG to create.3SG new.ACC vacancies.ACC
'He promised them to create new vacancies.'

Follow-up4

a. O ipurgos ergasias milise se anergus apo
the.NOM minister.NOM labour.GEN talk.3SG to unemployed.ACC from
to Menidi.
the.ACC Menidi
'The minister of labour talked to the unemployed from Menidi.'

b. Tus iposhethike na dimiurgisi nees thesis ergasias.
CL promise.3SG to create.3SG new.ACC vacancies.ACC
'He promised them to create new vacancies.'

## Appendix 4.1

Appendix 4.1 includes the material that was used in phase four of the questionnaire.

1. Question
Agorases to fustani i ti fusta?
buy.2SG the.ACC dress.ACC or the.ACC skirt.ACC
'Did you buy the dress or the skirt?'

Follow-up1

a. To fustani agorasa.
the.ACC dress.ACC buy.1SG
'The dress I bought.'

b. Ine kokino ke ehi ena kentima sto mpusto.
be.3SG red.NOM and have.3SG a.ACC embroidery.ACC in.the.ACC bodice.ACC
'It is red and has a embroidery in the bodice.'

Follow-up2

a. Agorasa to fustani.
buy.1SG the.ACC dress.ACC
'I bought the dress.'

b. Ine kokino ke ehi ena kentima sto mpusto.
be.3SG red.NOM and have.3SG a.ACC embroidery.ACC in.the.ACC bodice.ACC
'It is red and has a embroidery in the bodice.'

Follow-up3

a. To fustani agorasa.
the.ACC dress.ACC buy.1SG
'The dress I bought.'

b. Avrio pao diakopes.
tomorrow go.1SG holidays.ACC
'Tomorrow, I am going on holidays.'

Follow-up4
a. Agorasa to fustani.
buy.1SG the.ACC dress.ACC
'I bought the dress.'
b. Avrio pao diakopes
tomorrow go.1SG holidays.ACC
'Tomorrow, I am going on holidays.'
2. Question
Agorases ti fusta?
buy.2SG the.ACC skirt.ACC
'Did you buy the skirt?'
Follow-up1
a. To fustani agorasa.
the.ACC dress.ACC buy.1SG
'The dress I bought.'
b. Ine kokino ke ehi ena kentima sto mpusto.
be.3SG red.NOM and have.3SG a.ACC embroidery.ACC in.the.ACC bodice.ACC
'It is red and has a embroidery in the bodice.'
Follow-up2
a. Agorasa to fustani
buy.1SG the.ACC dress.ACC
'I bought the dress.'
b. Ine kokino ke ehi ena kentima.
be.3SG red.NOM and have.3SG a.ACC embroidery.ACC
sto mpusto
in.the.ACC bodice.ACC
'It is red and has a embroidery in the bodice.'
Follow-up3
a. To fustani agorasa.
the.ACC dress.ACC buy.1SG
'The dress I bought.'
b. Avrio pao diakopes.
tomorrow go.1SG holidays.ACC
'Tomorrow, I am going on holidays.'
Follow-up4
a. Agorasa to fustani
buy.1SG the.ACC dress.ACC
'I bought the dress.'
b. Avrio pao diakopes.
tomorrow go.1SG holidays.ACC
'Tomorrow, I am going on holidays.'
3. Question
Estiles ta grammata i ta demata?
send.2SG the.ACC letters.ACC or the.ACC parcels.ACC
'Have you posted the letters or the parcels?'
Follow-up1
a. Ta grammata estila.
the.ACC letters.ACC post.1SG
'The letters I posted.'
b. Milisa ke me ton Yani.
talk.3SG and with the.ACC John.ACC
'I also talked with John.'
Follow-up2
a. Estila ta grammata.
post.1SG the.ACC letters.ACC
'I posted the letters.'
b. Milisa ke me ton Yani.
talk.3SG and with the.ACC John.ACC
'I also talked with John.'

Follow-up3
a. Ta grammata estila.
the.ACC letters.ACC post.1SG
'The letters I posted.'
b. Tha ftasun avrio.
will arrive.3PL tomorrow
'They will arrive tomorrow.'
Follow-up4
a. Estila ta grammata.
post.1SG the.ACC letters.ACC
'I posted the letters.'
b. Tha ftasun avrio.
will arrive.3PL tomorrow
'They will arrive tomorrow.'
4. Question
Estiles ta demata?
send.2SG the.ACC parcels.ACC
'Have you posted the parcels?'
Follow-up1
a. Ta grammata estila.
the.ACC letters.ACC post.1SG
'The letters I posted.'
b. Milisa ke me ton Yani.
talk.3SG and with the.ACC John.ACC
'I also talked with John.'
Follow-up2
a. Estila ta grammata.
post.1SG the.ACC letters.ACC
'I posted the letters.'
b. Milisa ke me ton Yani.
talk.3SG and with the.ACC John.ACC
'I also talked with John.'
Follow-up3
a. Ta grammata estila.
the.ACC letters.ACC post.1SG
'The letters I posted.'
b. Tha ftasun avrio.
Will arrive.3PL tomorrow
'They will arrive tomorrow.'
Follow-up4
a. Estila ta grammata.
post.1SG the.ACC letters.ACC
'I posted the letters.'
b. Tha ftasun avrio
will arrive.3PL tomorrow
'They will arrive tomorrow.'
5. Question
Milises sto Yani i sti Maria?
talk.2SG to.the.ACC John.ACC or to.the.ACC Mary.ACC
'Did you talk to John or to Mary?'
Follow-up1
a. Sto Yani milisa.
to.the.ACC John.ACC talk.1SG
'To John I talked.'
b. Ine akoma poli thimomenos.
be.3SG still very angry.NOM
'He is still very upset.'

Follow-up2
a. Milisa sto Yani.
talk.1SG to.the.ACC John.ACC
'I talked to John.'
b. Ine akoma poli thimomenos.
be.3SG still very angry.NOM
'He is still very upset.'
Follow-up3
a. Sto Yani milisa.
to.the.ACC John.ACC talk.1SG
'To John I talked.'
b. Etimasa ke tis valitses.
prepare.1SG and the.ACC suitcase.ACC
'I also prepared the suitcases.'
Follow-up4
a. Milisa sto Yani.
talk.1SG to.the.ACC John.ACC
'I talked to John.'
b. Etimasa ke tis valitses.
prepare.1SG and the.ACC suitcase.ACC
'I also prepared the suitcases.'
6. Question
Milises sti Maria?
talk.2SG to.the.ACC Mary.ACC
'Did you talk to Mary?'
Follow-up1
a. Sto Yani milisa.
to.the.ACC John.ACC talk.1SG
'To John I talked.'
b. Ine akoma poli thimomenos.
be.3SG still very angry.NOM
'He is still very upset.'
Follow-up2
a. Milisa sto Yani.
talk.1SG to.the.ACC John.ACC
'I talked to John.'
b. Ine akoma poli thimomenos.
be.3SG still very angry.NOM
'He is still very upset.'
Follow-up3
a. Sto Yani milisa.
to.the.ACC John.ACC talk.1SG
'To John I talked.'
b. Etimasa ke tis valitses.
prepare.1SG and the.ACC suitcase.ACC
'I also prepared the suitcases.'
Follow-up4
a. Milisa sto Yani.
talk.1SG to.the.ACC John.ACC
'I talked to John.'
b. Etimasa ke tis valitses.
prepare.1SG and the.ACC suitcase.ACC
'I also prepared the suitcases.'
7. Question
Egrapses stus mpojatzides i stus idravlikus?
write.2SG to.the.ACC painters.ACC or to.the.ACC plumbers.ACC
'Have you written to the painters or to the plumbers?'

Follow-up1
a. Stus mpojatzides egrapsa.
to.the.ACC painters.ACC write.1SG
'To the painters I wrote.'
b. Tha erthun avrio.
will come.3PL tomorrow
'They will come tomorrow.'
Follow-up2
a. Egrapsa stus mpojatzides.
write.1SG to.the.ACC painters.ACC
'I wrote to the painters.'
b. Tha erthun avrio.
will come.3PL tomorrow
'They will come tomorrow.'
Follow-up3
a. Stus mpojatzides egrapsa.
to.the.ACC painters.ACC write.1SG
'To the painters I wrote.'
b. O Olimpiakos pire to protathlima.
the.NOM Olimpiakos get.3SG the.ACC championship.ACC
'Olympiakos won the championship.'
Follow-up4
a. Egrapsa stus mpojatzides.
write.1SG to.the.ACC painters.ACC
'I wrote to the painters.'
b. O Olimpiakos pire to protathlima.
the.NOM Olimpiakos get.3SG the.ACC championship.ACC
'Olympiakos won the championship.'
8. Question
Egrapses stus idravlikus?
write.2SG to.the.ACC plumbers.ACC
'Have you written to the plumbers?'
Follow-up1
a. Stus mpojatzides egrapsa.
to.the.ACC painters.ACC write.1SG
'To the painters I wrote.'
b. Tha erthun avrio.
will come.3PL tomorrow
'They will come tomorrow.'
Follow-up2
a. Egrapsa stus mpojatzides.
write.1SG to.the.ACC painters.ACC
'I wrote to the painters.'
b. Tha erthun avrio
will come.3PL tomorrow
'They will come tomorrow.'
Follow-up3
a. Stus mpojatzides egrapsa.
to.the.ACC painters.ACC write.1SG
'To the painters I wrote.'
b. O Olimpiakos pire to protathlima.
the.NOM Olimpiakos get.3SG the.ACC championship.ACC
'Olympiakos won the championship.'
Follow-up4
a. Egrapsa stus mpojatzides.
write.1SG to.the.ACC painters.ACC
'I wrote to the painters.'
b. O Olimpiakos pire to protathlima.
the.NOM Olimpiakos get.3SG the.ACC championship.ACC
'Olympiakos won the championship.'

9. Question
Thelis kafe i tsai?
want.2SG coffee.ACC or tea.ACC
'Would you like coffee or tea?'
Follow-up1
a. Thelo kafe.
want.1SG coffee.ACC
'I would like coffee.'
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'I like coffee very much.'
Follow-up2
a. Kafe thelo.
coffee.ACC want.1SG
'Coffee, I would like.'
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'I like coffee very much.'
Follow-up3
a. Thelo kafe.
want.1SG coffee.ACC
'I would like coffee.'
b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'I bought Karistiani's last book.'
Follow-up4
a. Kafe thelo.
coffee.ACC want.1SG
'Coffee, I would like.'
b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'I bought Karistiani's last book.'
10. Question
Thelis tsai?
want.2SG tea.ACC
'Would you like tea?'
Follow-up1
a. Thelo kafe.
want.1SG coffee.ACC
'I would like coffee.'
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'I like coffee very much.'
Follow-up2
a. Kafe thelo
coffee.ACC want.1SG
'Coffee, I would like.'
b. O kafes mu aresi poli.
the.NOM coffee.NOM me like.3SG very
'I like coffee very much.'
Follow-up3
a. Thelo kafe.
want.1SG coffee.ACC
'I would like coffee.'
b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'I bought Karistiani's last book.'

Follow-up4
a. Kafe thelo
coffee.ACC want.1SG
'Coffee, I would like.'
b. Agorasa to telefteo vivlio tis Karistiani.
buy.1SG the.ACC last.ACC book.ACC of Karistiani
'I bought Karistiani's last book.'
11. Question
Grafis piimata i peza?
write.2SG poems.ACC or novels.ACC
'Do you write poetry or prose?'
Follow-up1
a. Peza grafo.
novels.ACC write.1SG
'Prose I write.'
b. Ta stelno kathe dvomada stin efimerida gia dimosieusi.
CL send.1SG every.ACC week.ACC to.the.ACC newspaper.ACC for publishing
'I send them every week to the newspaper for publishing.'
Follow-up2
a. Grafo peza
write.1SG novels.ACC
'I write prose.'
b. Ta stelno kathe dvomada stin efimerida gia dimosieusi.
CL send.1SG every.ACC week.ACC to.the.ACC newspaper.ACC for publishing
'I send them every week to the newspaper for publishing.'
Follow-up3
a. Peza grafo
novels.ACC write.1SG
'Prose I write.'
b. Eho spudasi mathimatika.
have.1SG studied mathematics.ACC
'I have studied mathematics.'
Follow-up4
a. Grafo peza.
write.1SG novels.ACC
'I write prose.'
b. Eho spudasi mathimatika.
have.1SG studied mathematics.ACC
'I have studied mathematics.'
12. Question
Grafis piimata?
write.2SG poems.ACC
'Do you write poems?'
Follow-up1
a. Peza grafo.
novels.ACC write.1SG
'Prose I write.'
b. Ta stelno kathe dvomada stin efimerida gia dimosieusi.
CL send.1SG every.ACC week.ACC to.the.ACC newspaper.ACC for publishing
'I send them every week to the newspaper for publishing.'
Follow-up2
a. Grafo peza.
write.1SG novels.ACC
'I write prose.'
b. Ta stelno kathe dvomada stin efimerida gia dimosieusi.
CL send.1SG every.ACC week.ACC to.the.ACC newspaper.ACC for publishing
'I send them every week to the newspaper for publishing.'

