A Lexical Functional Grammar approach to Modern Greek Relative Clauses

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Abstract

This thesis presents an account of the properties of Relative Clauses in Modern Greek, with particular focus on the distribution of the resumption and gap relativization strategies. For the most part relative clauses have been regarded in the literature as a type of Long Distance dependencies with unique properties.This thesis looks at the properties of three types of relative clauses in Modern Greek (restrictive, non-restrictive and free relative clauses). Working in the framework of Lexical Functional Grammar, we present an overview of the most important properties of Modern Greek Relative Clauses focusing on the distribution of the gap and resumption strategies in these constructions. We propose an analysis of Relative Clauses that brings forward the similarities of the three types of Relatives while at the same time manages to account for their dissimilarities, and it is shown that such constructions can be accommodated in LFG quite straightforwardly. The thesis also presents a computational implementation of the analysis using XLE (Xerox Linguistics Environment) a platform for testing and writing LFG grammars.

"Time is a companion that goes with us on a journey. It reminds us to cherish each moment, because it will never come again. What we leave behind is not as important as how we have lived."

To *pappou* Niko Panteli, my beloved grandpa,
who left us before seeing this through &
thio Giorgo Ioannidi, my long missed music teacher

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CHAPTER 1

Introduction

This thesis presents an account of the properties of Relative Clauses in Modern Greek, with particular focus on the distribution of the resumption and gap relativization strategies. For the most part relative clauses have been regarded in the literature as a type of Long Distance dependencies with unique properties. The thesis looks at the properties of three types of relative clauses in Modern Greek: Restrictive, non-Restrictive and Free relative clauses. Working in the framework of Lexical Functional Grammar, we present an overview of the most important properties of Modern Greek Relative Clauses focusing on the distribution of the gap and resumption strategies in these constructions. We propose an analysis of Relative Clauses that brings forward the similarities of the three types of Relatives while at the same time manages to account for their dissimilarities, and it is shown that such constructions can be accommodated in LFG quite straightforwardly. The thesis also presents a computational implementation of the analysis using XLE (Xerox Linguistics Environment) a platform for testing and writing LFG grammars.

The organisation of the thesis is as follows:

Chapter 2 presents an overview of the *Lexical Functional Grammar* (LFG) framework and outlines the basic tools, formal and linguistic concepts of relevance

to the study of Relative Clauses, such as the c-structure, the f-structure and the s-structure as well as how LFG maps these levels of representation one to the other. We also present an overview of how LFG accounts for Unbounded Dependencies, particularly Long Distance Dependencies.

Chapter 3 presents a detailed overview of the data on Modern Greek Relative Clauses. We first look at some issues relevant to the Modern Greek Clause Structure, such as what is regarded as the basic word order and whether Modern Greek should be represented configurationally or non-configurationally. We then present the data on Modern Greek Relative Clauses, on which we base our analysis presented in the next chapter. We have also considered some of the properties of MG Relative Clauses, such as what kinds of elements they take as their antecedents, their internal structure as well as their relationship with the main clause. Since it is of particular interest to our analysis, in this chapter we also review the data on resumptive pronouns and argue that they are the ordinary forms of pronouns, and that they are not of the same status as doubling clitics. We also put forward arguments in favour of the view that Modern Greek resumptive pronouns have different properties and characteristics when compared to gaps. We conclude by providing data on relativisation strategies in Modern Greek Relative clauses and discuss some similarities and differences in the distribution of the resumption and the gap strategies.

Chapter 4 includes a discussion of the literature on Modern Greek relatives and of relevant LFG literature on Relative clauses. We review different approaches to Restrictive, Non-Restrictive and Free relative clauses as presented in the literature of Modern Greek. This is followed by a review of the LFG approaches to the different types of relative clauses, where we note different approaches to the issues under consideration and note trends and similarities. We then propose an LFG analysis of Modern Greek Relative Clauses for Local and Long-Distance dependencies which also takes under consideration the distribution of the gap and resumption strategies

in Restrictive, Non-Restrictive and Free relative Clauses.

Chapter 5 presents a computational implementation of the analysis presented in chapter 4 using the *Xerox Linguistics Environment* (XLE), a platform for developing and maintaining large-scale grammars. In our discussion, we have included some simplifying assumptions that applied when building the grammar and some notes on the grammar s coverage. Finally, we evaluate our grammar fragment and provide some ideas for possible development directions.

CHAPTER 2

Overview of the LFG Framework

2.1 Introduction

This chapter introduces the Lexical Functional Grammar theory and presents some of the key concepts and formal tools that will be used in chapter 4, where we provide an LFG account of the phenomena under consideration. Of course our aim here is not to give a complete introduction to the theory - for a more comprehensive introduction to Lexical Functional Grammar see Dalrymple (2001), Falk (2001) or Bresnan (2001) among others.

2.2 Basic Concepts

Lexical Functional Grammar is a theory of grammar initially set forth by Kaplan and Bresnan (1982). Here are some it its core properties:

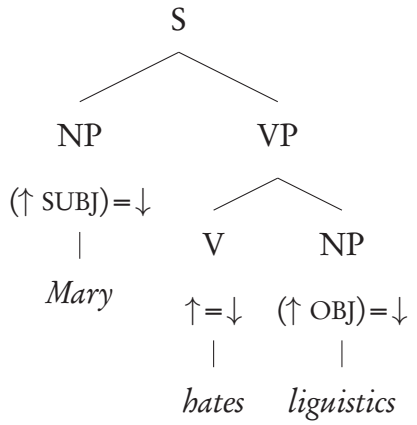
- it is *lexical*, therefore the lexicon plays an active role when accounting for linguistic phenomena;
- it is *functional*; since it uses grammatical functions like SUBJ(ect), OBJ(ect) and OBL(ique) to account for the grammatical role of each element under

examination;

- it is a *grammar*, and therefore its purpose is to descriptively account for individual languages as well as aiming at a universal grammar.

The basic mechanism behind the LFG formalism is the existence of different levels of projection. In their initial paper Kaplan and Bresnan (1982) de ned two levels of representation: the *constituent structure* (or *c-structure*), which includes the dominance and precedence relations between constituents and is schematically represented via a phrase structure tree, and the *functional structure* (or *f-structure*), which includes information on the grammatical relations between the elements of the c-structure and is represented through an attribute value matrix (AVM). Examples of a c-structure and its corresponding f-structure are shown in (1) and (2) respectively:

(1)

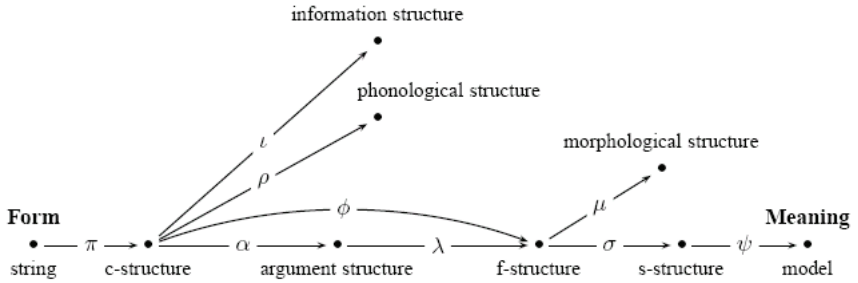


(2)

$$\begin{bmatrix} \text{PRED} & \text{hate}\left\langle \left(\uparrow\text{SUBJ}\right), \left(\uparrow\text{OBJ}\right) \right\rangle \\ \text{TENSE} & \text{present} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{Mary} \\ \text{NUM} & \text{sg} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{linguistics} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix}$$

LFG has evolved a lot since the original Kaplan and Bresnan (1982) paper and the architecture of the theory has been enhanced with more levels of projection in order to account for linguistic phenomena in linguistic levels other than the syntactic level. A summary of the LFG projection architecture, taking under consideration some recent proposals, is set forth in Asudeh (2004, 34), reproduced as (3) below:

(3)



The levels of representation of interest to the analysis of relative clauses are the c-structure, the f-structure, which we will further refer to in the following sections.

2.2.1 C-structure

C-structure is the place where dominance, precedence and constituency relations are expressed through a series of phrase structure rules, schematically represented – as previously mentioned – in a phrase structure tree. On the nature of phrase structure rules in LFG, Dalrymple (2001, 92) suggests that they are regarded as "node admissibility conditions".

Phrase structure rules can be optional, which in LFG is denoted by enclosing the optional constituent(s) in round brackets. They may also occur in repetition, formally encoded through the *Kleene star* (*) or the *Kleene plus* (+) operator: the former indicates zero or more occurrences, whereas the latter suggests one or more occurrences of the phrase structure category. In the c-structure rule in (4), of an imaginary language, PP* indicates that we can have zero or more instances of the PP node, whereas NP^{+} means that we can have one or more (but not zero) instances of the NP node:

(4) VP → V NP^{+} PP*

LFG can also allow disjunction over grammatical functions (5) or nodes (6), denoted by curly brackets {}.

(5) {(↑OBL)=↓ | ↓∈ (↑ ADJ)=↓ }

(6) VP → V NP NP | PP

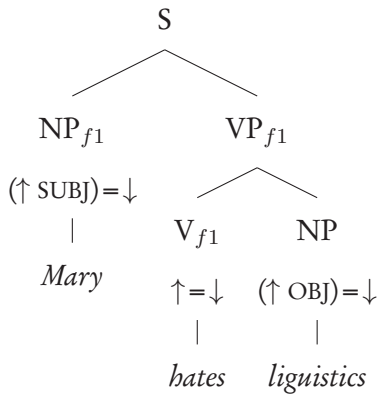
On speci c occasions, where we need to generalise over a set of categories, abbreviation over a set of categories in a rule is possible, using the XP metacategory to indicate a set of categories which may form a group (Dalrymple, 2001, 35), as in (7):

(7) CP → XP C
XP ≡ { NP | PP | VP | AP | AdvP }

In other words, the XP in the phrase structure rule above stands for either an NP or a PP or a VP and so on. A node of special status is the ϵ (empty) string node. ϵ can appear in a rule to denote that some f-structure information should be passed on to the mother node. The node itself doesn t appear in the c-structure.

LFG adopts a theory of the *extended projection* (Bresnan, 2001, Dalrymple, 2001) according to which various c-structure positions may project onto the same f-structure. This is done by associating the c-structure nodes with f-structure annotations (see also section 2.2.3 on projection mapping) which when resolved will be associated with the same f-structure. An example of this is provided in (8), where f-structure f_1 gets the f-structure information projected from the NP, the VP and the V c-structure nodes.

(8)



$$f_1\begin{bmatrix} \text{PRED} & \text{hate}\left\langle\left(\uparrow\text{SUBJ}\right),\left(\uparrow\text{OBJ}\right)\right\rangle \\ \text{TENSE} & \text{present} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{Mary} \\ \text{NUM} & \text{sg} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{linguistics} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix}$$

We further elaborate on f-structures in the following section.

2.2.2 F-structure

Functional Structure, is the level where syntactic relations are represented. The f-structure is reserved for the encoding of more abstract syntactic notions such as grammatical functions, case and agreement, anaphoric binding and functional control, unbounded dependencies and as Asudeh (2004, 38) points out "everything apart from categorial status, linearization and dominance". By integrating information from both the c-structure and the lexicon, by means of functional equations, assigned to the c-structure nodes and the lexical entries, an f-structure is schematically represented in an attribute value matrix (AVM), as in (2), reproduced here for convenience as (9):

(9)
$$\begin{bmatrix} \text{PRED} & \text{hate}\left\langle\left(\uparrow\text{SUBJ}\right),\left(\uparrow\text{OBJ}\right)\right\rangle \\ \text{TENSE} & \text{present} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{Mary} \\ \text{NUM} & \text{sg} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{linguistics} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix}$$

It is worth mentioning that the difference in representing the c- and the f- structure successfully captures the basic intuitions towards a common typology of all languages in general: c-structures may vary among languages, but their corresponding f-structures are quite similar.

The validity of the f-structure representation is ensured by compliance to three ***well-formedness conditions***: the *consistency/uniqueness condition*, the *completeness condition* and the *coherence condition*.

A. The Consistency or Uniqueness Condition The ***consistency / uniqueness condition*** ensures that "each (governable relation s structure) attribute is unique (Dalrymple, 2001, 39) or alternatively that each attribute should have a unique PRED value associated with it. (10) illustrates this point by providing an example of an *inconsistent* f-structure. The values in shaded background mark the values/features that are clashing, which render the f-structure inconsistent.

(10) F-structure for the sentence **Mary she hates linguistics*

$$\begin{bmatrix} \text{PRED} & \text{hates}\left\langle \left(\uparrow\text{SUBJ}\right), \left(\uparrow\text{OBJ}\right) \right\rangle \\ \text{TENSE} & \text{present} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{Mary} \\ \text{PRED} & \text{pro} \\ \text{NUM} & \text{sg} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{linguistics} \\ \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix}$$

As can be observed in all the f-structures presented so far, the value of the PRED attribute enjoys a special status in LFG: it may contain an argument list which demonstrates the subcategorization frame of the predicated item. If we take (10) for example, the argument list is located inside the PRED value of the verb *'hates'* which

takes as its arguments a SUBJ and an OBJ. Since these grammatical functions are subcategorised for by the main verb (*'hates'*), they need to have a PRED value, which should be unique. In order for the f-structure to be well-formed, it is vital that all and only these arguments appear in the f-structure – this is ensured with the help of the two remaining conditions, the *completeness condition* and the COHERENCE CONDITION.

B. The Completeness Condition The ***completeness condition*** ensures that all governable elements, that is the arguments in the subcategorisation frame of the verb are realised; if one of the elements of the argument list is missing, then the f-structure is *incomplete* and will be ruled out as ill-formed. Or as Dalrymple (2001) more formally expresses it:

> *An f-structure is locally complete if and only if it contains all the governable grammatical functions that its predicate governs. An f-structure is complete if and only if it and all its subsidiary f-structures are locally complete.*
>
> (Dalrymple, 2001, 37)

The absence of the PRED value of a governable grammatical function in an f-structure, as in (11) results in the violation of the completeness condition and therefore the f-structure is ruled out as *incomplete*:

(11) *'*Dave broke.'*

$$\begin{bmatrix} \text{PRED} & \text{broke}\left\langle \left(\uparrow\text{SUBJ}\right), \left(\uparrow\text{OBJ}\right) \right\rangle \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{Dave} \end{bmatrix} \\ \text{OBJ} & \end{bmatrix}$$

C. The Coherence Condition The ***coherence condition*** ensures that there are no additional governable elements in the f-structure other than those required by the subcategorisation frame indicated in the value of the PRED attribute of an f-structure. As Dalrymple (2001, 39) puts it, "[it] requires every f-structure bearing a governable GF to be governed by some predicate: that is, every governable GF that is present in an f-structure must be mentioned in the argument list of the PRED of that f-structure".

The presence of an extra governable grammatical function in the f-structure results in the violation of the coherence condition and the f-structure is ruled out as *incoherent*, as in (12) below:

(12) *"Dave broke the vase to Mary.'*

$$f_1\begin{bmatrix} \text{PRED} & \text{broke}\left\langle\left(\uparrow\text{SUBJ}\right),\left(\uparrow\text{OBJ}\right)\right\rangle \\ \text{SUBJ} & \begin{bmatrix}\text{PRED} & \text{Dave}\end{bmatrix} \\ \text{OBJ} & \begin{bmatrix}\text{PRED} & \text{vase}\end{bmatrix} \\ \text{OBL}_{goal} & \begin{bmatrix}\text{PRED} & \text{Mary}\end{bmatrix} \end{bmatrix}$$

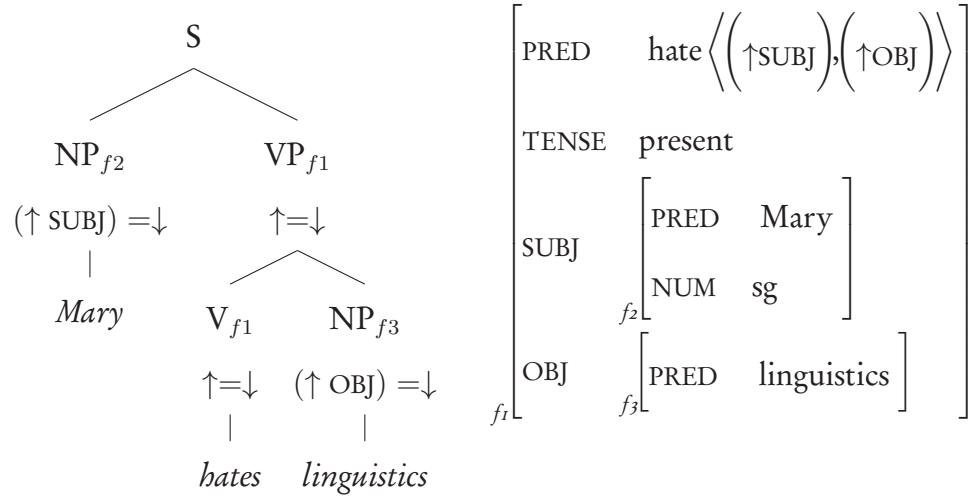
Here the f-structure f_1 contains one additional feature that the main predicate *broke* does not subcategorise for OBL_{goal}. The conference condition will ensure that this f-structure will be ruled out as ill-formed.

2.2.3 C-structure to F-structure mapping

One of the main strengths of the theory is that it can represent different levels of analysis in different representations. However, we need a way of connecting or relating one level of representation to the other. This is achieved by mapping one structure to the other by means of a *projection function*. In this section we look into how mapping between c-structure and f-structure works in the framework.

C-structure is projected to the f-structure using the ϕ projection function, schematically represented by curves which connect the relevant c-structure node with the information it contributes to the f-structure with the f-structure AVM, as shown below:

(13)



The ↑ notation roughly stands for the f-structure of the mother node of the current node whereas the ↓ symbol stands for the f-structure of the current node . In the NP$_{f2}$ node, for instance, the (↑ SUBJ) =↓ equation denotes that all the f-structure information of the NP s daughter node will be part of the mother s subject f-structure, or more simply that *Mary* is the subject of the sentence.

Let s have a closer look at how this works. Here is a very small grammar that could generate the example *Mary hates linguistics*:

(14) S → NP VP
VP → V NP
NP → Mary
NP → linguistics
V → hates

These simple Phrase structure rules need to be annotated with the relevant f-

structure information, as in (15). Only the right hand side of the rules can be annotated.

(15) **S** → **NP** **VP**
(↑ SUBJ)=↓ ↑=↓

VP → **V** **NP**
↑=↓ (↑ OBJ)=↓

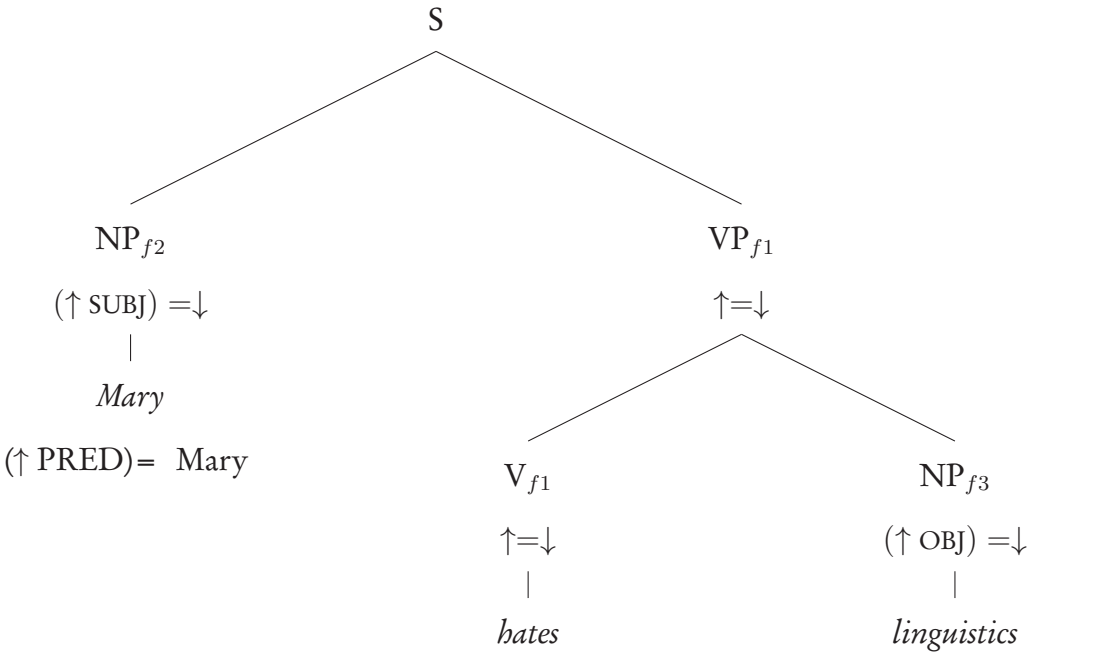
Mary NP (↑ PRED)= Mary

linguistics NP (↑ PRED)= linguistics

hates V (↑ PRED)= hate⟨(↑SUBJ), (↑OBJ)⟩

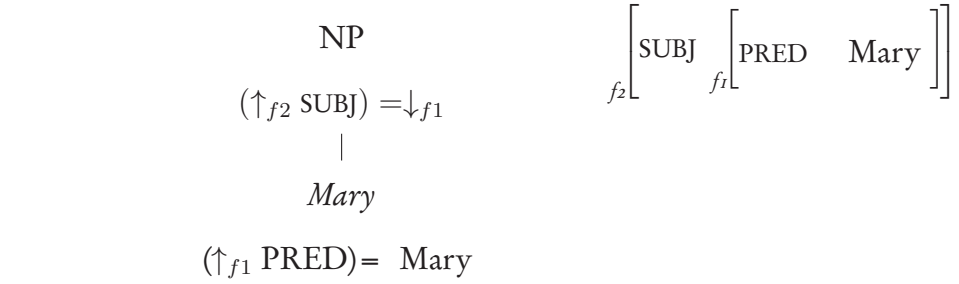
Using the rules, in (15) we can build the c-structure of this sentence and can add the f-structure annotations, which will look as in (16):

(16)



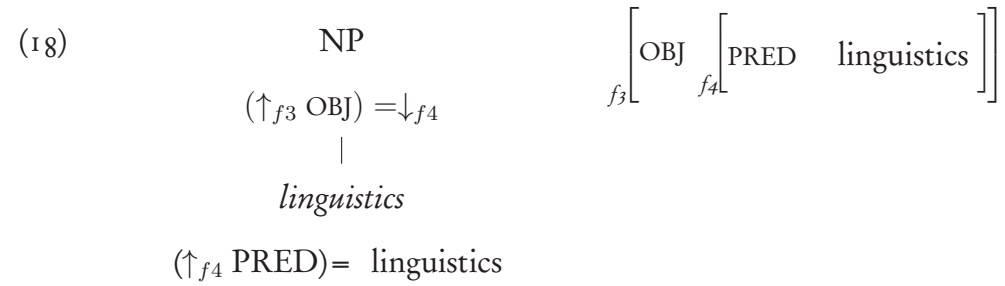
As we mentioned earlier, the ↑ refers to the mother f-structure, whereas ↓ refers to the current node s f-structure. The next step is to build the f-structure. To be able to tell which f-structure each of the ↑ and ↓ refer to, we will add some index numbers that will point to the relevant f-structure. Let s start by building the f-structure for the SUBJect NP, *Mary*.

(17)



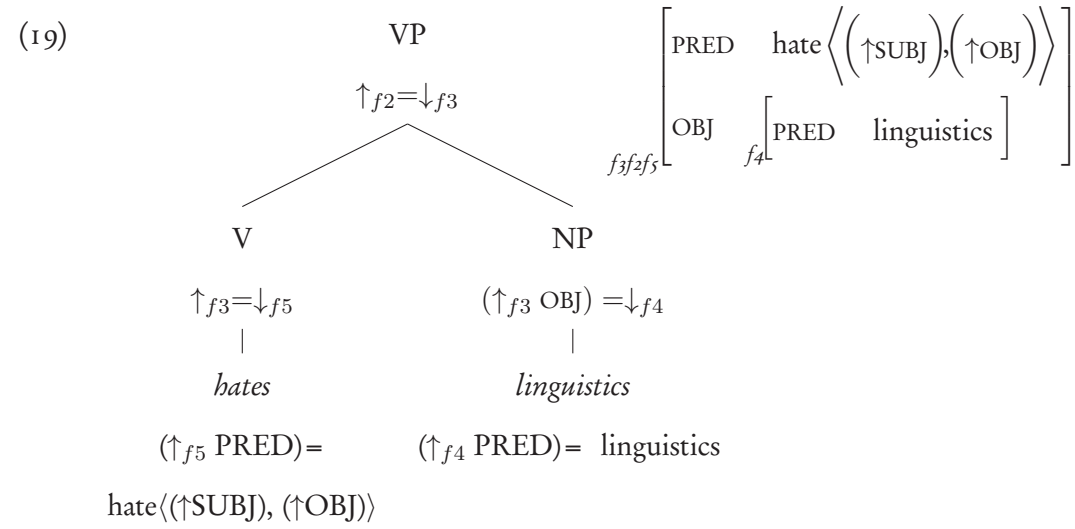
We will work in a similar way for the OBJect NP, *linguistics*.

(18)



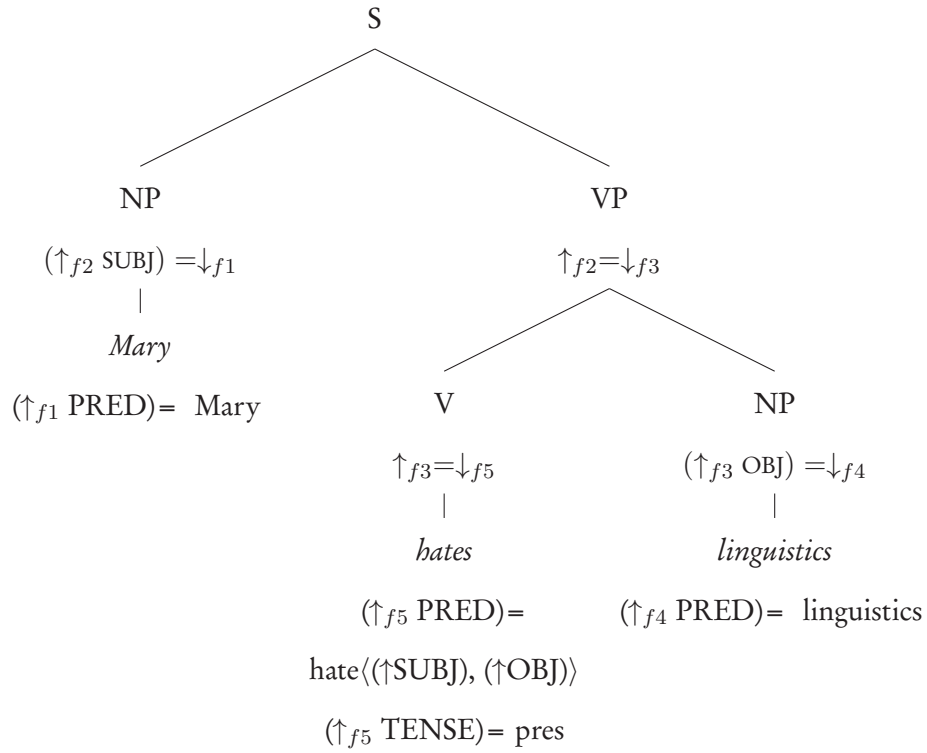
Again working in the same way, we will build the f-structure of the VP, *hates linguistics*.

(19)



Now if we combine the Object NP and the VP, the c-structure and the f-structure of the full sentence will look as in (20):

(20)



$$
f_3f_2f_5\begin{bmatrix}
\text{PRED} & \text{hate}\left\langle\left(\uparrow\text{SUBJ}\right),\left(\uparrow\text{OBJ}\right)\right\rangle \\
\text{SUBJ} & f_1\begin{bmatrix}\text{PRED} & \text{Mary}\end{bmatrix} \\
\text{OBJ} & f_4\begin{bmatrix}\text{PRED} & \text{linguistics}\end{bmatrix} \\
\text{TENSE} & \text{pres}
\end{bmatrix}
$$

As we see in (20), headedness in f-structures is depicted in a clear-cut way: the mother and the head are both associated with an ↑=↓ equation.

F-structure annotations like *(↑ f5 TENSE)= pres* are called *defining equations*, since they de ne the value of and attribute (here the TENSE attribute). They "determine the minimal solution" (Dalrymple, 2001, 115), that is an f-structure satis es it if it at least contains the attribute TENSE with a value *present*. This means that a de ning equation can satisfy more than one f-structure as in (21), provided, of course, that all the well-formedness conditions are ful lled.

(21) $f_3f_2f_5\begin{bmatrix}\text{TENSE} & \text{pres}\end{bmatrix}$ (The minimal f-structure)

$$f_3 f_2 f_5 \begin{bmatrix} \text{PRED} & \text{hate}\left\langle \left(\uparrow \text{SUBJ}\right), \left(\uparrow \text{OBJ}\right) \right\rangle \\ \text{TENSE} & \text{pres} \end{bmatrix}$$

There are other types of equations that are used to constraint f-structures. The *constraining equation* does not contribute any features to the f-structure; rather it checks that the minimal solution is well-formed, otherwise it fails. A constraining equation is usually of the following form:

(22) $(\uparrow \text{TENSE}) =_c \text{pres}$

The constraining equation in (22) checks that the f-structure has a TENSE feature whose value is *pres* (for *present*). If this is not the case, the f-structure will be ill-formed.

Another type of constraint is the *existential constraint*. This is used to check that a particular attribute is present in an f-structure (but does not contribute a value nor checks for it). An example of an existential constraint is given in (23):

(23) $(\uparrow \text{TENSE})$

The $(\uparrow \text{TENSE})$ constraint requires that there exists a feature TENSE in the f-structure the $\uparrow$ refers to. However, it does not contribute any value to the f-structure and does not check for some value of the attribute.

For more information on how the ϕ algorithm is used to transfer information from the c-structure to the f-structure, see Kaplan and Bresnan (1982) and Dalrymple (2001, 71-79).

2.2.4 F-structure to s-structure mapping

Semantic structure (or *s-structure* for short) is a level projected from the f-structure via a σ projection function, which is mainly used to account for the binding relations

in the LFG Theory of Anaphora. The advantage of treating this phenomenon on the s-structure level, according to Asudeh (2004, 47) is that "it allows a treatment of anaphora that takes both syntactic and semantic factors into account".

The logic behind the mapping between the f-structure and the s-structure is similar to that of the c- to f- structure mapping, discussed previously: parts of an f-structure are mapped onto parts of the s-structure through the σ projection function, schematically represented by a connecting curve with a σ index, as in (24). For more information on the s-structure and the ANTECEDENT, see Asudeh (2004, ch. 2) and Dalrymple (2001) throughout.

(24)
$$\begin{bmatrix} \text{TOPIC}_{\sigma_1} \begin{bmatrix} \text{PRED} & \text{pro} \end{bmatrix} \\ \text{SUBJ}_{\sigma_2} \begin{bmatrix} \text{PRED} & \text{pro} \end{bmatrix} \end{bmatrix} \qquad {}_{\sigma_2}\begin{bmatrix} \text{ANTECEDENT}_{\sigma_1} \begin{bmatrix} \quad \end{bmatrix} \end{bmatrix}$$

2.2.5 Summary

The schema in (25) below is a simpli ed version of the architecture in (3), showing the three levels of representation with their corresponding projection functions:

(25)

2.2.6 Some Regular Expressions

Similarly to c-structure rules, in f-structure we can use regular expressions to indicate relationships between features.

The *Kleene Star* (*) and the *Kleene Plus* (+) can be used on grammatical functions to allow for possible multiple instances of these functions in an f-structure. Here is an example:

(26) (↑ COMP* OBJ)=↓
(↑ XCOMP^{+} SUBJ)=↓

The first equation is using a Kleene Star (*) over the COMP grammatical function and allows zero or more instances of the COMP grammatical function, followed by an OBJ. In other words, any of the following are possible paths:

(27) (↑ OBJ)=↓
(↑ COMP OBJ)=↓
(↑ COMP COMP OBJ)=↓
(↑ COMP COMP COMP OBJ)=↓
⋮

The second equation is using the Kleene plus (+) over the XCOMP grammatical function and allows for one or more instances of the XCOMP followed by a SUBJ. In other words, any of the following are possible paths:

(28) (↑ XCOMP SUBJ)=↓
(↑ XCOMP XCOMP SUBJ)=↓
(↑ XCOMP XCOMP XCOMP SUBJ)=↓
⋮

Another expression is the ∈ (*in, a member of*) expression. It is used to denote membership relationships between features or grammatical functions (GFs) in f-structures that are members of a set. This is usually the case when an ADJUNCT, as in (29), or coordination of constituents, as in (30), is involved.

(29) f-structure for *in the park on sunday*

$$\begin{bmatrix} \vdots & \\ \text{ADJUNCT} & \left\{ \begin{bmatrix} \text{PRED} & \text{in}\left\langle\left(\uparrow\text{OBJ}\right)\right\rangle \\ \text{OBJ} & \begin{bmatrix}\text{PRED} & \text{park}\end{bmatrix} \end{bmatrix}, \begin{bmatrix} \text{PRED} & \text{on}\left\langle\left(\uparrow\text{OBJ}\right)\right\rangle \\ \text{OBJ} & \begin{bmatrix}\text{PRED} & \text{sunday}\end{bmatrix} \end{bmatrix} \right\} \end{bmatrix}$$

(30) f-structure for *Mary and Kim kissed John*

$$\begin{bmatrix} \text{SUBJ} & \left[\left\{ \begin{bmatrix}\text{PRED} & \text{mary}\end{bmatrix}, \begin{bmatrix}\text{PRED} & \text{kim}\end{bmatrix}, \begin{bmatrix}\text{CONJFORM} & \text{and}\end{bmatrix} \right\} \right] \\ \text{PRED} & \text{kissed}\left\langle\left(\uparrow\text{SUBJ}\right)\left(\uparrow\text{OBJ}\right)\right\rangle \end{bmatrix}$$

The f-structure annotation on the PP structure node will be $\downarrow\in(\uparrow\text{ADJUNCT})=\downarrow$, see (29), which means that the f-structure of each PP will be a member of (or will be in) the ADJUNCT set f-structure. The PP node with its annotation will look as in (31):

(31) **PP***
$\downarrow\in(\uparrow\text{ADJUNCT})=\downarrow$

For (30) the f-structure annotation on the two conjunct NPs will be $\downarrow\in\uparrow$ (for the NP conjunct rule, see (32). This means that the f-structure of each conjunct will be a member of the mother f-structure which in this case is a SUBJect.

(32) **S** $\rightarrow$ **NP** **V**
$(\uparrow\text{SUBJ})=\downarrow$ $\downarrow=\uparrow$

NP $\rightarrow$ **NP** **CONJ** **NP**
$\downarrow\in\uparrow$ $\downarrow=\uparrow$ $\downarrow\in\uparrow$

Another regular expression is ¬ ("not"). It usually appears before f-structure features as in (33) and negates them. The equation in (33) should be interpreted as the value of the SUBject s PERson feature cannot be 3 (i.e. the subject person should be non-third).