Follow-up3
a. Peza grafo.
novels.ACC write.1SG
'Prose I write.'
b. Eho spudasi mathimatika.
have.1SG studied mathematics.ACC
'I have studied mathematics.'
Follow-up4
a. Grafo peza.
write.1SG novels.ACC
'I write prose.'
b. Eho spudasi mathimatika.
have.1SG studied mathematics.ACC
'I have studied mathematics.'
13. Question
Milise o ipurgos pedias se fitites i se mathites?
talk.3SG the.NOM minister.NOM education.GEN to students.ACC or to pupils.ACC
'Did the minister of education talk to students or to pupils?'
Follow-up1
a. Se fitites milise o ipurgos pedias.
to students.ACC talk.3SG the.NOM minister.NOM education.GEN
'To students talked the minister of education.'
b. Tus parusiase tis nees tu idees.
CL present.3SG the.ACC new.ACC his ideas.ACC
'He presented his new ideas to them.'
Follow-up2
a. O ipurgos pedias milise se fitites.
the.NOM minister.NOM education.GEN talk.3SG to students.ACC
'The minister of education talked to students.'
b. Tus parusiase tis nees tu idees.
CL present.3SG the.ACC new.ACC his ideas.ACC
'He presented his new ideas to them.'
Follow-up3
a. Se fitites milise o ipurgos pedias.
to students.ACC talk.3SG the.NOM minister.NOM education.GEN
'To students talked the minister of education.'
b. Avrio tha sinantisi ton prothipurgo.
tomorrow will meet.3SG the.ACC prime-minister.ACC
'Tomorrow, he will meet the prime-minister.'
Follow-up4
a. O ipurgos pedias milise se fitites.
the.NOM minister.NOM education.GEN talk.3SG to students.ACC
'The minister of education talked to students.'
b. Avrio tha sinantisi ton prothipurgo.
tomorrow will meet.3SG the.ACC prime-minister.ACC
'Tomorrow, he will meet the prime-minister.'
14. Question
Milise o ipurgos pedias se mathites?
talk.3SG the.NOM minister.NOM education.GEN to pupils.ACC
'Did the minister of education talk to pupils?'
Follow-up1
a. Se fitites milise o ipurgos pedias.
to students.ACC talk.3SG the.NOM minister.NOM education.GEN
'To students talked the minister of education.'
b. Tus parusiase tis nees tu idees.
CL present.3SG the.ACC new.ACC his ideas.ACC
'He presented his new ideas to them.'

Follow-up2
a. O ipurgos pedias milise se fitites.
the.NOM minister.NOM education.GEN talk.3SG to students.ACC
'The minister of education talked to students.'
b. Tus parusiase tis nees tu idees.
CL present.3SG the.ACC new.ACC his ideas.ACC
'He presented his new ideas to them.'
Follow-up3
a. Se fitites milise o ipurgos pedias.
to students.ACC talk.3SG the.NOM minister.NOM education.GEN
'To students talked the minister of education.'
b. Avrio tha sinantisi ton prothipurgo.
tomorrow will meet.3SG the.ACC prime-minister.ACC
'Tomorrow, he will meet the prime-minister.'
Follow-up4
a. O ipurgos pedias milise se fitites.
the.NOM minister.NOM education.GEN talk.3SG to students.ACC
'The minister of education talked to students.'
b. Avrio tha sinantisi ton prothipurgo.
tomorrow will meet.3SG the.ACC prime-minister.ACC
'Tomorrow, he will meet the prime-minister.'
15. Question
I Maria hamogelase se enan agnosto i se enan filo apo
the.NOM Mary.NOM smile.3SG to a.ACC stranger.ACC or to a.ACC friend.ACC from
ta palia?
the old
'Did Mary smile to a stranger or to a friend from the past?'
Follow-up1
a. I Maria hamogelase se enan agnosto.
the.NOM Mary.NOM smile.3SG to a.ACC stranger.ACC
'Mary smiled to a stranger.'
b. Ekinos foruse ena kokino kapelo.
he/that.one.NOM wear.3SG a.ACC red.ACC hat.ACC
'He was wearing a red hat.'
Follow-up2
a. Se enan agnosto hamogelase i Maria.
to a.ACC stranger.ACC smile.3SG the.NOM Mary.NOM
'To a stranger Mary smiled.'
b. Ekinos foruse ena kokino kapelo.
he/that.one.NOM wear.3SG a.ACC red.ACC hat.ACC
'He was wearing a red hat.'
Follow-up3
a. I Maria hamogelase se enan agnosto.
the.NOM Mary.NOM smile.3SG to a.ACC stranger.ACC
'Mary smiled to a stranger.'
b. Ke meta hathike sto plithos.
and then get.lost3SG in.the.ACC crowd
'And then she got lost in the crowd.'
Follow-up4
a. Se enan agnosto hamogelase i Maria.
to a.ACC stranger.ACC smile.3SG the.NOM Mary.NOM
'To a stranger Mary smiled.'
b. Ke meta hathike sto plithos.
and then get.lost3SG in.the.ACC crowd
'And then she got lost in the crowd.'
16. Question
I Maria hamogelase se enan filo apo ta palia?
the.NOM Mary.NOM smile.3SG to a.ACC friend.ACC from the old
'Did Mary smile to a friend from the past?'

Follow-up1
a. I Maria hamogelase se enan agnosto.
the.NOM Mary.NOM smile.3SG to a.ACC stranger.ACC
'Mary smiled to a stranger.'
b. Ekinos foruse ena kokino kapelo.
he/that.one.NOM wear.3SG a.ACC red.ACC hat.ACC
'He was wearing a red hat.'
Follow-up2
a. Se enan agnosto hamogelase i Maria.
to a.ACC stranger.ACC smile.3SG the.NOM Mary.NOM
'To a stranger Mary smiled.'
b. Ekinos foruse ena kokino kapelo
he/that.one.NOM wear.3SG a.ACC red.ACC hat.ACC
'He was wearing a red hat.'
Follow-up3
a. I Maria hamogelase se enan agnosto.
the.NOM Mary.NOM smile.3SG to a.ACC stranger.ACC
'Mary smiled to a stranger.'
b. Ke meta hathike sto plithos.
and then get.lost3SG in.the.ACC crowd
'And then she got lost in the crowd.'
Follow-up4
a. Se enan agnosto hamogelase i Maria.
to a.ACC stranger.ACC smile.3SG the.NOM Mary.NOM
'To a stranger Mary smiled.'
b. Ke meta hathike sto plithos.
and then get.lost3SG in.the.ACC crowd
'And then she got lost in the crowd.'

## Appendix 4.2 Italian

1. Question
Maria sta annaffiando le rose?
Mary be water the roses
'Is Mary watering the roses?'
Follow-up1
a. Maria sta annaffiando le dalie.
Mary be water the dahlias
'Mary is watering the dahlias.'
b. Le poterà in primavera.
CL prune in spring
'She will prune them in spring.'
Follow-up2
a. Le dalie sta annaffiando Maria.
the dahlias is water Mary
'The dahlias Mary is watering.'
b. Le poterà in primavera.
CL prune in spring
'She will prune them in spring.'
Follow-up3
a. Maria sta annaffiando le dalie.
Mary be water the dahlias
'Mary is watering the dahlias.'
b. Dopo incontrerà Gianni.
after meet John
'She will meet John afterwards.'

Follow-up4
a. Le dalie sta annaffiando Maria.
the dahlias is water Mary
'The dahlias Mary is watering.'
b. Dopo incontrerà Gianni.
after meet John
'She will meet John afterwards.'
2. Question
Maria sta annaffiando le rose o le dalie?
Mary be water the roses or the dahlias
'Is Mary watering the roses or the dahlias?'
Follow-up1
a. Maria sta annaffiando le dalie.
Mary be water the dahlias
'Mary is watering the dahlias.'
b. Le poterà in primavera
CL prune in spring
'She will prune them in spring.'
Follow-up2
a. Le dalie sta annaffiando Maria.
the dahlias is water Mary
'The dahlias Mary is watering.'
b. Le poterà in primavera.
CL prune in spring
'She will prune them in spring.'
Follow-up3
a. Maria sta annaffiando le dalie.
Mary be water the dahlias
'Mary is watering the dahlias.'
b. Dopo incontrerà Gianni.
after meet John
'She will meet John afterwards.'
Follow-up4
a. Le dalie sta annaffiando Maria.
the dahlias is water Mary
'The dahlias Mary is watering.'
b. Dopo incontrerà Gianni.
after meet John
'She will meet John afterwards.'

# Appendix 2 (Chapter 5)

Appendix 5 includes the list of 12 sets of four question/answer pairs (Q/A pairs) that were used in the production experiment that was reported in section 5.1.

Set 1

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Eleni meloni mila]$_{Foc}$.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'Helen smears honey on apples.'

b. *Question*
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*
I Eleni [$_{VP}$ meloni mila]$_{Foc}$.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'Helen smears honey on apples.'

c. *Question*
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'
*Answer*
I Eleni meloni [$_{NP}$ mila]$_{Foc}$.
the.NOM Helen.NOM smear.honey.on.3SG apples.ACC
'Helen smears honey on apples.'

d. Question
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'
*Answer*
[$_{NP}$ Mila]$_{Foc}$ meloni i Eleni.
apples.ACC smear.honey.on.3SG the.NOM Helen.NOM
'On apples Helen smears honey.'

Set 2

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Melina analii onira]$_{Foc}$.
the.NOM Melina.NOM analyze.3SG dreams.ACC
'Melina is analyzing dreams.'

b. *Question*
Ti kani i Melina?
what do.3SG the.NOM Melina.NOM
'What is Melina doing?'
*Answer*
I Melina [VP analii onira]Foc.
the.NOM Melina.NOM analyze.3SG dreams.ACC
'Melina is analyzing dreams.'

c. *Question*
Ti analii i Melina?
what analyze.3SG the..NOM Melina..NOM
'What is Melina analyzing?'
*Answer*
I Melina analii [NP onira]Foc.
the.NOM Melina.NOM analyze.3SG dreams.ACC
'Melina is analyzing dreams.'

d. *Question*
Ti analii i Melina?
what analyze.3SG the.NOM Melina.NOM
'What is Melina analyzing?'
*Answer*
[NP Onira analii i Melina.
dreams.ACC analyze.3SG the.NOM Melina.NOM
'Dreams Melina is analyzing.'

Set 3

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[S I Marina anameni minima]Foc.
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'

b. *Question*
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
*Answer*
I Marina [VP anameni minima]Foc.
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'

c. *Question*
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina waiting for?'
*Answer*
I Marina anameni [NP minima]Foc.
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'

d. *Question*
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina waiting for?'
*Answer*
[NP Minima]Foc anameni i Marina.
message.ACC await.3SG the.NOM Marina.NOM
'For a message Marina is waiting.'

Set4

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Elina enoni rola]$_{Foc}$.
the.NOM Elina.NOM combine.3SG rolls.ACC
'Elina is combining rolls.'

b. *Question*
Ti kani i Elina?
what do.3SG the.NOM Elina.NOM
'What is Elina doing?'
*Answer*
I Elina [$_{VP}$ enoni rola]$_{Foc}$.
the.NOM Elina.NOM combine.3SG rolls.ACC
'Elina is combining rolls.'

c. *Question*
Ti enoni i Elina?
what combine.3SG the.NOM Elina.NOM
'What is Elina doing?'
*Answer*
I Elina enoni [$_{NP}$ rola]$_{Foc}$.
the.NOM Elina.NOM combine.3SG rolls.ACC
'Elina is combining rolls.'

d. *Question*
Ti enoni i Elina?
what combine.3SG the.NOM Elina.NOM
'What is Elina doing?'
Answer
[$_{NP}$ Rola]$_{Foc}$ enoni i Elina.
rolls.ACC combine.3SG the.NOM Elina.NOM
'Rolls Elina is combining.'