(33) $\neg(\uparrow \text{SUBJ PER}) = 3$

Similarly to c-structures, metacategories such as XP are also possible in f-structure equations. An example of such a use is shown in (34):

(34) $(\uparrow \text{TOPIC}) = (\uparrow \text{GapPath})$

This is one of the annotations we will use later in our analysis (chapter 4) on the CP rule to account for the distribution of gaps in Restrictive Relatives. Although the particulars of this equation will be discussed in chapter 4, here we would like to comment on the use of *GapPath* feature. Contrary to TOPIC, GapPath is a not a proper feature; it is a way of generalising over a collection of metacategories, a shortcut if you like of a path of grammatica functions (GFs), as in (35):

(35) $\text{GapPath} \equiv \{(\ \text{COMP}^*\ \text{SUBJ})|(\ \text{OBJ}\ )\}$

The use of $\equiv$ (*equivalent to*), instead of $=$ (*equal to*) is of importance, as it indicates that GapPath is not a feature itself, but rather a metacategory. So, when we build the f-structure the GapPath name will not appear anywhere. (36) shows an f-structure that could satisfy the $(\uparrow \text{TOPIC}) = (\uparrow \text{GapPath})$ taking the GapPath to be as in (35):

(36)
$$\begin{bmatrix} \text{TOPIC} & \underset{f_1}{\begin{bmatrix} \end{bmatrix}} \\ \text{COMP} & \begin{bmatrix} \text{SUBJ} & \underset{f_1}{\begin{bmatrix} \end{bmatrix}} \end{bmatrix} \end{bmatrix}$$

Very similar to the notion of metacategories is the use of *local names* in f-structures (Dalrymple, 2001, 146-148). These can be used in a lexical entry or as part of the

f-structure annotations on a c-structure node when we need to refer to the same f-structure feature or grammatical function. Local names only apply within the same lexical item or node annotations in a rule that it occurs in. Local names in sister or mother nodes or in different lexical entries will not be interpreted as such. An example of a local name is shown in (37) (from Dalrymple (2001, 147)):

(37)
$$\begin{array}{lcll} \text{NP} & \rightarrow & \text{(N)} & \text{(CP)} \\ & & \uparrow=\downarrow & \downarrow \in (\uparrow \text{ADJ}) \\ & & & (\downarrow \text{ TOPIC GF* }) = \text{\%RELPRON} \\ & & & (\text{\%RELPRON PRONTYPE}) =_c \text{REL} \\ & & & (\text{\%RELPRON NUM}) = (\uparrow \text{ NUM}) \\ & & & (\text{\%RELPRON GEND}) = (\uparrow \text{ GEND}) \end{array}$$

This rule accounts for Russian NPs and states that an NP may consist of an optional head noun, followed by a CP relative clause whose f-structure is a member of the ADJUNCT set f-structure. The local name is % RELPRON which is equated with the (↓ TOPIC GF*) path. Within this rule, all instances of % RELPRON are equivalent to the same (↓ TOPIC GF*) path, therefore the (% RELPRON PRONTYPE)$=_c$ REL equation will point to the same f-structure. Of course, one may wonder why there is a need to postulate an extra mechanism, when we can simply use the same path, that is what is the difference between (38) and (39) (assuming they all occur under the same node):

(38) (↓TOPIC GF*) =%RELPRON
(↓TOPIC GF* PRONTYPE)$=_c$REL
(↓TOPIC GF* NUM)=(↑NUM)
(↓TOPIC GF* GEND)=(↑GEND)

(39) (↓TOPIC GF*) =%RELPRON
(%RELPRON PRONTYPE)$=_c$ REL

(%RELPRON NUM) = (↑ NUM)

(%RELPRON GEND) = (↑ GEND)

The answer is that in (38), there is nothing to ensure that the (↓TOPIC GF*) path refers to the same f-structure for each feature, since the path can be any of the (↓TOPIC), (↓TOPIC SUBJ), (↓TOPIC COMP OBJ) and so on. In (39), however, the use of teh local name %RELPRON ensures that all constraints related to it apply to the same f-structure path. That s why local names are "particularly useful in expressions involving *functional uncertainty*: [they make] it possible to name a particular f-structure that participates in the uncertainty and to place constraints on it." (Dalrymple, 2001, 146)

Our analysis involves functional uncertainty relationships between the TOPIC discourse function and a GF and will be very useful when trying to capture constraints that apply to the same f-structure in a rule. We further elaborate on functional uncertainty in the next section, where we present some of the most common LFG approaches to Long Distance Dependencies.

2.3 Unbounded Dependencies

Long Distance Dependencies (LDDs) or ***Unbounded Dependency Constructions (UDCs)*** are constructions where a "displaced constituent bears a syntactic function usually associated with some other position in the sentence" (Dalrymple, 2001, 389). Common examples of such constructions are *wh-questions, topicalisation* and *relative clauses*. Below, we will exemplify the general LFG approach to Unbounded Dependencies, using English restrictive relative clauses (RRCs) introduced by a relative pronoun as a case study. We will present a more detailed account of LFG treatments of LDDs in chapter 4.2, where we refer to LFG treatments to Restrictive,

Non-restrictive and Free relative clauses.

What is interesting about *relative pronoun-restrictive relatives* compared to other kinds of UDCs, is that they involve two kinds of unbounded dependencies, as Dalrymple (2001, 400) observes: one between the head of the relative clause (usually a relative pronoun) and the grammatical function it fills in the modifying (relative) clause, and one between the relative pronoun and a possibly non-local position within the main clause.

In LFG, UDCs are accounted for in the f-structure (Kaplan and Bresnan, 1982, Dalrymple, 2001) through the use of two *discourse functions*: TOPIC and FOCUS. FOCUS is used to account for wh-questions, whereas TOPIC is used in topicalisation and the analysis of relative clauses. Since both of them are discourse functions – of different status compared to grammatical functions – it is necessary to define a condition which would ensure that they are somehow linked to a grammatical function in the f-structure, so that the resulting f-structures are *coherent*.

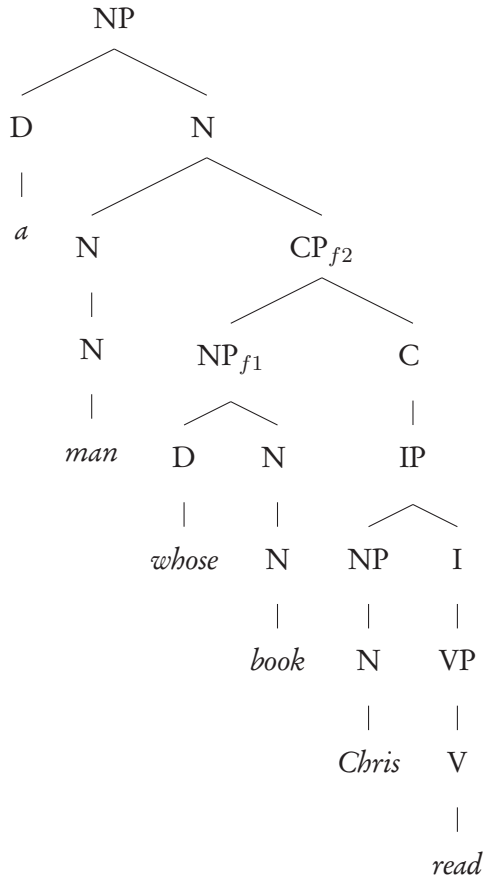
This condition was put forward by Bresnan and Mchombo (1987, 746), reproduced as (40) below:

(40) **Extended Coherence Condition (ECC)**

> FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or anaphorically binding an argument.

To illustrate this point, let us consider an example (from Dalrymple (2001, 402)):

(41)



$$
\begin{bmatrix}
\text{PRED} & \text{man} \\
\text{SPEC} & \begin{bmatrix}\text{PRED} & \text{a}\end{bmatrix} \\
\text{ADJUNCT} & \left\{ \begin{bmatrix}
\text{TOPIC} & \underset{f_1}{\begin{bmatrix}
\text{SPEC} & \begin{bmatrix}\text{PRED} & \text{pro} \\ \text{PRONTYPE} & \text{rel}\end{bmatrix}\boxed{1} \\
\text{PRED} & \text{book}
\end{bmatrix}}\boxed{2} \\
\text{RELPRO} & \boxed{1} \\
\text{PRED} & \text{read}\left\langle \left(\uparrow\text{SUBJ}\right), \left(\uparrow\text{OBJ}\right) \right\rangle \\
\text{SUBJ} & \begin{bmatrix}\text{PRED} & \text{Chris}\end{bmatrix} \\
\text{OBJ} & \boxed{2}
\end{bmatrix}_{f_2} \right\}
\end{bmatrix}
$$

As we can observe in (41), the *Extended Coherence Condition* is ful lled: the Discourse Function TOPIC is re-entrant with the Grammatical Function of the OBJ,

which indicates that the grammatical role it fulfils is associated with the object of the modifying clause. In addition to the above, the f-structure of the relative pronoun appears as the value of the feature RELPRO within the relative clause. To account for the above c- and f-structure, Dalrymple (2001, 402-405) proposes the following c-structure rules with their respective f-structure annotations:

(42)
$$\begin{array}{lcll} \text{N} & \rightarrow & (\text{ N }) & \text{CP}^{*} \\ & & \uparrow{=}\downarrow & \downarrow \in (\uparrow \text{ ADJUNCT }) \end{array}$$

$$\begin{array}{lcll} \text{CP} & \rightarrow & (\text{ RelP }) & (\text{ C }) \\ & & (\uparrow \text{ TOPIC }) {=} \downarrow & \uparrow{=}\downarrow \\ & & (\uparrow \text{ TOPIC }) = (\uparrow \text{ RTOPICPATH }) & \\ & & (\uparrow \text{ RELPRO }) = (\uparrow \text{ TOPIC RELPATH }) & \\ & & (\uparrow \text{ RELPRO PRONTYPE }) =_{c} \text{ REL} & \end{array}$$

The first phrase structure rule accounts for the modified constituent (N) and the modifying clause (CP). The Kleene Star (*) operator on the CP node denotes that there might be zero or more occurences of the relative clause, including cases where there is no relative clause and cases where there are multiple relative clauses. The $\downarrow \in$ (↑ADJUNCT) f-structure annotation under the CP node makes use of a regular expression of the set membership and ensures that the f-structure of the daughter s node is an element of the mother s adjunct set f-structure.

Moving on to the second phrase structure rule, the CP rule, we observe that it determines the linear precedence and dominance relations occurring inside the modifying clause. Dalrymple (2001, 403) suggests that *RelP* is equivalent to the occurrence of either of the phrase structure categories occurring in the initial position of the relative-pronoun relative clause as shown in (43) for English relative clauses:

(43) $\quad \textit{RelP} \equiv \{ \text{NP} \mid \text{PP} \mid \text{AP} \mid \text{AdvP} \}$

The first f-structure equation under the *RelP* node, implies that the f-structure of the daughter node is going to be part of TOPIC f-structure of its mother node. The second f-structure ensures that the TOPIC f-structure is equated with the RTOPIC-PATH, and that the TOPIC will fill a grammatical function in the f-structure so that the *Extended Coherence Condition* in (40) is fulfilled. RTOPICPATH is the path which shows how deeply embedded the TOPIC can be when co-indexed with grammatical functions. For English, Dalrymple (2001, 404) defines this path as follows:

(44) $$\text{RTOPICPATH} \equiv \{\ \text{XCOMP} \mid \underset{(\rightarrow \text{LDD}) \neq -}{\text{COMP}} \mid \underset{(\rightarrow \text{TENSE})}{\text{OBJ}}\ \}^* \{(\ \text{ADJ} \underset{\neg(\rightarrow \text{TENSE})}{\in}\ )\ (\ \text{GF}\ ) \mid \text{GF}\ \}$$

As Dalrymple (2001, 396) reports, this expression "allows the within clause grammatical function of the TOPIC to be arbitrarily deeply embedded inside any number of properly constrained XCOMP, COMP or OBJ functions and optionally to appear as an untensed member of the ADJ set of such a function or as an argument of the ADJ. The possibility of deeply embedded TOPICs is represented by the *Kleene Star* (*) operator permitting any number of XCOMP, COMP or OBJ attributes on the path." And she continues: "In the expression, $\underset{(\rightarrow \text{LDD}) \neq -}{\text{COMP}}$ the off-path constraint $(\rightarrow \text{LDD}) \neq -$ ensures that the path to the within clause function of the TOPIC phrase does not involve a non-bridge verb".

Returning to the f-structure annotations under the *RelP* node, let s have a look the third line of the rule; (↑ RELPRO)=(↑ TOPIC RELPATH) requires the value of the attribute RELPRO to be equated with the f-structure of the TOPIC RELPATH path, "the end of the path RELPATH that properly constrains the role of the relative pronoun within the fronted TOPIC phrase" (Dalrymple, 2001, 403).

Finally, the last equation is a ***constraining equation***. Contrary to the aforementioned equations, this one constrains the RELPRO attribute to have a feature PRONTYPE, which should obligatorily be of value REL. This means that the RELPRO the f-structure of the relative pronoun should be equated with the parts of the TOPIC s

f-structure that correspond to the f-structure of the relative pronoun.

In the analysis of the English Restrictive Relative Clauses introduced by a relative pronoun described above, Dalrymple (2001) used an analysis where the Discourse Function (here TOPIC) is equated through a series of functional equations to the grammatical function it fills in. This approach has used ***functional control***, where the grammatical function and the discourse function share the same f-structure.

Using functional uncertainty, we can express a relationship between discourse and grammatical functions, which can occur in an arbitrary level of embedding (Dalrymple, 2001, 143). Functional Uncertainty was first introduced in Kaplan et al. (1987) and Kaplan and Zaenen (1989) to account for Long Distance Dependencies. An example of functional uncertainty is the (↑TOPIC)=(↑ RTOPICPATH) equation. If we replace RTOPICPATH with what it stands for, for English Restrictive Relatives, the constraint will look as in (45):

(45) $(\uparrow \text{TOPIC}) = \{\text{XCOMP} \mid \underset{(\rightarrow \text{LDD})}{\text{COMP}} \mid \underset{(\rightarrow \text{TENSE})}{\text{OBJ}}\}^* \{(\text{ADJUNCT} \underset{\neg(\rightarrow \text{TENSE})}{\in}) (\text{GF}) \mid \text{GF}\}$

This constraint expresses the uncertainty about the grammatical function of the TOPIC discourse function and gives us additional information on all the possible options or combinations that may exist. Some of the f-structure paths that can satisfy this constraint, are presented in (46):

(46)
- (↑ XCOMP GF)
- (↑ XCOMP XCOMP GF)
- (↑ COMP GIF)
- (↑ COMP COMP GF)
- (↑ OBJ GF)
- (↑ XCOMP ADJUNCT ∈)
- (↑ XCOMP ADJUNCT ∈ GF)
- (↑ COMP ANDUNCT ∈)
- (↑ COMP ADJUNCT ∈ GF)

For a more detailed discussion of functional uncertainty see Baader et al. (1991), Bakhofen (1993), Dalrymple et al. (1995), Keller (1993).

Functional Uncertainty is very useful when we need to de ne constraints over one or more embedded structures, when for example, we need put constraints on the mother f-structure from an f-structure embedded in it. In this case another type of functional uncertainty is used, the *inside-out functional uncertainty* (as opposed to the *normal* or *outside-in functional uncertainty*. An example of this type of functional uncertainty can be found in our analysis of relative clauses in chapter 4, on which we will further elaborate there. Here, to further illustrate how inside-out functional uncertainty works, we will use an example of case stacking in Warlpiri from Nordlinger (1998) on Warlpiri case, cited in Dalrymple (2001, 143).

(47) **japanangka-rlu luwa-rnu marlu pirli-ngka-rlu**
japanangka-ERG shoot-PAST kangaroo rock-LOC-ERG
'Japanangka shot the kangaroo on the rock.'

As we can see the word *pirli-ngka-rlu* is marked with two cases: the locative with *ngka* and the ergative *rlu* which is also the case *Japanangka* is marked for. This is a type of **case stacking**: whereas the rst one (*ngka*) simply marks the case of *pirli*, the second *rlu* ensures that *pirli-ngka* modi es a phrase in ergative case (in this example *Japanangka-rlu*. If we also consider the fact that Warlpiri is an ergative language, then the ergative case speci cation speci es that the element *pirli-ngka-rlu* modi es is a SUBject. The f-structure that captures these constraints is shown in (48):

(48)
$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{CASE} & \text{erg} \\ \text{OBL}_{loc} & \begin{bmatrix} \text{PRED} & \text{rock} \\ \text{CASE} & \text{lock} \end{bmatrix}_{f_1} \end{bmatrix}_{f_2} \end{bmatrix}_{f_3}$$

Nordlinger (1998) uses inside-out functional uncertainty to ensure that these characteristics are accounted for by putting the following constraints on the lexical entry of *pirli-ngka-rlu*:

(49)
pirli-nka-rlu	(↑PRED)= rock
	(↑CASE)=loc
	((OBL↑)CASE)=ERG
	(SUBJ OBL$_{loc}$ ↑)

The constraints ((OBL↑)CASE)=ERG and (SUBJ OBL$_{loc}$ ↑) are examples of inside-out functional uncertainty expressions. The ((OBL↑)CASE) path is the path of "going out" from the current f-structure, finding an OBL$_{loc}$ f-structure. It might help to think of (OBL$_{loc}$ ↑ $_{f1}$) as referring to the $_{f2}$ f-structure (see also (48)). A similar interpretation is given to (SUBJ OBL$_{loc}$ ↑). Here the constraint will pick the path from the current f-structure ($_{f1}$) outside to find an OBL$_{loc}$ (in $_{f2}$) and to find a SUBJ ($_{f3}$). It is also an existential constraint, and requires that the current f-structure appears within the SUBJ OBL$_{loc}$ f-structure.

Another frequently used type of constraint are those used to refer to a feature within the same (current) f-structure. These constraints are called *off-path constraints* and have been discussed in Dalrymple (2001) and Bresnan (2001) among others. Here is an example of a node within an off-path constraint:

(50)
...	CP	...
	(↑OBJ)=↓	
	(→TENSE)	

The (→TENSE) constraint expresses an off-path constraint, which requires that the current f-structure (→) has a TENSE feature. They are used for instances when the Long Distance Dependency cannot be constrained using the grammatical functions that appear and rather depend upon other features (such as TENSE) to appear (Dalrymple, 2001, 148).

Another approach to analysing Long Distance Dependencies in LFG, particularly when a resumptive pronoun is involved and for languages such as Swedish, Irish and Hebrew (Asudeh, 2004) is that of anaphoric control. Unlike the functio-

nal uncertainty approach, in anaphoric control, the grammatical function and the discourse function are independent (do not share all or parts of their f-structure); however, they are linked in the semantics. An example of an anaphoric control analysis is shown in (51) (from (Dalrymple, 2001, 333-334))

(51) *David tried to leave*

$$\begin{bmatrix} \text{PRED} & \text{try}\langle(\uparrow\text{SUBJ})(\uparrow\text{OBJ})\rangle \\ \text{SUBJ} & {}_{f_1}\begin{bmatrix}\text{PRED} & \text{David}\end{bmatrix} \\ \text{COMP} & \begin{bmatrix} \text{PRED} & \text{leave}\langle(\uparrow\text{SUBJ})\rangle \\ \text{SUBJ} & {}_{f_2}\begin{bmatrix}\text{PRED} & \text{pro}\end{bmatrix}\end{bmatrix}\end{bmatrix} \; {}_{f_1}\begin{bmatrix}\text{ANTECEDENT} & {}_{f_2}\begin{bmatrix}\end{bmatrix}\end{bmatrix}$$

The lexical entry proposed for the verb *try* is presented in (52):

(52)
$$\begin{aligned} \textit{tried} \quad & (\uparrow\text{PRED}) = \text{try}\langle(\uparrow\text{SUBJ})(\uparrow\text{COMP})\rangle \\ & (\uparrow\text{COMP SUBJ PRED}) = \text{pro} \\ & ((\uparrow\text{COMP SUBJ})_\sigma \text{ ANTECEDENT}) = (\uparrow\text{SUBJ})_\sigma \end{aligned}$$

The second equation will ensure that the COMP SUBJ f-structure has a PRED (and that it is well-formed) whereas the third equation ensures that the two functions (here the SUBJ and the COMP SUBJ) are linked on the semantics. The σ subscript indicates that the linking is taking place at the s-projection (semantic projection) via mapping of the f-structure using the σ function.

Summary

This chapter presented an overview of the LFG framework and discussed some of its most notable notions relevant to the analysis of Relative Clauses. We presented LFG s basic projection architecture (the c-structure, the f-structure and touched

upon s-structure) and explained how they interact, and how they can be linked to each other using the projection functions ϕ and σ. We also provided a brief overview of the main notions involved in f-structure building including the *wellformedness conditions* and exempli ed some of the *regular expressions* (Kleene star, Kleene plus, metacategories, local names) and the types of equations and constraints, such as *defining equations*, *existential equations* and *constraining equations*. We also presented how functional uncertainty works (outside-in functional uncertainty, inside-out functional uncertainty, off-path constraints) and discussed how it differs from anaphoric control.

In the following chapter, we look into the Modern Greek Data on Relative Clauses. We rst discuss some issues regarding the Modern Greek clause structure and set the ground for some of the assumptions that we are going to follow in the analysis chapter. We also give an overview of the properties of Modern Greek Relative Clauses and identify some of their differences and similarities. Finally, we discuss the distribution of the gap and the resumptive strategies and attempt to observe some patterns.

CHAPTER 3

Modern Greek Relative Clauses: the Data

In this chapter, we look into the Modern Greek Data on Relative Clauses. We first discuss some issues relevant to the Modern Greek declarative clause structure that have been of quite controversial nature in the literature, such as whether there is an underlying or basic word order for Modern Greek and if so which one it is as well as the issue of whether this structure should be represented configurationally or not. The choice of representation or of underlying word order does not affect our LFG analysis, since the theory itself can quite easily accommodate either. Nevertheless, we thought that reviewing the literature on these issues and considering the arguments for and against each approach would help us get a more complete view over the Greek data and would help us make the necessary assumptions where appropriate.

We then look into the properties of Relative Clauses in more detail. We discuss the types of antecedents relative clauses may take and the relative pronouns and/or complementizers they are introduced with. We also report on their internal structure and try to identify patterns in their similarities and differences.

We conclude this chapter with an overview of resumptive pronouns in Modern

Greek Relative Clauses and discuss their distribution of the gap and the resumption strategy in Restrictive, Non-restrictive and Free Relative Clauses.

3.1 Modern Greek Clause Structure

Modern Greek is a morphologically rich language and as such allows for a relatively free word order in both matrix and subordinate clauses. It is *relatively* free since acceptability of some word orders relies heavily on intonation, contrastive focus as well as contextual information. For instance, most speakers would regard all possible orders in (53) as acceptable:

(53) a. **SVO**

O Kostas filise tin Eleni
The.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$ kissed.$_{3SG}$ the.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$

b. **VSO**

Filise o Kostas tin Eleni
Kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$

c. **VOS**

Filise tin Eleni o Kostas
Kissed.$_{3SG}$ the.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$ the.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$

d. **OVS**

Tin Eleni filise o Kostas
The.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$ kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$

e. **SOV**

O Kostas tin Eleni filise
The.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$ kissed.$_{3SG}$

f. **OSV**

Tin Eleni o Kostas filise
The.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$ the.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$ kissed.$_{3SG}$

'Kostas kissed Helen.'

The relative word order freedom of Modern Greek Clauses has created a controversy with respect to which one of the different word orders should be regarded as

the underlying or basic one. In what follows, we provide a brief account of the two major proposals arguing in favour of SVO or VSO as the basic word order to provide the reader with a rounded view of the Modern Greek data. We also address the issue of how to represent Modern Greek clause structure. We provide an overview of the major proposals in the literature that represent Modern Greek clause structure *configurationally* or *non-configurationally*. We then present the approach we will take in our thesis and their impact (if any) on the LFG analysis of Modern Greek Relative Clauses.

3.1.1 Basic word order: SVO or VSO?

As Holton et al. (1997, 426) point out, because of its rich morphological marking system, Modern Greek demonstrates a relative freedom in the way constituents are ordered within a declarative matrix clause. As seen in (53), each constituent order produces well-formed (but not equally acceptable for all speakers or discourse-marked) sentences.

All constituent orders in examples (53a) to (53f) are well-formed, however, they vary in terms of acceptability for Modern Greek speakers, their acceptability improving if particular constituents are intonationally marked (noted with SMALL CAPITAL font in the examples above). SVO and VSO have traditionally been regarded as the most unmarked word orders for matrix declarative clauses and arguments have been put forward arguing in favour of either as the underlying word order.

Some researchers have argued *in favour of SVO as the basic word order* (Tzartzanos, 1963, Greenberg, 1963, Horrocks, 1983, Siewierska et al., 1998), claiming that it is the most dominant and most frequent one (Lascaratou, 1984, 1989). They note that SVO is the most natural order when it comes to "cases where an answer is provided out of a question, where no previous context is available" (Horrocks, 1983). Consider the following example:

(54) **'Ti egine?' 'O Kostas filise tin Eleni.'**
What happened.$_{3SG}$ The.$_{MSG\cdot NOM}$ Kostas kissed.$_{3SG}$ the.$_{FSG\cdot ACC}$ Helen
'What happened?' 'Kostas kissed Helen.'

Tzanidaki (1996, 31) notes that in this example "the SVO sentence uttered [...] is an answer to the broad question *'What happened?'* in which nothing, including the subject is given from the previous discourse". Additional evidence in support of this argument used, is the first sentence of a novel, where again there is no previous context mentioned (Horrocks, 1983, Tzanidaki, 1996).

Interestingly enough, the same argument has been used as an argument against SVO and in favour of VSO as the underlying constituent order in Modern Greek. In particular Philippaki-Warburton (1985) and Holton et al. (1997, 432), put forward the claim that VSO is the most natural order when an answer is provided out of a question (where no previous context is available). So for them, the answer to *'What happened?'* of (54) would be as in (55):

(55) **'Ti egine?' 'Filise o Kostas tin Eleni.'**
What happened.$_{3SG}$ kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$ Kostas the.$_{FSG\cdot ACC}$ Helen
'What happened?' 'Kostas kissed Helen.'

Proposals *in favour of VSO as the dominant word order* in Modern Greek declarative clauses argue that SVO is simply the most dominant order, and that the underlying one is VSO, from which SVO is derived, using some particular mechanisms (see Philippaki-Warburton (1985, 1987), Lascaratou (1984, 1989, 1998), Catsimali (1990), Tsimpli (1990, 1995), Holton et al. (1997), Alexopoulou (1999) among others). They put forward the claim that only if we regard VSO as the basic word order, can we achieve the simplest grammar (Philippaki-Warburton (1985), Lascaratou (1984)). There is both theory-driven and data-driven evidence reinforcing this claim.

With respect to theory-driven evidence, as Philippaki-Warburton (1985) proposes, if we assumed SVO as the basic order, then it would be required by the

theory that the subject NP has a [+/- DEFINITE] or a [+/- ANAPHORIC] value, since these are the characteristics of the subject in a theme position according to the *Subject Thematization Rule* (STR). Thus assuming VSO as the basic order is something easier to account within the theory, with SVO deriving from it through the application of the STR. This claim, however, Philippaki-Warburton suggests, also draws from Modern Greek data. In particular, in some subordinate clauses (like relative clauses) the unmarked constituent order is VSO. Using the same VSO rule for both declarative and subordinate clauses will make our grammar more concise and robust.

Another argument in favour of VSO as the basic word order is the observation that in some of the subordinate adjunct clauses as in (56) SVO is impossible (Philippaki-Warburton (1985), Alexopoulou (1999, 5)):

(56) a. **Svisame ta fota ya na filisi**
Switched.off.$_{1PL}$ the.$_{NPL\cdot ACC}$ lights.$_{NPL\cdot ACC}$ for SUBJUNCTIVE.PART kiss.$_{3SG}$
o Kostas tin Eleni.
the.$_{MSG\cdot NOM}$ Kostas the.$_{FSG\cdot ACC}$ Helen

b. ***Svisame ta fota ya na**
Switched.off.$_{1PL}$ the.$_{NPL\cdot ACC}$ lights.$_{NPL\cdot ACC}$ for SUBJUNCTIVE.PART
o Kostas filisi tin Eleni.
the.$_{MSG\cdot NOM}$ Kostas kiss.$_{3SG}$ the.$_{FSG\cdot ACC}$ Helen.$_{FSG\cdot ACC}$
'We switched off the lights so that Kostas would kiss Helen.'

Adapted from (Philippaki-Warburton, 1985, ex.39), cited in (Alexopoulou, 1999, 5, ex. 12)

Alexopoulou (1999, 5) claims that VSO is the underlying word order since it is the only unambiguous order if all morphological markers are missing – or rather if the morphological marker cannot help us with identifying the grammatical function of a nominal element (when for instance the same form is used for both the nominative and the accusative case as in (57)):

(57) a. **Agaliase to koritsi TO AGORI.**
Hugged.$_{3SG}$ the.$_{NSG\cdot NOM}$ girl.$_{NSG\cdot NOM}$ the.$_{NSG\cdot ACC}$ boy.$_{NSG\cdot ACC}$
'The girl hugged the boy.'

b. **Agaliase TO KORITSI to agori**
Hugged.$_{3SG}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ the.$_{NSG\cdot NOM}$ boy.$_{NSG\cdot NOM}$
'The boy hugged the girl.'

She argues that the only reading the examples in (57) can have is that of (57a), since "the nuclear accent falls on the rightmost elements" (Alexopoulou, 1999, 5). If we take SVO as the basic word order, however, the sentence becomes ambiguous and the interpretation depends on the place of intonational stress (stressed elements are marked with CARITALS in the example below):

(58) a. **TO KORITSI agaliase to agori.**
The.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ hugged.$_{3SG}$ the.$_{NSG\cdot ACC}$ boy.$_{NSG\cdot ACC}$
'The boy hugged the girl.'

b. **To koritsi agaliase TO AGORI.**
The.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ hugged.$_{3SG}$ the.$_{NSG\cdot ACC}$ boy.$_{NSG\cdot ACC}$
'The girl hugged the boy.'

This argument was criticized in Tzanidaki (1996, 1998) who, in an effort to pinpoint the criteria used by a speaker to identify which of the phrases is the subject and which the object in cases such as the above, concludes that these criteria "seem to have nothing to do with any xed order" and that "the context, intonation (in spoken language), the semantics of the verb as well as general knowledge appear to be operational in these cases" (Tzanidaki, 1998, 11).

Despite the controversy discussed above regarding basic word order in matrix clauses, there is an overall agreement about which should be regarded as the basic word order in subordinate clauses. It is generally agreed that VSO is the *basic constituent order of subordinate clauses* (Tzartzanos, 1963, Lascaratou, 1998, Mackridge, 1985). Consider the following examples of subordinate (relative) clauses (again stressed elements are noted with a SMALL CAPS font; relative clauses are in sans-serif font):

(59) (Restrictive Relative Clause)

a. **agapai ti yineka pu filise o Petros**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$
'He loves the woman that Peter kissed'.

b. ***? agapai ti yineka pu o Petros**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$
filise
kissed.$_{3SG}$
'He loves the woman that Peter kissed'.

c. **agapai ti yineka pu O PETROS filise**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ kissed.$_{3SG}$
'He loves the woman that PETER *kissed'.*

(60) (Non-Restrictive Relative Clause)

a. **agapai ti Maria, pu ti filise o**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary.$_{FSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$ kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$
Petros
Peter.$_{MSG\cdot NOM}$
'He loves Mary, that Peter kissed'.

b. ***? agapai ti Maria, pu o Petros**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary.$_{FSG\cdot ACC}$ that the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$
ti filise
her.$_{FSG\cdot ACC}$ kissed.$_{3SG}$
'He loves Mary, that Peter kissed'.

c. **agapai ti Maria, pu O PETROS ti**
loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary.$_{FSG\cdot ACC}$ that the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ her.$_{FSG\cdot ACC}$
filise
kissed.$_{3SG}$
'He loves Mary, that PETER *kissed'.*

(61) (Free Relative Clause)

a. **O Manos agapai opja yineka**
the.$_{MSG\cdot NOM}$ Manos.$_{MSG\cdot NOM}$ loves.$_{3SG}$ whoever.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$
filise o Petros
kissed.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$
'Manos loves whichever woman Peter kissed'.

b. ***? O Manos agapai opja yineka**
the.$_{MSG\cdot NOM}$ Manos.$_{MSG\cdot NOM}$ loves.$_{3SG}$ whoever.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$

o **Petros** **filise**
the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ kissed.$_{3SG}$
'Manos loves whichever woman Peter kissed'.

c. **O** **Manos** **agapai** **opja** **yineka**
the.$_{MSG\cdot NOM}$ Manos.$_{MSG\cdot NOM}$ loves.$_{3SG}$ whoever.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$
O **PETROS** **filise**
the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ kissed.$_{3SG}$
'Manos loves whichever woman PETER *kissed'.*

As shown in the examples above, the VSO order in Modern Greek Relative Clauses seems to be the least marked one (see (59), (60), (61)). Notice that the SVO order in all three types of relative clauses (restrictive, non-restrictive and free) is possible only if the subject bears contrastive focus or is stressed, as in (59c), (60c) and (61c); otherwise the sentence is ungrammatical, as in (59b), (60b) and (61b).

Our choice over SVO or VSO as the underlying order does not immediately affect our LFG analysis, since in our account the treatment of resumption and of relative clauses occurs mainly in the f-structure. Nevertheless, we opted for VSO as the underlying order in order to account for constructions as in (62), as clitic left dislocated structures:

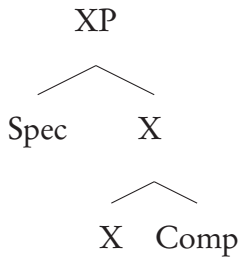
(62) **Ópjos** **filos** **/ Ópjon** **filo** **irthe,**
whoever.$_{MSG\cdot NOM}$ friend.$_{MSG\cdot NOM}$ whoever.$_{MSG\cdot ACC}$ friend.$_{MSG\cdot ACC}$ came.$_{3SG}$
ton **filepsame.**
him.$_{MSG\cdot ACC}$ treated.$_{1PL}$
'Whichever friend came, we treated him.'

3.1.2 Word order representation

Another issue relevant to the discussion of Modern Greek declarative clause structure is the way constituent order should be represented. Various proposals have been put forward from strictly con gurational accounts to completely at or non-con gurational proposals with the majority of them employing a mixed account. According to Tzanidaki (1999, 2) the term *configurationality* is used to refer "to a

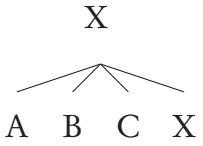
mode of formally representing syntactic structure". One way to represent a typical con gurational account is by means of a binary branching X-bar schema, similar to what is generally assumed in *Government and Binding Theory* (GB), as in (63):

(63)



There are languages, however, for which this binary-branching tree cannot provide a full account of various phenomena such as free constituent order, pro-drop, the existence of discontinuous constituents, null anaphora or the lack of evidence for a VP constituent (Tzanidaki, 1996, 1999). Since these languages demonstrate free word order, they primarily rely on morphological or agreement criteria to distinguish between arguments and non-arguments. For this purpose, their syntactic representation is a multi-branching schema similar to (64):

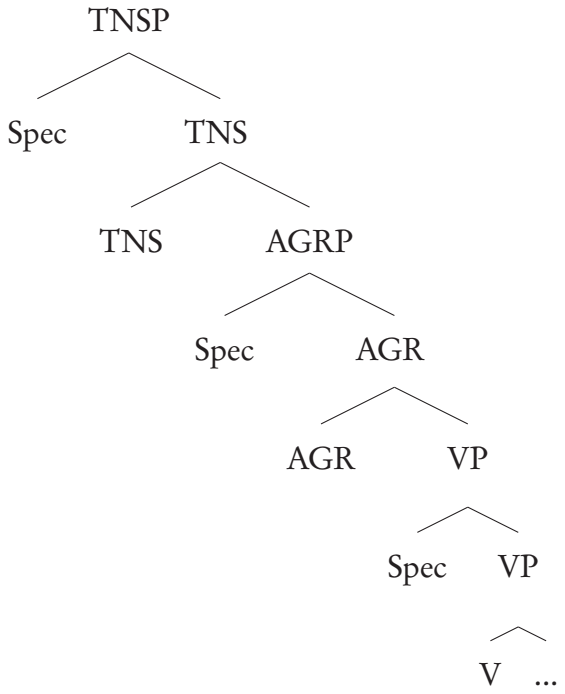
(64)



Approaches in line with the binary-branching schema in (63) are regarded as *configurational representations of constituent order*. On the other hand, approaches in-line with the multiple-branching schema in (64) propose a *non-configurational* or *flat representation of the constituent structure*.

An example of an analysis using a con gurational representation for Modern Greek declarative clauses is presented in Tsimpli (1990, 1995), who proposes the structure in (65):

(65)



(Tsimpli, 1995, 177, ex.3)

As Tsimpli (1995, 177-178) points out, "the overt subject is not the grammatical subject of the sentence, but rather a topic" and "the grammatical subjects in these orders [i.e. the VSO order (which Tsimpli regards as the basic word order for Modern Greek) and SVO (in which the subject is viewed as a topicalised constituent)] is a *pro* which occupies the canonical subject position [Spec, AGRP] and is linked to the overt subject via coindexation". This point, however, reveals the disadvantages of using a con gurational model to describe a relatively free constituent order language. As Tzanidaki (1996, 5) suggests, adopting a con gurational account implies that a lot of the variations observed in the free word order language, will be described in terms of movement of constituents and transformational operations or through scrambling of elements.

Tzanidaki (1999, 9) argues that there is no empirical evidence for the fact that the subject and the object in Modern Greek are of different hierarchical status. If they were, Kroeger (2004) claims, the subject and the object would demonstrate different behaviour when they would be extracted from a that-clause. In Modern Greek,

oti-clauses, a type of subordinate clauses equivalent to *that*-clauses of English, do not allow deletion of the operator *oti* and subjects are extracted in the same way as objects, as shown in (66):

(66) a. **Pjós nomizis óti sinantise to Yanni?**
Who.$_{MSG\cdot NOM}$ think.$_{2SG}$ that met.$_{3SG}$ the.$_{MSG\cdot ACC}$ John?
'Who do you think met John?'

b. **Pjón nomizis óti sinantise o Yannis?**
who.$_{MSG\cdot ACC}$ think.$_{2SG}$ that met.$_{3SG}$ the.$_{MSG\cdot NOM}$ John?
'Who do you think that John met?'