Set5

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Irini mareni manuri]$_{Foc}$.
the.NOM Irini.NOM wither.3SG cream cheese.ACC
'Irini is withering cream cheese.'

b. *Question*
Ti kani i Irini?
what do.3SG the.NOM Irini.NOM
'What is Irini doing?'
*Answer*
I Irini [$_{VP}$ mareni manuri]$_{Foc}$.
the.NOM Irini.NOM wither.3SG cream cheese.ACC
'Irini is withering cream cheese.'

c. *Question*
Ti mareni i Irini?
what combine.3SG the.NOM Irini.NOM
'What is Irini doing?'
*Answer*
I Irini mareni manuri]$_{Foc}$.
the.NOM Irini.NOM wither.3SG cream cheese.ACC
'Irini is withering cream cheese.'

d. *Question*
Ti mareni i Irini?
what combine.3SG the..NOM Irini.NOM
'What is Irini doing?'
Answer
[NP Manuri]Foc mareni i Irini.
cream cheese.ACC wither.3SG the.NOM Irini.NOM
'Cream cheese Irini is withering.'

Set6

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[SI Eleni imeroni nera]Foc.
the.NOM Helen.NOM tame.3SG water.ACC
'Eleni is taming water.'

b. *Question*
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*
I Eleni [VP imeroni nera]Foc.
the.NOM Helen.NOM tame.3SG water.ACC
'Eleni is taming water.'

c. *Question*
Ti imeroni i Eleni?
what tame.3SG the.NOM Helen.NOM
'What is Helen taming?'
*Answer*
I Eleni imeroni [NP nera]Foc.
the.NOM Helen.NOM tame.3SG water.ACC
'Eleni is taming water.'

d. *Question*
Ti imeroni i Eleni?
what tame.3SG the.NOM Helen.NOM
'What is Helen taming?'
*Answer*
[NP Nera]Foc imeroni i Eleni.
water.ACC tame.3SG the.NOM Helen.NOM
'Water Eleni is taming.'

Set7

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[SI Melina marinari mura]Foc.
the.NOM Melina.NOM marinate 3SG berries.ACC
'Melina is marinating berries.'

b. *Question*
Ti kani i Melina?
what do.3SG the.NOM Melina.NOM
'What is Melina doing?'
*Answer*
I Melina [VP marinari mura]Foc.
the.NOM Melina.NOM marinate 3SG berries.ACC
'Melina is marinating berries.'

c. *Question*
Ti marinari i Melina?
what marinate.3SG the.NOM Melina.NOM
'What is Melina marinating?'
*Answer*
I Melina marinari [NP mura]Foc.
the.NOM Melina.NOM marinate 3SG berries.ACC
'Melina is marinating berries.'

d. *Question*
Ti marinari i Melina?
what marinate.3SG the.NOM Melina.NOM
'What is Melina marinating?'
*Answer*
[NP Mura]Foc marinari i Melina.
berries.ACC marinate 3SG the.NOM Melina.NOM
'Melina is marinating berries.'

Set8

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[SI Marina lei melumena]Foc.
the.NOM Marina.NOM say.3SG things.to.come.ACC
'Marina is talking about things that are going to happen.'

b. *Question*
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
*Answer*
I Marina [VP lei melumena]Foc.
the.NOM Marina.NOM say.3SG things.to.come.ACC
'Marina is talking about things that are going to happen.'

c. *Question*
Ti lei i Marina?
what say.3SG the.NOM Marina.NOM
'What is Marina talking about?'
*Answer*
I Marina lei [NP melumena]Foc.
the.NOM Marina.NOM say.3SG things.to.come.ACC
'Marina is talking about things that are going to happen.'

d. *Question*
Ti lei i Marina?
what say.3SG the.NOM Marina.NOM
'What is Marina talking about?'
*Answer*
[NPMelumena]Fo lei i Marina.
things.to.come.ACC say.3SG the.NOM Marina.NOM
'Marina is talking about things that are going to happen.'

Set9

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[SI Elina maloni mora]Foc.
the.NOM Elina.NOM scolde.3SG babies.ACC
'Elina is scolding babies.'

b. *Question*
Ti kani i Elina?
what do.3SG the.NOM Elina.NOM
'What is Elina doing?'
*Answer*
I Elina [VP maloni mora]Foc.
the.NOM Elina.NOM scolde.3SG babies.ACC
'Elina is scolding babies.'

c. *Question*
Ti maloni i Elina?
what scolde.3SG the.NOM Elina.NOM
'What is Elina scolding?'
*Answer*
I Elina maloni [NP mora]Foc.
the.NOM Elina.NOM scolde.3SG babies.ACC
'Elina is scolding babies.'

d. *Question*
Ti maloni i Elina?
what scolde.3SG the.NOM Elina.NOM
'What is Elina scolding?'
*Answer*
[NP Mora]Foc maloni i Elina.
babies.ACC scolde.3SG the.NOM Elina.NOM
'Elina is scolding babies.'

Set10

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[SI ioni miniun ninemia]Foc.
the.NOM omens.NOM foretell.3PL tranquillity.ACC
'The omens are foretelling tranquillity.'

b. *Question*
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
*Answer*
I ioni [VP miniun ninemia]Foc.
the.NOM omens.NOM foretell.3PL tranquillity.ACC
'The omens are foretelling tranquillity.'

c. *Question*
Ti miniun i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'
*Answer*
I ioni miniun [NP ninemia].
the.NOM omens.NOM foretell.3SG tranquillity.ACC
'The omens are foretelling tranquillity.'

d. *Question*
Ti miniun i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'
*Answer*
[NP Ninemia]Foc miniun i ioni.
tranquillity.ACC foretell.3PL the.NOM omens.NOM
'The omens are foretelling tranquillity.'

Set11

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Eleni areoni ammonia]$_{Foc}$.
the.NOM Eleni.NOM reduce.3SG ammonia.ACC
'Helen is reducing ammonia.'

b. *Question*
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*
I Eleni [$_{VP}$ areoni ammonia]$_{Foc}$.
the.NOM Eleni.NOM reduce.3SG ammonia.ACC
'Helen is reducing ammonia.'

c. *Question*
Ti areoni i Eleni?
what reduce.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*
I Eleni areoni [$_{NP}$ ammonia]$_{Foc}$.
the.NOM Eleni.NOM reduce.3SG ammonia.ACC
'Helen is reducing ammonia.'

d. *Question*
Ti areoni i Eleni?
what reduce.3SG the.NOM Helen.NOM
'What is Helen doing?'
*Answer*
[$_{NP}$ Ammonia]$_{Foc}$ areoni i Eleni.
ammonia.ACC reduce.3SG the.NOM Eleni.NOM
'Helen is reducing ammonia.'

Set12

a. *Question*
Ti ginete?
what happen.3SG
'What is happening?'
*Answer*
[$_S$I Melina reni mira]$_{Foc}$.
the.NOM Melina.NOM scatter.3SG scents.ACC
'Melina is scattering scents.'

b. *Question*
Ti kani i Melina?
what do.3SG the.NOM Melina.NOM
'What is Melina doing?'
*Answer*
I Melina [$_{VP}$ reni mira]$_{Foc}$.
the.NOM Melina.NOM scatter.3SG scents.ACC
'Melina is scattering scents.'

c. *Question*
Ti reni i Melina?
what scatter.3SG the.NOM Melina.NOM
'What is Melina scattering?'
*Answer*
I Melina reni [$_{NP}$ mira]$_{Foc}$.
the.NOM Melina.NOM scatter.3SG scents.ACC
'Melina is scattering scents.'

d. *Question*
Ti reni i Melina?
what scatter.3SG the.NOM Melina.NOM
'What is Melina scattering?'
*Answer*
[NP Mira]Foc reni i Melina.
scents.ACC scatter.3SG the.NOM Melina.NOM
'Melina is scattering scents.'

## 5.1 Appendix

Appendix 5.1 includes the verbatim instructions that were used in the production experiment which was discussed in section 5.1.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Stin | othoni | tu | ipologisti | tha | dite | mia | | sira |
| in.the.ACC | screen.ACC | of.GEN | computer.GEN | will | see.2PL | a.ACC | | series.ACC |
| erotapokriseon. | Fantasthite | pos | ipodiesthe | | dio | rolus | | to |
| question.answer.GEN | imagine.2PL | that | perform.2PL | | two | role.ACC | | the.ACC |
| rolo | tu | anthropu | pu | rotai | ke | to | rolo | tu |
| role.ACC | of.GEN | person.GEN | that | ask.3SG | and | the.ACC | role.ACC | of.GEN |
| anthropu | pu | apantai. | Gia | na | dite | tin | epomeni | |
| person.GEN | that | answer.3SG | in.order | to | see.2PL | the.ACC | next.ACC | |
| erotapokrisi | | patiste | to | spacebar | | | | |
| question.answer.ACC | | press.2PL | the.ACC | spacebar | | | | |

'In your computer screen, you will see a series of question/answer pairs. Imagine that you are performing two roles, the role of the person who asks and the role of the answers. To see the next question/answer pair press spacebar.'

## 5.2 Appendix

Appendix 5.2 includes the twelve stimuli that were produced by the male and the female speaker, and were used in perception experiment that used natural stimuli. As already noted in section 5.2.1, the set of twelve stimuli was the same for the male and the female speaker. These twelve stimuli consist of four sets of three sentences featuring increasing narrowness of focus: $[_{S}SVO]_{Foc}$, $S[_{VP}VO]_{Foc}$ and $SV[_{NP}O]_{Foc}$.

Set 1
[S I ioni miniun ninemia]Foc.
I ioni [VP miniun ninemia]Foc.
I ioni miniun [NP ninemia]Foc.
the.NOM omens.NOM foretell.3PL tranquility.ACC
'The omens are foretelling tranquility.'

Set 2
[S I Marina anameni minima]Foc.
I Marina [VP anameni minima]Foc.
I Marina anameni [NP minima]Foc.
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'

Set 3
[S I Marina lei melumena]Foc.
I Marina [VP lei melumena]Foc.
I Marina lei [NP melumena]Foc.
the.NOM Marina.NOM tell.3SG things.to.come.ACC
'Marina talks about things that are going to happen.'

Set4

| | | | |
|---|---|---|---|
| [S I | Eleni | meloni | mila]Foc. |
| I | Eleni | [VP meloni | mila]Foc. |
| I | Eleni | meloni | [NP mila]Foc. |
| the.NOM | Helen.NOM | smear.honey.on.3SG | apples.ACC |

'Helen smears honey on apples.'

## 5.3 Appendix

Appendix 5.3 includes answer sheet type (a). This answer sheet was used in the perception experiment that used natural stimuli and was discussed in section 5.2. As indicated below, the questions are consistently ordered in the sequence ([S]$_{Foc}$Q), ([VP]$_{Foc}$Q), ([O]$_{Foc}$Q).

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
Ti minion i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'

Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
Ti minion i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
Ti miniun i ioni?

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
Ti minion i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'

Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'

Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
Ti minion i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti lei i Marina?
what tell.3SG the.NOM Marina.NOM
'What is Marina telling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kanun i ioni?
what do.3PL the.NOM omens.NOM
'What are the omens doing?'
Ti minion i ioni?
what foretell.3PL the.NOM omens.NOM
'What are the omens foretelling?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'
Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Marina?
what do.3SG the.NOM Marina.NOM
'What is Marina doing?'

Ti anameni i Marina?
what await.3SG the.NOM Marina.NOM
'What is Marina awaiting?'

---

Ti ginete?
what happen.3SG
'What is happening?'
Ti kani i Eleni?
what do.3SG the.NOM Helen.NOM
'What is Helen doing?'
Ti meloni i Eleni?
what smear.honey.on.3SG the.NOM Helen.NOM
'On what is Helen smearing honey?'

**Appendix 5.3.1**

Appendix 5.3.1 includes the verbatim instructions that were given to the particpants of the perception experiment that was reported in 5.2.