(Tsiplakou, 1998, ex.18)

Quite the opposite actually, as Catsimali (1990) notes, since "facts relating to ECP effects, subject-verb idioms, weak-crossover effect, the symmetrical behaviour of subjects and objects with respect to extraction out of secondary predicates and small clauses, binding, lack of pleonastics, lack of *pro*, absence of NP-raising at least as a case-driven operation" reinforce the opposite view (Tzanidaki, 1996, 26).

Another argument for subjects and objects as thematic roles of equivalent hierarchical status are proposed in Alexopoulou (1999, 6-10), Kroeger (2004) and Tsiplakou (1998) who point out that Modern Greek allows for both nominative and accusative re exes, as shown in (67).

(67) a. **O eaftos tu$_j$ katastrepse ton Petro$_j$.**
The.$_{MSG\cdot NOM}$ self.$_{MSG\cdot NOM}$ his.$_{MSG\cdot GEN}$ destroyed.$_{3SG}$ the.$_{MSG\cdot ACC}$ Peter
'Peter destroyed himself.'

b. **O Petros$_j$ katastrepse ton eafto tu$_j$**
the.$_{MSG\cdot NOM}$ Peter destroyed.$_{3SG}$ the.$_{MSG\cdot ACC}$ self.$_{MSG\cdot ACC}$ his.$_{MSG\cdot GEN}$
'Peter destroyed himself.'

(Tsiplakou (1998, ex. 19,20) cited in Alexopoulou (1999, 6, ex. 1-5))

Note, however, as Horrocks (1994) argues, that *o eaftós tu* does not have the status of a true re exive pronoun, but rather that of an NP which if taken under consideration makes the particular argument void.

Another argument put forward in favour of a non-con gurational account by Alexopoulou (1999, 7) is that in non-con gurational languages, dummy subjects should be absent which is the case for Modern Greek, as illustrated in (68):

(68) **vrehi**
Rain.$_{3SG}$
'It rains.'

(Alexopoulou, 1999, 7)

vrehi is an impersonal verb and as such it cannot take an overt subject (69) or a personal pronoun (70):

(69) * **O Petros vrehi.**
the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ rains.$_{3SG}$
**'Peter rains.'*

(70) * **Aftos vrehi.**
he.$_{MSG\cdot NOM}$ rains.$_{3SG}$
* *'He rains'.*

The availability of subject-verb idioms (Alexopoulou, 1999, Tsiplakou, 1998) and the availability of VP ellipsis (Tsiplakou, 1998) or at least ellipsis of subparts of the VP (Alexopoulou, 1999, Tsiplakou, 1998, Catsimali, 1990) both offer additional evidence to justify a non-con gurational approach for Modern Greek.

All these observations have led some scholars (Catsimali, 1990, Horrocks, 1983, 1994, Tzanidaki, 1996, Tsiplakou, 1998, Alexopoulou, 1999) to work towards a less con gurational representation of Modern Greek constituent structure, representing constituent structure with a varying degree of non-con gurationality

In this thesis, we will adopt a mixed approach: we will assume a non-con gurational representation for the Modern Greek Declarative clause structure whereas we will represent the internal structure of relative clauses in a more con gurational way. This choice is not crucial to our analysis, since we expect that it could be adapted to accommodate a con gurational representation quite straightforwardly.

Summary

In this section, we have identi ed two major issues relating to Modern Greek Clause structure for matrix and subordinate clauses: *word order* and *clause structure representation*. Modern Greek is a morphologically rich language and as such allows for a relative freedom in the ordering of matrix phrasal constituents, but allows for less freedom in the (internal) structure of nominal elements and subordinate clause elements. With respect to the basic word order, we have followed the proposals in favour of VSO as the underlying word order for both matrix and subordinate clauses. Regarding the issue of whether Modern Greek Clause Structure should be represented con gurationally or non-con gurationally, we have opted for the latter, drawing from Tzanidaki (1999) among others. Again, we represent both matrix and subordinate clauses non-con gurationally.

The data on subordinate clauses of course also apply to Modern Greek Relative Clauses, which are the focus of our research in in the present thesis. The following section presents a detailed overview of the data on Modern Greek Restrictive, non-Restrictive and Free Relative Clauses.

3.2 Overview of the data on Modern Greek Relative clauses

A relative clause is usually de ned as a clausal or nominal element which in some way modi es or restricts another constituent, quite often (but not always) a nominal element. In (71), for example, the relative clause *that Chris loved* modi es the nominal element *the girl*. *The girl* is also an element in another clause, the *matrix clause* restricting its meaning (it s not *any* girl it s *the girl that Chris loved*).

(71) Will saw *the girl* that Chris loved.

A relative clause can also function as a nominal element, as in (72):

(72) Whoever voted for Peter raised their hand.

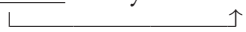
(73) The people raised their hand.

A common characteristic that relative clauses share cross-linguistically, as Alexiadou et al. (2000) point out is that "they are not arguments of a lexical predicate [and that] they share a dependency [which links] a position inside the clause and an item outside that clause" (Alexiadou et al., 2000, 2).

In example (74) the relative clause *whom we met yesterday* is not an argument of its antedecent *the girl* but rather modi es it. The relative and the matrix clause share a dependency between the antecedent and the relative pronoun introducing the relative clause (*whom*). There is also a dependency between the relative pronoun (*whom*) and a within-relative clause function which in the above example is empty.

(74) The girl whom we met øyesterday is my cousin.
The girl whom we met ø yesterday is my cousin.

A similar observation applies to relative clauses that do not have an overt antecedent, like *free relative clauses*, as in (75):

(75) Whoever Mary loves ø Peter hates him.

Whoever Mary loves ø Peter hates him.

In (75) the free relative clause *whoever Mary loves* is an argument of the matrix clause; nevertheless, the kind of dependencies involved are very similar. The relative clause *whoever Mary loves* and the matrix clause are linked through a dependency between the relative clause and the within matrix clause thematic role (the object of *hates* here occupied by a pronoun *him*). There is also a dependency between the relative pronoun introducing the free relative clause *whoever* and the within relative clause thematic role (the object of *loves*).

Based on the type of antecedent they modify and other properties, relative clauses are categorised in three types: *restrictive*, *non-restrictive* and *free relative clauses*. Restrictive relatives, as their name suggests, modify a constituent by restricting its referent. On the other hand, non-restrictive relative clauses modify a constituent without restricting it, but by providing some extra information about the modi ed head. Distinguishing between restrictive and non-restrictive relative clauses is sometimes facilitated by the presence of pauses and / or intonation variation in speech and by commas in writing, in the beginning and the end of the relative clause (Arnold, 2004, 1).

Due to their informational nature, it is possible to omit non-restrictive relative clauses without any loss of information or meaning. For a more detailed account of the difference between restrictive and non-restrictive relative clauses, the reader may consult among others (Fabb, 1990a, Borsley, 1992, Arnold, 2004).

Compare the following two examples:

(76) The students who passed their exams are relieved.
The rest of them are worried.

(77) The students, who passed their exams, are relieved.
?? The rest of them are worried.

In (76) the relative clause restricts the referent of *the students* into *the group of students who passed their exams*. In other words, not all of the students passed their exams and this is why the sentence *The rest of them are worried* is acceptable. The intended meaning of (77), however, is completely different, although structurally the differences compared to (76) are minimal (just the presence of commas – or had this been a spoken utterance, the change in intonation or the presence of pauses): it is all the students who are relieved (regardless of whether they have passed their exams or not since, for example, no one was hurt in the re); and just for your information, they have all passed their exams. This is why in (77) the second sentence takes us by surprise. Relative Clauses like (76) which modify an antecedent and restrict it are called *restrictive relative clauses* whereas relative clauses like (77) which modify an antecedent, but just offer additional information, similarly to parentheticals or appositions, without restricting the antecedent s referent are called *Non-Restrictive* or *Appositive Relative clauses*.

Another difference between Restrictive and Non-Restrictive Relative Clauses, as McCawley (1981) puts forward, is that in a question with a Restrictive Relative clause, we may quite easily answer by repeating the Relative clause, something that does not happen with non-Restrictive Relative clause. As he humourously points out, by using the non-restrictive clause as an answer, "the speaker purports to remind or inform the other party of what that other party has just reminded or informed *him* of; this party involves exactly the same sort of impoliteness that I would commit if I were to give you as a gift the vase that you had just given me as a gift":

(78) Did you read the exam I left you on your desk?
Yes, I read the exam that you left on my desk.

(79) Did you read Schwarz s exam, which I left on your desk?
?? Yes, I read Schwarz s exam, which you left on my desk

(McCawley, 1981, 117)

The third type of relative clauses is *Free Relative Clauses*. Unlike restrictives and non-restrictives, they do not have an overt antedent to modify and are thus sometimes referred to as *Headless relative clauses* (Holton et al. (1997, 145),Papadopoulou (2002, 96)) . An example of a free relative clause is shown in (80):

(80) Whoever is making a problem of dividing ministerial portfolios is obstructing cabinet information.

The free relative clause *whoever is making a problem of dividing ministerial portfolios* has no overt antecedent to modify; on the contrary, it appears where one would expect an NP to appear as illustrated in (81):

(81) The MP is obstructing cabinet information.

In the sections that follow, we present the properties of Modern Greek Relative Clauses (Restrictive, Non-Restrictive and Free) summarizing some of their characteristics, and discussing their internal structure and their relationship with the matrix clause and their antecedent (where applicable). We also look into the relativisation strategies they employ.

3.2.1 Properties of Modern Greek Relative Clauses

3.2.1.1 Restrictive Relative Clauses

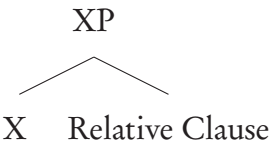
Modern Greek Restrictive Relative Clauses always depend on an antecedent which they modify. Their antecedent should always be present (overt), as shown by the ungrammaticality of (83):

(82) **I Georgia taise ton papagalo pu vrike**
the.$_{FSG\cdot NOM}$ Georgia.$_{FSG\cdot NOM}$ fed.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ that found.$_{3SG}$
o babas.
the.$_{MSG\cdot NOM}$ father.$_{MSG\cdot NOM}$
'Georgia fed the parrot that father found.'

(83) *** I Georgia taise ø pu vrike o babas.**
the.$_{FSG\cdot NOM}$ Georgia.$_{FSG\cdot NOM}$ fed.$_{3SG}$ that found.$_{3SG}$ the.$_{MSG\cdot NOM}$ father.$_{MSG\cdot NOM}$
'Georgia fed the parrot that father found.' (intended)

Restrictive relative clauses always occur *postnominally*: they occur after the head they modify (Lascaratou (1998, 166), Keenan and Comrie (1977, 65-78), Theophanopoulou-Kontou (1989, 998), Holton et al. (1997, 440), Kroeger (2004, 179)). In fact, as Siewierska et al. (1998) suggest, the NP-REL order is very common across European languages. Consequently, we will assume that restrictive relative clauses modifying an antecedent will occur in structures like the following:

(84)



Their antecedent is usually nominal, as in (82), in which case they are introduced by either the complementizer *pu* or the relative pronoun *o opios*. Restrictive Relatives introduced with *pu* can also take adverbial (85) or sentential (86) antecedents:

(85) **Eki pu piga me ipodehtikan me hara.**
there that went.$_{1SG}$ me.$_{ACC}$ welcomed.$_{3PL}$ with joy
'Where I went, they welcomed me with joy.'

(86) **Perimenontas ti Georgia fagame 10 bales pagoto, pu**
waiting the.$_{FSG\cdot ACC}$ Georgia ate.$_{1SG}$ 10 balls icecream, that
tin ekane na skasi apo ti zilia tis.
her.$_{FSG\cdot ACC}$ made.$_{3SG}$ to explode from the.$_{FSG\cdot ACC}$ jealousy her.$_{FSG\cdot GEN}$
'Waiting for Georgia, we ate 10 balls of icecream, which made her full of jealousy.'

In our analysis, we will mostly focus on nominal antecedents, since this is the environment resumptives appear in. Two more issues have attracted the attention of researchers, as reported in Varlokosta and Kotzoglou (2003, 170-173) concerning the relation of the head element and its modifying clause: rstly "the structural relation of the relative clause with the NP it is contained in, if that is the RC is a

complement or an adjunct" and secondly "the relation of the head of the RC with the anaphorization position, if that is the NP is born inside or outside the RC". In this thesis, restrictive relatives will be analysed not as arguments of their heads but rather as ADJUNCTS, a view widely adopted in the LFG literature (see also section 4.2 for LFG accounts of Relative Clauses).

The internal structure of MG RRCs As noted in section 3.1.1, where we examined Modern Greek Clause Structure, there seems to be an overall agreement in the literature concerning VSO as the *basic constituent order of subordinate clauses* (Tzartzanos, 1963, Lascaratou, 1998, Mackridge, 1985) similar to the rather fixed constituent order within a nominal phrase (Markantonatou, 1992, Lascaratou, 1998), as shown in (87) to (89):

(87) **O papagalos** pu vrike o Kostas **milise.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that found.$_{3SG}$ the.$_{MSG\cdot NOM}$ Kostas spoke.$_{3SG}$
'The parrot that Kostas found spoke.'

(88) ***O papagalos** vrike pu o Kostas **milise.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ found.$_{3SG}$ that the.$_{MSG\cdot NOM}$ Kostas spoke.$_{3SG}$
'The parrot that Kostas found spoke.' (intended meaning)

(89) ***O** pu vrike **papagalos** o Kostas **milise.**
the.$_{MSG\cdot NOM}$ that found.$_{3SG}$ parrot.$_{MSG\cdot NOM}$ the.$_{MSG\cdot NOM}$ Kostas spoke.$_{3SG}$
'The parrot that Kostas found spoke.'

A restrictive relative clause can be introduced by the complementizer *pu* [=that] or the relative pronoun *o opios* (the.$_{MSG\cdot NOM}$who.$_{MSG\cdot NOM}$), *i opia* (the.$_{FSG\cdot NOM}$who.$_{FSG\cdot NOM}$), *to opio* (the.$_{NSG\cdot NOM}$who.$_{NSG\cdot NOM}$). It can be followed by a resumptive pronoun (optional, can be obligatorily present or absent), depending on the relativisation position of the relative clause) followed by the rest of the relative clause in VSO order. Their distribution in Modern Greek varies depending on both "structural considerations as well as stylistic and pragmatic factors" (Holton et al., 1997, Mackridge, 1985, Papadopoulou, 2002). The complementizer and the relative pronoun are obligatory

and are mutually exclusive, as illustrated by the grammaticality of (90) and (91) and the ungrammaticality of (92) and (93):

(90) **o papagalos pu vrike i Maria petakse.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that found.$_{3SG}$ the.$_{FSG\cdot NOM}$ Mary ew.away.$_{3SG}$
'The parrot that Mary found flew away.'

(91) **o papagalos ton opio vrike i Maria petakse.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ found.$_{3SG}$ the.$_{FSG\cdot NOM}$ Mary ew.away.$_{3SG}$
'The parrot which Mary found flew away.'

(92) ***o papagalos ø vrike i Maria petakse.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ found.$_{3SG}$ the.$_{FSG\cdot NOM}$ Mary ew.away.$_{3SG}$
'The parrot Mary found flew away.'

(93) ***o papagalos pu ton opio vrike i Maria petakse.**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ found.$_{3SG}$ the.$_{FSG\cdot NOM}$ Mary ew.away.$_{3SG}$
'The parrot Mary found flew away.'

The internal structure of a restrictive relative clause is quite fixed and "any attempt of constituent extraction from inside the clause to the front results in an ill-formed sentence" (Theophanopoulou-Kontou, 1989, 338), as shown in (94):

(94) ***Itan I Maria o papagalos pu vrike ø petakse.**
was.$_{3SG}$ the.$_{FSG\cdot NOM}$ Mary.$_{FSG\cdot NOM}$ the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that found.$_{3SG}$ ew.$_{3SG}$
'It was the parrot that Mary found that flew away.'

In what follows, we look further into the complementizer and the relative pronoun introducing Restrictive Relative Clauses in Modern Greek.

A. The complementizer *pu* 'that'. The complementizer *pu* is one of the most frequently used words that introduce a restrictive relative clause (Mackridge, 1985, 248). Here we differentiate between the relative complementizer *pu* introducing

restrictive and non-restrictive relative clauses from other uses of *pu* including its use in a pseudo-relative construction where it functions as a relative adverbial and modifies a locative or temporal adverb like *eki* there and *tora* now, and its non-relative use, where it functions as an "object or subject of a verb" and can introduce "clauses governed by verbs of perception and verbs expressions of emotion (95), other clauses expressing cause or reason (96), clauses expressing *result or consequence* (97), *contrary/opposition clauses* (98) and *clauses governed by various other words* (99)" (Mackridge, 1985, 253):

(95) **ides pu den itan tipota?**
saw.$_{2SG}$ that not was.$_{3SG}$ nothing
'you see? it was nothing!'

(96) **su kano ti hari pu se metafero**
you.$_{GEN}$ do.$_{1SG}$ the.$_{FSG\cdot ACC}$ favour.$_{FSG\cdot ACC}$ that you.$_{ACC}$ transport.$_{1SG}$
'I'm doing you a favour transporting you.'

(97) **de fteo ego pu halase to aftokinito**
not blame.$_{1SG}$ I.$_{NOM}$ that broke down.$_{3SG}$ the.$_{NSG\cdot ACC}$ car.$_{NSG\cdot ACC}$
'It is not my fault the car broke down.'

(98) **apopse kimithike poli, pu alles vradies ksipnai sinehia**
tonight slept.$_{3SG}$ a.lot, that other.$_{FPL\cdot NOM}$ nights.$_{FPL\cdot NOM}$ wakes.up.$_{3SG}$ continuously
'Last night s/he slept a lot, whereas other nights she had been waking up.'

(99) **kathe pu pigeno stin agglia arosteno**
every.time that go.$_{1SG}$ to.the.$_{FSG\cdot ACC}$ England get.sick.$_{1SG}$
'Everytime I go to England I get ill.'

The relative complementizer *pu* should not be confused with the stressed *pú*, which is the interrogative pronoun for Where? :

(100) **pú piges htes?**
where went.$_{2SG}$ yesterday
'Where did you go yesterday?'

The relative complementizer *pu*, can introduce a restrictive or a non-restrictive relative clause and immediately followed by a resumptive pronoun (where appropriate) and a verb. Being a complementizer, *pu* is indeclinable, bearing no marking for case, gender or number (Kroeger, 2004, Mackridge, 1985, Alexiadou, 1997, Papadopoulou, 2002). It can, thus, stand for "a subject, an indirect object or a prepositional phrase" (Mackridge, 1985, 249), as shown in (101) to (104):

(101) **o papagalos pu tsibise ti Maria petakse**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that bit.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary ew.$_{3SG}$
'The parrot who bit Maria flew away.'

(102) **o papagalos pu ton/ø tsibise i Maria petakse**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that him.$_{MSG\cdot ACC}$ bit.$_{3SG}$ the.$_{FSG\cdot NOM}$ Maria few.$_{3SG}$
'The parrot that Mary bit flew away.'

(103) **o papagalos pu tu/*ø edoses ena biskoto petakse**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that his.$_{MSG\cdot GEN}$ gave.$_{2SG}$ a biscuit.$_{NSG\cdot ACC}$ ew.$_{3SG}$
'The parrot you gave a biscuit to flew.'

(104) **o papagalos pu brosta tu/*ø milises petakse**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that in front of his.$_{MSG\cdot GEN}$ spoke.$_{2SG}$ ew.$_{3SG}$
'The parrot in front of which you spoke flew.'

Pu cannot be used as the complement of a preposition, as Papadopoulou (2002, 106-108) suggests, as shown in (105):

(105) ***heretisa ton anthropo me pu malosa htes**
greeted.$_{1SG}$ the.$_{MSG\cdot ACC}$ person.$_{MSG\cdot ACC}$ with that fought.$_{1SG}$ yesterday
'I greeted the person I had a fight with yesterday.'

(Papadopoulou, 2002, 106-108)

Pu-Restrictive Relative Clauses may have more than one function in the same clause, as Mackridge (1985) suggests, where it is thought as performing two functions within the same clause as the coordinated *pu* Restrictive Relatives in (106) show:

(106) **o papagalos pu mas eferes ke pu tu edoses**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ that us.$_{ACC}$ brought.$_{2SG}$ and that him.$_{MSG\cdot GEN}$ gave.$_{2SG}$
to biskoto petakse
the.$_{NSG\cdot ACC}$ biscuit.$_{MSG\cdot ACC}$ ew.$_{3SG}$
'The parrot that you brought us and that you gave the biscuit to flew'

B. The relative pronoun *o opios* 'who'. Holton et al. (1997, 440) argue that the relative pronoun *o opios* is less frequent than *pu* being more often used in formal discourse, especially in written texts. The relative pronoun *o opios* consists of the de nite article *o* and the pronoun *opios*. Unlike the relative complementizer *pu*, it is declinable for case (nominative, accusative, genitive), number (singular and plural) and gender (masculine, feminine and neuter). Its declension paradigm is shown in Table 3.1 (the accent shows where stress falls).

Number	Case	Gender		
		MASC	FEM	NEUT
Singular	NOM	o opíos	i opía	to opío
	GEN	tu opíu	tis opías	tu opíu
	ACC	ton opío	tin opía	to opío
Plural	NOM	i opíi	i opíes	ta opía
	GEN	ton opíon	ton opíon	ton opíon
	ACC	tus opíus	tis opíes	ta opía

Table 3.1: Declension table of the relative pronoun *o opios, i opia, to opio*

Various arguments have been proposed (Alexiadou, 1997, 15) in favour of a structure which further analyses *opíos* into *o-* and *-pios*, the former functioning as an inde nite marker, or a de nite article, and the latter being a variation of the free relative pronoun *ópios*. We will not pursue this analysis in this thesis; we believe that a diachronic analysis of the relative pronouns and the relative complementizers throughout the history of the Greek Language would shed some light on the matter.

O opíos normally introduces a restrictive or non-restrictive relative clause and can be followed by a (resumptive) pronoun (if appropriate) and the verb, as shown in (107):

(107) **o papagalos o opios tsibise ti Maria**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ the.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ bit.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary
tromakse
was scared.$_{3SG}$
'The parrot who bit Mary was scared'

If, however, the relative pronoun *o opios* is part of a prepositional phrase, the relative pronoun must be preceded by the preposition (Lascaratou, 1998, 166) as in (108) :

(108) **o papagalos konta ston opio kathise i**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ near to the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ sat.$_{3SG}$ the.$_{FSG\cdot NOM}$
gata petakse
cat.$_{FSG\cdot ACC}$ ew.$_{3SG}$
'The parrot, next to whom the cat sat flew.'

When the relative pronoun is in the genitive case (which is usually the case when relativization involves a possessive relativised position), the antecedent of the possessor may precede the relative clause (Mackridge, 1985, 237) as in (111) (compare with (110)):

(109) **o papagalos tu opiu to biskoto**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ the.$_{MSG\cdot GEN}$ who.$_{MSG\cdot GEN}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$
eklepse i gata nevriase
stole.$_{3SG}$ the.$_{FSG\cdot NOM}$ cat.$_{FSG\cdot NOM}$ was angry.$_{3SG}$
'The parrot, whose biscuit the cat stole, was angry.'

(110) **o papagalos to biskoto tu opiu**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ the.$_{MSG\cdot GEN}$ who.$_{MSG\cdot GEN}$
eklepse i gata nevriase.
stole.$_{3SG}$ the.$_{FSG\cdot NOM}$ cat.$_{FSG\cdot NOM}$ was angry.$_{3SG}$
'The parrot whose biscuit the cat stole was angry.'

Although its frequency in speech is quite low, its use is preferred over *pu* when the relative pronoun is in genitive case , when it is part of a PP or when ambiguity arises (Mackridge, 1985, 248), as in (111). The ambiguity is easily resolved if we replace *pu* with the appropriate form of *o opíos*, as in (112):

(111) **i vasilopoula pu ithele na ti fai to**
the.$_{FSG\cdot NOM}$ princess.$_{FSG\cdot NOM}$ that wanted.$_{3SG}$ to her.$_{FSG\cdot ACC}$ eat.$_{3SG}$ the.$_{NSG\cdot NOM}$
therio
monster.$_{NSG\cdot NOM}$
'The princess whom the monster wanted to eat' or *'The princess who wished for the monster to eat her'*

(112) a. **i vasilopoula tin opía ithele na (ti)**
the.$_{FSG\cdot NOM}$ princess.$_{FSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ wanted.$_{3SG}$ to her.$_{FSG\cdot ACC}$
fai to therio
eat.$_{3SG}$ the.$_{NSG\cdot NOM}$ monster.$_{NSG\cdot NOM}$
'The princess whom the monster wanted to eat'

b. **i vasilopoula i opía ithele na**
the.$_{FSG\cdot NOM}$ princess.$_{FSG\cdot NOM}$ the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$ wanted.$_{3SG}$ to
ti fai to therio
her.$_{FSG\cdot ACC}$ the.$_{NSG\cdot NOM}$ monster.$_{NSG\cdot NOM}$
'The princess who wished for the monster to eat her'

Since the relative pronoun agrees with the antecedent phrase in gender and number, it gets its case marking from the "grammatical relation which the head NP is understood to bear within the modifying clause" (Kroeger, 2004, 178). Such ambiguities are easily resolved when the relative pronoun is present. There are cases where even the use of the relative pronoun is not helpful in disambiguating the sentence. Consider (113) for example:

(113) **to alogo pu prostatepse to**
the.$_{NSG\cdot NOM}$ horse.$_{NSG\cdot NOM}$ that protected.$_{3SG}$ the.$_{NSG[\cdot NOM/\cdot ACC]}$
agori itan aspro
boy.$_{NSG[\cdot NOM/\cdot ACC]}$ was.$_{3SG}$ white.$_{NSG\cdot NOM}$
'The horse that saved the boy was white.' or *'The horse that the boy saved was white.'*

(114) **to alogo to opío prostatepse**
the.$_{NSG\cdot NOM}$ horse.$_{NSG\cdot NOM}$ the.$_{NSG[\cdot ACC/\cdot NOM]}$ who.$_{NSG[\cdot ACC/\cdot NOM]}$ protected.$_{3SG}$
to agori itan aspro
the.$_{NSG[\cdot NOM/\cdot ACC]}$ boy.$_{NSG[\cdot NOM/\cdot ACC]}$ was.$_{3SG}$ white.$_{NSG\cdot NOM}$
'The horse that saved the boy was white.' or *'The horse that the boy saved was white.'*

Even if we replace the *pu* for *o opíos*, as in (114), it is not clear who was the protector. It seems that in this case, speakers rely heavily on intonation and/or context to disambiguate the sentence.

3.2.1.2 Non-Restrictive Relative clauses

Like Restrictive Relatives, Non-Restrictive Relatives depend on an antecedent, which they modify. As such, they are very similar to Restrictive Relatives, mainly with respect to their internal structure and the dependencies involved. Unlike Restrictive Relatives, however, they do not restrict the antecedent s referent, but rather offer additional information, much like appositions or parentheticals. For this purpose they are sometimes referred to as *appositive relative clauses*. The antecedent of non-Restrictive relative clauses can be nominal, (115) adverbial (116) or sentential (117) and cannot be omitted (118).

(115) **I Maria, pu ti sinantisame htes, ine ksaderfi mu.**
the.$_{FSG\cdot NOM}$ Mary, that her.$_{FSG\cdot ACC}$ met.$_{1PL}$ yesterday is.$_{3SG}$ cousin.$_{FSG\cdot ACC}$ mine.$_{GEN}$
'Mary, whom we met yesterday, is my cousin.'

(116) **Methavrio, pu tha se do, tha sou doso ta vivlia.**
The day after tomorrow that will you.$_{ACC}$ see.$_{1SG}$ will you.$_{GEN}$ give.$_{1SG}$ the.$_{NSG\cdot ACC}$ books.$_{NSG\cdot ACC}$
'The day after tomorrow, when I will see you , I will give you the books.'

(117) **To gegonos oti efere ton mikro sto grafio, pu eknevrise to afentiko, tis kostise ti thesi tis.**
The fact that brought.$_{3SG}$ the.$_{MSG\cdot ACC}$ small boy.$_{MSG\cdot ACC}$ to the of ce.$_{NSG\cdot ACC}$ that irritated.$_{3SG}$ the.$_{NSG\cdot ACC}$ boss.$_{NSG\cdot ACC}$ her.$_{GEN}$ cost.$_{3SG}$ the.$_{FSG\cdot ACC}$ position.$_{FSG\cdot ACC}$ her.$_{GEN}$
'The fact that she brought the little boy to the office, which irritated the boss, made her lose her job.'

(118) *** I Maria, ti sunantisame htes, ine ksaderfi mu.**
the.FSG·NOM Mary, her.ACC met.1PL yesterday, is.3SG cousin.ACC mine.GEN
'Mary, whom we met yesterday is my cousin.'

As observed from the examples above non-restrictive relatives occur after the element they modify. The types of dependencies involved are also similar to Restrictive Relatives. Non-restrictive relatives share a link with the matrix clause: the relative pronoun or complementizer introducing the non-restrictive relative shares a dependency with the antecedent in the matrix clause.

What distinguishes non-restrictives from restrictive relatives is that non-restrictive relatives can be omitted without major loss of information related to the modi ed element as shown in (119) and (120) (compare with (115) and (116) respectively):

(119) **I Maria ine ksaderfi mu.**
the.FSG·NOM Mary is.3SG cousin.FSG·NOM mine.GEN
'Mary is my cousin.'

(120) **Methavrio, tha su doso ta vivlia.**
The day after tomorrow will you.GEN give.1SG the.NSG·ACC books.NSG·ACC
'The day after tomorrow, I will give you the books.'

Another way to distinguish between restrictive and non-restrictive relative clauses is by means of the presence of pauses (in speech) or commas (in writing) before and after the non-restrictive relative clause or intonation variation as in (121). Below, CAPS FONT marks a raise in intonation, whereas *italic font* marks a dropped intonation.

(121) **I MARIA,** ***pu ti sinantisame htes*****, ine ksaderfi mu.**
the.FSG·NOM Mary that her.ACC met.1PL yesterday, is.3SG cousin.FSG·NOM mine.GEN
'Mary, whom we met yesterday, is my cousin.' (NRC interpretation)

Similarly to restrictive Relative clauses, non-restrictive relatives demonstrate as VSO word order as the basic/underlying constituent order, as shown in (122):

(122) **I Maria, pu ti sinantisame htes, ine ksaderfi**
the.$_{FSG\cdot NOM}$ Mary that her.$_{FSG\cdot ACC}$ met.$_{1PL}$ yesterday is cousin.$_{FSG\cdot NOM}$ **mu.**
mine.$_{GEN}$
'Mary, whom we met yesterday, is my cousin.'

(123) *** I Maria, ti sinantisame pu htes, ine**
the.$_{FSG\cdot NOM}$ Mary her.$_{FSG\cdot ACC}$ met.$_{1PL}$ that yesterday is **ksaderfi mu.**
cousin.$_{FSG\cdot NOM}$ mine.$_{GEN}$
'Mary, whom we met yesterday, is my cousin.' (intended meaning)

(124) *** I pu ti sinantisame htes Maria ine ksaderfi**
the.$_{FSG\cdot NOM}$ that her.$_{ACC}$ met.$_{3SG}$ yesterday Mary is cousin.$_{FSG\cdot NOM}$ **mu.**
mine.$_{GEN}$
'Mary, whom we met yesterday, is my cousin.' (intended meaning)

Like Restrictives, Non-Restrictive relatives have a VSO internal constituent order, as in (125):

(125) **Ine fili me ton Petro, pu ehi enan papagalo.**
is friends with the.$_{MSG\cdot ACC}$ Peter.$_{MSG\cdot ACC}$ that has.$_{3SG}$ a.$_{ACC}$ parrot.$_{MSG\cdot ACC}$
'She is friends with Peter, who has a parrot.'

If their antecedent is nominal, they are introduced by either the indeclinable complementizer *pu* (that) or the declinable relative pronoun *o opios* (the who) which are obligatory and mutually exclusive just as with restrictive relatives:

(126) **Ine fili me ton Petro, pu ehi enan papagalo.**
is friends with the.$_{MSG\cdot ACC}$ Peter.$_{MSG\cdot ACC}$ that has.$_{3SG}$ a.$_{ACC}$ parrot.$_{MSG\cdot ACC}$
'She is friends with Peter, who has a parrot.'

(127) **ine fili me ton Petro, o opios ehi enan**
is friends with the.$_{MSG\cdot ACC}$ Peter.$_{MSG\cdot ACC}$ the.$_{NSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ has.$_{3SG}$ a.$_{ACC}$ **papagalo.**
parrot.$_{MSG\cdot ACC}$
'She is friends with Peter, who has a parrot.'

(128) *** ine fili me ton Petro, ø ehi enan papagalo.**
is friends with the.$_{MSG\cdot ACC}$ Peter.$_{MSG\cdot ACC}$ has.$_{3SG}$ a.$_{ACC}$ parrot.$_{MSG\cdot ACC}$
'She is friends with Peter, who has a parrot.'

(129) *** ine fili me ton Petro, pu o opios ehi**
is friends with the.$_{MSG\cdot ACC}$ Peter.$_{MSG\cdot ACC}$ that the.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ has.$_{3SG}$
enan papagalo.
a.$_{ACC}$ parrot.$_{MSG\cdot ACC}$
'She is friends with Peter, who has a parrot.'

O opíos, as previously noted , agrees in number and gender with the modifying head (130), (131), (132) but gets its case, from the grammatical function it ful lls in the non-restrictive relative clause as in (133):

(130) **o Petros agapai ti Mirsini i**
the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mirsini.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$
opia ine ksaderfi tis Marias.
who.$_{FSG\cdot NOM}$ is.$_{3SG}$ cousin.$_{FSG\cdot NOM}$ the.$_{FSG\cdot GEN}$ Mary.$_{FSG\cdot GEN}$
'Peter loves Mirsini who is Mary's cousin.'

(131) *** o Petros agapai ti Mirsini o opios**
the.$_{MSG\cdot NOM}$ Peter.$_{MSG\cdot NOM}$ loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mirsini the.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$
ine ksaderfi tis Marias.
is cousin.$_{FSG\cdot NOM}$ the.$_{FSG\cdot GEN}$ Mary
'Peter loves Mirsini, who is Mary's cousin.'

(132) *** o Petros agapai ti Mirsini i opies ine**
the.$_{MSG\cdot NOM}$ Peter loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mirsini the.$_{FPL\cdot NOM}$ who.$_{FPL\cdot NOM}$ is
ksaderfi tis Marias.
cousin.$_{FSG\cdot NOM}$ the.$_{FSG\cdot GEN}$ Mary
'Peter loves Mirsini who is Mary's cousin.'

(133) *** o Petros agapai ti Mirsini tis opias ine**
the.$_{MSG\cdot NOM}$ Peter loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mirsini the.$_{FSG\cdot GEN}$ who.$_{FSG\cdot GEN}$ is
ksaderfi tis Marias.
cousin.$_{FSG\cdot NOM}$ the.$_{FSG\cdot GEN}$ Mary
'Peter loves Mirsini, who is Mary's cousin.'

If the antecedent is sentential they can be introduced either by *pu* (that) or the neuter gender form of the relative pronoun *o opios* (=who), as in (134) and (135).[1]

[1]Possible ways to explain the obligatoriness of neuter gender form of the relative pronoun in sentential antecedents include assuming that sentences carry a neuter gender index by default. Another explanation is that non-restrictive relative clauses do not take a sentence as an antecedent but that they rather modify an omitted/implied/elliptical noun *pragma* or *kati* (the thing) or *gegonos* (the

(134) **Ihe ena skilo dalmatias pu tu kostize mia**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ that him.$_{MSG\cdot GEN}$ cost.$_{3SG}$ a
periousia.
fortune
'He had a dalmatian, which cost him a fortune.'

(135) **Ihe ena skilo dalmatias to opio tu**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ the.$_{NSG\cdot NOM}$ who.$_{NSG\cdot NOM}$ him.$_{MSG\cdot GEN}$
kostize mia periousia.
cost.$_{3SG}$ a fortune
'He had a dalmatian, which (i.e. the fact that he had a dalmatian) cost him a fortune.'

(136) **Ihe ena skilo dalmatias o opios tu**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ the.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ him.$_{MSG\cdot GEN}$
kostize mia periousia.
cost.$_{3SG}$ a fortune
'He had a dalmatian, which (i.e. the dalmatian) cost him a fortune.'

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fact), which are in neuter gender, as in (1):

(1) **ihe ena skilo dalmatias pragma to opio tu**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ fact the.$_{NSG\cdot NOM}$ who.$_{NSG\cdot NOM}$ him.$_{MSG\cdot GEN}$
kostize mia periusia.
cost.$_{3SG}$ a fortune
'He had a dalmatian which cost him a fortune.'