Kathimerina akume plithos erotapokriseon. Sto pirama afto
daily hear.1PL number.NOM question.answers.GEN in.the.ACC experiment.ACC this.ACC
tha akusete mia sira katafatikon protaseon.
will hear.2PL a.ACC series.ACC affirmative.GEN sentence.GEN
Afto pu thelo na kanete gia kathe
this.ACC that want.1SG to do.2PL for every.ACC
katafatiki protasi pu akute ine na vrite se pja
affirmative ACC sentence.ACC that hear.2PL be.3SG to find.2PL to.ACC which.ACC
erotisi. antistihi. Sto harti pu ehete mprosta
question.ACC respond.3SG in.the.ACC paper.ACC that have.2PL in.front
sas sas didonte 3 epiloges. Simioste tin
you sas give.2PL choices.ACC note.2PL the.ACC
apantisi sas me ena x
answer.ACC yours with a.ACC

'Every day we hear a number of question/answer pairs. In this experiment you will hear a series of affirmative sentences. What I want you to do for every affirmative sentence that you listen is to find to which question it corresponds. In the paper that you have in front of you, you are given 3 choices. Note with a x your answer.'

**Appendix 5.3.1**

Appendix 5.4 contains a list of 48 manipulated stimuli that were used in the perception experiment which was discussed in section 5.4.

[sI Marina anameni minima]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
[sI Marina anameni minima]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
[sI Marina anameni minima]$_{Foc}$
(+break accent on V(V1) −high accent on O)
[sI Marina anameni minima]$_{Foc}$
(+break no accent on V(V0) +high accent on O)
[sI Marina anameni minima]$_{Foc}$
(−break no accent on V(V0) −high accent on O)

[$_S$I Marina anameni minima]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
[$_S$I Marina anameni minima]$_{Foc}$
(−break accent on V(V1) −high accent on O)
[$_S$I Marina anameni minima]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(+break accent on V(V1) −high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(+break no accent on V(V0) +high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(−break no accent on V(V0) −high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(−break accent on V(V1) −high accent on O)
I Marina [$_{VP}$ anameni minima]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(+break accent on V(V1) −high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(+break accent on V(V1) −high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(−break no accent on V(V0) −high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(−break accent on V(V1) −high accent on O)
I Marina anameni [$_{NP}$ minima]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM Marina.NOM await.3SG message.ACC
'Marina is waiting for a message.'
[$_S$I ioni miniun ninemia]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(+break accent on V(V1) −high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(+break no accent on V(V0) +high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(−break no accent on V(V0) −high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
[$_S$I ioni miniun ninemia]$_{Foc}$
(−break accent on V(V1) −high accent on O)

[$_S$I ioni miniun ninemia]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM omens.NOM foretell.3PL tranquility.ACC
'The omens are foretelling tranquility.'
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(+break accent on V(V1) −high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(+break no accent on V(V0) +high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(−break no accent on V(V0) −high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(−break accent on V(V1) −high accent on O)
I ioni [$_{VP}$ miniun ninemia]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM omens.NOM foretell.3PL tranquility.ACC
'The omens are foretelling tranquility.'
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(+break higher accent on V(V2) +high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(+break no accent on V(V0) −high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(+break accent on V(V1) −high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(+break no accent on V(V0) +high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(−break no accent on V(V0) −high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(−break higher accent on V(V2) +high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(−break accent on V(V1) −high accent on O)
I ioni miniun [$_{NP}$ ninemia]$_{Foc}$
(−break no accent on V(V0) +high accent on O)
the.NOM omens.NOM foretell.3PL tranquility.ACC
'The omens are foretelling tranquility.'

**Appendix 5.4.1**

This ppendix contains the verbatim instructions for the perception experiment that was discussed in section 5.4

Kathimerina akume plithos erotapokriseon. Se afto to pirama
daily hear.1PL number.NOM questions/answers.GEN in this.ACC the.ACC experiment.ACC
tha akusete mia sira katafatikon protaseon. Gia na akusete tin
will hear.2PL a.ACC series.ACC affirmative.GEN sentences.GEN in.order to hear.2PL the.ACC
katafatiki protasi metakiniste ton kersora sas sto ikonidio ihu
affirmative.AC sentence.ACC move.2PL the.ACC cursor.ACC yours to.the.ACC icon.ACC sound.GEN
C
ke kanete klik. Thelo na akute kathe katafatiki protasi mia mono
and do.2PL click want.1SG to hear.2PL every.ACC affirmative.ACC sentence.ACC one only
fora. Sti sinehia thelo na vrite se pja erotisi antistihi i
time in.the.ACC next want to find.2PL to which question correspond.3SG the.NOM
katafatiki protasi pu just akusate. Simioste tin apantisi
affirmative.NOM sentence.NOM that molis hear.2PL note.2PL the.ACC answer.ACC

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| sas | epilegontas | tin | antistihi | erotisi. | | | | | | |
| yours | selecting | the.ACC | corresponding | answer.ACC | | | | | | |
| Thelo | akomi | na | dilosete | poso | vevei | isthe | gia | tin | apantisi | sas |
| want.1SG | also | to | note.2PL | how | certain | be.2PL | for | the.ACC | answer.ACC | yours |
| simionontas | to | vathmo | vevaiotitas | sas. | | | | | | |
| noting | the.ACC | degree | certainty.GEN | yours | | | | | | |
| 0=telios | | aveveos | | | | 10=apolita | | veveos | | |
| completely | | uncertain.NOM | | | | totally | | certain.NOM | | |

"Every day we are lisening a number of question/answer pairs. In this experiment, you will hear a series of affirmative sentences. In order to listen to the affirmative sentence, move your cursor at the sound icon and click. I want you to listen to each affirmative sentence only once. Then, I want you to find to which question corresponds the affirmative sentence that you just heard. Note your answer selecting the corresponding question. I also want you to not how certain you are for your answer by indicating your degree of certainty, 0= completely uncertain, 10= completely certain."

# Appendix 3 (Chapter 6)

Appendix 6 contains a list of 85 {17 stimulus types (12 part A + 5 part B) × 5 instantiations of a type = 85} Q/A pairs that were used in the production experiment that was discussed in chapter 6.

Set1

1. *Question*
   Se pjon matheni Elinika i Melina?
   to who.ACC teach.3SG Greek.ACC the.NOM Melina.NOM
   'To whom is Melina teaching Greek?'
   *Answer*
   Stin Eleni matheni Elinika
   to.the.ACC Helen.ACC teach.3SG Greek.ACC
   'To Helen she is teaching Greek.'
2. *Question*
   Se pjon matheni Elinika i Melina?
   to who.ACC teach.3SG Greek.ACC the.NOM Melina.NOM
   'To whom is Melina teaching Greek?'
   *Answer*
   Elinika matheni stin Eleni
   Greek.ACC teach.3SG to.the.ACC Helen.ACC
   'Greek she is teaching to Helen.'
3. *Question*
   I Melina matheni Elinika stin Elena i
   the.NOM Melina.NOM teach.3SG Greek.ACC to.the.ACC Elena.ACC or
   stin Eleni?
   to.the.ACC Helen.ACC
   'Is Melina teaching Greek to Elena or to Helen?'
   *Answer*
   Stin Eleni matheni Elinika
   to.the.ACC Helen.ACC teach.3SG Greek.ACC
   'To Helen she is teaching Greek.'
4. *Question*
   I Melina matheni Elinika stin Elena i
   the.NOM Melina.NOM teach.3SG Greek.ACC to.the.ACC Elena.ACC or
   stin Eleni?
   to.the.ACC Helen.ACC
   'Is Melina teaching Greek to Elena or to Helen?'
   *Answer*
   Elinika matheni stin Eleni
   Greek.ACC teach.3SG to.the.ACC Helen.ACC
   'Greek she is teaching to Helen.'
5. *Question*
   I Melina matheni Elinika stin Elena?
   the.NOM Melina.NOM teach.3SG Greek.ACC to.the.ACC Elena.ACC
   'Is Melina teaching Greek to Elena?'

*Answer*
Ohi stin Eleni matheni Elinika
No to.the.ACC Helen.ACC teach.3SG Greek.ACC
'No, to Helen she is teaching Greek.'

6. *Question*
I Melina matheni Elinika stin Elena?
the.NOM Melina.NOM teach.3SG Greek.ACC to.the.ACC Elena.ACC
'Is Melina teaching Greek to Elena?'
*Answer*
Ohi Elinika matheni stin Eleni
no Greek.ACC teach.3SG to.the.ACC Helen.ACC
'No, Greek she is teaching to Helen.'

7. *Question*
Ti matheni i Melina stin Eleni?
what teach.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC
'What is Melina teaching to Helen?'
*Answer*
Elinika matheni stin Eleni
Greek.ACC teach.3SG to.the.ACC Helen.ACC
'Greek she is teaching to Helen.'

8. Question
Ti matheni i Melina stin Eleni?
what teach.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC
'What is Melina teaching to Helen?'
*Answer*
Stin Eleni matheni Elinika
to.the.ACC Helen.ACC teach.3SG Greek.ACC
'To Helen she is teaching Greek.'

9. *Question*
I Melina matheni stin Eleni Elinika i
the.NOM Melina.NOM teach.3SG to.the.ACC Helen.ACC Greek.ACC or
magiriki?
cooking.ACC
'Is Melina teaching Helen Greek or how to cook?'
*Answer*
Elinika matheni stin Eleni
Greek.ACC teach.3SG to.the.ACC Helen.ACC
'Greek she is teaching to Helen.'

10. *Question*
I Melina matheni stin Eleni Elinika i
the.NOM Melina.NOM teach.3SG to.the.ACC Helen.ACC Greek.ACC or
magiriki?
cooking.ACC
'Is Melina teaching Helen Greek or how to cook?'
*Answer*
Stin Eleni matheni Elinika
to.the.ACC Helen.ACC teach.3SG Greek.ACC
'To Helen she is teaching Greek.'

11. *Question*
I Melina matheni stin Eleni magiriki?
the.NOM Melina.NOM teach.3SG to.the.ACC Helen.ACC cooking.ACC
'Is Melina teaching to Helen how to cook?'
*Answer*
Ohi, stin Eleni matheni Elinika
no to.the.ACC Helen.ACC teach.3SG Greek.ACC
'No, to Helen she is teaching Greek.'

12. *Question*
I Melina matheni stin Eleni magiriki?
the.NOM Melina.NOM teach.3SG to.the.ACC Helen.ACC cooking.ACC
'Is Melina teaching to Helen how to cook?'

*Answer*
Ohi, Elinika matheni stin Eleni
no Greek.ACC teach.3SG to.the.ACC Helen.ACC
'No, Greek she is teaching to Helen.'

13. *Question*
Ti matheni i Melina sta pedja?
what teach.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina teaching the children?'
*Answer*
Stin Eleni matheni Elinika
to.the.ACC Helen.ACC teach.3SG Greek.ACC
'To Helen she is teaching Greek.'

14. *Question*
Ti matheni i Melina sta pedja?
what teach.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina teaching the children?'
*Answer*
Elinika matheni stin Eleni
Greek.ACC teach.3SG to.the.ACC Helen.ACC
'Greek she is teaching to Helen.'

15. *Question*
Ti matheni i Melina stin Eleni ke stin
what teach.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Melina teaching to Helen and to Elena?'
*Answer*
Stin Eleni matheni Elinika stin Elena matheni
to.the.ACC Helen.ACC teach.3SG Greek.ACC to.the.ACC Elena.ACC teach.3SG
magiriki
cooking.ACC
'To Helen she is teaching Greek, to Elena she is teaching how to cook.'

16. *Question*
Ti matheni i Melina stin Eleni ke stin
what teach.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Melina teaching to Helen and to Elena?'
*Answer*
Elinika matheni stin Eleni magiriki matheni
Greek.ACC teach.3SG to.the.ACC Helen.ACC cooking.ACC teach.3SG
stin Elena
to.the.ACC Elena.ACC
'Greek she is teaching to Helen, how to cook she is teaching to Elena'

17. *Question*
Ti ginete me tin Eleni ke tin Elena?
what happen.3SG with the.ACC Helen.ACC and the.ACC Elena.ACC
'What about Helen and Elena?'
*Answer*
Stin Eleni matheni Elinika stin Elena matheni
to.the.ACC Helen.ACC teach.3SG Greek.ACC to.the.ACC Elena.ACC teach.3SG
magiriki
cooking.ACC
'To Helen she is teaching Greek, to Elena she is teaching how to cook.'

Set2

1. *Question*
Se pjon harizi morudjaka i Melina?
to who.ACC give.for.free.3SG baby.clothes.ACC the.NOM Melina.NOM
'To whom is Melina giving for free baby clothes?'

*Answer*
Stin Eleni harizi morudjaka
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'To Helen she is giving for free baby clothes.'

2. *Question*
Se pjon harizi morudjaka i Melina?
to who.ACC give.for.free.3SG baby.clothes.ACC the.NOM Melina.NOM
'To whom is Melina giving for free baby clothes?'
*Answer*
Morudjaka harizi stin Eleni
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'Baby clothes she is giving for free to Helen.'

3. *Question*
I Melina harizi morudjaka stin Elena
the.NOM Melina.NOM give.for.free3SG baby.clothes.ACC to.the.ACC Elena.ACC
i stin Eleni?
or to.the.ACC Helen.ACC
'Is Melina giving for free baby clothes to Elena or to Helen?'
*Answer*
Stin Eleni harizi morudjaka
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'To Helen she is giving for free baby clothes.'

4. *Question*
I Melina harizi morudjaka stin Elena
the.NOM Melina.NOM give.for.free3SG baby.clothes.ACC to.the.ACC Elena.ACC
i stin Eleni?
or to.the.ACC Helen.ACC
'Is Melina giving for free baby clothes to Elena or to Helen?'
*Answer*
Morudjaka harizi stin Eleni
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'Baby clothes she is giving for free to Helen.'

5. *Question*
I Melina harizi morudjaka stin Elena?
the.NOM Melina.NOM give.for.free3SG baby.clothes.ACC to.the.ACC Elena.ACC
'Is Melina giving for free baby clothes to Elena?'
*Answer*
Ohi stin Eleni harizi morudjaka
no to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'No, to Helen she is giving for free baby clothes.'

6. *Question*
I Melina harizi morudjaka stin Elena?
the.NOM Melina.NOM give.for.free3SG baby.clothes.ACC to.the.ACC Elena.ACC
'Is Melina giving for free baby clothes to Elena?'
*Answer*
Ohi morudjaka harizi stin Eleni
no baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'No, baby clothes she is giving for free to Helen.'

7. *Question*
Ti harizi i Melina stin Eleni?
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC
'What is Melina giving for free to Helen?'
*Answer*
Morudjaka harizi stin Eleni
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'Baby clothes she is giving for free to Helen.'

8. *Question*
Ti harizi i Melina stin Eleni?
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC
'What is Melina giving for free to Helen?'

*Answer*
Stin Eleni harizi morudjaka
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'To Helen she is giving for free baby clothes.'

9. *Question*
I Melina harizi stin Eleni morudjaka
the.NOM Melina.NOM give.for.free3SG to.the.ACC Helen.ACC baby.clothes.ACC
i mirodika?
or spices.ACC
'Is Melina giving for free to Helen baby clothes or spices?'
*Answer*
Morudjaka harizi stin Eleni
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'Baby clothes she is giving for free to Helen.'

10. *Question*
I Melina harizi stin Eleni morudjaka
the.NOM Melina.NOM NOMgive.for.free3SG to.the.ACC Helen.ACC baby.clothes.ACC
i mirodika?
or spices.ACC
'Is Melina giving for free to Helen baby clothes or spices?'
*Answer*
Stin Eleni harizi morudjaka
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'To Helen she is giving for free baby clothes.'

11. *Question*
I Melina harizi stin Eleni mirodika?
the.NOM Melina.NOM give.for.free.3SG to.the.ACC Helen.ACC spices.ACC
'Is Melina giving for free spices to Helen?'
*Answer*
Ohi stin Eleni harizi morudjaka
no to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'No, to Helen she is giving for free baby clothes.'

12. *Question*
I Melina harizi stin Eleni mirodika?
the.NOM Melina.NOM give.for.free.3SG to.the.ACC Helen.ACC spices.ACC
'Is Melina giving for free spices to Helen?'
*Answer*
Ohi morudjaka harizi stin Eleni
no baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'No, baby clothes she is giving for free to Helen.'

13. *Question*
Ti harizi i Melina sta pedja?
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina giving for free to the children?'
*Answer*
Stin Eleni harizi morudjaka
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC
'To Helen she is giving for free baby clothes.'

14. *Question*
Ti harizi i Melina sta pedja?
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina giving for free to the children?'
*Answer*
Morudjaka harizi stin Eleni
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC
'Baby clothes she is giving for free to Helen.'

15. *Question*
Ti harizi i Melina stin Eleni ke
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC and
stin Elena?
to.the.ACC Elena.ACC
'What is Melina giving for free to Helen and to Elena?'
*Answer*
Stin Eleni harizi morudjaka stin
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC to.the.ACC
Elena harizi mirodika
Elena.ACC give.for.free.3SG spices.ACC
'To Helen she is giving for free baby clothes, to Elena she is giving for free spices.'
16. *Question*
Ti harizi i Melina stin Eleni
what give.for.free.3SG the.NOM Melina.NOM to.the.ACC Helen.ACC
ke stin Elena?
and to.the.ACC Elena.ACC
'What is Melina giving for free to Helen and to Elena?'
*Answer*
Morudjaka harizi stin Eleni mirodika
baby.clothes.ACC give.for.free.3SG to.the.ACC Helen.ACC spices.ACC
harizi stin Elena
give.for.free.3SG to.the.ACC Elena.ACC
'Baby clothes she is giving for free to Helen, spices she is giving for free to Elena.'
17. *Question*
Ti ginete me tin Eleni ke tin Elena?
what happen.3SG with the.ACC Helen.ACC and the.ACC Elena.ACC
'What about Helen and Elena?'
*Answer*
Stin Eleni harizi morudjaka stin
to.the.ACC Helen.ACC give.for.free.3SG baby.clothes.ACC to.the.ACC
Elena harizi mirodika
Elena.ACC give.for.free.3SG spices.ACC
'To Helen she is giving for free baby clothes, to Elena she is giving for free spices.'

Set3

1. *Question*
Se pjon milai Olandika i Eleni?
to who.ACC speak.3SG Dutch.ACC the.NOM Helen.NOM
'To whom is Helen speaking Dutch?'
*Answer*
Stin Elina milai Olandika
to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'To Elina she is speaking Dutch.'
2. *Question*
Se pjon milai Olandika i Eleni?
to who.ACC speak.3SG Dutch.ACC the.NOM Helen.NOM
'To whom is Helen speaking Dutch?'
*Answer*
Olandika milai stin Elina
Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'Dutch she is speaking to Elina.'
3. *Question*
I Eleni milai Olandika stin Irini
the.NOM Helen.NOM speak3SG Dutch.ACC to.the.ACC Irene.ACC
i stin Elina?
or to.the.ACC Elina.ACC
'Is Helen speaking Dutch to Irene or to Elina?'

*Answer*
Stin Elina milai Olandika
to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'To Elina she is speaking Dutch.'

4. *Question*
I Eleni milai Olandika stin Irini
the.NOM Helen.NOM speak3SG Dutch.ACC to.the.ACC Irene.ACC
i stin Elina?
or to.the.ACC Elina.ACC
'Is Helen speaking Dutch to Irene or to Elina?'
*Answer*
Olandika milai stin Elina
Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'Dutch she is speaking to Elina.'

5. *Question*
I Eleni milai Irini?
the.NOM Helen.NOM speak3SG Irene.ACC
'Is Helen speaking Dutch to Irene?'
*Answer*
Ohi stin Elina milai Olandika
no to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'No, to Elina she is speaking Dutch.'

6. *Question*
I Eleni milai Olandika stin Irini?
the.NOM Helen.NOM speak3SG Dutch.ACC to.the.ACC Irene.ACC
'Is Helen speaking Dutch to Irene?'
*Answer*
Ohi Olandika milai stin Elina
no Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'No, Dutch she is speaking to Elina.'

7. *Question*
Ti milai i Eleni stin Elina?
what speak.3SG the.NOM Helen.NOM to.the.ACC Elina.ACC
'What is Helen speaking to Elina?'
*Answer*
Olandika milai stin Elina
Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'Dutch she is speaking to Elina.'

8. *Question*
Ti milai i Eleni stin Elina?
what speak.3SG the.NOM Helen.NOM to.the.ACC Elina.ACC
'What is Helen speaking to Elina?'
*Answer*
Stin Elina milai Olandika
to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'To Elina she is speaking Dutch.'

9. *Question*
I Eleni milai stin Elina Olandika
the.NOM Helen.NOM speak.3SG to.the.ACC Elina.ACC Dutch.ACC
i Aravika?
or Arabic.ACC
'Is Helen speaking to Elina Dutch or Arabic?'
*Answer*
Olandika milai stin Elina
Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'Dutch she is speaking to Elina.'

10. *Question*
I Eleni milai stin Elina Olandika
the.NOM Helen.NOM speak.3SG to.the.ACC Elina.ACC Dutch.ACC
i Aravika?
or Arabic.ACC
'Is Helen speaking to Elina Dutch or Arabic?'
*Answer*
Stin Elina milai Olandika
to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'To Elina she is speaking Dutch.'

11. *Question*
I Eleni milai stin Elina Aravika?
the.NOM Helen.NOM speak.3SG to.the.ACC Elina.ACC arabic.ACC
'Is Helen speaking to Elina Arabic?'
*Answer*
Ohi stin Elina milai Olandika
no to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'No, to Elina she is speaking Dutch.'

12. *Question*
I Eleni milai stin Elina Aravika?
the.NOM Helen.NOM speak.3SG to.the.ACC Elina.ACC arabic.ACC
'Is Helen speaking to Elina Arabic?'
*Answer*
Ohi Olandika milai stin Elina
no Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'No, Dutch she is speaking to Elina.'

13. *Question*
Ti milai i Eleni sta pedja?
what speak.3SG the.NOM Helen.NOM to.the.ACC children.ACC
'What is Helen speaking to the children?'
*Answer*
Stin Elina milai Olandika
to.the.ACC Elina.ACC speak.3SG Dutch.ACC
'To Elina she is speaking Dutch.'

14. *Question*
Ti milai i Eleni sta pedja?
what speak.3SG the.NOM Helen.NOM to.the.ACC children.ACC
'What is Helen speaking to the children?'
*Answer*
Olandika milai stin Elina
Dutch.ACC speak.3SG to.the.ACC Elina.ACC
'Dutch she is speaking to Elina.'

15. *Question*
Ti milai i Eleni sti Melina
what speak.3SG the.NOM Helen.NOM to.the.ACC Melina.ACC
ke stin Elina?
and to.the.ACC Elina.ACC
'What is Helen speaking to Melina and to Elina?'
*Answer*
Stin Elina milai Olandika stin Melina
to.the.ACC Elina.ACC speak.3SG Dutch.ACC to.the.ACC Melina.ACC
milai Aravika
speak.3SG Arabic.ACC
'To Elina she is speaking Dutch, to Melina she is speaking Arabic.'

16. *Question*
Ti milai i Eleni stin Melina ke
what speak.3SG the.NOM Helen.NOM to.the.ACC Melina.ACC and
stin Elina?
to.the.ACC Elina.ACC
'What is Helen speaking to Melina and to Elina?'

*Answer*
Olandika milai stin Elina Aravika milai
Dutch.ACC speak.3SG to.the.ACC Elina.ACC Arabic.ACC speak.3SG
stin Melina
to.the.ACC Melina.ACC
'Dutch she is speaking to Elina, Arabic she is speaking to Melina.'

17. *Question*
Ti ginete me tin Elina ke tin Elena?
what happen.3SG with the.ACC Elina.ACC and the.ACC Elena.ACC
'What about Elina and Elena?'
*Answer*
Stin Elina milai Olandika sti Melina
to.the.ACC Elina.ACC speak.3SG Dutch.ACC to.the.ACC Melina.ACC
milai Aravika
speak.3SG Arabic.ACC
'To Elina she is speaking Dutch, to Melina she is speaking Arabic.'

Set4

1. *Question*
Se pjon milai Aravika i Elina?
to who.ACC speak.3SG Dutch.ACC the.NOM Elina.NOM
'To whom is Elina speaking Arabic?'
*Answer*
Stin Melina milai Aravika
to.the.ACC Melina.ACC speak.3SG Arabic.ACC
'To Melina she is speaking Arabic.'

2. *Question*
Se pjon milai Aravika i Elina?
to who.ACC speak.3SG Dutch.ACC the.NOM Elina.NOM
'To whom is Elina speaking Arabic?'
*Answer*
Aravika milai stin Melina
Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'Arabic she is speaking to Melina.'

3. *Question*
I Elina milai Aravika stin Irini
the.NOM Elina.NOM speak3SG Arabic.ACC to.the.ACC Irene.ACC
i stin Melina?
or to.the.ACC Melina.ACC
'Is Elina speaking Arabic to Irene or to Melina?'
*Answer*
Stin Melina milai Aravika
to.the.ACC Melina.ACC speak.3SG Arabic.ACC
'To Melina she is speaking Arabic.'