Since *o opios* should always agree in gender and number with its antecedent, the other genders become unavailable, as in (2) and (3):

(2) *** ihe ena skilo dalmatias pragma i opia tu**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ fact the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$ him.$_{MSG\cdot GEN}$
kostize mia periusia.
cost.$_{3SG}$ a fortune
'He had a dalmatian which cost him a fortune.' (intended meaning)

(3) *** ihe ena skilo dalmatias pragma o opios tu**
had.$_{3SG}$ a dog.$_{MSG\cdot ACC}$ dalmatian.$_{GEN}$ fact the.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ him.$_{MSG\cdot GEN}$
kostize mia periusia.
cost.$_{3SG}$ a fortune
'He had a dalmatian which cost him a fortune.'

If on the other hand, the antecedent is adverbial the non-restrictive relative can only be introduced by *pu* as in (137).

(137) **Eki pu ise imuna, edw pu ime tha 'rthis.**
There that are.$_{2SG}$ was.$_{1SG}$, here that am.$_{1SG}$ will come.$_{2SG}$
'I was at your place, you'll come to mine.' (Greek proverb)

(138) **Avrio pu tha figis, min ksehasis ta klidia su.**
Tomorrow that will go.$_{2SG}$ not forget.$_{2SG}$ the.$_{NPL\cdot ACC}$ keys.$_{NPL\cdot ACC}$ your.$_{GEN}$
'Tomorrow when you go, do not forget your keys.'

As we have seen so far, there are a lot of similarities in the structure of restrictive and non-restrictive relative clauses: they are introduced by the same complementizer and relative pronoun, they have the same internal structure and the type of dependencies involved between the matrix and the relative clause are also very similar. It therefore seems that in order to disambiguate between a restrictive or a non-restrictive reading of the relative clause, speakers rely heavily on prosodic/intonational information. For example, the sentence in (139) could potentially have either a restrictive or a non-restrictive reading:

(139) **Irthe o Giorgos pu pigename mazi dimotiko.**
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George that went.$_{1PL}$ together primary school
'George, with who we went to primary school together, came.'

If we do not add a pause or change in the intonation downwards in the boundaries between the matrix and the relative clause, then the only reading we get is a restrictive reading; i.e. *George* my primary school classmate, not *George* my brother. In (140) below, the dot shows the boundary between the relative and the matrix clause and the italic font denotes a single intonation unit:

(140) **Irthe *o Giorgos • pu pigename mazi dimotiko.***
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George that went.$_{1PL}$ together primary school
'George with who we went to primary school together, came.'

If however we add a pause or change the intonation in the boundaries of the matrix and relative clause, then we can only get a non-restrictive reading (i.e. it was George who came, who by the way was my primary school classmate):

(141) **Irthe o Giorgos,• *pu pigename mazi dimotiko.***
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George that went.$_{1PL}$ together primary school
'George with who we went to primary school together, came.'

These observations apply to *o opios* Non-restrictive relatives, too, as shown in (142):

(142) **Irthe o Giorgos • *me ton opio pigename***
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George with the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ went.$_{1PL}$
mazi dimotiko.
together primary school
'George came with who we went to the same promary school."

Again if we do not pause or change the intonation pattern in the clausal boundaries, we get a restrictive reading similar to (140):

(143) **Irthe o Giorgos me ton opio pigename**
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George with the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ went.$_{1PL}$
mazi dimotiko
together primary school
'The George that we went to primary school with came.'

On the other hand if we pause or modify the intonation, then we only get a non-restrictive reading, similar to that of (141):

(144) **Irthe o Giorgos, me ton opio pigename**
came.$_{3SG}$ the.$_{MSG\cdot NOM}$ George with the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ went.$_{1PL}$
mazi dimotiko.
together primary school
'George whom we went to the primary school with, came.'

3.2.1.3 Free relative clauses

Free relative clauses are a type of relatives very distinct from dependent (restrictive and non-restrictive) relative clauses. Compare (145), (146), (147), (148) for example:

(145) (Restrictive Relative Clause)

I Kiki eroteftike ton andra pu (tin) esose.
the.$_{FSG\cdot NOM}$ Kiki fell in love.$_{3SG}$ the.$_{MSG\cdot ACC}$ man.$_{MSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$ saved.$_{3SG}$

'Kiki fell in love with the man that saved her.'

(146) (Non-restrictive Relative Clause)

I Kiki eroteutike ton Marko pu ton / *ø
the.$_{FSG\cdot NOM}$ Kiki fell in love.$_{3SG}$ the.$_{MSG\cdot ACC}$ Markos that him.$_{MSG\cdot ACC}$
agapai i Eleni.
loves.$_{3SG}$ the.$_{FSG\cdot NOM}$ Helen.

Kiki fell in love with Markos, whom Helen loves.'

(147) (Nominal Free Relative Clause)

Ópja kopela agapai o Yannis ine tiheri.
whever.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ loves.$_{3SG}$ the.$_{MSG\cdot NOM}$ Yiannis is lucky.$_{FSG\cdot NOM}$

'Whichever girl Yannis loves is lucky.'

(148) (Adverbial free relative clause)

Ópu pige, ton ipodehtikan me hara.
wherever went.$_{3SG}$ him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy

'Wherever he went, they welcomed him with joy.'

A rst observation is that unlike restrictive and non-restrictive relatives, Modern Greek Free Relative Clauses do not depend on an (overtly) present head or antecedent. For this purpose they are sometimes called in the literature as headless relatives. Free relative clauses may function as nominal (149) or adverbial (150) elements in a sentence, depending on the thematic role the free relative clause ful lls in the matrix clause.

Free Relatives are not adjuncts of an antecedent; when they function as nominal elements, they ll in argument positions and can function as subjects, objects, obliques objects of a preposition and so on just like a nominal element as in (150). Similarly, *adverbial Free relative clauses* may function as adverbs (151):

(149) (Nominal Free Relative Clause)

Ópja kopela agapai o Stelios ine tiheri.
Whoever.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ loves.$_{3SG}$ the.$_{MSG\cdot NOM}$ Stelios is lucky.$_{FSG\cdot NOM}$.
'Whichever girl Stelios loves is lucky.'

(150) **I Maria ine tiheri.**
the.$_{FSG\cdot NOM}$ Mary is lucky.$_{FSG\cdot NOM}$
'Mary is lucky.'

(151) (Adverbial Free Relative Clause)

Otan eftase ton ipodehtikan me hara.
whenever arrived.$_{3SG}$ him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy
'When he arrived, they welcomed him with joy.'

(152) **Tote ton ipodehtikan me hara.**
then him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy
'Then, they welcomed him with joy.'

Free Relative Clauses can occur either *pre-verbally* or *post-verbally*, depending on the grammatical role they ful ll in the matrix clause. Assuming VSO as the unmarked matrix clause word order, when free relatives precede the main clause, they function as topicalized elements, as shown by the obligatory presence of the doubling clitic in (154):

(153) **Sholiaze opja kopela pernuse apo brosta tu.**
gossip.$_{3SG}$ whoever.$_{FSG\cdot ACC}$ girl.$_{FSG\cdot ACC}$ passed.$_{3SG}$ from front him.$_{MSG\cdot GEN}$
'He gossiped whichever girl passed in front of him.'

(154) **Opja kopela pernuse apo brosta tu ti**
whoever.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ passed.$_{3SG}$ from front him.$_{MSG\cdot GEN}$ her.$_{FSG\cdot ACC}$
/ *ø sholiaze.
gossip.$_{3SG}$
Whichever girl passed in front of him, he gossiped about her.

The same applies to adverbial Free Relative Clauses as in (155) and (156):

(155) **Otan eftase ton ipodehtikan me hara**
when arrived.$_{3SG}$ him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy
'When he arrived, they welcomed him with joy.

(156) **Ton ipodehtikan me hara, otan eftase.**
him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy when arrived.$_{3SG}$
'They welcomed him with joy, when he arrived.'

Let us know look in mordetail at the internal structure of free relative clauses.

Internal Structure of Free relatives Nominal Free Relative Clauses are introduced by the indeclinable neuter relative pronoun *o,ti* (=whatever), and the declinable relative pronouns *ópjos* [=whoever] or *ósos* [=as much as]. They are all obligatory (they cannot be omitted) and are mutually exclusive as shown in (158), (160) and (162):

(157) **Pire o,ti ithele.**
got.$_{3SG}$ whatever wanted.$_{3SG}$
'He got whatever he wanted.'

(158) *** pire ø ithele.**
got.$_{3SG}$ wanted.$_{3SG}$
'He got whatever he wanted.' (intended meaning)

(159) **Ópjos irthe efere ki ena doro.**
whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$ brought.$_{3SG}$ and a gift
'Whoever came also brought a gift.'

(160) *** ø irthe efere ki ena doro.**
came.$_{3SG}$ brought.$_{3SG}$ and a gift
'Whoever came also brought a gift.' (intended meaning)

(161) **Osi parakolouthisan to seminario piran**
Whichever.$_{MSG\cdot NOM}$ attended.$_{3PL}$ the.$_{NSG\cdot ACC}$ seminar.$_{NSG\cdot ACC}$ got.$_{3PL}$
diploma.
diploma
'Those that attended the seminar got a diploma.'

(162) *** ø parakolouthisan to seminario piran diploma.**
attended.$_{3PL}$ the.$_{NSG\cdot ACC}$ seminar.$_{NSG\cdot ACC}$ got.$_{3PL}$ dimploma
'Those that attended the seminary got a diploma.' (intended meaning)

The relative pronouns introducing nominal free relative clauses (*ópjos*, *ósos* and *o,ti*) may also function as speci ers of a nominal constituent as in (163) and (164):

(163) **Ópjos filos irthe efere ki ena doro.**
Whoever.MSG·NOM friend.MSG·NOM came.3SG brought.3SG and a gift
'Whichever friend came also brought a gift.'

(164) **Ósi mathites parakolouthisan to**
Whichever.MPL·NOM students.MPL·NOM attended.3PL the.NSG·ACC
seminario piran diploma.
seminar.NSG·ACC got.3PL diploma
'Those of the students that attended the seminary got a diploma.'

(165) **Pire o,ti doro ithele.**
got.3SG whatever gift wanted.3SG
'He got whichever gift he wanted.'

The unmarked internal constituent order of free relatives is relatively fixed (similarly to other subordinate clauses), but they must be introduced by the appropriate free relative pronoun. The free relative pronoun may optionally be followed by a noun phrase (without a determiner) as in (168):

(166) Relative pronoun + (NP) + V XP*

(167) **Kerasa opjus irthan sti giorti mu.**
treated/1sg whoever.MPL·ACC came.3PL to the.FSG·ACC celebration.FSG·ACC my.GEN
'I treated whoever attended my celebration.'

(168) **Kerasa opjus filus irthan sti**
treated.1SG whoever.MPL·ACC friends.MPL·ACC came.3PL to the.FSG·ACC
giorti mu.
celebration.FSG·ACC my.GEN
'I treated whichever friend attended my celebration.

(169) * **Kerasa opjus sti giorti mu irthan.**
treated.1SG whoever.MPL·ACC to the.FSG·ACC celebration.FSG·ACC my.GEN came.3PL
'I treated whoever attended my celebration.' (intended meaning)

(170) * **Kerasa sti giorti mu opjus irthan.**
treated.1SG to the.FSG·ACC celebration.FSG·ACC my.GEN whoever.MPL·ACC came.3PL
'I treated whoever attended my celebration.'

The main verb of free relative clauses is usually finite, as in (171):

(171) **Ópu pije ton ipodehtikan me hara.**
wherever went.$_{3SG}$ him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy.
'Wherever he went, they welcomed him with joy.'

It is also possible for the verb of free relatives to appear in subjunctive. This happens when they are introduced by a complex wh- element, the free relative pronoun followed by *ke na* (and to) as in (172):

(172) **Ópjos ke na erthi, tha ton filoskeniso.**
whoever.$_{MSG\cdot NOM}$ and to come, will him.$_{MSG\cdot ACC}$ accommodate.$_{1SG}$
'Regardless of who comes, I will accommodate them.'

It is even possible for *ke* to be omitted, so the free relative clause is in subjunctive:

(173) **Ópjos na erthi, tha ton filokseniseis.**
whoever.$_{MSG\cdot NOM}$ to come, will him.$_{MSG\cdot ACC}$ accommodate.$_{1SG}$
'Regardless of who comes, I will accommodate them.'

All free relative pronouns also appear as rst compounds with *-dipote*(=ever) as their second compound, as in (174). *-dipote* emphasizes the inde nitiness of the free relative pronoun whoever.

(174) **Efage o,tidipote vrike brosta tis.**
ate.$_{3SG}$ whatever found.$_{3SG}$ front her.$_{FSG\cdot GEN}$
'She ate whatever she found in front of her.'

(175) **Miluse me opjondipote pernuse apo to diadromo.**
spoke.$_{3SG}$ with whoever.$_{MSG\cdot ACC}$ passed.$_{3SG}$ with the.$_{MSG\cdot ACC}$ corridor.$_{MSG\cdot ACC}$
'He was talking with whoever was passing by the corridor.'

(176) **I Maria voithise opjondipote ihe anagki.**
the.$_{FSG\cdot NOM}$ Mary helped.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ had.$_{3SG}$ need
'Mary helped whoever was in need.'

The compounded forms *ososdipote*, *o,tidipote* and *opjondipote* cannot act as speci ers of a nominal phrase as one would expect for *opjos*, *osos* and *o,ti*-clauses:

(177) *** I Maria voithise opjondipote ilikiomeno ihe anagki.**
the.$_{FSG\cdot NOM}$ Maria helped.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ elderly.$_{MSG\cdot ACC}$ had.$_{3SG}$ need
'Mary helped whichever elderly was in need.' (intended meaning)

(178) *** I Maria magirepse o,tidipote fagito ithele o**
the.$_{FSG\cdot NOM}$ Mary cooked.$_{3SG}$ whatever food wanted.$_{3SG}$ the.$_{MSG\cdot NOM}$
Petros.
Peter
'Mary cooked whatever food Peter wanted.'

Let us have a closer look at the relative pronouns introducing nominal free relative clauses.

A. Ó,ti: The relative pronoun *o,ti* (=whatever) is indeclinable for number, gender and case. It demonstrates neutral gender agreement with the matrix the relative clause (179):

(179) **O,ti ithele itan diskolo na gini.**
Whatever wanted.$_{3SG}$ was.$_{3SG}$ dif cult to do
'Whatever he wanted was difficult to do.'

(180) **Ekane o,ti itan kalitero.**
did.$_{3SG}$ whatever was.$_{3SG}$ better
'He did whatever was best.'

The presence of the comma in *o,ti* is obligatory. This is done in order to distinguish the free relative pronoun *o,ti* from the complementizer *oti*, which introduces subordinate clauses as complements to some verbs that mean feel , say or perceive such as *pistevo* [believe], *nomizo* [think] [feel], as in (182):

(181) **Pire o,ti / *ø ithele.**
got.$_{3SG}$ whatever wanted.$_{3SG}$
'He got whatever he wanted.'

(182) **Nomizo oti ithele na figi.**
think.$_{1SG}$ that wanted.$_{3SG}$ to go
'I think he wanted to go.'

B. Ópjos: The free relative pronoun *opjos* (whoever) *opja-opjo* introduces nominal Free relative clauses. It should not be confused with *o opios* (the who) = (who) the relative pronoun introducing restrictive and non-restrictive relative clauses, which

is preceded by a de nite article *o* and is stressed differently. *Opjos* is declinable for case, gender and number according to the declension paradigm presented in Table 3.2.

Number	Case	Gender		
		MASC	FEM	NEUT
Singular	NOM	ópjos	ópja	ópjo
	GEN	ópju	ópjas	ópju
	ACC	ópjo	ópja	ópjo
Plural	NOM	ópji	ópjes	ópja
	GEN	ópjon	ópjon	ópjon
	ACC	ópjus	ópjes	ópja

Table 3.2: Declension table of the free relative pronoun *ópjos, ópja, ópjo*

The nominal free relative clause introduced by *opjos* has the behavior of a nominal phrase and as such may function as an argument of a verb, with which it will agree as appropriate (183), (184). It may also agree in gender and number with any adjectival phrases in the matrix clause (185), (186), (187):

(183) **Ópjos foruse kokkino bluzaki travuse ta vlemata olon.**
whoever.$_{MSG\cdot NOM}$ wear.$_{3SG}$ red T-shirt attracted.$_{3SG}$ the eyes everyone.$_{GEN}$
'Whoever wore a red T-shirt attracted everyone's attention.'

(184) *** Ópji forusan kokkino bluzaki travuse ta vlemata olon.**
whoever.$_{MPL\cdot NOM}$ wear.$_{2PL}$ red T-shirt attracted.$_{3SG}$ the eyes everyone.$_{GEN}$
'Whoever wore a red T-shirt attracted everyones attention.' (intended meaning)

(185) **Ópjos foruse kokkino bluzaki itan sti moda.**
whoever.$_{MSG\cdot NOM}$ wear.$_{3SG}$ red T-shirt was.$_{3SG}$ in fashion
'Whoever wore a red T-shirt was in fashion.'

(186) *** Opja foruse kokkino bluzaki itan sti moda.**
whoever.$_{FSG\cdot NOM}$ wear.$_{3SG}$ red T-shirt was.$_{3SG}$ in fashion
'Whoever wore a red T-shirt was in fashion.'

(187) *** Opjii forusan kokkino bluzaki akoluthise ti moda.**
whoever.$_{MPL\cdot NOM}$ wear.$_{3PL}$ red T-shirt followed.$_{3SG}$ in fashion
'Whoever wore a red T-shirt followed the fashion.'

Except for the link the free relative and the matrix clause share in the form of a dependency as described above, there is another dependency involved in free relatives, that of the free relative pronoun with the within relative clause thematic role it lls in. Again, the free relative pronoun should agree in number with the relative clause verb, as illustrated in (188) and (189).

(188) **Ópjos foruse kokkino bluzaki itan sti moda.**
whoever.$_{MSG\cdot NOM}$ wear.$_{3SG}$ red T-shirt was in fashion
'Whoever wore a red T-shirt was in fashion.'

(189) *** Ópjos forusan kokkino bluzaki itan sti moda.**
whoever.$_{MSG\cdot NOM}$ wear.$_{3PL}$ red T-shirt was in fashion
'whoever wore a red T-shirt was in fashion.'

Declinable Nominal Free Relative Pronouns normally do not agree in gender and number with a constituent in the main clause, except if they function as subjects. In this case, there is number and person agreement between the verb of the main clause and the relative pronoun (subject-verb agreement), as shown in (190) to (192):

(190) **Ópjos mathitis diavazi perni kalo vathmo.**
Whoever.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ reads.$_{3SG}$ takes.$_{3SG}$ good.$_{MSG\cdot ACC}$ grade.$_{MSG\cdot ACC}$
'Whichever student reads takes good grades.'

(191) *** Opji mathites diavazi perni kalo**
whoever.$_{MPL\cdot NOM}$ students.$_{MPL\cdot NOM}$ reads.$_{3SG}$ takes.$_{3SG}$ good.$_{MSG\cdot ACC}$
vathmo.
grade.$_{MSG\cdot ACC}$
'Whichever student reads takes good grades.' (intended meaning)

(192) *** Ópjos mathitis diavazi perno kalo vathmo.**
whoever.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ reads.$_{3SG}$ take.$_{1SG}$ good.$_{MSG\cdot ACC}$ grade.$_{MSG\cdot ACC}$
'Whichever student reads takes good grades.' (intended meaning)

If there is an adjectival phrase in the relative clause, the relative pronoun will

agree with it in gender and number as appropriate, as shown by the ungrammaticality of (194) and (195):

(193) **Ópjos itan stenahorimenos, pige sto**
whoever.$_{MSG\cdot NOM}$ was.$_{3SG}$ sad.$_{MSG\cdot NOM}$ went.$_{3SG}$ to the.$_{MSG\cdot ACC}$
giatro.
doctor.$_{MSG\cdot ACC}$
'Whoever was sad went to the doctor.'

(194) *** Ópjos itan stenahorimeni, pige sto**
whoever.$_{MSG\cdot NOM}$ was.$_{3SG}$ sad.$_{FSG\cdot NOM}$, went.$_{3SG}$ to the.$_{MSG\cdot ACC}$
giatro.
doctor.$_{MSG\cdot ACC}$
'Whoever was sad went to the doctor.' (intended meaning)

(195) *** Ópjos itan stenahorimeni, pige sto**
whoever.$_{MSG\cdot NOM}$ was.$_{3SG}$ sad.$_{MPL\cdot NOM}$ went.$_{3SG}$ to the.$_{MSG\cdot ACC}$
giatro.
doctor.$_{MSG\cdot ACC}$
'Whoever was sad went to the doctor.' (intended meaning)

In Nominal free relative clauses, the case of the relative pronoun introducing the free relative should match the case requirements of the matrix clause and not those of the relative clause, as in (196) and (197):

(196) **Kalese opjon itan filos tis.**
invited.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ was.$_{3SG}$ friends.$_{MSG\cdot ACC}$ her.$_{FSG\cdot GEN}$
'She invited whoever was a friend of hers.'

(197) **Heretisan ópjon bike stin ethusa.**
greeted.$_{3PL}$ whoever.$_{MSG\cdot ACC}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room.$_{FSG\cdot ACC}$
'They greeted whoever entered the room.'

In these examples the free relative pronoun *ópjos* has the potential of agreeing in case with either the case required by the matrix verb or the case required by the free relative clause verb. In Modern Greek, when a free relative clause follows the matrix verb, it may only take its case depending on the matrix clause requirements, i.e the case of the relative pronoun introducing the free relative clause should match

the case requirements of tthe matrix clause and not those of the relative clause, as illustrated in (197) and (198):

(198) *** heretisan opjos bike stin ethusa.**
greeted.$_{3PL}$ whoever.$_{MSG\cdot NOM}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room
'They greeted whoever entered the room.'

Free relatives do not show such case matching effects on all occasions, however. Declinable Nominal Free Relative pronouns can sometimes get their case depending on either the grammatical function they ful l within the Free Relative clause or the grammatical function the free Relative clause ful ls in the main clause. This seems possible only when the FRC precedes the main clause in which case (assuming VSO as the basic word order) it functions as a topicalised element, as in examples (199) to (202). Further evidence that a fronted free relative is in topicalised position, comes from the obligatoriness of the doubling clitic as in (202).The relative clause case requirement option is unavailable if the free relative follows the main clause, as shown previously in (197), and (198) and the nominal free relative pronoun gets its case from the matrix clause requirements. This observation has been traditionally referred to as an example of forward attraction of case (Tzartzanos, 1963, 169-170).

(199) **Ópjon bike stin ethusa ton heretisan.**
whoever.$_{MSG\cdot ACC}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room him.$_{MSG\cdot ACC}$ greeted.$_{3PL}$
'whoever entered the room, they greeted him.'

(200) **Ópjos bike stin ethusa ton heretisan.**
whoever.$_{MSG\cdot NOM}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room him.$_{MSG\cdot ACC}$ greeted.$_{3PL}$
'whoever entered the room, they greeted him.'

(201) **Ópjon bike stin ethusa ø heretisan.**
whoever.$_{MSG\cdot ACC}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room greeted.$_{3PL}$
'whoever entered the room, they greeted him.' (intended meaning)

(202) *** Ópjos bike stin ethusa ø heretisan.**
whoever.$_{MSG\cdot NOM}$ entered.$_{3SG}$ to the.$_{FSG\cdot ACC}$ room greeted.$_{3PL}$
'whoever entered the room, they greeted him.' (intended meaning)

C. Ósos: *Ósos - ósi - óso* (as much as) is another relative pronoun introducing nominal free relative clauses. It is obligatory and declinable for case, gender and number, according to the declension paradigm in Table (3.3):

Number	Case	Gender		
		MASC	FEM	NEUT
Singular	NOM	ósos	ósi	óso
	GEN	ósu	ósis	ósu
	ACC	óso	ósi	óso
Plural	NOM	ósi	óses	ósa
	GEN	óson	óson	óson
	ACC	ósus	óses	ósa

Table 3.3: Declension table of the free relative pronoun *ósos, ósi, óso*

Ósos, like *ópjos*, is ful lling two dependencies at the same time: it lls in a thematic role in the matrix clause and a thematic role in the free relative clause at the same time. Like *ópjos*, when the *ósos*-free relative follows the matrix verb, it can only take its case from the requirements of the matrix verb, as in (203). When the free relative clause is topicalized, and the doubling clitic is present, both options are made available and the free relative pronoun may agree with the requirements of either the matrix or the relative clause as shown in (204) and (205).

(203) *** Kerasa osi irthan sti giorti**
treated.$_{1SG}$ as many as.$_{MPL\cdot NOM}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$
mu.
my.$_{GEN}$
'I treated those that attended my celebration.' (intended meaning)

(204) **Kerasa osus irthan sti giorti mu.**
treated.$_{1SG}$ as many as.$_{MPL\cdot ACC}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
'I treated those that attended my celebration.'

(205) **Ósi irthan sti giorti mu**
as many as.$_{MPL\cdot NOM}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
tus kerasa.
them.$_{MPL\cdot ACC}$ treated.$_{1SG}$
'Those that came to my celebration, I treated (them).'

(206) **Ósus irthan sti giorti mu**
as many as.$_{MPL\cdot ACC}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
tus kerasa.
them.$_{MPL\cdot ACC}$ treated.$_{1SG}$
'Those that came to my celebration, I treated (them).'

(207) ***Ósi irthan sti GIORTI mu ø**
as many as.$_{MPL\cdot NOM}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
kerasa.
treated.$_{1SG}$
'Those that came to my celebration, I treated (them).'

(208) **Ósus irthan sti GIORTI mu ø**
as many as.$_{MPL\cdot ACC}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
kerasa.
treated.$_{1SG}$
'Those that came to my celebration, I treated (them).'

Like *ópjos* and *ó,ti*, the presence of *ósos* is obligatory in free relatives, as shown by the ungrammaticality of (209):

(209) ***Kerasa ø irthan sti giorti mu.**
treated.$_{1SG}$ came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$
'I treated those that attended my celebration.' (intended meaning)

(210) ***ø irthan sti giorti mu tus kerasa.**
came.$_{3PL}$ to the.$_{FSG\cdot ACC}$ celebration.$_{FSG\cdot ACC}$ my.$_{GEN}$ them.$_{MSG\cdot ACC}$ treated.$_{1SG}$
'Those that attended my celebration, I treated them.' (intended meaning)

Ósos usually co-occurs with *tósos - tósi - tóso* [= that much as] in the matrix clause, as in (211). *ósos ... tósos* means an equal quantity of referents involved in the matrix and the free relative clause.

(211) **Ósi bikan, tosi vgikan.**
as many as.$_{MPL\cdot NOM}$ entered.$_{3PL}$ as many as.$_{MPL\cdot NOM}$ exited.$_{3PL}$
'As many entered, those exited.'

Adverbial Free Relative Clauses Adverbial free relative clauses are introduced by relative pronouns such as *ópu* (=wherever) and *ópote*(=whenever), examples of which are provided in (212) and (213):

(212) **Emine opu ihe ftinotero niki.**
stayed.$_{3SG}$ wherever had.$_{3SG}$ cheaper rent
'He stayed wherever the rent was cheaper.'

(213) **Efere tin paragelia opote borese.**
brought.$_{3SG}$ the.$_{FSG\cdot ACC}$ order.$_{FSG\cdot ACC}$ whenever could.$_{3SG}$
'He brought the order whenever he could.'

Adverbial free relative pronouns are obligatory as shown in (214) and (215) and, like adverbs, indeclinable for gender number and case.

(214) *** Emine ø ihe ftinotero niki.**
stayed.$_{3SG}$ had.$_{3SG}$ cheaper rent
'He stayed wherever the rent was cheaper.' (intended meaning)

(215) *** Efere tin paragelia ø borese.**
brought.$_{3SG}$ the.$_{FSG\cdot ACC}$ order.$_{FSG\cdot ACC}$ could.$_{3SG}$
'He brought the order whenever he could.' (intended meaning)

Like nominal free relative clauses their internal structure is quite xed as shown by the ungrammaticality of (216) and (217):

(216) *** Emine opu ftinotero niki ihe.**
stayed.$_{3SG}$ wherever cheaper rent had.$_{3SG}$
'He stayed wherever the rent was cheaper.' (intended meaning)

(217) *** Emine ftinotero niki opu ihe.**
stayed.$_{3SG}$ cheaper rent wherever had.$_{3SG}$
'He stayed wherever the rent was cheaper.' (intended meaning)

Since they function as adverbial elements, they occur where adverbs are expected to appear; they can follow or precede the matrix clause as in (218) and (219):

(218) **Efere tin paragelia opote borese.**
brought.$_{3SG}$ the.$_{FSG\cdot ACC}$ order.$_{FSG\cdot ACC}$ whenever could.$_{3SG}$
'He brought the order whenever he could.'

(219) **Opote borese efere tin paragelia.**
whenever could.$_{3SG}$ brought.$_{3SG}$ the.$_{FSG\cdot ACC}$ order.$_{FSG\cdot ACC}$
'He brought the order whenever he could.'

Like nominal free relative pronouns, they can appear with *-dipote* (ever) as their second compound, forming inde nite adverbial free relative pronouns like *opudipote* and *opotedipote* as in (220) and (221) below:

(220) **Rotise opudipote borese.**
asked.$_{3SG}$ wherever could.$_{3SG}$
'He asked wherever he could.'

(221) **Efere tin paragelia opotedipote borese.**
brought.$_{3SG}$ the.$_{FSG\cdot ACC}$ order.$_{FSG\cdot ACC}$ whenever could.$_{3SG}$
'He brought the order whenever he could.'

Summary

In this section, we presented a more detailed overview of the data on Modern Greek Relative Clauses. We discussed issues such as their internal structure, the type of antecedent and their relationshp with the matrix clause and observed that all three types of relative clauses share a lot of similar properties. For example, they are all introduced by an appropriate obligatory complementizer or relative pronoun, they all have an internal relatively xed structure and they are involved in two types of dependencies one within Relative Clause and one with an antecedent or a place in the matrix clause.

However, not all take the same type of antecedent; restrictives and non-restrictives have an overt antecedent which they modify whereas free relative clauses do not; it seems that this role is taken by the free relative pronoun which ful ls both dependencies at the same time. before discussing how we approached these characteristics in our analysis of Modern Greek Relatives, we are going to explore the resumption strategy in these constructions. We hope that a careful consideration of the distribution of the resumptive and gap strategy will shed some light on the properties of Relative Clauses and how they are related to each other.

In the section that follows, we present an overview of resumptive pronouns in

Modern Greek Relative Pronouns. We first discuss some issues on their properties compared to other enclitic forms, such as doubling clitics, as well as their relationship with the gap strategy. We will add to that a discussion of the relativisation strategies and the distribution of the gap and resumption strategies in restrictive, non-restrictive and free relative clauses.

3.3 Modern Greek Resumptive Pronouns

3.3.1 Overview of the data

Greek resumptive pronouns have the form of the unstressed monosyllable clitic forms, the weak form of the personal pronoun, as illustrated in (222). As clitics, they are declinable according to the paradigm presented in Table (3.4).

(222) a. **To koritsi pu tu edoses ta luludia**
the.$_{NSG\cdot NOM}$ girl.$_{NSG\cdot NOM}$ that CL.$_{NSG\cdot GEN}$ gave.$_{2SG}$ the.$_{NPL\cdot ACC}$ owers.$_{NPL\cdot ACC}$
ine kala.
is.$_{3SG}$ well.
'The girl that you gave the flowers to is fine.'

b. **Ta luludia ta opía ta/ø edose**
the.$_{NPL\cdot NOM}$ owers.$_{FSG\cdot NOM}$ the.$_{NPL\cdot ACC}$ who.$_{NPL\cdot ACC}$ them.$_{NSG\cdot ACC}$ gave.$_{3SG}$
i kopela sto Yianni ine freska.
the.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ to.the.$_{MSG\cdot ACC}$ John is.$_{3PL}$ fresh.$_{NPL\cdot NOM}$
'The flowers (that) the girl gave to John are fresh.'

		1st pers	2nd pers	3rd person		
Singular	Nom	–	–	(tos)	(ti)	(to)
	Gen	me	se	ton	ti(n)	to
	Acc	mu	su	tu	tis	to
Plural	Acc	mas	sas	tus	tis	ta
	Gen	mas	sas	tus	tis	ta

Table 3.4: Declension table of the Modern Greek resumptive pronoun (Tzartzanos, 1943, 131)

Note that the nominative case form of the clitics is reserved for special uses only, in certain expressions following *na* and *pu'n'* as in *pu'n'tos?* [=where is he?] and *na tos!* [=there he is!] (Tzartzanos (1943, 130: §130), Mackridge (1985, 221) Joseph (1980), Joseph and Philippaki-Warburton (1987, 214-215), Lascaratou (1989, 169)). Since resumptive pronouns are just ordinary clitics, as will be further pointed out in the following section, this observation also applies to resumptive pronouns.

The position of the resumptive pronoun is relatively fixed: it normally precedes the verb and follows the relativizer, following the order in (223):

(223) COMPLEMENTIZER OR RELPRON + (RESUMPTIVE PRONOUN) + VERB + ...

Here are some examples:

(224) a. **To koritsi pu tu edoses ta luludia**
the.$_{NSG\cdot NOM}$ girl.$_{NSG\cdot NOM}$ that him.$_{NSG\cdot GEN}$ gave.$_{2SG}$ the.$_{NPL\cdot ACC}$ owers.$_{NPL\cdot ACC}$
ine kala.
is.$_{3SG}$ well
'The girl that you gave the flowers to is fine.'

b. **Ta luludia ta opía ta /ø edose**
the.$_{NPL\cdot NOM}$ owers.$_{FSG\cdot NOM}$ the.$_{NPL\cdot ACC}$ who.$_{NPL\cdot ACC}$ them.$_{NSG\cdot ACC}$ gave.$_{3SG}$
i kopela sto Yianni ine freska.
the.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ to.the.$_{MSG\cdot ACC}$ John is.$_{3PL}$ fresh.$_{NPL\cdot NOM}$
'The flowers (that) the girl gave to John are fresh.'

However, if a negative marker is present in the relative clause, the resumptive pronoun precedes the main verb and follows the negative marker, as illustrated in (225):

(225) a. COMPLEMENTIZER OR RELPRO + NEGATIVE MARKER + (RESUMPTIVE PRONOUN) + VERB + ...

b. **To koritsi pu den tu edoses ta**
the.$_{NSG\cdot NOM}$ girl.$_{NSG\cdot NOM}$ that him.$_{NSG\cdot GEN}$ not gave.$_{2SG}$ the.$_{NPL\cdot ACC}$
luludia ine kala.
owers.$_{NPL\cdot ACC}$ is.$_{3SG}$ well
'The girl that you didn't give the flowers to is fine.'

c. **Ta luludia ta opía den ta / ø**
the.$_{NPL\cdot NOM}$ owers.$_{FSG\cdot NOM}$ the.$_{NPL\cdot ACC}$ who.$_{NPL\cdot ACC}$ not them.$_{NSG\cdot ACC}$
edose i kopela sto Yianni ine freska.
gave.$_{3PL}$ the.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ to.the.$_{MSG\cdot ACC}$ John is.$_{3PL}$ fresh.$_{NPL\cdot NOM}$
'The flowers (that) the girl didn't give to John are fresh.'

Still, in some Relative clauses, such as in *pu*-Restrictive Relatives in oblique relativised position, the resumptive pronoun precedes the negative marker and follows

the preposition, as shown in (226):

(226) **I kopela pu konta tis den ekatse o Yiannis**
the.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ that near her.$_{FSG\cdot GEN}$ not sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ John
ine omorfi.
is.$_{3SG}$ pretty.$_{FSG\cdot NOM}$
'The girl that John didn't sit next to is pretty.'

With respect to agreement relations, the resumptive pronoun agrees in gender and number with the modifying head if present or the free relative pronoun as in (227). It also gets its case from the grammatical function it ful ls within the relative clause, as shown in (228) and (229).

(227) **eklapse opjos andras tin akouse na mila gia**
cried.$_{3SG}$ whoever.$_{MSG\cdot NOM}$ man.$_{MSG\cdot NOM}$ her.$_{FSG\cdot ACC}$ heard.$_{3SG}$ to speak for
ti zoi tis.
the.$_{FSG\cdot ACC}$ life.$_{FSG\cdot ACC}$ her.$_{FSG\cdot GEN}$
'Whichever man heard her talk about her life cried.'

(228) **I kopela pu tis edoses ta luludia ine**
the.$_{FSG\cdot NOM}$ girl.$_{FSG\cdot NOM}$ that her.$_{FSG\cdot GEN}$ gave.$_{2SG}$ the.$_{NPL\cdot ACC}$ owers.$_{NPL\cdot ACC}$ is.$_{3SG}$
kala.
well
'The girl that you gave the flowers to is fine.'

(229) **to koritsi pu (to) agapai i mama**
the.$_{NSG\cdot NOM}$ girl.$_{NSG\cdot NOM}$ that it.$_{NSG\cdot ACC}$ love.$_{3SG}$ the.$_{FSG\cdot NOM}$ mother.$_{FSG\cdot NOM}$
tu eklapse
it.$_{NSG\cdot GEN}$ cried.$_{3SG}$
'The girl that her mother loves (her).'

3.3.2 On some of the properties of the Modern Greek Resumptive Pronouns

3.3.2.1 Resumptive Pronouns: special or ordinary pronouns?

An important property of resumptive pronouns is that they are usually the ordinary pronouns of the language, as McCloskey (2002, 192) suggests. Modern Greek func-

tions in line to this suggestion, although not all languages do[2]. In particular, Modern Greek Resumptive pronouns exhibit Asudeh (2004) s morphological consequences of this observation presented in (230):

(230) Resumptive pronoun languages do not have resumptive-speci c morphological paradigms.

(Asudeh, 2004, 111)

As was further elaborated in the previous section (3.3.1), resumptive pronouns have the ordinary form of the clitic form of personal pronouns. This property is better understood, if we compare (231a) to (231b).

(231) a. **i gata pu tis edosa to gala**
the.$_{\text{FSG·NOM}}$ cat.$_{\text{FSG·NOM}}$ that her.$_{\text{FSG·GEN}}$ gave.$_{\text{1SG}}$ the.$_{\text{NSG·ACC}}$ milk.$_{\text{NSG·ACC}}$
'the cat that I gave her the milk'

b. **tis edosa to gala**
her.$_{\text{FSG·GEN}}$ gave.$_{\text{1SG}}$ the.$_{\text{MSG·ACC}}$ milk.$_{\text{NSG·ACC}}$
'I gave her the milk'

The pronoun in (231a) is a resumptive pronoun, whereas the pronoun in (231b) is an ordinary clitic pronoun - it is apparent that both of them they have the same form. What is more, the syntactic distribution of resumptive pronouns is identical to that of the clitics: they immediately precede the verb.

This observation brings us to another issue relevant to the status of Greek resumptive pronouns: *are resumptive pronouns resumptive indeed or are they doubling clitics?*

[2]Not all languages behave according to McCloskey (2002) s claim. *Vata*, for instance, (Koopman, 1982) has special pronouns to denote resumption and *Kaqchikel* (Falk, 2002), a Mayan language, appears to have a resumptive that is not a pronoun.

3.3.2.2 Resumptive pronouns or doubling clitics?

Whether the clitic pronouns appearing in Modern Greek Relative Clauses should be treated as resumptive pronouns or doubling clitics has been an issue of great controversy in the Greek literature.

On the one hand, Alexiadou and Anagnostopoulou (2000, 54) have suggested that the pronoun appearing in relative clauses is a doubling clitic. In their *head-raising analysis of restrictive relatives* (see section 4.1.1.3 for an overview), they analyse the clitic as being a "member of a doubling con guration" (Alexiadou and Anagnostopoulou, 1996, 311) claiming that "resumptive clitic relatives result from Vergnaud-raising to [Spec, CP] with the input being a clitic-doubling structure" (Alexiadou and Anagnostopoulou, 1996, 309).

Their proposal has been challenged by Varlokosta and Kotzoglou (2003, 180) who argue that the clitic in relative clauses cannot be a doubling clitic, at least not in *pu*-Restrictive Relatives, since "the use of clitics in *pu*- Restrictive Relatives with inde nite head is more frequent than clitic doubling or dislocation of an inde nite head" and "clitics may also be used with relative heads which do not have the property of familiarity" (Varlokosta and Kotzoglou, 2003, 181) as in (232):

(232) **Su milusa gia ena pedi pu to gnorisa**
you.$_{GEN}$ talked.$_{1SG\cdot PAST}$ for a.$_{NSG\cdot ACC}$ kid.$_{NSG\cdot ACC}$ that CL.$_{NSG\cdot ACC}$ met.$_{1SG}$
'I talked to you about a boy that I met it'

(Varlokosta and Kotzoglou, 2003, 181, ex.28) (glosses adapted))

Based on this observation, they claim that "what should be proved in order for their proposal to be valid is that the subject structure with a clitic in pu-RRCs with an inde nite head is grammatical; which is not the case"(Varlokosta and Kotzoglou, 2003, 181).

We will further look into this issue by putting resumptive pronouns to the test, using Chao and Sells (1983) s criteria for true resumptive pronouns.

Chao and Sells (1983) propose three tests for the identi cation of true resumptive pronouns; we will rst refer to each criterion separately and illustrate its application to an English sentence. Then we will apply it to Greek resumptive pronouns and provide evidence in favour of the view that they are indeed true resumptive pronouns.

The rst criterion Chao and Sells (1983) propose is that if we bind "the pronoun by a quanti er that does not license a coreferential or e-type reading [...] such as every, each, or no" in an unbounded dependency, and and the output is grammatical, then the pronoun is a true resumptive pronoun. This is illustrated in (233) where the resumptive is not a true resumptive, since the output is ungrammatical:

(233) *I d like to review every book that Mary couldn t remember if she d read it before.

(Chao and Sells, 1983, 49, ex. 5c)

Now consider a similar example in Modern Greek:

(234) **tha ithela na katagrapso kathe vivlio**$_i$ **pu i Maria den**
would like.$_{1SG}$ to record.$_{1SG}$ every book.$_{NSG\cdot ACC}$ that the.$_{FSG\cdot NOM}$ Mary not
boruse na thimithi óti to$_i$ **ihe diavasi**
could.$_{3SG}$ to remember.$_{3SG}$ that CL.$_{NSG\cdot ACC}$ had.$_{3SG}$ read.PARTICIPLE
'I would like to record every book$_i$ that Mary could not remember that she had read it$_i$'

The fact that the clitic pronoun to is bound to *káthe vivlío* [= every book] provides evidence in favour of the argument that Greek clitics are true resumptive pronouns.

A second criterion they put forward is that resumptive pronouns "support a list-answer to a wh-question" (Asudeh, 2004, 109). Languages which do not have true resumptive pronouns do not provide the list-answer in a question like (235), as shown in (235a) and (235b):

(235) – Which of the linguists do you think that if Mary hires him then everyone will be happy?

a. – Chris.

b. – *Chris, Daniel or Bill.

(Sells, 1985, 13, ex.10b)

On the other hand, languages like Modern Greek where a list-answer is available are claimed to have true resumptive pronouns. In (236) below, both the list and the non-list answer are acceptable in Modern Greek:

(236) **– Pjós apo tus fitites pu tu milise**
which.$_{MSG\cdot NOM}$ of the.$_{MPL\cdot ACC}$ students.$_{MPL\cdot ACC}$ that him.$_{MSG\cdot GEN}$ talked.$_{3SG}$
htes i Maria tha ti voithisi na metakomisi?
yesterday the.$_{FSG\cdot NOM}$ Mary will her.$_{FSG\cdot ACC}$ help.$_{3SG}$ to move.$_{3SG}$?
'Which of the students that Maria spoke to them yesterday will help her move?'

a. **– i o Kostas i o Yannis**
or the.$_{MSG\cdot NOM}$ Kostas or the.$_{MSG\cdot NOM}$ Yannis
'either Kostas or Yannis'

b. **– o Kostas**
the.$_{MSG\cdot NOM}$ Kostas
'Kostas'

c. **– *o Kostas ke o Yannis**
the.$_{MSG\cdot NOM}$ Kostas and the.$_{MSG\cdot NOM}$ Yannis
'Kostas and Yannis'

Further to the wh-test, Chao and Sells (1983), suggest that a true resumptive pronoun appearing in a question with a pronoun in the unbounded dependency may have both a functional and an individual answer. In example (237) the pronoun used is not a true resumptive, since it "disallows the [...] functional reading and allows only the individual reading" (Asudeh, 2004, 110):

(237) – Which exam question does no professor even wonder if it will be tough enough?

a. *The one her students aced last year *(functional)*

b. Question 2A. *(individual)*

(Chao and Sells, 1983, 51, ex. 10a)

Modern Greek allows both the functional and the individual reading as illustrated in (238):

(238) **– Pjá erótisi den amfiváli kanénas kathigitís**
which.$_{\text{FSG·NOM}}$ question.$_{\text{FSG·NOM}}$ not doubt.$_{\text{3SG}}$ noone.$_{\text{MSG·NOM}}$ professor.$_{\text{MSG·NOM}}$
óti tha tin éhun apantísi sostá?
that will cl.3.$_{\text{FSG·ACC}}$ have.$_{\text{3PL}}$ answered.$_{\text{PARTICIPLE}}$ correctly
'Which question none of the professors doubts that they will have answered it correctly?'

a. **– afti pu i mathites tus den**
the.one.$_{\text{FSG·ACC}}$ that the.$_{\text{MPL·NOM}}$ students.$_{\text{MPL·NOM}}$ their.$_{\text{MPL·GEN}}$ not
apantisan perisi
answered.$_{\text{3PL}}$ last year
'The one that their students did not answer last year'(functional)

b. **– tin erotisi 2A**
the.$_{\text{FSG·ACC}}$ question.$_{\text{FSG·ACC}}$ 2A
'Question 2A (individual)'

In addition to Chao and Sells (1983) s tests, evidence in favour of treating clitics in Relative Clauses as resumptives comes from Sells (1987), who puts forward that "real resumptive pronouns as in Swedish or Hebrew do not show weak crossover effects" (Sells, 1987, 296). Modern Greek relative clauses with a clitic exhibit "absence of weak crossover effects" as Alexopoulou (2006, 26) observes, which is illustrated in (239):

(239) **o fititis pu tu$_i$ estile ta vivlia**
the.$_{\text{MSG·NOM}}$ student.$_{\text{MSG·NOM}}$ that him.$_{\text{MSG·GEN}}$ sent.$_{\text{3SG}}$ the.$_{\text{NPL·ACC}}$ books.$_{\text{NPL·ACC}}$
i daskala tu$_{i/j}$
the.$_{\text{MSG·NOM}}$ teacher.$_{\text{FSG·NOM}}$ his.$_{\text{MSG·GEN}}$
'the student that his teacher sent the books to'

(Alexopoulou, 2006, 26, ex.43)

Overall, based on the evidence from Chao and Sells (1983), Sells (1987), Alexopoulou and Keller (2002), Alexopoulou (2006) among others we have shown arguments in favour of treating Modern Greek Clitics in Relative clauses as resumptive pronouns.

3.3.2.3 Resumptive pronouns vs. gaps

One of the core issues in the treatment of resumptive pronouns is whether resumptive pronouns are alternative manifestations of a gap i.e. whether they should be analysed similarly to gaps, or whether the dependency between the resumptive and its binder should be analysed differently from a ller-gap dependency. Some scholars (Zaenen et al., 1981, Engdahl, 1985, Shlonsky, 1992, Kayne, 1994, Alexopoulou, 2006) have put forward arguments in favour of the former, whereas some others – such as McCloskey (1990, 2002), Sells (1985, 1987), Merchant (2001), Asudeh (2004) – have expressed arguments in favour of the latter. In this section, we will investigate the issue basing our claims on tests proposed in the literature.

Asudeh (2004) puts forward the criterion of *island sensitivity*. He suggests that resumptive pronouns occur freely in islands, or rather that "the dependency between a resumptive and its binder is island sensitive" (Asudeh, 2004, 127), whereas the gap is disallowed in the same environment. Here we will consider two of the island constructions in Modern Greek: the *wh-island* (240) and the *complex-NP island* (242):

(240) **Gnorisa mia gineka pu den ksero pjos tin pantreftike.**
met.$_{1SG}$ a.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that not know.$_{1SG}$ who.$_{MSG\cdot NOM}$ her.$_{FSG\cdot ACC}$ married.$_{1SG}$
'I met a woman that I do not know who married her.'

(241) ***Gnorisa mia gineka pu den ksero pjós ø pantreftike**
met.$_{1SG}$ a.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that not know.$_{1SG}$ who.$_{MSG\cdot NOM}$ married.$_{3SG}$

'I met a woman that I do not know who married her.'

(242) **afti ine mia glossa pu tha evgnomonusa**
this.FSG·NOM is.3SG a.FSG·NOM language.FSG·NOM that would be grateful to.1SG
ekinon pu tha ti miluse
the one.MSG·ACC that will her.FSG·ACC spoke.3SG
'This is a language I would be grateful to the one who would speak it.'

(243) ***afti ine mia glossa pu tha evgnomonusa**
this.FSG·NOM is.3SG a.FSG·NOM language.FSG·NOM that would be grateful to.1SG
ekinon pu tha ø miluse
the one.MSG·ACC that will spoke.3SG
'This is a language I would respect the one who would speak it.'

In both examples, the sentence with the gap is ungrammatical, which constitutes some first evidence in favour of a distinct treatment of resumptives and gaps.

Another argument put forward is based on evidence from weak crossover effects. According to McCloskey (1990, 236-237) there is a contrast between the dependency involving a gap and the dependency involving a resumptive, since the ungrammatical examples with a gap become ungrammatical with the presence of the resumptive pronoun.

Consider the following example of a weak crossover effect in Modern Greek:

(244) **o fititis pu tu$_i$ estile ta vivlia**
the.MSG·NOM student.MSG·NOM that him.MSG·GEN sent.3SG the.NPL·ACC books.NPL·ACC
i daskala tu$_{i/j}$
the.FSG·NOM teacher.FSG·NOM his.MSG·GEN
'the student that his teacher sent him the books'

(Alexopoulou, 2006, 26, ex. 43)

If the resumptive pronoun *tu* is removed, then the output is ungrammatical, as shown in (245):

(245) ***o fititis pu ø$_i$ estile ta vivlia i**
the.MSG·NOM student.MSG·NOM that sent.3SG the.NPL·ACC books.NPL·ACC the.FSG·NOM
daskala tu$_{i/j}$
teacher.FSG·NOM his.MSG·GEN
Intended meaning: 'the student that his teacher sent him the books'

Further to the above, (Zaenen et al., 1981, Sells, 1985, Engdahl, 1985) among others, have argued in favour of a common treatment of gaps and resumptives, based on evidence coming from *across-the-board extraction* (i.e. from all conjuncts) in a coordinate structure. In other words, if in a coordinate structure we can extract the resumptive pronoun out of all coordinated conjuncts, and the output is still grammatical, then this would provide evidence in favour of a common treatment of gaps and resumptives.

Let us now have a look at some Modern Greek data. In (246) a coordinated structure of *pu* Restrictive Relatives is demonstrated, where none of the resumptives is removed:

(246) **Na i gineka pu tis edosa nero alla pu**
Here the.$_{\text{FSG·NOM}}$ woman.$_{\text{FSG·NOM}}$ that her.$_{\text{FSG·GEN}}$ gave.$_{\text{1SG}}$ water.$_{\text{NSG·ACC}}$ but that
de thimame pjó ine to pedi pu ti
not remember.$_{\text{1SG}}$ which.$_{\text{NSG·NOM}}$ is.$_{\text{3SG}}$ the.$_{\text{NSG·NOM}}$ child.$_{\text{NSG·NOM}}$ that her.$_{\text{FSG·ACC}}$
filise
kissed.$_{\text{3SG}}$
'Here is the woman that I gave water to, but I do not remember who is the child that kissed her'

According to this criterion, it should be possible to replace both resumptives with a gap, and at the same time maintain the grammaticality of the sentence. This, however, is not the case in Modern Greek as shown in (247):

(247) ***Na i gineka pu ø edosa nero alla pu de**
Here the.$_{\text{FSG·NOM}}$ woman.$_{\text{FSG·NOM}}$ that gave.$_{\text{1SG}}$ water.$_{\text{NSG·ACC}}$ but that not
thimame pjó ine to pedi pu ø filise
remember.$_{\text{1SG}}$ which.$_{\text{NSG·NOM}}$ is.$_{\text{3SG}}$ the.$_{\text{NSG·NOM}}$ child.$_{\text{NSG·NOM}}$ that kissed.$_{\text{3SG}}$
'Here is the woman that I gave some water to, but I do not remember who is the child that kissed her' (intended meaning)

The sentence is ungrammatical even if we only extract one of the two conjuncts and allow a resumptive pronoun in the other, as is the case for Swedish according to

Engdahl (1985) and Williams (1978). Similar observations apply to Modern Greek (248),(249):

(248) ***Na i gineka pu ø edosa nero alla pu de**
Here the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that gave.$_{1SG}$ water.$_{NSG\cdot ACC}$ but that not
thimame pjó ine to pedi pu ti
remember.$_{1SG}$ which.$_{NSG\cdot NOM}$ is.$_{3SG}$ the.$_{NSG\cdot NOM}$ child.$_{NSG\cdot NOM}$ that her.$_{FSG\cdot ACC}$
filise
kissed.$_{3SG}$
Intended meaning: 'Here is the woman that I gave some water to, but I do not remember who is the child that kissed her'

(249) ***Na i gineka pu tis edosa nero alla pu**
Here the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that her.$_{FSG\cdot GEN}$ gave.$_{1SG}$ water.$_{NSG\cdot ACC}$ but that
de thimame pjó ine to pedi pu ø
not remember.$_{1SG}$ which.$_{NSG\cdot NOM}$ is.$_{3SG}$ the.$_{NSG\cdot NOM}$ child.$_{NSG\cdot NOM}$ that
filise
kissed.$_{3SG}$
Intended meaning: 'Here is the woman that I gave some water to, but I do not remember who is the child that kissed her'

In addition to the above, Engdahl (1985)suggests that if the resumptive pronoun licenses a parasitic gap, it would be considered as evidence in favour of their view that resumptive pronouns are spelled out gaps. Evidence from Modern Greek data, shows that parasitic gaps are not licensed as illustrated in (250):

(250) ***o mathitis pu den borusan i kathigites**
the.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ that not could.$_{3PL}$ the.$_{MPL\cdot NOM}$ professors.$_{MPL\cdot NOM}$
na tu$_i$ eksigisun óti ihe apovlithi horis na ø$_i$
to him.$_{MSG\cdot GEN}$ explain.$_{3PL}$ that had.$_{3SG}$ expelled.PARTICIPLE without to
kalesun sto grafio, to eskase.
call.$_{3PL}$ to the.$_{NSG\cdot ACC}$ of ce.$_{NSG\cdot ACC}$, it.$_{NSG\cdot ACC}$ run-away.$_{3SG}$
'The student that the professors could not explain that he had been expelled without calling him to the office, run away'

The same applies to parasitic gaps on adjuncts as in (251), although if the parasitic gap is licensed by a gap, the grammaticality of the sentence gets better (252):

(251) ***na ta vivlia pu ta$_i$ edose horis na ø$_i$**
here the.NPL·NOM books.NPL·NOM that them.NPL·ACC gave.3SG without to
diavasi
read.PART
'Here are the books that he gave without reading them.'

(252) a. **?na ta vivlia pu ø$_i$ edose horis na ø$_i$**
here the.NPL·NOM books.NPL·NOM that gave.3SG without to
diavasi
read.PARTICIPLE
'Here are the books that he gave without reading them.'

b. **na ta vivlia ta opia ø$_i$ edose horis**
here the.NPL·NOM books.NPL·NOM the.NPL·ACC who.NPL·ACC gave.3SG without
na øp_i diavási
to read.PARTICIPLE
'Here are the books that he gave(to someone) without reading them.'

Another argument put forward in Merchant (2001) in favour of a different treatment of gaps and resumptives, is that contrary to ller-gap dependencies, binder-resumptive dependencies exhibit what Asudeh (2004, 128) de nes as *form-identity effects*, such as case-marking. In other words, in the binder-resumptive dependency the binder cannot receive the case of the argument position of the resumptive, since this case is assigned to the resumptive pronoun. On the contrary, in the ller-gap dependency, the ller is understood as sharing its position with the gap, and will consequently receive the case of the gap, among others.

Modern Greek exhibits this distinct behaviour as illustrated in (253):

(253) a. **pjós itan o fititis pu tu edoses**
who.MSG·NOM was.3SG the.MSG·NOM student.MSG·NOM that him.MSG·GEN gave.2SG
hastuki?
slap?
'Who was the student you slapped?'

b. ***pjón itan o fititis pu tu edoses**
who.MSG·ACC was.3SG the.MSG·NOM student.MSG·NOM that him.MSG·GEN gave.2SG
hastuki?
slap?
Intended meaning: 'Who was the student you slapped?'

This argument is further reinforced by Mackridge (1985, 252) s observation of examples of ***anakolouthon***, where *pu* is used without a resumptive pronoun, something which creates possibilities of ambiguity. An example is illustrated in (254):

(254) **tus monus pu ø akuse o dikastis itan**
the.$_{MPL\cdot ACC}$ only.$_{MPL\cdot ACC}$ that heard.$_{3SG}$ the.$_{MSG\cdot NOM}$ judge.$_{MSG\cdot NOM}$ was.$_{3PL}$
i astinomiki [instead of *i moni*]
the.$_{MPL\cdot NOM}$ policemen.$_{MPL\cdot NOM}$ the.$_{MPL\cdot NOM}$ only.$_{MPL\cdot NOM}$
'The only ones that the judge listened to were the police officers.'

(Mackridge, 1985, 252, ex.21)

He suggests that in such constructions, "the antecedent, instead of the relative pronoun, indicates government by the verb of the relative clause or by a preposition which equally belongs to the relative clause" (Mackridge, 1985, 252). If the resumptive pronoun had been in the position of the gap, the example would be ungrammatical, as shown in (255):

(255) ***tus monus pu tus akuse o dikastis**
the.$_{MPL\cdot ACC}$ only.$_{MPL\cdot ACC}$ that them.$_{MPL\cdot ACC}$ heard.$_{3SG}$ the.$_{MSG\cdot NOM}$ judge.$_{MSG\cdot NOM}$
itan i astinomiki [instead of *i móni*]
were.$_{3PL}$ the.$_{MPL\cdot NOM}$ policemen.$_{MPL\cdot NOM}$ the.$_{MPL\cdot NOM}$ only.$_{MPL\cdot NOM}$
'The only ones that the judge listened to were the police officers.'

(Mackridge, 1985, 252, ex.21)

To conclude, it can be argued that the overwhelming majority of the test results suggests that gaps and resumptives in Modern Greek Relative Clauses are dissimilar and therefore it would be better if they were analysed in a different way, too.

3.4 Relativisation Strategies of MG RCs and distribution of gap and resumption strategies

Keenan and Comrie (1977) is one of the early works arguing for a cross-linguistic typology of the relativisation process. After a close examination of how relativisation works in various languages, they conclude that "the relativizability of certain positions is dependent on that of others" (Keenan and Comrie, 1977, 66), which is determined by the *accessibility hierarchy* (AH), shown in (256):

(256) **The Accessibility Hierarchy (Keenan and Comrie, 1977)**

S > DO > IO > OBL > GEN > OCOMP

S standing for subject, DO for direct object, IO for Indirect object, OBL for Oblique constituent, GEN for Constituents in genitive case, OCOMP for objects of comparison and > meaning that what comes to the left is more accessible (i.e. more easily relativised) than what follows.

What the hierarchy indicates is that if in a language relativisation on subject position[3] is possible, this will be easier compared to relativising on a direct object position, and that if available will be easier to relativise on compared to an indirect or oblique position and so on. It also implies that the harder to relativise positions, (i.e. the more oblique positions) will require some additional element to facilitate their processing.

Thus, languages may use different ways of encoding the relative clause construction, and could employ one or more of the following relativisation strategies (see Kroeger (2004, 174), Comrie and Kuteva (2005)):

- the *gap or extraction strategy*

[3]By *relativised positions* we refer to the thematic roles within the Relative Clause that the relative pronoun may occupy.

- the *pronoun retention or resumption strategy*
- the *relative pronoun strategy*
- the *non-reduction strategy*

A. The (filler-)gap or extraction strategy. This strategy is characterised by a missing or covert element in the relative clause and a relativised constituent regarded as " lling" in this empty position.

According to Keenan and Comrie (1977) and Comrie and Kuteva (2005), the gap strategy seems to be the preferred strategy for most languages when relativising on subjects. (257) shows an example of an English relative clause with an OBJect-gap:

(257) I met the teacher I admired ø when I was young.

B. The pronoun retention or resumption strategy. Here a pronoun, co-referent with the head noun is present in the relative clause to indicate the position relativised. These pronouns, are usually forms of the personal pronoun and they agree in number, gender and person with the head element in the matrix clause. If pronouns are marked for case in a language, then "the case marking of a pronoun will re ect the grammatical behaviour of the relativised function" (Kroeger, 2004, 177). An example of a Greek (Restrictive) Relative Clause with a resumptive pronoun is shown in (258):

(258) **Fonakse ton Yorgo, pu ton ide na vgeni apo to autokinito.**
yelled at.$_{3SG}$ the.$_{MSG\cdot ACC}$ George, that him.$_{MSG\cdot ACC}$ saw.$_{3SG}$ to get off of the car.
'She yelled at George, whom she saw getting off the car.'

C. The relative pronoun strategy. When this strategy is employed, relative clauses are introduced by a relative pronoun which ful lls a within relative clause relativised

position and which is quite often an anaphoric element. The resumption strategy is the overall preferred strategy employed when relativising on non-subject, more oblique positions (Comrie and Kuteva, 2005).

The relative pronoun is usually marked for case and its case indicates the role of the relative pronoun (and thereby of the head element) in the relative clause. In other words, the relative pronoun will be assigned the case of the within Relative Clause thematic Role. Relative pronouns are usually distinct from the personal pronouns of the language (Kroeger, 2004, McCloskey, 2002, Asudeh, 2004). It is worth mentioning, however, that just the presence of a relative pronoun introducing the relative clause is not enough to note it as an example of relativisation using the relative pronoun strategy.

As Comrie (1998) and Comrie and Kuteva (2005) suggest, the relative pronoun is assigned its case according to the role it ful lls in the relative clause as in (259) and does not need to agree in case with the head noun or role in the matrix clause. If this happens, as in (260), then the strategy used is not a relative pronoun strategy according to Comrie (1998, 61-62) and Comrie and Kuteva (2005, 4).

(259) **O mathitis ston opio edosa to klidi tha**
the.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ to the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ gave.$_{1SG}$ the key will
filaksi ta pragmata sou.
guard.$_{3SG}$ the things yours.
'The student whom I gave the key to will guard your belongings.'

(260) **Tha filaksi ta pragmata sou opjos tu edosa to**
will guard.$_{3SG}$ the things yours whoever.$_{MSG\cdot NOM}$ him.$_{MSG\cdot GEN}$ gave.$_{1SG}$ the
klidi.
key
'Whoever I have the key to, will guard your belongings.'

D. The non-reduction strategy. In languages that employ this strategy, the head noun appears as a full noun phrase within the relative clause. Comrie and Kuteva (2005) identify three subtypes of this strategy: the *correlative clauses*, the *internally*

headed relative clauses and the *paratactic relative clauses*.

In *correlative clauses*, "the head noun appears as a full- edged noun phrase in the relative clause and is taken up again by a pronominal or a non-pronominal element in the main clause" (Comrie and Kuteva, 2005).

In *internally headed relative clauses*, the head of the relative clause is a full noun phrase. Contrary to the pronoun retention strategy, however, the relative pronoun does not have an overt role in the main clause.

In *paratactic relative clauses*, the relative clause is again headed by a full nominal element; however, we can only tell where the relative ends and where the matrix clause starts by means of non-syntactic information (such as via rising intonation at clause boundaries or pauses), since the connection between the relative and the matrix clause seems very loose (Comrie and Kuteva, 2005, 6). Here is an example from English:

(261) The man just passed by us, he introduced me to the Chancellor of the University yesterday.

(Comrie and Kuteva, 2005, 6)

Modern Greek employs usually the gap, the pronoun retention (resumption) or relative pronoun strategy with a varied degree of acceptability, without excluding occurences of correlative clauses, internally headed relative clauses and paratactic relative clauses. Examples of some relativised sentences are in (262):

(262) gap strategy

O mathitis pu ø edosa to klidi tha filaksi ta pragmata sou.
the.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ that gave.$_{1SG}$ the key will guard.$_{3SG}$ the things yours

'The student that I gave the key to will guard your belongings.'

(263) pronoun retention (resumption) strategy

O mathitis pu tu edosa to klidi tha filaksi
the.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ that him.$_{MSG\cdot ACC}$ gave.$_{1SG}$ the key will guard.$_{3SG}$
ta pragmata sou.
the things yours.

'The student whom I gave the key to will guard your belongings.'

(264) relative pronoun strategy

O mathitis ston opio edosa to klidi tha
the.$_{MSG\cdot NOM}$ student.$_{MSG\cdot NOM}$ to the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ gave.$_{1SG}$ the key will
filaksi ta pragmata sou.
guard.$_{3SG}$ the things yours.

'The student whom I gave the key to will guard your belongings.'

Here, we will consider the relativisation strategies of Modern Greek Relative clauses focusing on the distribution of the gap and the pronoun retention (resumptive) strategy. We will refer to the distribution of the two strategies in restrictive, non-restrictive and free relative clauses and we will then make some more general observations overall. The distribution of gap and the resumptive strategies presented, were based on the grammaticality judgements of 15 informants, all native speakers of Modern Greek between 20 and 40 years old, permanent residents of Athens, Greece for at least the 5 past years. The collection of data of ine occurred by asking the participants to judge the grammaticality of a given set of sentences by lling in a questionnaire (sent by email) or via personal communication. Although the results were collected informally and the data was not analysed quantitatively, the distribution tables presented are based on that set of data. A more detailed description of the survey s results with tables and graphs is provided in the Appendix.

The distribution of the gap and the resumptive strategy seems to pattern in a similar way irrespective of the Grammatical function of the relative clause in the matrix clause for all three types of relative clauses (restrictive, non-restrictive and free). Table (3.5) presents the distribution of the two strategies in Modern Greek Restrictive Relative Clauses; Table (3.6) presents the distribution of the strategies in

Non-restrictive relative clauses and Table (3.7) in Free Relative Clauses.

Role of RC in Main Clause→		SUBJ		OBJ		OBJ2		OBL/OoP	
RC relativised position ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
pu	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	POSS	rp	rp	rp	rp	rp	rp	rp	rp
o opios	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	gp	gap/?rp	gp	gp/?rp	gp	gp/?rp	gp	gp/?rp
	OBL/OoP	gp	gp	gp	gp	gp	gp	gp	gp
	POSS	gp	gp	gp	gp	gp	gp	gp	gp

Table 3.5: Distribution of resumptive and gap strategies. Modern Greek Restrictive Relatives. *gp*: gap strategy, *rp*: resumptive pronoun strategy, *gp/rp*:either gap or resumptive strategy, *?*: acceptable for some speakers

Role of Relative in Matrix Clause→		SUBJ		OBJ		OBJ2		OBL/OoP	
Relative Clause relativised position ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
pu	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	POSS	rp	rp	rp	rp	rp	rp	rp	rp
o opios	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBL/OoP	gp	gp	gp	gp	gp	gp	gp	gp
	POSS	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp

Table 3.6: Distribution of resumptive and gap strategies. Modern Greek Non-Restrictive Relatives. *gp*: gap strategy, *rp*: resumptive pronoun strategy, *gp/rp*:either gap or resumptive strategy, *?*: acceptable for some speakers

Role of Relative in Matrix Clause→		SUBJ		OBJ		OBJ2		OBL/OoP	
Relative Clause relativised position ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
opjos	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	gp/rp	rp	gp/rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp

Table 3.7: Distribution of resumptive and gap strategies. Modern Greek Free Relatives. *gp*: gap strategy, *rp*: resumptive pronoun strategy, *gp/rp*:either gap or resumptive strategy, *?*: acceptable for some speakers

As seen from the distribution tables, for all three types of relative clauses, when the relative clause is in subject relativised position, the only strategy available is the gap strategy, as demonstrated in (265) to (269):

(265) pu-RRC in subject position

O Kostas agapai ti yineka pu ø / *tin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$
vrike ton papagalo.
found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Kostas loves the woman that found the parrot.'

(266) o opios-RRC in subject position

O Kostas agapai ti yineka o opia ø
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$
/ *tin vrike ton papagalo.
her.$_{FSG\cdot ACC}$ found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Kostas loves the woman that found the parrot.'

(267) pu-NRC in subject position

O Kostas agapai ti Sofia pu ø / *tin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a.$_{FSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$
vrike ton papagalo.
found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Kostas loves Sofia, who found the parrot.'

(268) o opios-NRC in subject position

O Kostas agapai ti Sofia i opia ø /
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ so a.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$
***tin vrike ton papagalo.**
her.$_{FSG\cdot ACC}$ found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Kostas loves Sofia, who found the parrot.'

(269) opjos-FRC in subject position

O Kostas agapai opjon ø / *tis agapai
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ whoever.$_{MSG\cdot NOM}$ her.$_{FSG\cdot ACC}$ loves.$_{3SG}$
ti Sofia.
the.$_{FSG\cdot ACC}$ So a

'Kostas loves whoever loves Sofia.'

This is possibly due to the fact that resumption is not available in this position, since there is no nominative form for the resumptive pronoun that could be used for the subject relativised position, as shown by the declension table of the resumptive pronoun in Table (3.4), reproduced here for convenience, as Table (3.8):

		1st pers	2nd pers	3rd person		
Singular	Nom	–	–	–	–	–
	Gen	me	se	ton	ti(n)	to
	Acc	mu	su	tu	tis	to
Plural	Acc	mas	sas	tus	tis	ta
	Gen	mas	sas	tus	tis	ta

Table 3.8: Declension table of the Modern Greek resumptive pronoun (Tzartzanos, 1943, 131, §80)

As we observe from Tables (3.5) and (3.6), there is a variation in the distribution of the gap and the resumption strategies in *pu* and *o opios* Non-Restrictive Relative Clauses. For *pu* Restrictives and Non-Restrictives, it seems that those relativised positions higher in the accessibility hierarchy favour the gap strategy (mainly the SUBJ and OBJ positions) whereas more oblique positions like Indirect Object (OBJ2), Oblique (Object of the Preposition / OoP) or Possessor (POSS) favour the resumptive pronoun strategy. Compare examples (270) to (276):

(270) pu-RRC in Subject position

O Kostas agapai ti yineka pu ø / *tin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$
vrike ton papagalo.
found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves the woman that found the parrot.'

(271) pu-RRC in OBJect position

O Kostas agapai ti yineka pu ø / *tin
the.MSG·NOM Kostas loves.3SG the.FSG·ACC woman.FSG·ACC that her.FSG·ACC
tsibise o papagalos.
bit.3SG the.MSG·NOM parrot.MSG·NOM
'Kostas loves the woman that the parrot bit.'

(272) pu-RRC in OBJ2 position

I Kiki edose to biskoto ston papagalo
the.FSG·NOM Kiki gave.3SG the.NSG·ACC biscuit.NSG·ACC to the.MSG·ACC parrot.MSG·ACC
pu ø / *ton tsibise ti Maria.
that him.MSG·ACC bit.3SG the.FSG·ACC Mary
'Kiki gave the biscuit to the parrot that bit Maria.'

(273) pu-RRC in OBL position

I yineka pu konta tis / *ø kathise o
the.FSG·NOM woman.FSG·NOM that near her.FSG·GEN sat.3SG the.MSG·NOM
Petros ine thia mu.
Peter is.3SG aunt my.GEN
'The woman that Peter was sitting next to is my aunt.'

(274) pu-NRC in SUBJ position

O Kostas agapai ti Sofia pu ø / *tin vrike
the.MSG·NOM Kostas loves.3SG the.FSG·ACC So a that her.FSG·ACC found.3SG
ton papagalo.
the.MSG·ACC parrot.MSG·ACC
'Kostas loves Sofia, who found the parrot.'

(275) pu-NRC in OBJ position

O Kostas agapai ti Sofia pu *ø / tin
the.MSG·NOM Kostas loves.3SG the.FSG·ACC So a.FSG·ACC that her.FSG·ACC
tsibise o papagalos.
bit.3SG the.MSG·NOM parrot.MSG·NOM
'Kostas loves Sofia, whom the parrot bit.'

(276) pu-NRC in OBL position

I Kiki edose to biskoto ston Ilia pu
the.FSG·NOM Kiki gave.3SG the.NSG·ACC biscuit.NSG·ACC to the.MSG·ACC Ilias that
tu / *ø harise i Eleni ena amaksi.
his.MSG·GEN gifted.3SG the.FSG·NOM Helen a car.

'Kiki gave the biscuit to Ilias whom Helen gave a car to.

O opios Restrictive and Non-Restrictive Relative Clauses overall show a preference for the gap strategy except for some positions like embedded Direct Object (OBJ) or Indirect Object (OBJ2), where the gap strategy can be alternated with the resumptive pronoun strategy, as shown in (277) to (280):

(277) o opios-RRC in SUBJ position

O Kostas agapai ti yineka i opia
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$
i Maria ipe oti ø / *tin vrike ton
the.$_{FSG\cdot NOM}$ Maria said.$_{3SG}$ that her.$_{FSG\cdot ACC}$ found.$_{3SG}$ the.$_{MSG\cdot ACC}$
papagalo.
parrot.$_{MSG\cdot ACC}$

'Kostas loves the woman whom Maria said that found the parrot.'