4. *Question*
I Elina milai Aravika stin Irini
the.NOM Elina.NOM speak3SG Arabic.ACC to.the.ACC Irene.ACC
i stin Melina?
or to.the.ACC Melina.ACC
'Is Elina speaking Arabic to Irene or to Melina?'
*Answer*
Aravika milai stin Melina
Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'Arabic she is speaking to Melina.'

5. *Question*
I Elina milai Aravika stin Irini?
the.NOM Elina.NOM speak3SG Arabic.ACC to.the.ACC Irene.ACC
'Is Elina speaking Arabic to Irene?'

*Answer*
Ohi stin Melina milai Aravika
no to.the.ACC Elina.ACC speak.3SG Arabic.ACC
'No, to Melina she is speaking Arabic.'

6. *Question*
I Elina milai Aravika stin Irini?
the.NOM Elina.NOM speak3SG Arabic.ACC to.the.ACC Irene.ACC
'Is Elina speaking Arabic to Irene?'
*Answer*
Ohi Aravika milai stin Melina
no Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'No, Arabic she is speaking to Melina.'

7. *Question*
Ti milai i Elina stin Melina?
what speak.3SG the.NOM Elina.NOM to.the.ACC Melina.ACC
'What is Elina speaking to Melina?'
*Answer*
Aravika milai stin Melina
Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'Arabic she is speaking to Melina.'

8. *Question*
Ti milai i Elina stin Melina?
what speak.3SG the.NOM Elina.NOM to.the.ACC Melina.ACC
'What is Elina speaking to Melina?'
*Answer*
Stin Melina milai Aravika
to.the.ACC Melina.ACC speak.3SG Arabic.ACC
'To Melina she is speaking Arabic.'

9. *Question*
I Elina milai stin Melina Olandika
the.NOM Elina.NOM speak.3SG to.the.ACC Melina.ACC Dutch.ACC
i Aravika?
or Arabic.ACC
'Is Elina speaking to Melina Dutch or Arabic?'
*Answer*
Aravika milai stin Melina
Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'Arabic she is speaking to Melina.'

10. *Question*
I Elina milai stin Melina Olandika
the.NOM Elina.NOM speak.3SG to.the.ACC Melina.ACC Dutch.ACC
i Aravika?
or Arabic.ACC
'Is Elina speaking to Melina Dutch or Arabic?'
*Answer*
Stin Melina milai Aravika
to.the.ACC Melina.ACC speak.3SG Arabic.ACC
'To Melina she is speaking Arabic.'

11. *Question*
I Elina milai stin Irini Aravika?
the.NOM Elina.NOM speak.3SG to.the.ACC Irine.ACC Arabic.ACC
'Is Elina speakingArabic to Irene?'
*Answer*
Ohi stin Melina milai Aravika
no to.the.ACC Elina.ACC speak.3SG Arabic.ACC
'No, to Melina she is speaking Arabic.'

12. *Question*
I Elina milai stin Irini Aravika?
the.NOM Elina.NOM speak.3SG to.the.ACC Irine.ACC Arabic.ACC
'Is Elina speakingArabic to Irene?'

*Answer*
Ohi Aravika milai stin Melina
no Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'No, Arabic she is speaking to Melina.'

13. *Question*
Ti milai i Elina sta pedja?
what speak.3SG the.NOM Elina.NOM to.the.ACC children.ACC
'What is Elina speaking to the children?'
*Answer*
Stin Melina milai Aravika
to.the.ACC Melina.ACC speak.3SG Arabic.ACC
'To Melina she is speaking Arabic.'

14. *Question*
Ti milai i Elina sta pedja?
what speak.3SG the.NOM Elina.NOM to.the.ACC children.ACC
'What is Elina speaking to the children?'
*Answer*
Aravika milai stin Melina
Arabic.ACC speak.3SG to.the.ACC Melina.ACC
'Arabic she is speaking to Melina.'

15. *Question*
Ti milai i Elina sti Melina ke stin
what speak.3SG the.NOM Elina.NOM to.the.ACC Melina.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Elina speaking to Melina and to Elena?'
*Answer*
Sti Melina milai Aravika stin Elena
to.the.ACC Melina.ACC speak.3SG Arabic.ACC to.the.ACC Elena.ACC
milai Olandika
speak.3SG Dutch.ACC
'To Melina she is speaking Arabic, to Elena she is speaking Dutch.'

16. *Question*
Ti milai i Elina sti Melina ke stin
what speak.3SG the.NOM Elina.NOM to.the.ACC Melina.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Elina speaking to Melina and to Elena?'
*Answer*
Aravika milai stin Melina Olandika milai
Arabic.ACC speak.3SG to.the.ACC Melina.ACC Dutch.ACC speak.3SG
stin Elena
to.the.ACC Elena.ACC
'Arabic she is speaking to Melina, Dutch she is speaking to Elena.'

17. *Question*
Ti ginete me tin Melina ke tin Elena?
what happen.3SG with the.ACC Melina.ACC and the.ACC Elena.ACC
'What about Melina and Elena?'
*Answer*
Stin Melina milai Aravika, stin Elena
to.the.ACC Melina.ACC speak.3SG Arabic.ACC to.the.ACC Elena.ACC
milai Olandika
speak.3SG Dutch.ACC
'To Melina she is speaking Arabic, to Elena she is speaking Dutch.'

Set5

1. *Question*
   Se pjon matheni magiriki i Melina?
   to who.ACC teach.3SG cooking.ACC the.NOM Melina.NOM
   'To whom is Melina teaching how to cook?'
   *Answer*
   Stin Elina matheni magiriki
   to.the.ACC Elina.ACC teach.3SG cooking.ACC
   'To Elina she is teaching how to cook.'
2. *Question*
   Se pjon matheni magiriki i Melina?
   to who.ACC teach.3SG cooking.ACC the.NOM Melina.NOM
   'To whom is Melina teaching how to cook?'
   *Answer*
   Magiriki matheni stin Elina
   Greek.ACC teach.3SG to.the.ACC Elina.ACC
   'How to cook she is teaching to Elina.'
3. *Question*
   I Melina matheni magiriki stin i Elena
   the.NOM Melina.NOM teach.3SG cooking.ACC to.the.ACC or Elena.ACC
   stin Elina?
   to.the.ACC Elina.ACC
   'Is Melina teaching Elena or Elina how to cook?'
   *Answer*
   Stin Elina matheni magiriki
   to.the.ACC Elina.ACC teach.3SG cooking.ACC
   'To Elina she is teaching how to cook.'
4. *Question*
   I Melina matheni magiriki stin i Elena
   the.NOM Melina.NOM teach.3SG cooking.ACC to.the.ACC or Elena.ACC
   stin Elina?
   to.the.ACC Elina.ACC
   'Is Melina teaching Elena or Elina how to cook?'
   *Answer*
   Magiriki matheni stin Elina
   Greek.ACC teach.3SG to.the.ACC Elina.ACC
   'How to cook she is teaching to Elina.'
5. *Question*
   I Melina matheni magiriki stin Elena?
   the.NOM Melina.NOM teach.3SG cooking.ACC to.the.ACC Elena.ACC
   'Is Melina teaching Elena how to cook?'
   *Answer*
   Ohi stin Elina matheni magiriki
   No to.the.ACC Elina.ACC teach.3SG cooking.ACC
   'No, to Elina she is teaching how to cook.'
6. *Question*
   I Melina matheni magiriki stin Elena?
   the.NOM Melina.NOM teach.3SG cooking.ACC to.the.ACC Elena.ACC
   'Is Melina teaching Elena how to cook?'
   *Answer*
   Ohi magiriki matheni stin Elina
   No cooking.ACC teach.3SG to.the.ACC Elina.ACC
   'No, how to cook she is teaching to Elina.'
7. *Question*
   Ti matheni i Melina stin Elina?
   what teach.3SG the.NOM Melina.NOM to.the.ACC Elina.ACC
   'What is Melina teaching to Elina?'

*Answer*
Magiriki matheni stin Elina
cooking.ACC teach.3SG to.the.ACC Elina.ACC
'How to cook she is teaching to Elina.'

8. *Question*
Ti matheni i Melina stin Elina?
what teach.3SG the.NOM Melina.NOM to.the.ACC Elina.ACC
'What is Melina teaching to Elina?'
*Answer*
Stin Elina matheni magiriki
to.the.ACC Helen.ACC teach.3SG cooking.ACC
'To Elina she is teaching how to cook.'

9. *Question*
I Melina matheni stin Elina Elinika i
the.NOM Melina.NOM teach.3SG to.the.ACC Elina.ACC Greek.ACC or
magiriki?
cooking.ACC
'Is Melina teaching Elina Greek or how to cook?'
*Answer*
Magiriki matheni stin Elina
cooking.ACC teach.3SG to.the.ACC Elina.ACC
'How to cook she is teaching to Elina.'

10. *Question*
I Melina matheni stin Elina Elinika i
the.NOM Melina.NOM teach.3SG to.the.ACC Elina.ACC Greek.ACC or
magiriki?
cooking.ACC
'Is Melina teaching Elina Greek or how to cook?'
*Answer*
Stin Elina matheni magiriki
to.the.ACC Helen.ACC teach.3SG cooking.ACC
'To Elina she is teaching how to cook.'

11. *Question*
I Melina matheni stin Elina Elinika?
the.NOM Melina.NOM teach.3SG to.the.ACC Elina.ACC Greek.ACC
'Is Melina teaching to Elina Greek?'
*Answer*
Ohi, stin Elina matheni magiriki
No to.the.ACC Elina.ACC teach.3SG cooking.ACC
'No, to Elina she is teaching how to cook.'

12. *Question*
I Melina matheni stin Elina Elinika?
the.NOM Melina.NOM teach.3SG to.the.ACC Elina.ACC Greek.ACC
'Is Melina teaching to Elina Greek?'
*Answer*
Ohi, magiriki matheni stin Elina
no cooking.ACC teach.3SG to.the.ACC Elina.ACC
'No, how to cook she is teaching to Elina.'

13. *Question*
Ti matheni i Melina sta pedja?
what teach.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina teaching the children?'
*Answer*
Stin Elina matheni magiriki
to.the.ACC Elina.ACC teach.3SG cooking.ACC
'To Elina she is teaching how to cook.'
*Question*

14. Ti matheni i Melina sta pedja?
what teach.3SG the.NOM Melina.NOM to.the.ACC children.ACC
'What is Melina teaching the children?'

*Answer*
Magiriki matheni stin Elina
cooking.ACC teach.3SG to.the.ACC Elina.ACC
'How to cook she is teaching to Elina.'

15. *Question*
Ti matheni i Melina stin Elina ke stin
what teach.3SG the.NOM Melina.NOM to.the.ACC Elina.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Melina teaching to Elina and to Elena?'
*Answer*
Stin Elina matheni magiriki stin Elena matheni Aravika
to.the.ACC Elina.ACC teach.3SG cooking.ACC to.the.ACC Elena.ACC teach.3SG Arabic
'To Elina she is teaching how to cook, to Elena she is teaching Arabic.'

16. *Question*
Ti matheni i Melina stin Elina ke stin
what teach.3SG the.NOM Melina.NOM to.the.ACC Elina.ACC and to.the.ACC
Elena?
Elena.ACC
'What is Melina teaching to Elina and to Elena?'
*Answer*
Magiriki matheni stin Elina Aravika matheni stin Elena
cooking.ACC teach.3SG to.the.ACC Elina.ACC Arabic.ACC teach.3SG to.the.ACC Elena.ACC
'How to cook she is teaching to Elina, Arabic she is teaching to Elena'

17. *Question*
Ti ginete me tin Elina ke tin Elena?
what happen.3SG with the.ACC Elina.ACC and the.ACC Elena.ACC
'What about Elina and Elena?'
*Answer*
Stin Elina matheni magiriki stin Elena matheni Aravika
to.the.ACC Elina.ACC teach.3SG cooking.ACC to.the.ACC Elena.ACC teach.3SG Arabic.ACC
'To Elina she is teaching how to cook, to Elena she is teaching Arabic.'

## Appendix 6.1

Appendix 6.1 includes the verbatim instructions that were used in the production experiment which was discussed in chapter 6.