(278) o opios-RRC in OBJ position

O Kostas agapai ti yineka tin
the.$_{MSG\cdot NOM}$ Kostas.$_{MSG\cdot NOM}$ loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot ACC}$
opia i Maria ipe oti ø / tin tsibise o
who.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Maria said.$_{3SG}$ that her.$_{FSG\cdot ACC}$ bit.$_{3SG}$ the.$_{MSG\cdot NOM}$
papagalos.
parrot.$_{MSG\cdot NOM}$

'Kostas loves the woman whom Maria said that the parrot bit.'

(279) o opios-NRC in SUBJ position

O Kostas agapai ti Sofia i opia *tin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$ her.$_{FSG\cdot ACC}$
/ ø vrike ton papagalo.
found.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves Sofia, who found the parrot.'

(280) o opios-NRC in OBJ position - LDD

O Kostas agapai ti Sofia tin opia i
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$
Maria ipe oti tin / ø tsibise o papagalos.
Maria said.$_{3SG}$ that her.$_{FSG\cdot ACC}$ bit.$_{3SG}$ the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$

'Kostas loves Sofia whom Maria said that the parrot bit (her).'

It also seems that in the more oblique positions like the Oblique (OBL/OoP) or Possessive (POSS) the resumptive pronoun strategy becomes unavailable again:

(281) pu -RRC in OoP position

O Kostas agapai ti yineka konta ston
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ near to the.$_{FSG\cdot ACC}$
opia ø / *tis kathise o Petros.
who.$_{FSG\cdot ACC}$ her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter

'Kostas loves the woman next to whom Peter sat.'

(282) o opios-RRC in OoP position

O Petros kathise dipla sti yineka tis
the.$_{MSG\cdot NOM}$ Peter sat.$_{3SG}$ next to the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot GEN}$
opias i aderfi ø / *tis dulevi me ton
who.$_{FSG\cdot GEN}$ the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot ACC}$
Ilia.
Ilias

'Peter sat next to the woman whose sister works with Ilias.'

(283) pu-NRC in OoP position

O Kostas agapai ti Sofia stin opia
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$
i Kiki ø / *tis edose ton papagalo.
the.$_{FSG\cdot NOM}$ Kiki her.$_{FSG\cdot GEN}$ gave.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves Sofia, whom Kiki sent the parrot to.'

(284) o opios-NRC in OoP position

O Petros kathise dipla sti Sofia tis opias
the.$_{MSG\cdot NOM}$ Peter sat.$_{3SG}$ next to the.$_{FSG\cdot ACC}$ So a the.$_{FSG\cdot GEN}$ who.$_{FSG\cdot GEN}$
i aderfi ?tis / ø dulevi me ton Ilia.
the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Ilias

'Peter sat next to Sofia whose sister works with Ilias.'

This is most probably because the fronted PP has to stay at the top of the dependency, as close to the matrix clause as possible.

(285) o opios-RRC

i yineka tis opias i aderfi ø /
the.FSG·NOM woman.FSG·NOM the.FSG·GEN who.FSG·GEN the.FSG·NOM sister.FSG·NOM
***tis dulevi me ton Kosta ine thia mu.**
her.FSG·NOM works.3SG with the.MSG·ACC Kostas is aunt my.GEN
'The woman whose sister works with Kostas is my aunt.'

(286) o opios-NRC

i Sofia, tis opias i aderfi ?tis / ø
the.FSG·NOM So a the.FSG·GEN who.FSG·GEN the.FSG·NOM sister.FSG·NOM her.FSG·GEN
dulevi me ton Ilia, ine thia mu.
works.3SG with the.MSG·ACC Ilias is aunt my.GEN
'Sofia, whose sister works with Ilias, is my aunt.'

In *pu* relative clauses of OBJect relativised position, the choice of the gap or the resumptive strategy seems to be very important in determining whether the relative clause is restrictive or a non-restrictive. This occurs when the relative clause is in a non-embedded position (local dependency). If a resumptive pronoun is present then the *pu* relative clause gets non-restrictive meaning (288), whereas if a gap is present, the *pu* Relative clause gets the restrictive meaning (287).

(287) **i yineka pu *tin / ø tsibise o**
the.FSG·NOM woman.FSG·NOM that her.FSG·ACC bit.3SG the.MSG·NOM
papagalos ine thia mu.
parrot.MSG·NOM is aunt my.GEN
'The woman that the parrot bit is my aunt.'

(288) **i Sofia, pu *ø / tin tsibise o papagalos ine**
the.FSG·NOM So a, that her.FSG·ACC bit.3SG the.MSG·NOM parrot.MSG·NOM is
thia mu.
aunt my.GEN
'Sofia, whom th parrot bit, is my aunt.'

In Restrictive Relative clauses introduced by the complementizer *pu* the resumptive pronoun is obligatory in the more Oblique relativised positions such as OBJect (direct), OBL (oblique) (Indirect Object) or POSS(essive). In less oblique positions, it is alternated with the gap strategy, as seen in (289) to (293):

(289) pu-RRC in OBJect relativised position with a resumptive pronoun - local

O Kostas agapai ti yineka pu *ø / tin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that her.$_{FSG\cdot ACC}$
tsibise o papagalos.
bit.$_{3SG}$ the parrot.$_{MSG\cdot NOM}$

'Kostas loves the woman that the parrot bit.'

(290) pu-RRC in OBJect relativised position with a resumptive pronoun - LDD

O Kostas agapai ti yineka pu i Maria
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{FSG\cdot NOM}$ Maria
ipe oti ø / tin tsibise o papagalos.
said.$_{3SG}$ that her.$_{FSG\cdot ACC}$ bit.$_{3SG}$ the parrot.$_{MSG\cdot NOM}$

'Kostas loves the woman that Maria said that the parrot bit (her).'

(291) pu-RRC in Indirect Object (OBJ2) position

O Kostas agapai ti yineka pu i Kiki
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{FSG\cdot NOM}$ Kiki
tis / *ø edose ton papagalo.
her.$_{FSG\cdot GEN}$ gave.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves the woman that Kiki gave the parrot to.'

(292) pu-RRC as an Object of the Preposition

O Kostas agapai ti yineka pu konta tis /
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that close her.$_{FSG\cdot GEN}$
***ø kathise o Petros.**
sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter

'Kostas loves the woman that Peter sat next to.'

(293) pu-RRC in a POSS relativised position

O Kostas agapai ti yineka pu i aderfi
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{FSG\cdot NOM}$ sister
tis / *ø dulevi me ton Ilia.
her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot NOM}$ Ilia.

'Kostas loves the woman whose sister works with Ilias.'

In Restrictive Relatives introduced by the relative pronoun *o opios*, the gap strategy is available on all relativised positions. It is obligatory in Subject, Local Direct

Object (OBJ) and Local Indirect Object (OBJ2) relativised positions as well as in Oblique and Possessive relativised positions, as shown in examples (294) to (300):

(294) o opios RRC in Subject relativised position

O Kostas agapai ti yineka i opia ø
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ who.$_{FSG\cdot NOM}$
/ *tin vrike ton papagalo.
her.$_{FSG\cdot ACC}$ found.$_{3SG}$ the parrot
'Kostas loves the woman who found the parrot.'

(295) o opios RRC in Object relativised position

O Kostas agapai ti yineka tin opia ø
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$
/ *tin tsibise o papagalos.
her.$_{FSG\cdot ACC}$ bit.$_{3SG}$ the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$
'Kostas loves the woman whom the parrot bit.'

(296) o opios RRC in Object relativised position - LDD

O Kostas agapai ti yineka tin opia
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$
i Maria ipe oti ø / tin tsibise o papagalos.
the.$_{FSG\cdot NOM}$ Mary said.$_{3SG}$ that her.$_{FSG\cdot ACC}$ bit.$_{3SG}$ the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$
'Kostas loves the woman whom Maria said that the parrot bit.'

(297) o opios RRC in Indirect Object (OBJ2) relativised position

O Kostas agapai ti yineka stin opia
the.$_{MSG\cdot NOM}$ Kostas loves the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$
i Kiki ø / *tis edose ton papagalo.
the.$_{FSG\cdot NOM}$ Kiki her.$_{FSG\cdot GEN}$ gave.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Kostas loves the woman whom Kiki gave the parrot to.'

(298) o opios RRC in Indirect Object (OBJ2) relativised position - LDD

O Kostas agapai ti yineka stin opia
the.$_{MSG\cdot NOM}$ Kostas loves the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$
i Maria nomizi oti i Kiki ø / *tis edose
the.$_{FSG\cdot NOM}$ Maria thinks.$_{3SG}$ that the.$_{FSG\cdot NOM}$ Kiki her.$_{FSG\cdot GEN}$ gave.$_{3SG}$
ton papagalo.
the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves the woman whom Maria things that Kiki gave the parrot to.'

(299) o opios RRC in Oblique (Object of Preposition) relativised position

O Kostas agapai ti yineka konta stin
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ next to the.$_{FSG\cdot ACC}$
opia ø / *tis kathise o Petros
who.$_{FSG\cdot ACC}$ her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter

'Kostas loves the woman next to whom Peter sat.'

(300) o opios RRC in Possessive relativised position.

O Kostas agapai ti yineka tis opias
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ the.$_{FSG\cdot GEN}$ whose.$_{FSG\cdot GEN}$
i aderfi ø / *tis dulevi me ton Ilia.
the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Ilia

'Kostas loves the woman whose sister works with Ilias.'

In Non-Restrictive Relative Clauses introduced by the complementizer *pu*, the gap strategy is only available in the Subject relativised positions, as in (301) and (302):

(301) pu NRC in Subj position

O Kostas agapai ti Sofia pu ø / *tin vrike
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a that her.$_{FSG\cdot ACC}$ found.$_{3SG}$
ton papagalo.
the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

'Kostas loves Sofia, who found the parrot.'

(302) o opios NRC in Subj position

I Kiki edose to biskoto ston Ilia o opios
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ bisuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias the.$_{MSG\cdot NOM}$
ø / *ton tsibise ti Maria.
who.$_{MSG\cdot NOM}$ him.$_{MSG\cdot ACC}$ bit.$_{3SG}$ the.$_{FSG\cdot ACC}$ Mary

'Kiki gave the biscuit to Ilias, who bit Maria.'

The resumptive pronoun strategy is used in the rest of the relativised positions (OBJ, OBJ2, OBL, POSS) and is obligatorily (thus excluding the use of the gap strategy, as in (303) to (306):

(303) pu NRC in the (Direct) Object relativised position

I Kiki edose to biskoto ston Ilia, pu
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias, that
ton / *ø taise i Maria
him.$_{MSG\cdot ACC}$ fed.$_{3SG}$ the.$_{FSG\cdot NOM}$ Maria

'Kiki gave the biscuit to Ilias, whom Maria had fed.'

(304) pu NRC in the (Indirect) Object or Oblique positions

I Kiki edose to biskoto ston Ilia, pu
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias, that
tu / *ø harise i Eleni ena amaksi.
his.$_{MSG\cdot GEN}$ gifted.$_{3SG}$ the.$_{FSG\cdot NOM}$ Helen a car

'Kiki gave the biscuit to Ilias, to whom Helen gifted with a car.'

(305) pu NRC in the Oblique (Object of Preposition) relativised position

I Kiki edose to biskoto ston Ilia pu
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias that
konta tu / *ø kathotan o Petros.
near his.$_{MSG\cdot GEN}$ was sitting.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter

'Kiki gave the biscuit to Ilias, near whom Peter was sitting.'

(306) pu NRC in the POSS relatiised position

I Kiki edose to biskoto ston Ilia pu
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias that
i aderfi tu / *ø dulevi me tin Eleni.
the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ his.$_{MSG\cdot GEN}$ works.$_{3SG}$ with the.$_{FSG\cdot ACC}$ Helen

'Kiki gave the biscuit to Ilias, whose sister works with Eleni.'

o opios Non-Restrictive Relative Clauses are reported in the literature to demonstrate availability of the resumptive pronoun strategy only. However, for some speakers, in o opios NRCs, the gap strategy is sometimes available in embedded relativised positions, as shown in (307) to (311):

(307) o opios NRC in Subject relativised position

I Kiki edose to biskoto ston Ilia pu
the.FSG·NOM Kiki gave.3SG the.NSG·ACC biscuit.NSG·ACC to the.NSG·ACC Ilias that
i aderfi tu / *ø dulevi me tin Eleni.
the.FSG·NOM sister.FSG·NOM his.MSG·GEN works.3SG with the.FSG·ACC Helen.
'Kiki gave half the bisuit to Ilias whose sister works with Helen.'

(308) o opios NRC in Object relativised position

I Kiki edose to biskoto ston Ilia
the.FSG·NOM Kiki gave.3SG the.MSG·NOM biscuit.MSG·NOM to the.MSG·NOM Ilia
ton opio *ø / ton taise i Maria.
the.MSG·ACC who.MSG·ACC him.MSG·NOM fed.3SG the.NSG·NOM Mary
'Kiki gave the biscuit to Ilias whom Maria fed.'

(309) o opios NRC in Indirect Object or Oblique position

I Kiki edose to biskoto ston Ilia
the.FSG·NOM Kiki gave.3SG the.NSG·ACC biscuit.NSG·ACC to the.MSG·ACC Ilias
ston opio ø / *tu harise i Eleni ena
to the.MSG·ACC who.MSG·ACC his.MSG·GEN gifted.3SG the.FSG·NOM Helen a
amaksi.
car
'Kiki gave the biscuit to Ilias whom Helen gave a car to as a gift.'

(310) o opios NRC in Oblique (Object of Preposition) relativised position

O Petros kathise konta sti Sofia pano stin
the.MSG·NOM Peter sat.3SG next to the.MSG·ACC So a on to the.FSG·ACC
opia ø / *tis stirizete oli i epihirisi.
who.FSG·ACC her.FSG·GEN rely on.3SG all the.FSG·NOM business.FSG·NOM
'Peter sat next to Sofia whom the whole business relies on.'

(311) o opios NRC in POSS relativised position

O Kostas agapai ti Sofia, tis opias i
the.MSG·NOM Kostas loves.3SG the.FSG·ACC So a the.FSG·GEN who.FSG·GEN the.FSG·NOM
aderfi ø / *tis dulevi me ton Ilia
sister.FSG·NOM her.FSG·GEN works.3SG with the.MSG·ACC Ilias
'Kostas loves Sofia, whose sister works with Ilias.'

In the Direct (OBJ) and the Indirect (OBJ2) Object relativised positions, the resumptive pronoun strategy is also available in the embedded positions:

(312) o opios NRC in OBJ position - LDD

I Kiki edose to biskoto ston Ilia ton
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilia the.$_{MSG\cdot ACC}$
opio i Eleni ipe oti ton / ø taise i
who.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Helen said.$_{3SG}$ that him.$_{MSG\cdot ACC}$ fed.$_{3SG}$ the.$_{FSG\cdot NOM}$
Maria.
Mary.

'Kiki gave the biscuit to Ilias whom Helen said that Mary fed him.'

(313) o opios NRC in OBJ2 position - LDD

I Kiki edose to biskoto ston Ilia
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias
ston opio i Maria nomizi oti ø / tu
to the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Maria thinks.$_{3SG}$ that him.$_{MSG\cdot ACC}$
harise i Eleni ena amaksi.
gifted.$_{3SG}$ the.$_{FSG\cdot NOM}$ Helen a car

'Kiki gave a biscuit to Ilias to whom Mary thinks that Helen gave him a car as a gift.'

In the POSS relativised positions, the resumptive pronoun strategy is also sometimes available in the embedded positions, as in (314); however, the acceptability of these sentences is not the same for all speakers.

(314) o opios NRC in POSS position

I Kiki edose to biskoto ston Ilia
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias
tu opiu i aderfi ø / *tu dulevi me
the.$_{MSG\cdot GEN}$ who.$_{MSG\cdot GEN}$ the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ his.$_{MSG\cdot GEN}$ works.$_{3SG}$ with
tin Eleni.
the.$_{FSG\cdot ACC}$ Helen

'Kiki gave the biscuit to Ilias whose sister works with Helen.'

(315) o opios NRC in POSS position - LDD

I Kiki edose to biskoto ston Ilia
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias
tu opiu i Maria pistevi oti i
the.$_{MSG\cdot GEN}$ who.$_{MSG\cdot GEN}$ the.$_{FSG\cdot NOM}$ Mary believes.$_{3SG}$ that the.$_{FSG\cdot NOM}$

aderfi tu / ø dulevi me tin Eleni.
sister.$_{FSG\cdot NOM}$ his.$_{MSG\cdot GEN}$ works.$_{3SG}$ with the.$_{FSG\cdot ACC}$ Helen
'Kiki gave the biscuit to Ilias whose sister Mary believes to work with Helen.'

In Oblique (OBL/OoP) relativised position, the preposition follows the complementizer *pu* but precedes the relative pronoun *o opios*.

(316) pu RRC in OoP position

I Kiki edose to biskoto sti yineka
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$
pu konta tis / *ø kathotan o Petros.
that near her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter
'Kiki gave the biscuit to the woman that Peter was sitting next to.'

(317) o opios RRC in OoP position

I Kiki edose to biskoto sti yineka
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$
konta stin opia ø / *tis kathotan o Petros.
next to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter
'Kiki gave the biscuit to the woman next to whom Peter was sitting.'

(318) pu NRC in OoP position

I Kiki edose to biskoto ston Ilia pu
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias that
konta tu / *ø kathotan o Petros.
near him.$_{MSG\cdot ACC}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter
'Kiki gave the biscuit to Ilias, next to whom Peter was sitting.'

(319) o opios NRC in OoP position

I Kiki edose to biskoto ston Ilia konta
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to the.$_{MSG\cdot ACC}$ Ilias next
ston opio ø / *tu kathotan o Petros.
to the.$_{MSG\cdot ACC}$ who.$_{MSG\cdot ACC}$ him.$_{MSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter
'Kiki gave the biscuit to Ilias, near whom Peter was sitting.'

When the relative clause is embedded, the preposition in the *o opios* Relative Clause should remain at the top of the dependency, as in (320) and (321):

(320) o opios RRC in OoP position - LDD

i yineka konta stin opia i Maria
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ next to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Maria
ipe oti ø / *tis kathise o Petros ine thia mu.
said.$_{3SG}$ that her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter is aunt my.$_{GEN}$
'The woman next to whom Maria said that Peter was sitting is my aunt.'

(321) o opios RRC in OoP position - LDD

O Petros kathise konta sti yineka pano
the.$_{MSG\cdot NOM}$ Peter sat.$_{3SG}$ next to the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ on
stin opia i Maria ipe oti ø / *tis
to the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Maria said.$_{3SG}$ that her.$_{FSG\cdot GEN}$
stirizete i epihirisi.
rely on.$_{3SG}$ the.$_{FSG\cdot NOM}$ company.$_{FSG\cdot NOM}$
'Peter sat next to the woman whom Maria said that the company relies on.'

The preposition in *pu* relative clauses, however, occurs in situ as in (322):

(322) pu-RRC in OoP position - LDD

i yineka pu i Maria ipe oti konta
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that the.$_{FSG\cdot NOM}$ Maria.$_{FSG\cdot NOM}$ said.$_{3SG}$ that near
tis / *ø kathise o Petros ine thia mu.
her.$_{FSG\cdot GEN}$ sat.$_{3SG}$ the.$_{MSG\cdot NOM}$ Peter is aunt my.$_{GEN}$
'The woman that Maria said that Peter sat next to is my aunt.'

Similar behaviour is shown from the possessive phrase when the relativised clause is in possessive relativised position: the possessive phrase in *pu* relative clause may occur at the bottom of the long-distance dependency, as shown in (323) and (324), whereas in *o opios* relative clauses the possessive phrase may occur only at the top of the dependency, as in (325) and (326).

(323) pu RRC in POSS position - local

i yineka pu i aderfi tis / *ø
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$ her.$_{FSG\cdot GEN}$
dulevi me ton Kosta ine thia mu.
works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Kostas is aunt my.$_{GEN}$

'The woman whose sister works with Kostas is my aunt.'

(324) pu NRC in POSS position - LDD

i yineka pu i Maria ipe oti i
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that the.$_{FSG\cdot NOM}$ Maria said.$_{3SG}$ that the.$_{FSG\cdot NOM}$
aderfi tis / *ø dulevi me ton Kosta ine thia
sister.$_{FSG\cdot NOM}$ her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{FSG\cdot ACC}$ Kosta is aunt
mu.
my.$_{GEN}$

'The woman Mary said that her sister works with Kostas is my aunt.'

(325) o opios RRC in POSS position - local

i yineka tis opias i aderfi ø /
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{FSG\cdot GEN}$ whose.$_{FSG\cdot GEN}$ the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$
***tis dulevi me ton Kosta ine thia mu.**
her.$_{FSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Kosta is aunt my.$_{GEN}$

'The woman whose sister works with Kostas is my aunt.'

(326) o opios NRC in POSS position - LDD

i yineka tis opias i aderfi ø /
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$
***tis i Maria ipe oti dulevi me ton Kosta**
her.$_{FSG\cdot GEN}$ the.$_{FSG\cdot NOM}$ Maria said.$_{3SG}$ that works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Kosta
ine thia mu.
is aunt my.$_{GEN}$

'The woman whose sister Maria said that works with Kostas is my aunt.'

The distribution of the gap and the resumption strategies in *nominal* Free Relative Clauses is similar to the distribution of restrictive relatives introduced by the complementizer *pu*. Compare (328) which shows a pu-Restrictive relative clause and (327) which shows an *opjos* nominal restrictive relative clause:

(327) **O Kostas agapai opjon i Kiki *ø / tu**
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Kiki his.$_{MSG\cdot GEN}$
edose enan papagalo.
gave.$_{3SG}$ a parrot
'Kostas loves whomever Kiki gave a parrot to.'

(328) **O Kostas agapai ti yineka pu i Kiki**
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$ that the.$_{FSG\cdot NOM}$ Kiki
tis / *ø edose ton papagalo
her.$_{FSG\cdot GEN}$ gave.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot
'Kostas loves the woman that Kiki gave her the parrot.'

In (nominal) free relative clauses introduced by *opjos* or *osos*, the resumptive pronoun strategy is available in the embedded OBJect and the OBJ2, OoP and POSS relativised positions as in examples (329) to (332). The resumptive pronoun strategy is obligatory in the more embedded positions. Since the relative pronoun takes matrix case by default, if a resumptive is available, it is preferred over the gap strategy, since it can ll in the missing argument positions.

(329) opjos FRC in OBJ position

O Kostas agapai opjon ø / *ton agapai
the.$_{MSG\cdot NOM}$ Kostas agapai.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ him.$_{NSG\cdot ACC}$ loves.$_{3SG}$
i Sofia.
the.$_{MSG\cdot NOM}$ So a

'Kostas loves whoever Sofia loves.'

(330) opjos FRC in OBJ2 position

O Kostas agapai opjon i Kiki *ø / tu
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ Kiki his.$_{MSG\cdot GEN}$
edose ena papagalo.
gave.$_{3SG}$ a papagalo

'Kostas loves whoever Kiki gave a parrot to'.

(331) opjos FRC in OoP position

O Kostas agapai opjon konta tu / *ø kathise
the.$_{MSG\cdot NOM}$ Kostas agapai.$_{3SG}$ whoever.$_{MSG\cdot NOM}$ near his.$_{MSG\cdot GEN}$ sat.$_{3SG}$
i Sofia.
the.$_{FSG\cdot NOM}$ So a

'Kostas loves whoever Sofia sat next to.'

(332) opjos FRC in POSS position

O Kostas agapai opjon i aderfi
the.$_{MSG\cdot NOM}$ Kostas loves.$_{3SG}$ whoever.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ sister.$_{FSG\cdot NOM}$
tu / *ø dulevi me ton Ilia.
his.$_{MSG\cdot GEN}$ works.$_{3SG}$ with the.$_{MSG\cdot ACC}$ Ilias

'Kostas loves whomever his sister works with Ilias.'

The gap strategy is available on the SUBJect position as well as the OBJ position both in local and long distance dependencies.

(333) opjos FRC in SUBJ position - local

I Kiki edose to biskoto se opjon ø /
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to whoever.$_{MSG\cdot ACC}$
***tin agapai ti Sofia.**
her.$_{FSG\cdot ACC}$ loves.$_{3SG}$ the.$_{FSG\cdot ACC}$ So a

'Kiki gave the biscuit to whoever loves Sofia.

(334) opjos FRC in OBJ position - local

I Kiki edose to biskoto se opjon ø /
the.$_{FSG\cdot NOM}$ Kiki gave.$_{3SG}$ the.$_{NSG\cdot ACC}$ biscuit.$_{NSG\cdot ACC}$ to whomever.$_{MSG\cdot ACC}$
***ton agapai i Sofia.**
him.$_{MSG\cdot ACC}$ loves.$_{3SG}$ the.$_{FSG\cdot NOM}$ So a

'Kiki gave the biscuit to whomever Sofia loves.'

Overall, we have seen that Modern Greek can relativise on all positions. In Modern Greek Relative Clauses, the gap strategy is the preferred strategy when relativising on subject position, whereas the resumption strategy seems to be more frequently used when relativising on more oblique positions such as Direct and Indirect Objects, Obliques or possessives.

The distribution of resumption and gap strategies in Modern Greek Relatives seems to reinforce Keenan and Comrie (1977) s accessibility hierarchy which proposes that "it is easier to relativise on subjects than it is to relativise on any of the other positions" and that "the pronoun retention [resumptive] strategy is preferred at the lower end of the hierarchy" i.e. the more oblique relativised positions.

Summary

In this chapter, we presented the data on Modern Greek Relative Clauses. We first discussed some issues on Modern Greek declarative clause structure that have been of quite controversial nature in the literature, such as whether there is an underlying or basic word order for Modern Greek and if so which one it is as well as the issue of whether this structure should be represented configurationally or not. On these we concluded that regarding the basic (underlying) word order, we will take VSO as the basic (underlying) word order, since the evidence provided in the literature matches our findings (i.e. that observation that when a free relative clause is fronted, a doubling clitic appears in the main clause. With regards to configurational vs. non-confurational representation of the language, we opted for a flat non-configurational account of the matrix declarative clause and for a more configurational representation of the internal structure of the Relative clauses. We thought that this was faithful to the data presented in this section, as matrix declarative sentences have a relatively free word order, whereas relative clauses have a more fixed one. It is worth noting, however, that the choice of representation or of underlying word order does not affect our LFG analysis, since the theory itself can quite easily accommodate either.

We then looked into the properties of Relative Clauses in more detail. We discussed about the types of antecedents relative clauses may take and the relative pronouns and/or complementizers they are introduced with. We observed that RRCs and NRCs are introduced by the same complementizer and relative pronoun and that free relative clauses can be nominal or adverbial. We also reported on their internal structure and identified similarities and differences in their properties, that we aim to capture in our analysis. Finally, we provided an overview of resumptive pronouns in Modern Greek Relative Clauses and discussed their distribution of the

gap and the resumption strategy in Restrictive, Non-restrictive and Free Relative Clauses.

The following chapter presents our analysis of resumption related phenomena in Modern Greek Relative Clauses, taking under consideration some of the data presented in this chapter. We first set the scene, by presenting analyses of Modern Greek Relative Clauses in the literature which follow other frameworks and try to account for some of the data presented in this chapter. We also give an overview of LFG approaches to Relative clauses for other languages and discuss whether they could be accommodated to match the Modern Greek Data. Finally, we present our LFG analysis of Modern Greek Relative Clauses with particular focus on the distribution of the gap and the resumptive strategy in them.

CHAPTER 4

Modern Greek Relative Clauses: Analysis

This chapter presents our analysis of resumption related phenomena in Modern Greek Relative Clauses, taking under consideration some of the data presented in this chapter. We first present some of the analyses of Modern Greek Relative Clauses in the literature which follow other frameworks and try to account for some of the data presented in chapter 3. We also give an overview of LFG approaches to Relative clauses for other languages and discuss whether they could be accommodated to match the Modern Greek Data. Finally, we present our LFG analysis of Modern Greek Relative Clauses with particular focus on the distribution of the gap and the resumptive strategy in them.

4.1 Analyses of Modern Greek Relative Clauses in the Literature

Restrictive Relative Clauses seem to have been the type of relative clauses to have received the main focus of attention from scholars working on Modern Greek. Joseph (1980) and Ingria (1981) are of the first works to present an analysis of Modern

Greek Restrictive Relative Clauses and argue for a deletion analysis, presented in 4.1.1.1. Other analyses presented include the *movement or operator analysis* (section 4.1.1.2), the *head-raising analysis* (section 4.1.1.3) and the *matching analysis* (section 4.1.1.4).

Some of the early work on Modern Greek non-restrictive relative clauses is presented in Stavrou (1983), who notes that restrictive and non-restrictive relative clauses are somewhat different. Alexopoulou (2006) is another more recent account of non-restrictive relatives, where she proposes the view that restrictive relative clauses involve quanti cation. In the same work she presents a head-internal account of free relative clauses, and Daskalaki (2005) provides additional data in support of the *complex DP analysis*. Espanol-Echevarría and Ralli (2000) s account is also presented, where they present an account for case mismatches in Greek nominal Free Relative Clauses. While case mismatching was not the focus of our analysis, we have included their approach since we to the best of our knowledge their analysis was one of the few around to account for such phenomena in Modern Greek Free Relative Clauses.

4.1.1 Restrictive Relative Clauses

4.1.1.1 The Deletion Analysis

The main assumption behind the deletion analysis, put forward by Joseph (1980), Klein (1993) and Ingria (1981) is that there is no movement involved in Restrictive Relative Clauses, since the target of relativisation is deleted after identity with the head of the RC" (Joseph, 1980, 237). As Papadopoulou (2002, 110) reports, rst the target of relativisation appears both in situ in the matrix clause and in the position of the relativised function inside the modifying clause, as in (335) below:

(335) **zografisan to koritsi pu agapas to koritsi**
draw.$_{3PL}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ that loves.$_{2SG}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$

'They made a picture of the girl that you love.'

Then "in order for the Relative Clause to be correctly interpreted as a predicate" the two elements are coindexed (Papadopoulou, 2002, 110), as in (336):

(336) **zografisan to koritsi$_i$ pu agapas to koritsi$_i$**
draw.$_{3PL}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ that loves.$_{2SG}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$
'They made a picture of the girl that you love.'

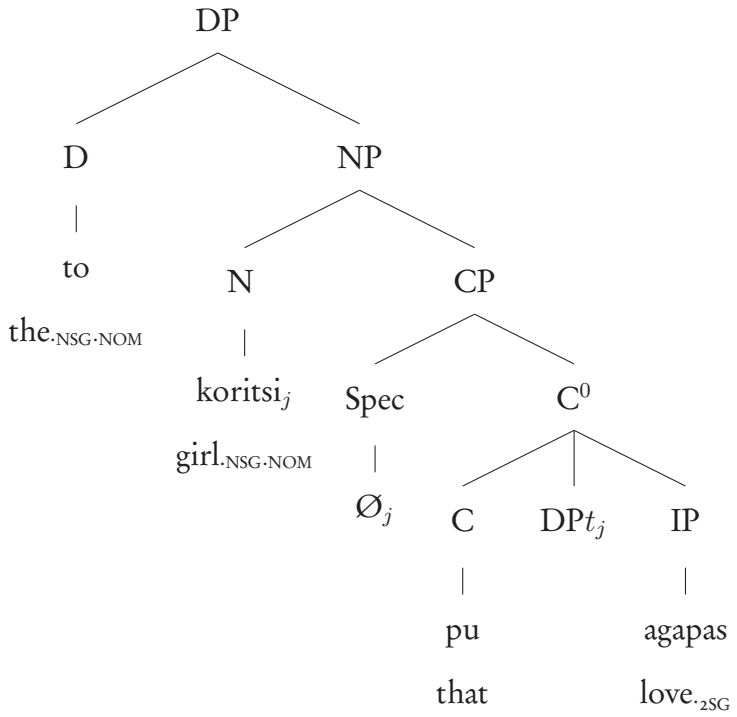
By application of the *Relative Deletion Rule* (Joseph, 1980, 238), also known as *Object Pronoun Deletion Rule* (Ingria, 1981, 164), the target of relativisation is deleted from its position in the modifying clause:

(337) **zografisan to koritsi$_i$ pu agapas ø**
draw.$_{3PL}$ the.$_{NSG\cdot ACC}$ girl.$_{NSG\cdot ACC}$ that loves.$_{2SG}$
'They made a picture of the girl that you love.'

4.1.1.2 The movement or 'operator' analysis

Treatments of this type assume an empty operator as the core mechanism behind the workings of restrictive relatives. This operator moves from its originating position inside the RRC to a [Spec,CP] position, something which is generally assumed for English that-clauses (Haegeman, 1991, Radford, 1988, Sa r, 1984). Varlokosta (1997, 1998, 1999) provides evidence in favour of a movement analysis of *pu*-RRCs. As shown in (338) below, she hypothesizes a null element which will move to the [Spec,CP] position, thus simultaneously functioning as both an empty operator Ø and the antecedent of the *t* trace (Papadopoulou, 2002, 113-114) (indicated in the example by the co-indexation on the operator and the DP trace).

(338)



The arguments Varlokosta (1997) puts forward in support of this analysis include data on the sensitivity of the *pu*-restrictive relative clauses, to subjacency violations based on research on the acquisition of the restrictive relative clauses in Modern Greek. Thus, her data suggest that (339) is ungrammatical:

(339) *** O anthropos$_j$ pu mas ekseplikse to gheghonos oti**
the.MSG·NOM man.MSG·NOM that us surprised.3SG the.NSG·NOM fact.NSG·NOM that
o Ghjiannis idhe e$_j$ ine plousios.
the.MSG·NOM John.NOM saw.3SG is rich.MSG·NOM
'The man that the fact that John saw surprised us is rich.'

(Ingria, 1979, 47)

Varlokosta (1997) offers additional evidence in support of the movement analysis: Modern Greek *pu*-restrictive relative clauses exhibit weak crossover effects (340) and license parasitic gaps (341).

(340) Weak CrossOver Effects

*** Sinantisa kapjon$_i$ pu$_i$ i aderfi tu$_i$ eghrapse**
met.1SG someone.MSG·ACC that the.FSG·NOM sister.FSG·NOM his wrote.3SG

ena spudheo vivlio mazi tu$_i$
an.$_{\text{NSG·ACC}}$ important.$_{\text{NSG·ACC}}$ book.$_{\text{NSG·ACC}}$ together his
'I met someone that his sister wrote an important book with.'

(341) Parasitic Gaps

*** Afta ine ta arthra**$_i$ **pu**$_i$ **archiothetisa e**$_i$ **horis**
these.$_{\text{NPL·NOM}}$ are the.$_{\text{NPL·NOM}}$ papers.$_{\text{NPL·NOM}}$ that led.$_{\text{1SG}}$ without
na dhiavaso e$_i$**.**
to read.$_{\text{1SG}}$
'These are the papers which I filed without reading.'

4.1.1.3 The head-raising analysis

Alexiadou and Anagnostopoulou (2000, 47), following Kayne (1994), observe the following asymmetry in Modern Greek restrictive relative clauses: "while direct object clitics in *pu*-relatives are sensitive to the inde niteness of the head, indirect object clitics are obligatory in these constructions regardless of the de niteness of the head". To account for this asymmetry, they propose a head-raising analysis of restrictive relative clauses, based on Kayne (1994) s theory of Antisymmetric Syntax.

Their analysis offers the advantage that contrary to the movement analysis it does not involve an operator to account for the *pu*-restrictive relative clauses. In particular, they adopt a structural analysis of restrictive relative clauses, which is based on the following two assumptions:

1. the de nite determiner that appears to precede the head of relative clause is external to the clause [the relative clause is the complement of the determiner]

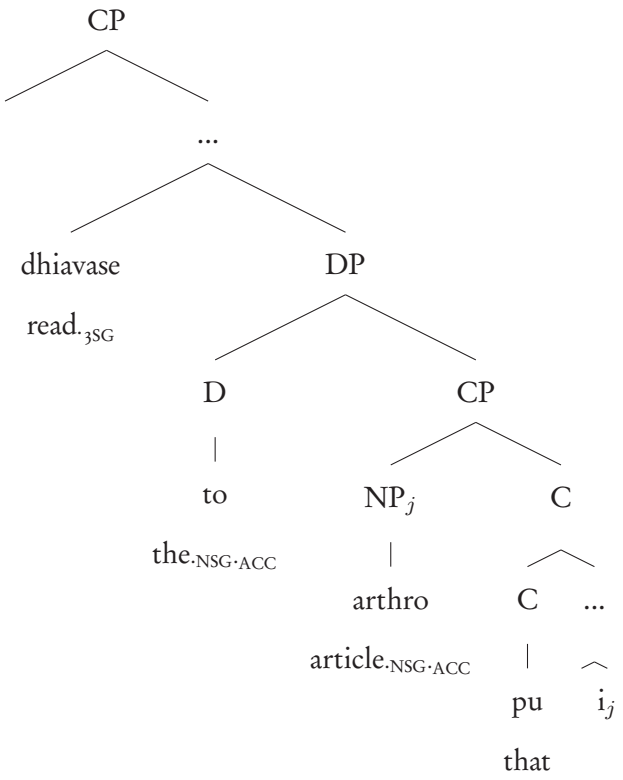
2. the phrase which raises to Spec CP in *pu*-RRCs is an NP and not a null-operator as in the standard analysis.

(Alexiadou and Anagnostopoulou, 2000, 51)

In other words, the head of the relative clause is analysed as originating inside the relative clause in the relativisation position. To account for the relativisation

process, they suggest that the head is raised [for which it was named head-raising analysis] to the Spec CP position, as illustrated in (342):

(342)



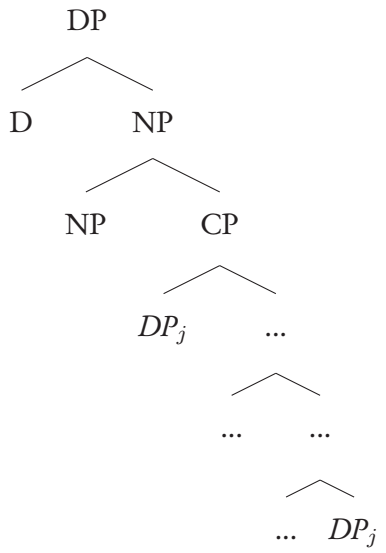
The head-raising analysis successfully accounts for issues of agreement between the head of the restrictive relative clause and of the relative clause and the relativisation position. Nevertheless, as Varlokosta and Kotzoglou (2003) suggest, this account has certain disadvantages. First of all, in this analysis the D and the NP do not form a constituent, which as they suggest results in a problematic account for the Modern Greek data. Secondly, it does not provide an explanation of the existence of double case-marking, when, that is, the head NP and the complementizer or relative pronoun have different case, as in (343):

(343) **Iothetisa to ghati pu tu ihan patisi**
adopted.1SG the.NSG·ACC cat.NSG·ACC that his.NSG·GEN have.3PL stepped on.PAST
tin ura.
the.FSG·ACC tail.FSG·ACC
'I adopted the cat that someone had stepped on its tail.'

4.1.1.4 The Matching analysis

The matching analysis, put forward by Varlokosta and Kotzoglou (2003) is one of the most recent accounts on *pu*-restrictive relative clauses. They observe that there are certain issues Varlokosta (1997) s operator and Alexiadou and Anagnostopoulou (2000) s head-raising analysis fail to successfully account for as well as an asymmetry between *pu*-restrictives with an object relativised position and *pu*-restrictives involving an indirect object position, in that the clitics are obligatory in the latter but not in the former. They put forward an analysis which combines characteristics from both the operator and the head-raising analysis: they use the general analysis of the operator analysis as well as having a full copy of the relativised position. This copy is raised in the [Spec,CP] position of the modifying clause and is matched on the relative head. This process is illustrated in (344) (example from Varlokosta and Kotzoglou (2003, 183)):

(344)



Varlokosta and Kotzoglou (2003) s analysis, unlike previous analyses, accounts for double-case marking of the DPs, since the DPs involved are two and therefore nothing prevents them from bearing an individual case. They also account for the issue of *reconstruction*: the position of the trace in the subordinate clause is not simply replaced by the trace of the operator, but rather with a non-phonetically

realised copy of the DP that has raised to the [Spec,CP] position.

However, their analysis fails to explain all facts. As they note, the matching analysis does not succeed in providing a satisfactory explanation of the reason behind the obligatoriness of the resumptive pronoun when the within-restrictive relative clause function is an oblique, as in (345):

(345) **Ida to pedi pu tu / *ø espasan to**
saw.$_{1SG}$ the.$_{NSG\cdot ACC}$ child.$_{NSG\cdot ACC}$ that his.$_{MSG\cdot GEN}$ broke.$_{3PL}$ the.$_{NSG\cdot ACC}$
podilato.
bike.$_{NSG\cdot ACC}$
'I saw the child whose bike they broke.'

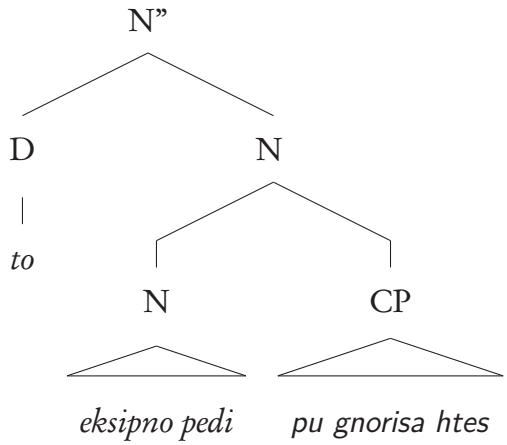
4.1.2 Non-Restrictive Relative Clauses

4.1.2.1 Stavrou (1983)

Some of the early work on Modern Greek non-restrictive relative clauses is presented in Stavrou (1983). Stavrou notes that there is a difference between appositive (non-restrictive) relative clauses and restrictive relative clauses and accounts for the difference between them by selecting a different level of attachment for each.

Assuming a two-bar system of syntactic representation, she claims that restrictive relatives attach to N level, like *eksipno pedi* (smart.$_{NSG\cdot NOM}$ child.$_{NSG\cdot NOM}$), whereas non-restrictives attach to N" level like *to eksipno pedi* (the.$_{NSG\cdot NOM}$ smart.$_{NSG\cdot NOM}$ child.$_{NSG\cdot NOM}$), as in (346) and (347):

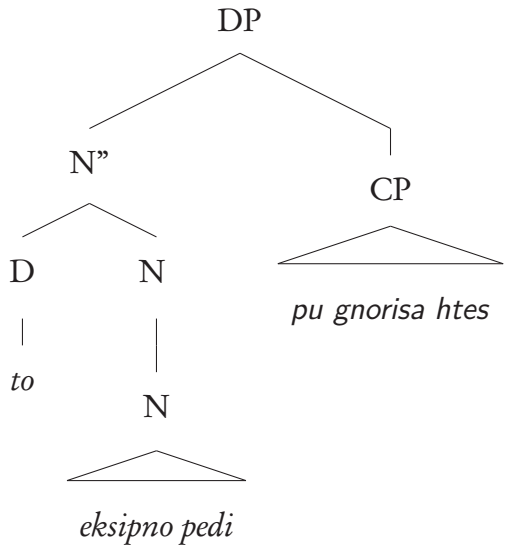
(346) Restrictive Relative



to eksipno pedi pu gnorisa htes
the.NSG·NOM smart.NSG·NOM child.NSG·NOM that met.1SG yesterday

‘The smart child that I met yesterday.’

(347) Non-Restrictive Relative



to eksipno pedi pu gnorisa htes
the.NSG·NOM smart.NSG·NOM child.NSG·NOM that met.1SG yesterday

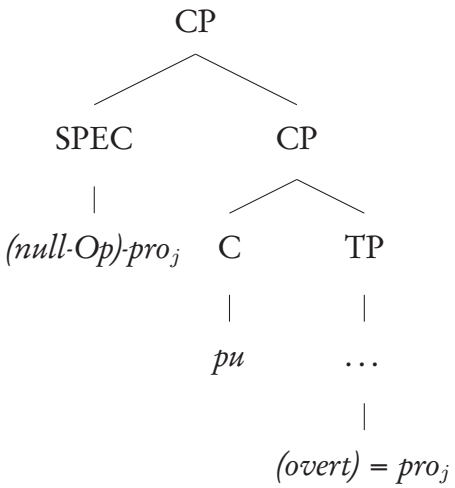
‘The smart child that I met yesterday.’

4.1.2.2 Alexopoulou (2006)

More recently, Alexopoulou (2006), considers Lasnik and Stowell (1991) s view that restrictive relative clauses involve quanti cation (using an A-bar operator) and Mc-

Closkey (2002) s view that resumption in relative clauses is an indicator of an *Operator* feature from C. She proposes that non-restrictive relatives also involve a null operator in their [SPEC,CP], which is anaphoric in nature, similarly to anaphoric operators/binders in *Clitic Left Dislocated Dependencies*. The structure she assumes for Non-Restrictive Relatives is shown in (348):

(348)



Alexopoulou (2006) notes that this operator is usually associated with a feature (like *uOp*) which triggers AGREE. She also suggests that the relation between the null operator on [SPEC,CP] and the *pro* feature in the sentence is not syntactic in nature and puts forward the proposal that resumption in Non-Restrictive Relative Clauses is related to the absence of syntactic features.

4.1.3 Free Relative Clauses

Free relatives are a very interesting type of subordinate clauses: although their internal structure is clearly similar to that of a secondary clause, at the same time they also function as nominal or adverbial elements in the main clause either as arguments (nominal free relatives) or as non-arguments (adverbial free relatives).

This hybrid character of free relatives has raised a number of issues for consideration when trying to account for their structure, such as:

- what is the phrasal category of the free relatives ; is it a CP or NP?

- what is the phrasal category of the free relatives at the point of attachment to the main clause; is it a bare CP or a CP embedded in a DP?

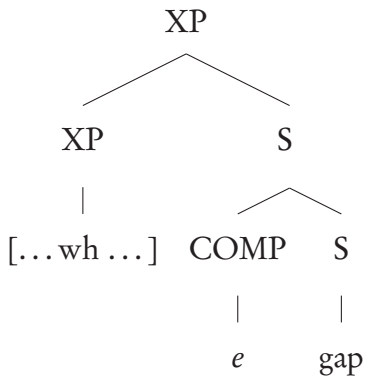
  The former is also called the *bare CP analysis*, whereas the latter is called the *complex DP analysis*.

- what is the position of the head of the free relative clause; is the free relative pronoun the head of the the construction or is it a complementizer in (in C position) and the head of the free relative clause is empty?

  The former is also called the the **head-internal analysis** whereas the second has also been referred to as the **head-external** *or* COMP *or* **Filler analysis**. We further elaborate on their main assumptions in the following part.

The Head-Internal hypothesis This approach assumes that the *wh*-phrase is in the position of the head of the FRC constructions. In particular, the *wh*-phrase itself occupies the position of the head, whereas the complementizer position is empty (Bresnan and Grimshaw, 1978) (Larson, 1987). The tree in (349) shows Groos and van Riemsdijk (1981, 179) s sketch for this hypothesis.

(349)



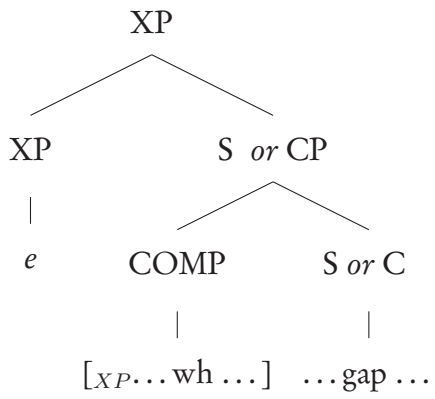
The Head-External/COMP **Hypothesis** This approach assumes that the *wh*-phrase that introduces the FRC occupies the complementizer position while the head of the FRC is empty (Groos and van Riemsdijk, 1981, Rivero, 1981, Grosu and Landman, 1998, Grosu, 1994, 1996). The crucial difference between this analysis and and the

Head-Hypothesis is the way they account for the matching effect: they assume that rules like subcategorization, case marking and number agreement apply to the *wh-phrase* in COMP. This is the *Comp Accessibility Hypothesis* which is de ned in (350) (Groos and van Riemsdijk, 1981):

(350) The COMP of a free relative clause is syntactically accessible to matrix rules, such as subcategorization and case marking, and furthermore it is the *wh-* phrase in COMP, not the empty head, which is relevant for the satisfaction or non-satisfaction of the matrix requirements.

The tree in (351) shows a sketch for this hypothesis.

(351)

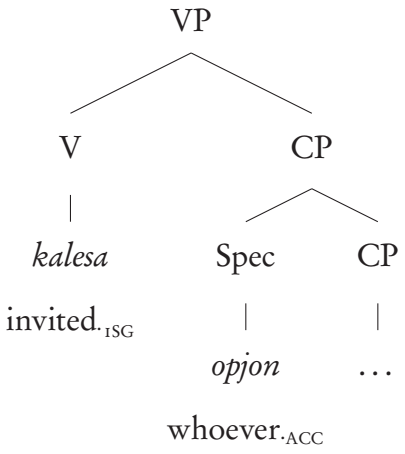


The following sections present some representative analysis of Modern Greek Free Relative Clauses.

4.1.3.1 Alexopoulou (2006)

Alexopoulou (2006) considers Modern Greek Free relatives as *operator* clauses, similarly to interrogative and *o opios* restrictive and non-restrictive relatives. For *opjos* free relatives, she follows Alexiadou and Varlokosta (1996) and proposes a *head-internal analysis* (Bresnan and Grimshaw, 1978),(Larson, 1987) as in (352):

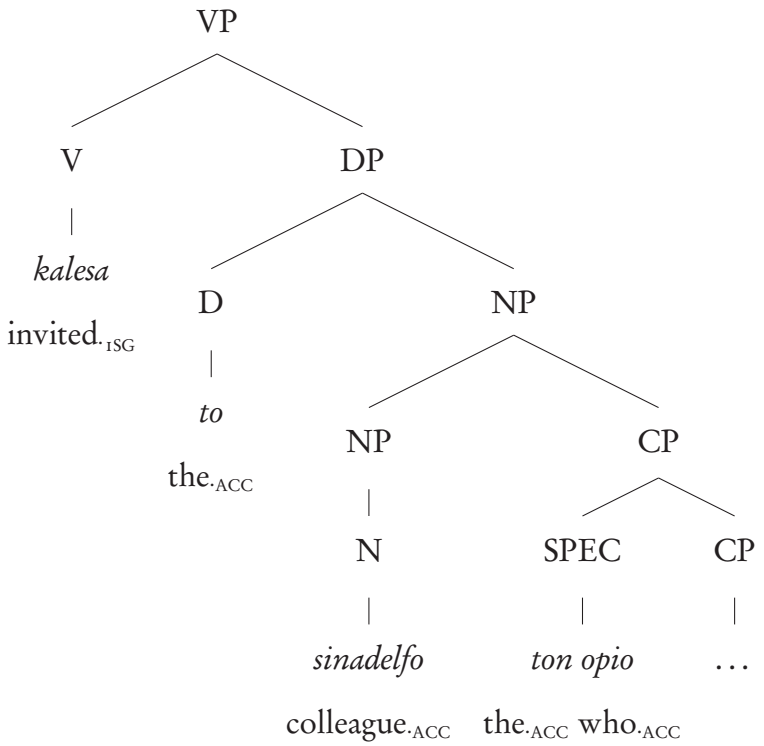
(352)



(Alexopoulou, 2006, 88)

Contrary to other operator clauses, where the relative clause is headed by an explicit head, the free relative operator is covert, as seen if we compare (352) to (353):

(353)



It therefore seems tat in *opjos* free relatives the operator is shared by the matrix and the relative clause, or as Alexopoulou puts it "it may satisfy thematic roles associated with more than one predicate" (Alexopoulou, 2006, 92). Based on this

observation, she proposes the use of MERGE instead of MOVE, and accounts for the fact that the operator may ful l more than one thematic role not by moving the operator, but by merging it in case position.

4.1.3.2 Daskalaki (2005)

Daskalaki (2005) addresses the issue of what is the external category of free relatives i.e. the phrasal category of the free relative when attached to the main clause, and provides additional data in support of the *complex DP analysis*.

Free relatives are CPs like interrogative complements, as in (354) and (355) below:

(354) **Opjos irthe efige.**
whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$ left.$_{3SG}$
'Whoever came, left.'

(355) **Pjos irthe?**
who.$_{MSG\cdot NOM}$ came.$_{3SG}$
'Who came?'

However, interrogative clauses, contrary to free relatives, do not show matching effects. Observe these examples of Relative and Interrogative clauses in (356) and (357):

(356) **Rotisa opjon / *opjos irthe.**
asked.$_{1SG}$ whoever.$_{MSG\cdot ACC}$ whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$
'I asked whoever came.'

(357) **Rotisa pjos / *pjon irthe.**
asked.$_{1SG}$ who.$_{MSG\cdot NOM}$ who.$_{MSG\cdot ACC}$ came.$_{3SG}$
'I asked who had come.'

When they are topicalised, only the free relative clause shows mismatching phenomena as in (358) and (359):

(358) **Opjon / Opjos irthe, ton rotisa.**
whoever.$_{MSG\cdot ACC}$ whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$ him.$_{MSG\cdot ACC}$ asked.$_{3SG}$
'Whoever cam, I asked him.'

(359) ***Pjon / Pjos irthe, ton rotisa.**
who.$_{MSG\cdot ACC}$ Who.$_{MSG\cdot NOM}$ came.$_{3SG}$ him.$_{MSG\cdot ACC}$ asked.$_{1SG}$
'I asked him who had come'.

They also share many similarities with "uncontroversially complex DPs such as restrictive *pu* relatives" (Daskalaki, 2005, 87). Free relative clauses can be paraphrased as *pu* restrictives, if headed by an inde nite head pronoun such as *ekinos* (=that one.$_{MSG\cdot NOM}$) or *aftos* (=this one.$_{MSG\cdot NOM}$), as in (360) to (362):

(360) **Opjos irthe efige.**
whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$ left.$_{3SG}$
'Whoever came left.'

(361) **Ekinos pu irthe efige.**
that one.$_{MSG\cdot NOM}$ that came.$_{3SG}$ left.$_{3SG}$
'The one that came left.'

(362) **Aftos pu irthe efige.**
this one.$_{MSG\cdot NOM}$ that came.$_{3SG}$ left.$_{3SG}$
'This one that came left.'

Additional evidence in support of Daskalaki s observation comes from the observations on the distribution of the gap and resumption strategy described in chapter 3, namely that the distribution of gap and resumption strategies of Free relatives and are very similar to *pu* restrictive relatives, as shown in (363) and (364):

(363) *pu* restrictive relatives

RC Role Main →		SUBJ		OBJ		OBJ2		OBL/OoP	
RC rel pos ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
pu	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp

Table 4.1: Distribution of resumptive and gap strategies. Restrictive Relatives.

(364) *opjos* free relatives

RC Role Main →		SUBJ		OBJ		OBJ2		OBL/OoP	
RC relpos ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
opjos	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	gp/rp	rp	gp/rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp

Table 4.2: Distribution of resumptive and gap strategies. Free Relatives.

These observations have lead Daskalaki (2005) to propose that Modern Greek Free relatives are complex DPs much like *pu* Restrictive Relatives with their antecedent.

4.1.3.3 Espanol-Echevarría and Ralli (2000)

Espanol-Echevarría and Ralli (2000), investigating the Case properties of Clitic Left Dislocation in Modern Greek, look at case matching and mismatching phenomena in Modern Greek Free Relative Clauses.

They note that case resolution in Modern Greek Topicalised Free relatives is of great typological interest as "Greek is a language which combines overt-casemarking

with Clitic Left Dislocated (CLLD) constructions" Espanol-Echevarría and Ralli (2000, 191). As they suggest, most of the literature on CLLD constructions draws from Languages with both Clitics and CLLD constructions, but without an overt case marking system like Spanish or Catalan (see for example the accounts in Hirschbuler and Rivero (1981), Suner (1984), or with languages that have overt case systems but no clitics (see the accounts in Groos and van Riemsdijk (1981), Harbert (1983), McCreight (1988)).

They propose that (topicalised) CLLDed free relatives, in Modern Greek are an instance of case attraction, "the term referring to situtation in which the wh-phrase agrees in case with its antecedent or - in the case of free relatives - receives its case marking from the matrix clause". (Groos and van Riemsdijk, 1981) and that they demostrate the following properties:

- case attraction is always optional
- case attraction does not seem to obey a case hierarchy, contrary to Ancient and Medieval Greek (see Harbert (1983) for more information on the attraction hierarchy for Medieval Greek).

Thus, they propose the following resolution table (Table 4.3) for these constructions (the cl+ row corresponds to the case requirements posed by the matrix clause verb whereas the cl- column to the case requirements of the free relative clause.

+cl	nom	acc	nom
-cl			
nom	nom	nom/acc	nom/gen
acc	nom/acc	acc	acc
gen	gen	gen	gen

Table 4.3: Case Attraction Resolution in Modern Greek CLLDed Free Relative Clauses. (Espanol-Echevarría and Ralli, 2000, 196)

To account for case attraction phenomena, in CLLDed free relatives, they propose the use of a [+/- GENITIVE] feature, since according to the table above, no-

minative and accusative could be grouped together, as opposed to genitive, which cannot be attracted into nominative or accusative case.

4.2 LFG Approaches to Relative Clauses

The term *Long Distance Dependencies* (henceforth LDDs) is usually used in LFG to denote constructions which involve linking more than one position in a clause. Other terms (some framework speci c) include *unbounded dependencies, filler-gap dependencies, wh-movement, A' movement, A' dependencies* and so on.

Standard treatments of Long Distance Dependencies in LFG usually are accounted for in the f-structure. The elements involved in a LDD bear a discourse function like TOPIC or FOCUS. To ensure well-formedness of the f-structure, all discourse functions must be linked to a grammatical function within the clause s f-structure, a condition expressed in the *Extended Coherence Condition*, we have mentioned elsewhere, repeated in (365) for convenience:

(365) **Extended Coherence Condition**

> FOCUS and TOPIC must be linked to the semantic predicate argument structure of the sentence in which they occur, either by functionally or anaphorically binding an argument.
>
> (Zaenen, 1980, Bresnan and Mchombo, 1987)

4.2.1 Restrictive Relative Clauses

Relative Clauses have been regarded as an interesting case of Long Distance Dependencies; unlike other constructions, such as topicalisation, relative clauses actually involve two kinds of dependencies:

- a dependency between the fronted material and the GF within the relative clause
- a dependency between the relative pronoun (or in general the element introducing a relative clause) and the head of the matrix clause function

Both dependencies are represented in the f-structure. The rst dependency is represented by associating a grammatical relation in the relative clause with a discourse function. In the case of relative clauses, there is an overall agreement in the literature that it takes the TOPIC discourse function. As previously mentioned, in order for the f-structure to be coherent, the TOPIC function needs to be coindexed with a grammatical function as required by the *Extended Coherence Condition*.

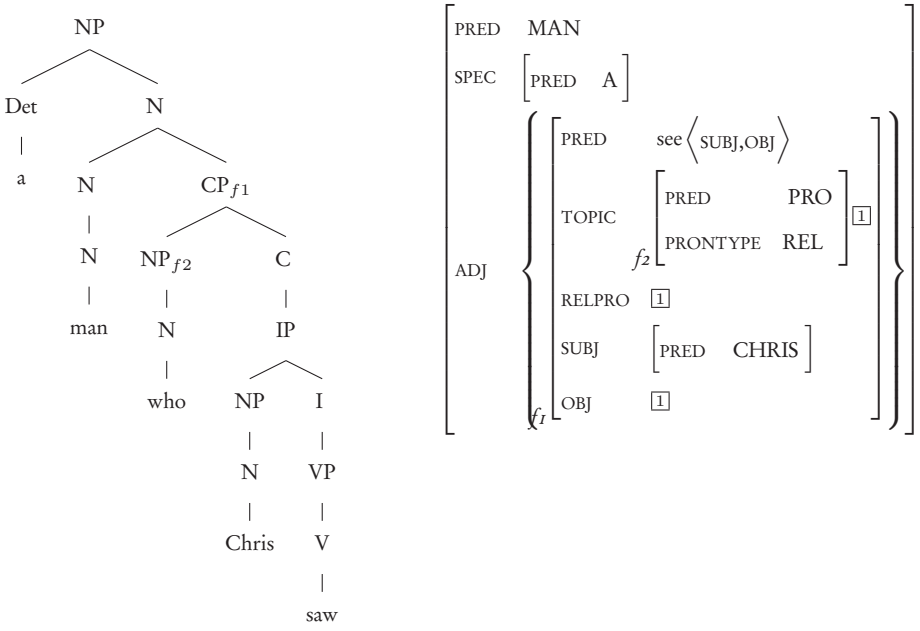
The second dependency (i.e. the dependency between the relative pronoun and the head or PRED of the function it modi es) is represented in various ways in the literature and usually involves coindexing the f-structure of the relative pronoun with the value of a feature. An important fact is that it is not necessary for each dependency to target the same element.

This section presents an overview of some of the most representative LFG approaches to Relative Clauses, that mostly draw from English, German and Norwegian.

Dalrymple (2001, 400) presents an account of **English restrictive relatives** to illustrate LFG s treatment of Long Distance Dependencies. She follows Bresnan and Mchombo (1987) in representing the dependency within the relative clause itself using the TOPIC discourse function and she adds to the relative clause f-structure a RELPRO feature whose value is the f-structure of the relative pronoun within the relative clause.

A relative clause like *who Chris saw* in *a man who Chris saw* will have the following c- and corresponding f-structures (example from Dalrymple (2001, 401)):

(366)



In (366) the relative pronoun is the TOPIC of the relative clause f-structure and is coindexed with a grammatical function (OBJ in this example) as well as with the RELPRO feature.

Dalrymple (2001, 402) proposes the following set of phrase structure rules and f-structure annotations for English restrictive relatives:

(367)
$$\begin{array}{lcll} \text{N} & \rightarrow & (\text{N}) & \text{CP*} \\ & & \uparrow=\downarrow & \downarrow \in (\uparrow \text{ADJ}) \end{array}$$

(368)
$$\begin{array}{lcll} \text{CP} & \rightarrow & (\text{RelP}) & (\text{C}) \\ & & (\uparrow \text{TOPIC}) = \downarrow & (\uparrow=\downarrow) \\ & & (\uparrow \text{TOPIC}) = (\uparrow \textit{RTOPICPATH}) & \\ & & (\uparrow \text{RELPRO}) = (\uparrow \text{TOPIC RELPATH}) & \\ & & (\uparrow \text{RELPRO PRONTYPE}) =_c \text{REL} & \end{array}$$

RelP is not a proper phrase structure node; it is actually used in here more like a *metacategory*, a mechanism that works more like a shortcut for a longer equation. Here a *RelP* stands for any of the phrase structure categories that can introduce a relative clause, and for English relative clauses is de ned as follows:

(369) $\text{RelP} \equiv \{ \text{NP} \mid \text{PP} \mid \text{AP} \mid \text{AdvP} \}$

This means that the element introducing a restrictive relative clause in English can appear in any of the phrasal categories above (≡ means *is defined as...*) (see section 2.2.6 for more information on these expressions).

Let us now have a look at the functional equations under the *RelP* node.

The (↑ TOPIC) = ↓ constraint requires the f-structure of the relative pronoun to be part of the mother f-structure (the f-structure of the the relative clause). At the same time, the mother s TOPIC f-structure needs to be linked with the f-structure of a grammatical function. The range of grammatical functions the fronted element in English Restrictive Relative Clauses can be linked to are de ned in the RTOPIC-PATH feature, which stands for the following path of grammatical functions:

(370) **English RTOPICPATH**

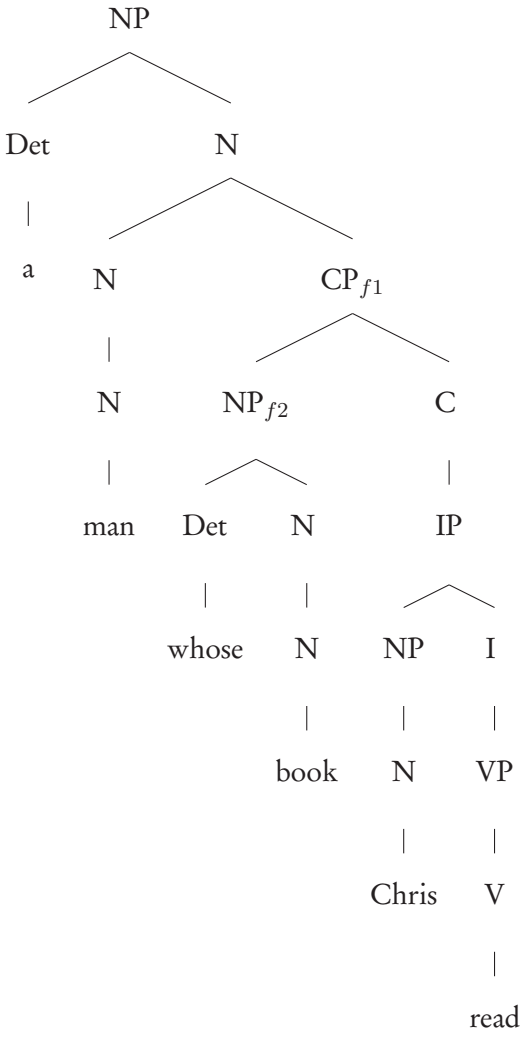
$$\{\textbf{XCOMP} \mid \underset{(\rightarrow LDD)\neq -}{\textbf{COMP}} \mid \underset{(\rightarrow TENSE)}{\textbf{OBJ}}\}^{*}\ \{(\ \textbf{ADJ} \in \underset{\neg(\rightarrow TENSE)}{\quad})(\textbf{GF}) \mid \textbf{GF}\}$$

The following equation (↑ RELPRO) = (↑ TOPIC RELPATH) links the value of the f-structure of the RELPRO feature with a TOPIC path followed by zero or more Grammatical functions de ned as below:

(371) {SPEC* | [OBL_{θ} OBJ]* }

This covers the cases as in (372), where the fronted element *contains* the relative pronoun.

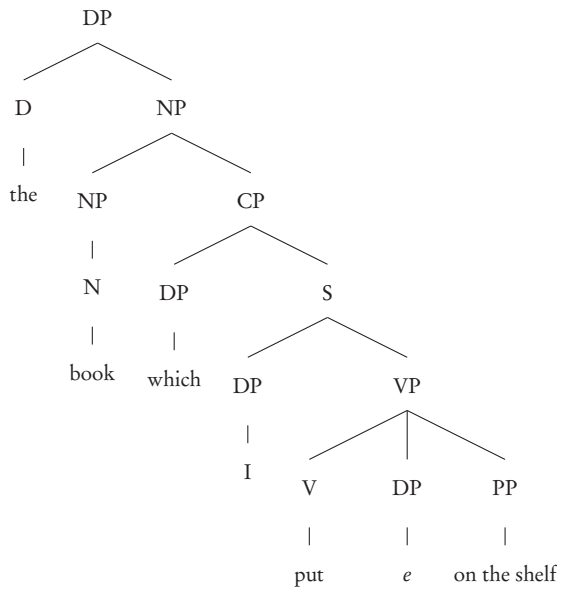
(372)



$$\begin{bmatrix} \text{PRED} & \text{MAN} \\ \text{SPEC} & \begin{bmatrix} \text{PRED} & \text{A} \end{bmatrix} \\ \text{ADJ} & \left\{ \begin{bmatrix} \text{PRED} & \text{read}\left\langle \text{SUBJ,OBJ} \right\rangle \\ \text{TOPIC} & \begin{bmatrix} \text{SPEC} & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{PRONTYPE} & \text{REL} \end{bmatrix} \boxed{2} \\ {}_{f_2}\begin{bmatrix} \text{PRED} & \text{BOOK} \end{bmatrix} \end{bmatrix} \boxed{1} \\ \text{RELPRO} & \boxed{2} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{CHRIS} \end{bmatrix} \\ {}_{f_1}\text{OBJ} & \boxed{1} \end{bmatrix} \right\} \end{bmatrix}$$

Falk (2001, 165–171) puts forward a similar analysis for English restrictive relatives. He follows the standard approach in the LFG literature which regards the restrictive relative to function as an Adjunct on the head nominal phrase it modi es. Falk (2001) follows Dalrymple (2001) and Bresnan and Mchombo (1987) in taking the relative pronoun (or in general the element introducing the relative pronoun) to be part of the TOPIC f-structure, as illustrated in (373):

(373) The book which I put on the shelf

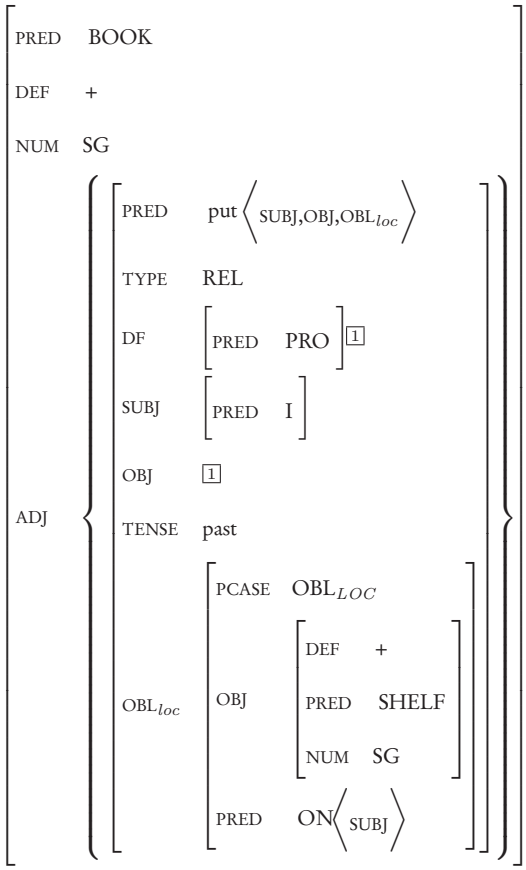


$$\begin{bmatrix}
\text{PRED} & \text{BOOK} \\
\text{DEF} & + \\
\text{NUM} & \text{SG} \\
\text{ADJ} & \left\{ \begin{bmatrix}
\text{PRED} & \text{put}\left\langle \text{SUBJ,OBJ,OBL}_{loc} \right\rangle \\
\text{TYPE} & \text{REL} \\
\text{TOPIC} & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{PRON} & \text{WH} \end{bmatrix} \boxed{1} \\
\text{OPER} & \boxed{1} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{I} \end{bmatrix} \\
\text{OBJ} & \boxed{1} \\
\text{TENSE} & \text{past} \\
\text{OBL}_{loc} & \begin{bmatrix}
\text{PCASE} & \text{OBL}_{LOC} \\
\text{OBJ} & \begin{bmatrix} \text{DEF} & + \\ \text{PRED} & \text{SHELF} \\ \text{NUM} & \text{SG} \end{bmatrix} \\
\text{PRED} & \text{ON}\left\langle \text{SUBJ} \right\rangle
\end{bmatrix}
\end{bmatrix} \right\}
\end{bmatrix}$$

Falk accounts for the dependency between the TOPIC and the within clause grammatical function by using the *Extended Coherence Condition*, and ensuring that the TOPIC discourse function in the f-structure is coindexed with a grammatical function in the f-structure. Instead of the RELPRO feature, he uses the OPER (operator) feature, which is linked to the TOPIC function, in a similar way that RELPRO was to TOPIC in Dalrymple (2001).

Falk (2001) goes further into differentiating between *wh*-restrictive and *that*-restrictive relative clauses. He proposes that for the first, the structure he assumes is as in (373), whereas for complementizer restrictive relatives the f-structure is a bit different, as in (374):

(374) The book that I put on the shelf



In complementizer (that) - restrictive relatives the dependency between the discourse function and the within clause grammatical function is the same (the discourse function is coindexed/linked with a grammatical function, in this case the OBJ GF). However, if we take a closer look at the f-structure of the relative complementizer, we observe that its discourse function has been left unspeci ed and there is no indication of the wh-character of the complementizer.

Falk (2002) builds on Falk (2001) presenting a treatment of resumption in LFG. He observes that a resumptive pronoun is an element "which refers but has no inherent reference of its own. Therefore, it must pick up its reference from something else in the discourse, usually something relatively prominent in the discourse". (Falk, 2002, 8)

Assuming that in LFG referentiality should be represented at a non-syntactic level of representation, he proposes the following de nition of an extra level of representation, the ρ projection, as an extra projection from the f-structure, as in (375):

(375) c-structure $\xrightarrow{\phi}$ f-structure $\xrightarrow{\rho}$ ρ projection

The ρ level of representation is represented, Falk proposes, as a list of elements that have entered into discourse, as in (376) (example from Falk (2002, 9)):

(376) Dan is reading a book. I see him.