Stin othoni tu ipologisti tha dite mia sira
in.the.ACC screen.ACC of.GEN computer.GEN will see.2PL a.ACC series.ACC
erotapokriseon. Fantasthite pos ipodiesthe dio rolus to
question.answer.GEN imagine.2PL that perform.2PL two role.ACC the.ACC
rolo tu anthropu pu rotai ke to rolo tu
role.ACC of.GEN person.GEN that ask.3SG and the.ACC role.ACC of.GEN
anthropu pu apantai. Gia na dite tin epomeni
person.GEN that answer.3SG in.order to see.2PL the.ACC next.ACC
erotapokrisi patiste to spacebar
question.answer.ACC press.2PL the.ACC spacebar
'In your computer screen, you will see a series of question/answer pairs. Imagine that you are performing two roles, the role of the person who asks and the role of the answers. To see the next question/answer pair press spacebar.'

# Appendix 4 (Chapter 7)

Appendix 7 includes the list of 24 stimuli that were used in the perception experiment that was discussed in chapter seven. Having three lexical sets, four information structure conditions and two word orders (3 × 4 × 2 = 24), a total of 24 stimuli per speaker was obtained.

Lexical set A

| | | | |
|---|---|---|---|
| [Stin | Eleni]C-Top/Complex D-move | matheni | Elinika |
| [Stin | Eleni]C-Top/Simple D-move | matheni | Elinika |
| [Stin | Eleni]Corrective/contrastive Foc | matheni | Elinika |
| Stin | Eleni | matheni | Elinika]New information Foc |
| to.the.ACC | Helen.ACC | teach.3SG | Greek.ACC |

'To Helen she is teaching Greek.'

| | | | |
|---|---|---|---|
| Elinika | matheni | [stin | Eleni]C-Top/Complex D-move |
| Elinika | matheni | [stin | Eleni]C-Top/Simple D-move |
| Elinika | matheni | [stin | Eleni]Corrective/contrastive Foc |
| [Elinika]New information Foc | matheni | stin | Eleni |
| Greek.ACC | teach.3SG | to.the.ACC | Helen.ACC |

'Greek she is teaching to Helen.'

Lexical set B

| | | | |
|---|---|---|---|
| [Stin | Eleni]C-Top/Complex D-move | harizi | morudjaka |
| [Stin | Eleni]C-Top/Simple D-move | harizi | morudjaka |
| [Stin | Eleni]Corrective/contrastive Foc | harizi | morudjaka |
| Stin | Eleni | harizi | [morudjaka]New information Foc |
| to.the.ACC | Helen.ACC | give.for.free.3SG | baby.clothes.ACC |

'To Helen she is giving for free baby clothes.'

| | | | |
|---|---|---|---|
| Morudjaka | harizi | [stin | Eleni]C-Top/Complex D-move |
| Morudjaka | harizi | [stin | Eleni]C-Top/Simple D-move |
| Morudjaka | harizi | [stin | Eleni]Corrective/contrastive Foc |
| [Morudjaka]New information Foc | harizi | stin | Eleni |
| baby.clothes.ACC | give.for.free.3SG | to.the.ACC | Helen.ACC |

'Baby clothes she is giving for free to Helen.'

Lexical set C

| | | | |
|---|---|---|---|
| [Stin | Melina]C-Top/Complex D-move | milai | Aravika |
| [Stin | Melina]C-Top/Simple D-move | milai | Aravika |
| [Stin | Melina]Corrective/contrastive Foc | milai | Aravika |
| Stin | Melina | milai | [Aravika]New information Foc |
| to.the.ACC | Melina.ACC | speak.3SG | Arabic.ACC |

'To Melina she is speaking Arabic.'

| | | | |
|---|---|---|---|
| Aravika | milai | [stin | Melina]C-Top/Complex D-move |
| Aravika | milai | [stin | Melina]C-Top/Simple D-move |
| Aravika | milai | [stin | Melina]Corrective/contrastive Foc |
| [Aravika]New information Foc | milai | stin | Melina |
| Arabic.ACC | speak.3SG | to.the.ACC | Melina.ACC |

'Arabic she is speaking to Melina.'

**Appendix 7.1**

Appendix 7.1 concludes the answer sheet that was used in the perception experiment that was discussed in chapter seven.

Matheni Elinika sti Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching Helen?'
Ti matheni stin Eleni ke sti Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching the children?

---

Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby-clothes to Melina?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'

---

Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni stin Eleni ke sti Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Matheni Elinika sti Melina
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

---

Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby-clothes to Melina?'

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Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'

Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothe.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.ACC to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is giving to Helen and to Melina?'

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Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai stin Eleni ke stin Melina
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is giving for free to the children?'
Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'

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Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Does she speak Arabic to Elina?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC

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Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
'What is she speaking to Melina?'

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Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai stin Eleni ke sti Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'

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Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'

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Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'

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Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'

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Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

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Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'

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Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'

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Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'

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Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'

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Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'

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Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?

Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'

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Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'

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Matheni Elinika sti Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching Helen?'
Ti matheni stin Eleni ke sti Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching the children?

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Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby-clothes to Melina?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'

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Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni stin Eleni ke sti Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Matheni Elinika sti Melina
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

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Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby-clothes to Melina?'

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Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Harizi morudjaka sti Melina?
give.for.free.3SG baby.clothe.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.ACC to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is giving to Helen and to Melina?'

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Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is giving for free to the children?'
Harizi morudjaka sti Melina?
give.for.f ree.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'

Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving for free to Helen?'

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Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Does she speak Arabic to Elina?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC

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Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?'
'What is she speaking to Melina?'

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Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai stin Eleni ke sti Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

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Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'

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Ti milai sti Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'
Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'

---

Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'

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Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'

---

Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?
Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'

---

Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'

Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'

---

Ti milai sta pedja?
what speak.3SG to.the.ACC children.ACC
'What is she speaking to the children?'
Ti milai stin Eleni ke stin Melina?
what speak.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she speaking to Helen and to Melina?'
Ti milai stin Melina?
what speak.3SG to.the.ACC Melina.ACC
'What is she speaking to Melina?'
Milai Aravika stin Elina?
speak.3SG Arabic.ACC to.the.ACC Elina.ACC
'Is she speaking Arabic to Elina?'

---

Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'

---

Ti harizi stin Eleni ke sti Melina?
what give.for.free.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she giving for free to Helen and to Melina?'
Harizi morudjaka stin Melina?
give.for.free.3SG baby.clothes.ACC to.the.ACC Melina.ACC
'Is she giving for free baby clothes to Melina?'
Ti harizi sta pedja?
what give.for.free.3SG to.the.ACC children.ACC
'What is she giving for free to the children?
Ti harizi stin Eleni?
what give.for.free.3SG to.the.ACC Helen.ACC
'What is she giving to Helen?'

---

Matheni Elinika stin Melina?
teach.3SG Greek.ACC to.the.ACC Melina.ACC
'Is she teaching Greek to Melina?'
Ti matheni sta pedja?
what teach.3SG to.the.ACC children.ACC
'What is she teaching to the children?'
Ti matheni stin Eleni ke stin Melina?
what teach.3SG to.the.ACC Helen.ACC and to.the.ACC Melina.ACC
'What is she teaching to Helen and to Melina?'
Ti matheni stin Eleni?
what teach.3SG to.the.ACC Helen.ACC
'What is she teaching to Helen?'

---

| | | | | | | |
|---|---|---|---|---|---|---|
| Ti | milai | stin | Eleni | ke | stin | Melina? |
| what | speak.3SG | to.the.ACC | Helen.ACC | and | to.the.ACC | Melina.ACC |

'What is she speaking to Helen and to Melina?'

| | | | |
|---|---|---|---|
| Ti | milai | stin | Melina? |
| what | speak.3SG | to.the.ACC | Melina.ACC |

'What is she speaking to Melina?'

| | | | |
|---|---|---|---|
| Milai | Aravika | stin | Elina? |
| speak.3SG | Arabic.ACC | to.the.ACC | Elina.ACC |

'Is she speaking Arabic to Elina?'

| | | | |
|---|---|---|---|
| Ti | milai | sta | pedja? |
| what | speak.3SG | to.the.ACC | children.ACC |

'What is she speaking to the children?'

---

| | | | |
|---|---|---|---|
| Harizi | morudjaka | stin | Melina? |
| give.for.free.3SG | baby.clothes.ACC | to.the.ACC | Melina.ACC |

'Is she giving for free baby clothes to Melina?'

| | | | |
|---|---|---|---|
| Ti | harizi | sta | pedja? |
| what | give.for.free.3SG | to.the.ACC | children.ACC |

'What is she giving for free to the children?

| | | | |
|---|---|---|---|
| Ti | harizi | stin | Eleni? |
| what | give.for.free.3SG | to.the.ACC | Helen.ACC |

'What is she giving to Helen?'

| | | | | | | |
|---|---|---|---|---|---|---|
| Ti | harizi | stin | Eleni | ke | sti | Melina? |
| what | give.for.free.3SG | to.the.ACC | Helen.ACC | and | to.the.ACC | Melina.ACC |

'What is she giving for free to Helen and to Melina?'

---

| | | | | | | |
|---|---|---|---|---|---|---|
| Milai | Aravika | stin | Elina? | | | |
| speak.3SG | Arabic.ACC | to.the.ACC | Elina.ACC | | | |
| Ti | milai | stin | Eleni | ke | stin | Melina? |
| what | speak.3SG | to.the.ACC | Helen.ACC | and | to.the.ACC | Melina.ACC |

'What is she speaking to Helen and to Melina?'

| | | | |
|---|---|---|---|
| Ti | milai | sta | pedja? |
| what | speak.3SG | to.the.ACC | children.ACC |

'What is she speaking to the children?'

| | | | |
|---|---|---|---|
| Ti | milai | stin | Melina? |
| what | speak.3SG | to.the.ACC | Melina.ACC |

'What is she speaking to Melina?'

**Appendix 7.2**

Appendix 7.2 contains the verbatim instructions that were used in the perception experiment that was discussed in chapter seven.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tha | akousete | mia | sira | katafatikon | protaseon. | Meta | | |
| will | hear.2PL | a.ACC | series.ACC | affirmative.GEN | sentences GEN | After | | |
| apo | kathe | protasi | akougete | enas | ihos | (mpip) | | |
| from | every.ACC | sentence.ACC | hear.3SG | a.NOM | sound | (bip) | | |
| kai | sti | sinehia | iparhi | ena | mikro | keno. | | |
| and | in.the.ACC | afterwards | exist.3SG | a.ACC | small.ACC | gap.ACC | | |
| Afto | pou | thelo | na | kanete | ine | na | | |
| this.NOM | that | want.1SG | to | do.2PL | be.3SG | to | | |
| vrite | se | pia | erotisi | antistihi | i | katafatiki | | |
| find.2PL | to | which | question.ACC | correspond.3S | the.NOM | affirmative.NOM | | |
| protasi | pou | akousate | kai | na | simiosete | tin | | |
| sentence.NOM | that | hear.2PL | and | to | note.2PL | the.ACC | | |
| apantisi | sas | me | ena | x. | Min | simplironete | | |
| response.ACC | yours | with | a.ACC | x | not | fill.in.2PL | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| eno | akoute, | akouste | prota | tin | katafatiki | | protasi |
| while | listen.2PL | hear.PL | first | the.ACC | affirmative.ACC | | sentence.ACC |
| kai | meta, | kata | ti | diarkia | tou | kenou, | |
| and | after | in | the.ACC | duration.ACC | the.GEN | gap.GEN | |
| doste | | tin | apantisi | sas. | | | |
| give.2PL | | the.ACC | response.ACC | yours. | | | |

'You will hear a series of affirmative sentences. After each sentence a bip sound is heard and then there is a small pause. What I want you to so is to find to which question corresponds the affirmative sentence you just heard and to note your answer with an x. Don't note your answer while listening, listen first the affirmative sentence and afterwards in the time of the pause, give your answer.'

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# Samenvatting

Dit proefschrift heeft als doel een bijdrage te leveren aan ons inzicht in de semantische en prosodische eigenschappen van object foci. Dit proefschrift bespreekt voornamelijk het Grieks. Object focus kan in postverbale en preverbale positie voorkomen in het Grieks. Een voorbeeld daarvan wordt in (1) gegeven. Vierkante haakjes en de subscript $_{\text{Foc}}$ duiden focus aan.

(1) *Vraag*
a. Ti ftiahni i Eleni?
wat maken.3SG de.NOM Helen.NOM
'Wat is Helen aan het maken?'
*Antwoord* 1
b. I Eleni Ftiahni [ntolmadakia]$_{\text{Foc}}$.
de.NOM Helen.NOM maken.3SG gevulde.druivenblad.ACC
'Helen is [gevulde druivenblad]$_{\text{Foc}}$ aan het maken.'
*Antwoord* 2
c. [Ntolmadakia]$_{\text{Foc}}$ ftiahni i Eleni.
gevulde.druivenblad.ACC maken.3SG de.NOM Helen.NOM
'[Gevulde druivenblad]$_{\text{Foc}}$ is Helen is aan het maken.'

Op het eerste gezicht lijkt het voorbeeld in (1) te suggereren dat postverbale en preverbale object foci onderling uitwisselbaar zijn. De belangrijkste onderzoeksvraag die in dit proefschrift wordt behandeld is geformuleerd in (2).

(2) Verschillen object foci in preverbale positie in het Grieks van hun tegenhangers in postverbale positie?

**Deel een**

**Hoofdstuk twee**. Hoofdstuk twee vergelijkt preverbale en postverbale object foci in het Grieks met elkaar met betrekking tot *exhaustivity*. Dit hoofdstuk heeft voornamelijk het doel om de vraag in (i) te beantwoorden.

(i) Verschillen preverbale object foci in het Grieks van hun postverbale tegenhangers wat betreft *exhaustivity*?

Er zijn twee testen gebruikt om de vraag in (i) te beantwoorden: een test om de nieuwe informatie focus te identificeren en een ander om *exhaustivity* te identificeren.

De uitkomsten van de eerste test tonen aan dat zowel preverbale object focus als zijn postverbale tegenhanger in het Grieks als een nieuwe informatie focus geïnterpreteerd kan worden. De uitkomsten van de tweede test duiden aan dat preverbale object focus in het Grieks niet uitputtend wordt geïnterpreteerd. Het hoofdstuk eindigt met een kort overzicht van focus in het Hongaars. Preverbale object focus in het Hongaars verschilt van zijn postverbale tegenhanger met betrekking tot *exhaustivity*.

**Hoofdstuk drie**. Hoofdstuk drie behandelt het begrip "contrast" en heeft als doel antwoord te geven op de vragen in (ii) en (iii) vanuit zowel een syntactisch als een semantisch uitgangspunt.

(ii) Wat is de status van contrast in de grammatica?
(iii) Wat is het verband tussen preverbale object foci en contrast?

Om de kwesties in (ii) en (iii) te behandelen, bespreek ik de omstandigheden die contrast eliciteren en zet ik een aantal testen op om contrast te identificeren. Deze testen worden toegepast op het Grieks. De uitkomsten van de testen geven aan dat preverbale objecten in het Grieks niet verschillen van hun postverbale tegenhangers wat betreft contrast. In dit hoofdstuk onderzoek ik ook het verband tussen contrast en exhaustivity door Italiaanse data te bestuderen. Door de relevante testen toe te passen wordt aangetoond dat contrastieve object focus in preverbale positie in het Italiaans niet uitputtend wordt geïnterpreteerd.

**Hoofdstuk vier**. Hoofdstuk vier is een voortzetting van de uitkomsten uit hoofdstuk twee en drie. Na te hebben aangetoond dat preverbale object foci in het Grieks niet verschillen van hun postverbale tegenhangers wat betreft *exhaustivity* of contrast, keert hoofdstuk vier terug naar de hoofdvraag van het proefschrift. De hoofdvraag wordt herhaald in (iv).

(iv) Verschillen object foci in preverbale positie in het Grieks van hun tegenhangers in postverbale positie?

In dit hoofdstuk beargumenteer ik dat preverbale object foci in het Grieks van hun postverbale tegenhangers verschillen wat betreft discourse topichood. Het verschil tussen Griekse preverbale en postverbale object foci heeft in die zin geen betrekking tot focus. Dit kan vooral gezegd worden nadat het is aangetoond dat Griekse discourse topics syntactisch gemarkeerd kunnen worden en dat preverbale object foci in het Grieks noodzakelijkerwijs als conversatie thema's moeten fungeren. Het bewijs voor deze stelling wordt geleverd door de uitkomsten van de backward anaphora resolution en door de uitkomsten van een continuïteitstest dat door middel van een questionnaire is uitgevoerd.

**Deel twee**

**Hoofdstuk vijf**. Hoofdstuk vijf onderzoekt de fonetische eigenschappen van preverbale en postverbale object foci in het Grieks door middel van een productie en twee perceptie experimenten. De twee perceptie experimenten verschillen met betrekking tot het type stimuli dat gebruikt is: in het eerste experiment gebruik ik natuurlijke stimuli terwijl ik in het tweede experiment aangepaste stimuli gebruik. De OVS volgorde kan een preverbale object focus, ($[_{NP}O]_{Foc}VS$), teweegbrengen maar geen predicaat focus, ($*[_{VP}OV]_{Foc}S$), of zinsfocus, ($*[_{S}OVS]_{Foc}$). De SVO volgorde kan in tegenstelling tot de OVS volgorde drie verschillende focus condities bewerkstelligen; namelijk zinsfocus, ($[_{S}SVO]_{Foc}$), predicaat focus ($S[_{VP}VO]_{Foc}$), en postverbale object focus ($SV[_{NP}O]_{Foc}$). Het productie experiment heeft als doel om de vraag in (v) te beantwoorden.

(v) Maken sprekers een verschil tussen zinsfocus, predicaat focus en object focus?

De uitkomsten van het productie experiment laten zien dat preverbale object focus $[_{NP}O]_{Foc}VS$ en postverbale object focus $SV[_{NP}O]_{Foc}$ aanzienlijk van elkaar verschillen; in het geval van preverbale object is er een stijging in de toonhoogte gevolgd door een daling in de toonhoogte en de post-focus serie is vlak terwijl er meer beweging in toonhoogte is in postverbale object focus. Zinsfocus, predicaat focus en postverbaal object focus verschillen onderling niet radicaal. Desondanks zijn er wel een paar verschillen. De eerst toonstijging is met name in predicaat focus hoger dan in postverbale object focus. Deze twee soorten focus verschillen van elkaar in het geval van de tweede toonstijging: de predicaat focus laat een hogere toonstijging zien dan de postverbale object focus. Bovendien is de tweede toonstijging van de predicaat focus hoger dan de tweede toonstijging van de zinsfocus.

Het perceptie experiment dat natuurlijke stimuli gebruikt, richt zich op het beantwoorden van de vraag in (vi) terwijl het perceptie experiment dat aangepaste stimuli gebruikt het beantwoorden van de vraag in (vii) als doel heeft.

(vi) Nemen de luisteraars een verschil tussen zinsfocus, predicaat focus en object focus waar?
(vii) Wat is het relatieve belang van pauze, accent op het werkwoord en accent op object binnen de waarneming van focus?

De uitkomsten van het perceptie experiment dat natuurlijke stimuli gebruikt, toont aan dat luisteraars preverbale object focus $SV[_{NP}O]_{Foc}$ ruim boven kansniveau (74,7%), predikaat focus $S[_{VP}VO]_{Foc}$ boven kansniveau (42,2%) en zinsfocus $[_{S}SVO]_{Foc}$ onder kansniveau (14,1%) waarnemen. De uitkomsten van het perceptie experiment dat aangepaste stimuli gebruikt, geven aan dat van pauze, accent op het werkwoord en accent op het object onderling pauze de belangrijkste variabele is bij

het waarnemen van focus. Daarachter volgt accent op het object terwijl accent op het werkwoord het minst belangrijk is.

**Hoofdstuk zes**. Hoofdstuk zes onderzoekt de fonetische realisatie van contrast in het Grieks door middel van een productie experiment. Hoofdstuk zes richt zich op het beantwoorden van de vraag zoals geformuleerd in (viii) met in achtneming van het feit dat contrastieve foci en contrastieve topics in het Grieks in preverbale of postverbale positie kunnen voorkomen.

(viii) Maken sprekers een verschil tussen contrastieve focus en contrastieve topic?

Om de vraag in (viii) the beantwoorden, moet men eerst de volgende vragen beantwoorden.

a. Maken sprekers een verschil tussen nieuwe informatie focus en contrastieve focus?
b. Maken sprekers een verschil tussen C-Top/*complex discourse moves* en C-Top/*simple discourse moves*?

De uitkomsten van het experiment laten zien dat nieuwe informatie focus, corrigerende-contrastieve focus en gesloten-set/contrastieve focus statistiek gezien niet aanzienlijk van elkaar verschillen. De uitkomsten laten ook zien dat C-Top/complex discourse moves verschillen van C-Top/simple discourse moves; de laatste is korter qua duur en hoger qua intensiteit. Wat betreft de vraag in (viii) is aangetoond dat contrastieve foci van contrastieve topics verschillen. $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ verschilt vooral van $[IO]_{Corrective\text{-}contrastive\ Foc}VO$; de eerste vertoont meer bewegingen in toonhoogte die eindigen met een stijging in toonhoogte en de uiting is zowel langer qua duur als hoger qua intensiteit. Boven verschilt $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ van $[IO]_{Corrective\text{-}contrastive\ Foc}VO$; de eerste stijging in toonhoogte in $OV[IO]_{C\text{-}Top/Complex\ D\text{-}move}$ is hoger dan de eerste stijging in toonhoogte in $OV[IO]_{Corrective\text{-}contrastive\ Foc}$, terwijl de tweede stijging in toonhooge in $OV[IO]_{C\text{-}Top/Complex\ D\text{-}move}$ minder is dan de tweede stijging in $OV[IO]_{Corrective\text{-}contrastive\ Foc}$,. Deze twee verschillen ook onderling met betrekking tot duur en intensiteit; de eerste is langer qua duur en hoger qua intensiteit.

**Hoofdstuk zeven.** Hoofdstuk zeven bouwt verder op de bevindingen van hoofdstuk zes en beschrijft de uitkomsten van een perceptie experiment over contrast. Het richt zich vooral op het beantwoorden van de vragen die in (ix) en (x) worden gegeven.

(ix) Nemen luisteraars enig verschil tussen nieuwe informatie focus, corrigerend-constrastieve focus, C-Top/*complex* en C-Top/*simple discourse moves* waar?
(x) Kan de laatste toonstijging van $[IO]_{C\text{-}Top/Complex\ D\text{-}move}VO$ in verband worden gebracht met $C_{\text{-Top complex discourse moves}}$?

De uitkomsten van het experiment geven aan dat luisteraars corrigerende en nieuwe informatie focus ruim boven kansniveau waarnemen. C-Top/complex discourse move wordt boven kansniveau waargenomen, maar luisteraars verwarren het met C-Top/simple discourse move. Met name wanneer de beoogde informatie structuur [IO]C-Top/Complex D-moveVO was, werd deze informatie structuur in 42% van de relevante gevallen waargenomen terwijl het in 42% verward werd met [IO]C-Top/Simple D-moveVO. Wanneer de beoogde informatie structuur OV[IO] C-Top/Complex D-move was, dan werd deze in 32,1% van de relevante gevallen correct waargenomen terwijl deze in 56,4% werd verward met C-Top/simple discourse move. Er moet opgewezen worden dat C-Top/simple discourse move niet verward wordt met C-Top/complex discourse move; het wordt nogal verward met de nieuwe informatie focus of met corrigerend-contrastieve focus. Met name wanneer de beoogde informatie structuur [IO]C-Top/Simple D-moveVO was, werd deze in 82,1% van alle relevante gevallen verward met nieuwe informatie focus. Wanneer de beoogde informatie structuur OV[IO]C-Top/Simple D-move was, dan werd deze in 52,6% van de relevante gevallen verward met corrigerend-contrastieve focus. Wat betreft de vraag in (x), de kans dat nieuwe informatie focus of corrigerend-contrastieve focus als antwoord gekozen wordt in plaats van C-Top/complex discourse move vermindert met de laatste toonstijging. De kans dat C-Top/simple discourse move gekozen wordt in plaats van C-Top/complex discourse move, hangt niet beduidend af van de laatste toonstijging.

# Curriculum Vitae

Stella Gryllia was born in Athens, Greece on October 1, 1977. She holds a university diploma in Literature, majoring in Linguistics from the National and Kapodistrian University of Athens, 2001. In 2003, she completed her MPhil in Linguistics at University Leiden Centre for Linguistics. From 2004 till 2008, she carried out her PhD project at Leiden University Centre for Linguistics with a scholarship from Lingua, Elsevier. During these years, she also provided administrative assistance to the executive editor of Lingua. The present thesis is the result of the work that she did for this PhD project.