$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{I} \end{bmatrix}\boxed{1} \\ \text{PRED} & \text{see}\left\langle \text{SUBJ,OBJ} \right\rangle \\ \text{OBJ} & \begin{bmatrix} \text{NUM} & \text{SG} \\ \text{GEND} & \text{M} \end{bmatrix}\boxed{2} \end{bmatrix} \qquad \left[\left\{ \begin{array}{l} \boxed{2}\text{DAN} \\ \text{BOOK} \\ \boxed{1}\ \text{SPEAKER} \end{array} \right\}\right]$$

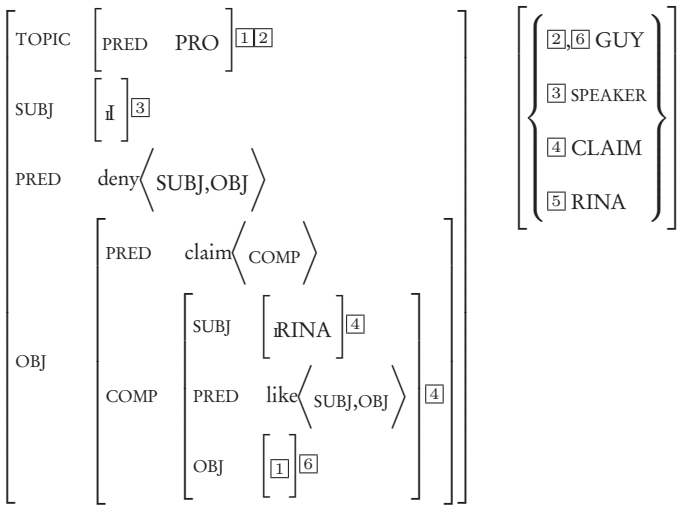
Falk s proposal is that resumptive pronouns participate in Long-Distance Dependency constructions which "are not licensed in the normal way by functional uncertainty equations, but rather by establishing a referential (anaphoric) identity between the two positions" (Falk, 2002: 16) So, instead of postulating a [PRED PRO] feature on the resumptive pronoun, Falk proposed the following equation:

(377) $f \in \rho^{-1}(\uparrow_{\rho}) \wedge (DFf) \Rightarrow \uparrow = f$

What (377) does is essentially to establish a link of identity between the two f-structure elements. This, we end up with an ordinary Long Distance Dependency

which is licensed not by a functional uncertainty equation (like (↑TOPIC) = (↑GF)), but by a speci cation or constraint, as in (377). The ϕ- and ρ projection of the phrase *the guy that I denied the claim that Rina likes him* will look as in (378):

(378) f-structure and ρ projection of *the guy that I denied the claim that Rina likes him*



The LFG analyses so far presented have assumed some sort of a structure sharing relation, in the f-structure, either licensed by a functional uncertainty control equation as in Dalrymple (2001) and Falk (2001) or by establishing a referential link between the two positions involved, as in Falk (2002).

Alsina (2008) proposes a different approach to Long-Distance Dependencies in LFG. He notes that the existing approaches have failed to account for parasitic gaps where a single ller corresponds to two gaps, when anaphoric binding is not involved, as in (379) :

(379) Which book do you think [Kim will read ø]? *(from Alsina (2008))*

(380) Who announced øthat the car broke down?

(381) *ø announced who (that) the car broke down?

His proposal is that structures like these as well as raising constructions are governed by a set of conditions that determine the *f-command* and the *f-prominence* of the grammatical functions in an f-structure[1].

Alsina (2008) s proposal successfully accounts for the dependency between the *filler* and the *gap*, that is the dependency between the relative clause and the within main clause grammatical function. It also rules out ungrammatical instances of multiple gaps as in (381).

However, as Alsina himself notes, since mapping between c- to f-structure is not necessarily occurring through functional uncertainty equations adopting such a theory might have implications on the mapping architecture of the theory, since mapping between the two projections does not necessarily occur via the f-structure annotations on the c-structure nodes.

[1]Examples of such conditions are the *non-thematic condition on structure sharing* or the *locality of structure sharing*

4.2.2 Non-Restrictive Relative Clauses

Non-Restrictive Relative Clauses have been receiving renewed attention in the literature, especially in constraint-based frameworks like HPSG (Arnold, 2004, 2007, Arnold and Borsley, 2008, Sag, 1997) or Dynamic Syntax (Kempson, 2003). As (Cinque, 2008, 9) notes, non-restrictive or *appositive* relative clauses have always been compared to restrictive relatives.

In work by scholars like Jackendoff (1977), Perzanowski (1980), Kayne (1994), Kempson (2003), Arnold (2004, 2007), Arnold and Borsley (2008), they are sometimes treated as a "*sentence grammar phenomenon*[...] as clauses internal to the nominal projection that also contains the Head" (Cinque, 2008, 99), much like restrictives. However, in work by other scholars like Ross (1967), Sells (1985), Haegeman (1988), Fabb (1990b), Peterson (2004) and more recently Grosu (2005), it is represented as "a *discourse grammar phenomenon*, i.e. as sentences generated independently of the sentence containing the Head, whose pronouns relative to an antecedent across discourse" (Cinque, 2008).

We will focus on Peterson (2004) s account here since to the best of our knowledge, it presents one of the few efforts to account for non-restrictive relative clauses within the framework of LFG.

Peterson (2004) argues in favour of a treatment of English non-restrictive relatives within the discourse structure, and not as syntagmatic relations. By *syntagmatic Relations* he means "involving relations the linking of two or more elements to form a single grammatical construction." (Peterson, 2004, 392). These can be

headed (also called *hypotactic syntagmatic relations*) like subordinate structures or non-headed (also *paratactic syntagmatic relations*) like coordinated structures.

What Peterson de nes as *non-syntagmatic* or *discourse structure relations* relates to structures which "involve loose linking of two or more items in a sequence which does not constitute a single grammatical construction" (Peterson, 2004, 392). Although they do not form grammatical constituents, non syntagmatic relations "demonstrate discourse unity" (Bloom eld, 1933, Peterson, 2004)

Peterson argues in favour of discourse structure relations for English non-restrictives based on arguments such as that non-restrictive relatives have a separate illocutionary force (they have "illocutionary independence" in Cinque (2008, 102) s terms): they can be declarative, even if the main clause is interrogative as in (382) (example from Peterson (2004, 393)):

(382) Has John, who was supposed to lead the discussion, changed his mind?

His proposal is very different from Arnold (2004) and Arnold (2007) s proposal, where he presents data in favour of a syntagmatic treatment of non-restrictive relatives, proposing that restrictives and non-restrictives have the same basic structure.

Arnold (2004) observes that non-restrictive relative clauses are part of a constituent with their antecedent since when topicalised we have to refer to the whole phrase, as in (383) below (example from Arnold (2004)):

(383) I don t often see Kim, but [Sandy, who I m sure you remember]$_i$ I see regularly ø$_i$

The fact that we can co-index the øwith the whole phrase suggest that the phrase

forms a constituent.

Peterson (2004, 394) argues against this suggesting that it is just *Sandy* that should be co-indexed with the gap not the whole phrase. The analysis presented in Peterson (2004) is therefore based on the assumption that the connection between the non-restrictive relative and its host/antecedent should be represented in a level of representation other than the syntactic level (i.e. different from the c- or the f-structure). Peterson (2004, 395) suggests that this relation would be more effectively represented in LFG s s-structure (semantic structure) where usually anaphora-related phenomena can be dealt with. The non-restrictive relative and its antecedent will have distinct c- and f-structures, but they will be linked at the discourse level of information representation.

A non-formal representation of the proposed mappings is presented in (384):

(384) phonetic string $\xrightarrow{\pi}$ c-structure$_{host}$

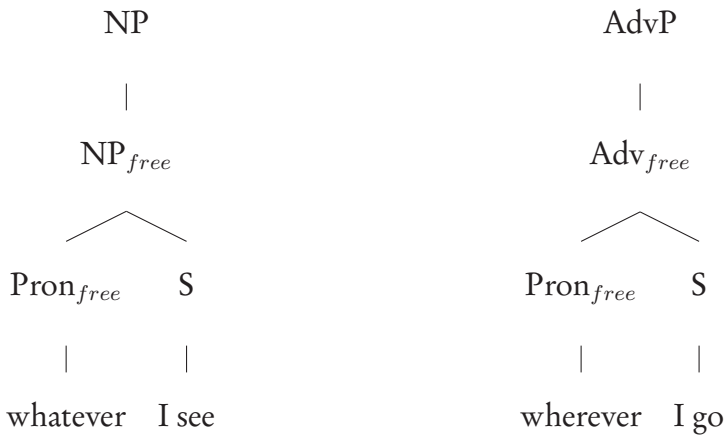
In our analysis we follow Arnold (2004) in regarding the phrase structure of Non-Restrictives very similar to the phrase structure of Restrictive Relatives (hence their c-structure rule is very similar). We account for their differences in the f-structure where we also account for the differences in the distribution of the gap and the resumption strategies. However, we do not ignore Peterson (2004) s proposal about the relation of Non-Restrictives to discourse, and for that we postulate a feature (CLAUSETYPE) to distinguish between them. This feature can be used by other levels of representation such as the i-structure or the s-structure to manipulate.

4.2.3 Free Relative Clauses

LFG Analyses of Free Relative Clauses adopt a mixed approach depending on what the element heading the free relative clause construction is as well as the phrasal category of the free relatives, which depends on the language under investigation.

In the English ParGram Grammar (see chapter 5 for a more detailed description of the project and its objectives), English free relatives are assigned the phrasal category of an NP or an ADVP, as in (385):

(385)

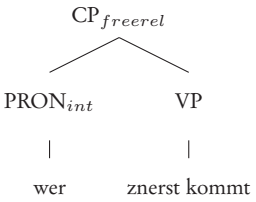


They follow the *Head Internal Analysis* (Bresnan and Grimshaw, 1978, Larson, 1987) and treat the relative pronoun as the head of the f-structure. If there isn t a relative pronoun, a dummy/empty one is provided, by postulating a [PRED PRO] feature. An example f-structure of this approach is shown in (386):

(386)
$$\begin{bmatrix}
\text{PRED} & \text{PRO} \\
\text{PRONTYPE} & \text{FREE} \\
\text{PRONFORM} & \text{WHATEVER} \\
\text{NUM} & \text{SG} \\
\text{PERS} & 3 \\
\text{ADJUNCT} & \left\{ \begin{bmatrix}
\text{PRED} & \text{see}\langle \text{SUBJ,OBJ} \rangle \\
\text{STMT-TYPE} & \text{DECLARATIVE} \\
\text{PRONREL} & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{CASE} & \text{ACC} \\ \text{PRON-TYPE} & \text{REL} \end{bmatrix} \boxed{1} \\
\text{TOPIC-REL} & \boxed{1} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{PRON-TYPE} & \text{PERS} \\ \text{PRON-FORM} & \text{I} \\ \text{ANIM} & + \\ \text{CASE} & \text{NOM} \end{bmatrix} \\
\text{OBJ} & \boxed{1}
\end{bmatrix} \right\}
\end{bmatrix}$$

Similar assumptions are made in the German ParGram Grammar with regards to the f-structure, only that in German the overt pronoun is taken as the c-structure head of the relative clause. Again, the whole structure is headed by a [PRED PRO] dummy pronoun, as in (387). Their structure is a bit different, though, as the phrasal category of the free relative proposed is to an NP but a type of CP, as in (388), since "they cannot like other nite clauses, appear clause internally and are thus treated as a special category in the grammar (a $CP_{\textit{freerel}}$)" (Butt and King, 2007, 109).

(387)



(388)

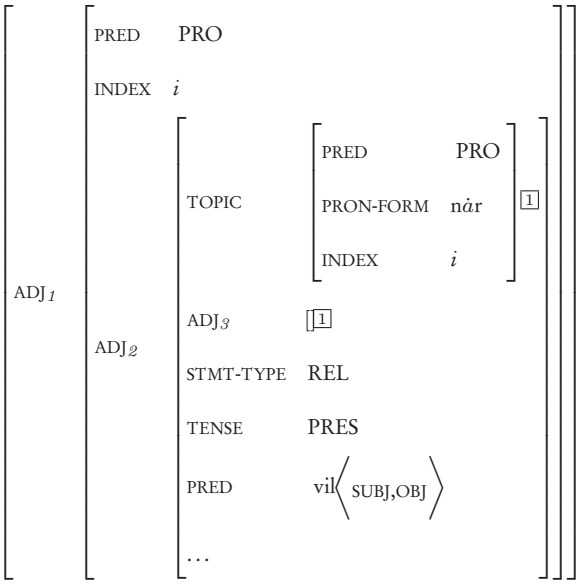
$$\begin{bmatrix}
\text{PRED} & \text{PRO} \\
\text{GEND} & \text{M} \\
\text{CASE} & \text{NOM} \\
\text{PRON-TYPE} & \text{NULL} \\
\text{PERS} & 3 \\
\text{NUM} & \text{SG} \\
\text{ADJUNCT} & \left\{ \begin{bmatrix}
\text{PRED} & \text{kommen}\langle \text{SUBJ} \rangle \\
\text{STMT-TYPE} & \text{DECLARATIVE} \\
\text{PRON-REL} & \begin{bmatrix}
\text{PRED} & \text{PRO} \\
\text{PRON-TYPE} & \text{INT} \\
\text{GEND} & \text{M} \\
\text{CASE} & \text{NOM} \\
\text{NUM} & \text{SG} \\
\text{PRON-FORM} & \text{WER} \\
\text{PERS} & 3
\end{bmatrix} \boxed{1} \\
\text{TOPIC-REL} & \boxed{1} \\
\text{SUBJ} & \boxed{1} \\
\text{ADJUNCT} & \left\{ \begin{bmatrix} \text{PRED} & \text{ZUERST} \end{bmatrix} \right\}
\end{bmatrix} \right\}
\end{bmatrix}$$

A similar approach has been proposed for Norwegian *when* free relatives in Stephens (2006). An example from Stephens (2006, 477) is shown in (389):

(389) **Det skier nå**r **folket vil.**
that happens NÅR people.DEF will
'That happens when the people want.'

The treatment proposed for *when*-clauses when no overt antecedent is presented, is shown in (390).

(390) partial f-structure for *når folket vil*



Although in this analysis it is assumed that adjuncts are not sets which is not the standard view in LFG, we can see that the head of the relative clause is taken to be outside the free relative clause s f-structure and that it is a [PRED PRO] dummy pronoun.

A different approach to German free relatives is proposed in Dalrymple and Kaplan (1997). Although the purpose of their paper is to account for case indeterminate environments in German Free relatives, they also present a sketch of a slightly different analysis than the ones already discussed. This analysis takes the f-structure of the head of the relative clause is a PRED WHO which is then linked to the within relative clause grammatical function.

Instead of a TOPIC discourse function, they represent the free relative f-structure clause as the value of a RELMOD feature and the whole of the relative clause is analysed as being an argument of the rest of the clause and not an ADJUNCT. Example (391) presents such an instance of case underspeci cation/ mismatch in German,

and Dalrymple and Kaplan (1997) provide its f-structure, reproduced here as (392):

(391) **Ich habe gegessen was übrig wor**
I have$_{ACC \in OBJCASE}$ eaten what$_{\{NOM,ACC\}}$ was$_{NOM \in SUBJCASE}$ left
'I ate what was left.'

(392)
$$\begin{bmatrix} \text{PRED} & \text{eat}\langle \text{SUBJ} \rangle \\ \text{TENSE} & \text{PAST} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{PRO} \\ \text{NUM} & \text{SG} \\ \text{PERS} & \text{rst} \end{bmatrix} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & & \text{WHAT } \boxed{1} \\ \text{CASE} & & \{ \text{NOM, ACC} \}\boxed{2} \\ \text{RELMOD} & \begin{bmatrix} \text{PRED} & \text{left}\langle \text{SUBJ} \rangle \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \boxed{1} \\ \text{CASE} & \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

As we observe in (392), in the free relative construction, the PRED and the CASE values of the relative pronoun are shared between the matrix sentence and the relative clause. To be able to account for cases when indeterminate for case free relative pronouns introduce a free relative, Dalrymple and Kaplan (1997) propose that the lexical entry of the indeterminate pronoun bears a CASE feature with a set as its value, as in (393), and the requirements of the two verbs as in (394) and (395):

(393) *was*: (↑ CASE) = { NOM, ACC }

(394) *gegessen*: ACC ∈ (↑ CASE)

(395) *übrig*: NOM ∈ (↑ CASE)

4.3 An LFG Analysis of Modern Greek RCs

In this section, we put together the data observations on Modern Greek Relative Clauses, the observations on the distribution on the gap and resumption strategies and the LFG tools presented in chapters 2 and earlier in this chapter to present an account of Modern Greek Relative Clauses with nominal antecedents in LFG, that accounts for the gap and resumption strategy distribution.

We first review some of the properties of each type of relative clause as well as the distribution of the two strategies in them. We then build our CP rule progressively taking into consideration the characteristics of all three relative clauses.

4.3.1 Restrictive Relative Clauses

As we saw in Chapter 3, Restrictive Relative clauses involve two kinds of dependencies: a dependency between the antecedent it modifies and the relative pronoun *o opios* or the complementizer *pu* introducing them, and one of the relative pronoun or complementizer and the within relative clause grammatical function. In (396), for example, the antecedent *ton papagalo* is modified by the RRC *ton opio vrike o babas* and shares a dependency with the relative pronoun *ton opio*. This is indicated by the fact that they have some sort of agreement (number and gender). The relative pronoun *ton opio* is also involved in another dependency, by fulfilling a grammatical role in the RRC - that's why it agrees in case (accusative) with the grammatical function it fulfils in the relative clause (an OBJect in this case).

(396) **I Georgia taise ton papagalo ton**
the.FSG·NOM Georgia.FSG·NOM fed.3SG the.MSG·ACC parrot.MSG·ACC the.MSG·ACC
opio vrike o babas.
who.MSG·ACC found.3SG the.MSG·NOM father.MSG·NOM
'Georgia fed the parrot that father found.'

LFG accounts for both dependencies in the f-structure: for the first dependency (i.e. the dependency between the antecedent and the relative clause (or its relative pronoun) by assigning to the relative clause the ADJunct function, as in (397) below. The second dependency is accounted for using the TOPIC discource function, in combination with the *Extended Coherence Condition* which will require for the TOPIC discource function to be equated/reentrant with a grammatical function in the f-structure - in this case a grammatical function in the relative clauses f-structure.

(397)
$$\begin{bmatrix} \text{PRED} & \text{parrot} \\ \text{ADJ} & \left\{ {}_{f_1}\begin{bmatrix} \text{PRED} & \text{found}\langle \text{SUBJ,OBJ} \rangle \\ \text{TOPIC} & {}_{f_2}\begin{bmatrix} \text{PRED} & \text{pro} \\ \text{PRONTYPE} & \text{REL} \end{bmatrix} \boxed{1} \\ \text{RELPRO} & \boxed{1} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{dad} \end{bmatrix} \\ \text{OBJ} & \boxed{1} \end{bmatrix} \right\} \end{bmatrix}$$

You might also observe that there is an additional feature reentrant with the TOPIC discourse function: the RELPRO feature. This is a feature used to indicate that the relative clause is introduced by a relative pronoun (as opposed to a complementizer).

The lexical entry for *opios* and its definite article, is provided in (398):

(398) *o :* D
(↑ DEF) = +
(↑ CASE) = NOM
(↑ GEND) = M
(↑ NUM) = SG

(399) *opios:* N
(↑ PRED) = PRO
(↑ CASE) = NOM
(↑ GEND) = M
(↑ NUM) = SG
(↑ DEF) = +
(↑ PRONTYPE) = REL
¬(↑∈ ADJ)

The last equation is an existential equation i.e. denotes what should (or rather here what should not exist) in the a given f-structure. Here we specify that in the f-structure of the relative pronoun cannot be modi ed by an adjective. This prevents an adjective from occurring within the relative pronoun phrase, as in (400:

(400) **o andras o *omorfos opios irthe**
the man the.$_{MSG\cdot NOM}$ beautiful.$_{MSG\cdot NOM}$ who.$_{MSG\cdot NOM}$ case.$_{3SG}$
'The man who came' (intended meaning)

The lexical entry for the complementizer *pu* does not contribute any PRED value to the mother f-structure, as in (401) It only provides an additional feature COMPFORM with value *pu* which denotes that the f-structure it is contained in is a pu-subordinate clause.

(401) *pu:* C (↑ COMPFORM) = pu

We opted to account for the fact that the resumptive pronoun has the same form as the clitic of the language, by associating two groups of f-structure features with each lexical entry: one with a PRED value for the resumptive pronoun, and one without for the clitic forms. The lexical entry for the resumptive pronoun is given in (402):

(402) *ton:* NP
{ (↑ PRED)= pro (↑ PRONTYPE)=$_c$ RP|
(↑ PRONTYPE)=clitic}
(↑ GEND)= M
(↑ NUM)= SG
(↑ PERS)= 3
(↑ CASE)=ACC

We also considered the fact that resumptive pronouns also have the same form as the de nite articles of the language and accounted for them by adding a separate entry, as shown in (403):

(403) *ton:*
D
(↑ DEF)= +
(↑ GEND)= M
(↑ NUM)= SG
(↑ PERS)= 3
(↑ CASE)=ACC

With respect to the distribution of the gap and resumption strategies, Modern Greek Restrictive Relative Clauses only show the gap strategy in SUBJ relativised position, both in *pu* and *o opios* Restrictive Relatives. Both strategies alternate for both subtypes in the OBJect relativised position and (for some speakers) for the *opios* Restrictive Relatives in the non-local OBJ2 (Indirect Object) positions. For the rest of the relativised positions, *pu*-Restrictives only allow for the resumptive strategy (OBJ2, OBL and POSS), whereas *o opios* restrictive relatives only allow for the gap strategy. Table 4.3.1 reminds us of the patterns previously discussed.

We follow Dalrymple (2001), and Falk (2001) in accounting for the dependencies involved in the f-structure and propose a set of phrase structure rules for both *o*

RC Role Main→		SUBJ		OBJ		OBJ2		OBL/OoP	
RC RelPos ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
pu	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	POSS	rp	rp	rp	rp	rp	rp	rp	rp
o opios	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	gp	gap/?rp	gp	gp/?rp	gp	gp/?rp	gp	gp/?rp
	OBL/OoP	gp	gp	gp	gp	gp	gp	gp	gp
	POSS	gp	gp	gp	gp	gp	gp	gp	gp

Table 4.4: Distribution of resumptive and gap strategies. Restrictive Relatives

opios and *pu* Restrictives. We also need to differentiate between *pu*-Restrictives and for *pu*-clauses that function as complements to a verb (which are not relatives) and make sure that when the *pu* clause is a complement of a verb that it does not get the equations of the relative *pu* Clause(which is always an adjunct to the nominal head). A rst approach is to have a CP rule as follows:

(404) (Tentative CP rule - version 1)

CP → { RelP | ϵ } C
¬(↑ TOPIC COMPFORM) {(↑ TOPIC PRED) = PRO ↑=↓
(↑ TOPIC) = (↑ COMP* GF)
(ADJ ∈ ↑)
|(COMP ↑) }

The *RelP* phrase structure node allows for the different types of o opios relative clause (nominal and adverbial), whereas the ϵ phrase structure node allows for the information relevant to complementizer *pu*- RRCs to be passed on to the mother f-structure. The C phrase structure is for the rest of the relative clause (including the resumptive, the main verb and the rest of the arguments).

Let us have a look at the f-structure information associated with each phrasal node. On the RelP node, the ¬(↑ TOPIC COMPFORM) constraint ensures that a complementizer cannot appear in the place of the relative pronoun , in other words

that the complementizer and the relative pronoun will be mutually exclusive. To "mutually" constraint this even further, we will need to add another constraint on the ϵ node (see future versions of this rule).

The first part of the disjunction {...} under the ϵ node constraints pu-Restrictive relatives as adjuncts on a (nominal) antecedent (ADJ $\in \uparrow$) – in which case it contributes the TOPIC PRED value the {($\uparrow$ TOPIC PRED) = PRO and sets the path with which TOPIC is co-indexed ($\uparrow$ TOPIC) = ($\uparrow$ COMP* GF). This path is not sensitive to the gap-resumptive distinction yet and will be refined as we go along.

The second part of the disjunction under the ϵ node constrains *pu* subordinate Clauses as complements to a verb. In this case no additional features are contributed to the mother f-structure. The ($\uparrow$ COMP) existential declaration ensures that the *pu*-Restrictive Relative is indeed a complement (as opposed to an Adjunct).

To account for the difference in the distribution of the two strategies, we need to make a modification on the empty string (ϵ node). We will need to further constraint the path to the TOPIC f-structure. If we update the ($\uparrow$ TOPIC) = ($\uparrow$ COMP* GF) with the necessary constraints, the CP rule in (404) will now look as follows:

(405) (Tentative CP rule - version 2)

CP →	{ RelP			C
	¬($\uparrow$ TOPIC COMPFORM)	{($\uparrow$ TOPIC PRED) = PRO		$\uparrow$=$\downarrow$
		(ADJ $\in \uparrow$)		
		{ ($\uparrow$ **TOPIC**) = ($\uparrow$ **GapPath**))		
		| ($\uparrow$ **ResPath PRONTYPE**) = $_c$ **RP** }		
		|(COMP $\uparrow$) }		

The *ResPath* feature is a metacategory and stands for the following path (which is defined here explicitly). It defines the environments where the resumptive strategy is allowed in *pu* Restrictive Relative Clauses:

(406) *ResPath* ≡ { COMP$^+$ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }

The *GapPath* feature is another a metacategory and stands for the path in (407). It de nes the environments where the gap strategy is allowed in *pu* - Restrictive Relative clauses:

(407) *GapPath* ≡ { (COMP* SUBJ) | (OBJ)}

We can now replace the RelP metacategory in (405) to match the phrasal categories of the relative pronoun, and propose f-structure annotations to account for the distribution of the gap and resumptive strategies in *o opios* restrictive relatives (marked in bold face). Note the addition of the RELPRO feature to denote that there is a relative pronoun in the f-structure and the use of the *local variable* % TOPICPATH to ensure that there is no COMPFORM feature in the *o opios* RRC f-structure:

(408) (Tentative CP rule - version 3 (nal for RRCs))

CP →	{ {DP|PP|ADVP}	| ϵ }	C
	¬(%TOPICPATH COMPFORM)	{(↑ TOPIC PRED) = PRO	↑=↓
	(↑ TOPIC)=↓	(ADJ ∈ ↑)	
	(↑ RELPRO)=(%TOPICPATH)	{ (↑ TOPIC)=(↑ GapPath))	
	{ (↑ **TOPIC**) = (↑ **GapPath1**)	| (↑ ResPath PRONTYPE) = $_c$ RP }	
	| (↑ **ResPath2 PRONTYPE**) = $_c$ **RP** }		
		|(COMP ↑) }	

The *ResPath2* feature is a metacategory and stands for the path in (409). It de nes the environments where the resumptive strategy is allowed in *opios* Restrictive Relative Clauses. The $COMP_*$ denotes one or more instances of the COMP grammatical function:

(409) *ResPath2* ≡ { $COMP^+$ OBJ | $COMP^+$ OBJ_2 }

The *GapPath* feature is another metacategory and the path it stands for is presented in (410). It de nes the environments where the gap strategy is allowed in *opios* - Restrictive Relative clauses. Note that the $COMP_*$ means zero or more instances of the COMP grammatical function:

(410) *GapPath1* ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

Up to this point, the paths de ned for restrictive relatives clause gap and resumption distribution are as follows:

(411) (Path for resumption strategy, pu-RRCs)
ResPath ≡ { COMP+ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(412) (Path for gap strategy, pu-RRCs)
GapPath ≡ { (COMP* SUBJ) | (OBJ)}

(413) (Path for gap strategy, opios-RRCs)
GapPath1 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

(414) (Path for resumption strategy, opios-RRCs)
ResPath2 ≡ { COMP+ OBJ | COMP+ OBJ2 }

In the following section we will look at the analysis of Non-Restrictive Relative Clauses and will enrich the CP rule with more information coming from the distribution of the two strategies in non-restrictive and free relative clauses.

4.3.2 Non-Restrictive Relative Clauses

As we have discussed in chapter 3, non-restrictive relative clauses show very similar dependencies with Restrictive relative clauses, so all the comments made previously on restrictives also apply here. They are also introduced by the same relative pronoun (*o opios*) and complementizer (*pu*), so again we will be using the same lexical entries as for the restrictives.

Non-restrictives also show some similarities in the distribution of the gap and resumptive strategies with Restrictives, namely allowing only the gap strategy in SUBJ relativised positions. That s where their similarities end, however, since the two types of restrictive relatives demonstrate a different distribution, of the gap and resumptive strategies in the rest of the positions. For *pu* Non-restrictive relatives,

RC Role Main→		SUBJ		OBJ		OBJ2		OBL/OoP	
RC RelPos ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
pu	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	POSS	rp	rp	rp	rp	rp	rp	rp	rp
o opios	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBL/OoP	gp	gp	gp	gp	gp	gp	gp	gp
	POSS	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp	gp/?rp

Table 4.5: Distribution of resumptive and gap strategies. Non-Restrictive Relatives.

resumption is the only available option for all the other relativised positions (OBJ, OBJ2, OBL and POSS), whereas *o opios* restrictive relatives allow for both strategies, in the OBJ, OBJ2 and POSS positions, with the exception of OBL positions, where the gap is the only available strategy. A summary of their distribution is repeated as Table (4.5):

We follow Arnold (2004) in assuming that non-restrictives have the similar syntactic structure as restrictives, and we therefore account for them using a similar CP c-structure rule. We account for their differences in the f-structure where we also account for the different distribution of the gap and resumption strategies. Further to this, we do not ignore Peterson (2004) s proposal about the relation of non-restrictives to discourse, so we postulate a feature CLAUSETYPE to distinguish non-restrictives from restrictive relatives. This feature can then be used by other levels of representation such as the prosody-structure, the discourse-structure or the s-structure to manipulate.

As we did with Restrictive Relatives, we will build the CP rule for Non-Restrictive Relatives only at rst; we will then collapse them into one rule, encoding information from both types of clauses.

The CP rule we propose for non-restrictives is presented in (415). :

(415) (CP rule for NRCs only)

CP →	{ {DP|PP|ADVP}	| ϵ }	C
	¬(%TOPICPATH COMPFORM)	{(↑ TOPIC PRED) = PRO	↑=↓
	(↑ TOPIC)=↓	(ADJ ∈ ↑)	
	(↑ RELPRO)=(%TOPICPATH)	(↑ CLAUSETYPE) = NRC	
	{ (↑ TOPIC) = (↑ GapPath1)	{ (↑ TOPIC)=(↑ GapPath))	
	| (↑ ResPath2 PRONTYPE) = $_c$ RP }	| (↑ ResPath PRONTYPE) = $_c$ RP }	
	(↑ CLAUSETYPE) = NRC	|(COMP ↑) }	

The f-structure information on the nodes is similar to the ones proposed for Restrictive relatives. We have associated an extra feature (↑ CLAUSETYPE) = NRC to distinguish between the two different uses of the relative clauses (restrictive and non-restrictive). We will use this feature to associate different types of relatives with different values for the *GapPath*, *GapPath1*, *ResPath* and *ResPath2* metacategories, as in (416) to (419):

(416) (Resumption strategy distribution in pu NRCs)
ResPath ≡ { COMP* OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(417) (Resumption strategy distribution in opios NRCs)
ResPath2 ≡ { COMP+ OBJ | COMP+ { OBJ2 }}

(418) (Gap strategy Distribution in pu NRCs)
GapPath ≡ { (COMP* SUBJ)}

(419) (Gap strategy Distribution in opios NRCs)
GapPath1 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

So after considering both Restrictives and non-Restrictives, if we put all the information together, the relative clause CP rule will look as in (420)[2]

[2]This treatment assumes that both RRCs and NRCs have the same attachment point i.e. that they attach to the same type of nominal element. While Catsimali (1990) has claimed otherwise about non-restrictive relative clauses, we believe that a different assumption than the one we have made here could be easily accommodated, simply by slightly changing the paths proposed which

(420) (CP rule for RRCs and NRCs)

CP →	{ {DP|PP|ADVP}	| ϵ }
	¬(↑ %TOPICPATH COMPFORM)	{(↑ TOPIC PRED) = PRO
	(TOPIC)=↓	(ADJ ∈ ↑)
	(↑ RELPRO)=(%TOPICPATH)	
	{ { (↑ TOPIC) = (↑ GapPath1)	{ { (↑ TOPIC)=(↑ GapPath))
	| (↑ ResPath2 PRONTYPE) = $_c$ RP }	| (↑ ResPath PRONTYPE) = $_c$ RP }
	(↑ CLAUSETYPE) = RRC	(↑ CLAUSETYPE) = RRC
	| { (↑ TOPIC) = (↑ GapPath3)	| { (↑ TOPIC)=(↑ GapPath4))
	| (↑ ResPath3 PRONTYPE) = $_c$ RP }	| (↑ ResPath4 PRONTYPE) = $_c$ RP }
	(↑ CLAUSETYPE) = NRC }	(↑ CLAUSETYPE) = NRC }
		|(COMP ↑) }

C
↑=↓

A summary of the de nitions of the metacategories de ned so far is provided here for the readers convenience:

(421) (Path for resumption strategy, pu-RRCs)
ResPath ≡ { COMP$^+$ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(422) (Path for gap strategy, pu-RRCs)
GapPath ≡ { (COMP* SUBJ) | (OBJ)}

(423) (Path for gap strategy, opios-RRCs)
GapPath1 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

(424) (Path for resumption strategy, opios-RRCs)
ResPath2 ≡ { COMP$^+$ OBJ | COMP$^+$ OBJ2 }

(425) (Resumption strategy distribution in pu NRCs)
ResPath4 ≡ { COMP* OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(426) (Resumption strategy distribution in opios NRCs)
ResPath3 ≡ { COMP$^+$ OBJ | COMP$^+$ { OBJ2 }}

(427) (Gap strategy Distribution in pu NRCs)
GapPath4 ≡ { (COMP* SUBJ)}

(428) (Gap strategy Distribution in opios NRCs)
GapPath3 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

In the next section we look at the third type of relative clauses and summarise all the information in our nal rule for the distribution of the gap and resumptive strategies in Modern Greek Relative Clauses.

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would not cause problems to our treatment.

4.3.3 Free Relative Clauses

The last type of relative Clauses we are going to discuss is Free Relative Clauses. As we noted in Chapter 3, Free Relatives do not have an overt head that they can modify like Restrictives or Non-restrictives. Further to this, they can act as nominal elements and fill in appropriate thematic roles in the main clause themselves. As such, they can be fronted which makes the doubling clitic in the main clause available.

An example of a free relative clause is shown in (429):

(429) **Ópjos pije ton ipodehtikan me hara.**
whoever.$_{MSG\cdot NOM}$ went.$_{3SG}$ him.$_{MSG\cdot ACC}$ welcomed.$_{3PL}$ with joy.
'Wherever he went, they welcomed him with joy.'

We follow Daskalaki (2005) and King (2007) in regarding Free relatives as complex DPs, by taking the head of the free relative to be an ϵ category, a covert element and the free relative pronoun being the TOPIC of the free relative clause. The DP rule below is speci fic to nominal Free relative clauses:

(430) (NP$_{freerel}$ rule (Free relatives))

$$DP_{freerel} \rightarrow \quad \underset{\substack{(\uparrow \text{PRED}) = \text{PRO} \\ (\uparrow \text{CLAUSETYPE}) = \text{FRC}}}{\epsilon} \qquad \underset{\downarrow \in (\uparrow \text{ADJUNCT})}{\text{CP}}$$

The lexical entry for the relative pronoun *opjos* introducing free relatives is shown in (431). It is assigned a NP phrasal node to prevent it from appearing with an article. The (↑ ADJUNCT ∈ CLAUSETYPE) = FRC equation ensures that *opjos* appears in Free relative clauses only:

(431) *opjos:* NP
(↑ PRED) = PRO
(↑ CASE) = NOM

RC role Main→		SUBJ		OBJ		OBJ2		OBL/OoP	
RC RelPos ↓		Local	LDD	Local	LDD	Local	LDD	Local	LDD
opjos	SUBJ	gp	gp	gp	gp	gp	gp	gp	gp
	OBJ	gp	gp/rp	gp	gp/rp	gp	gp/rp	gp	gp/rp
	OBJ2	rp	rp	rp	rp	gp/rp	rp	gp/rp	rp
	OBL/OoP	rp	rp	rp	rp	rp	rp	rp	rp
	OBJ2	rp	rp	rp	rp	rp	rp	rp	rp

Table 4.6: Distribution of resumptive and gap strategies. Free Relatives.

(↑ GEND)=M
(↑ NUM) = SG
(↑ ADJUNCT ∈ CLAUSETYPE)=FRC
(↑ PRONFORM)=opjos
¬(↑∈ ADJ)

The distribution of the gap and the resumptive strategies in Free relatives, looks similar to the distribution in *pu* Restrictive relatives. For the SUBJ relativised position, the only available option again is the gap strategy, whereas for the more oblique positions (like OBJ2 OBL and POSS) the gap strategy is unavailable, and the resumptive strategy is used instead. As for the OBJ relativised position, there, both strategies are available. A summary of the distribution of resumption is given in Table (4.6).

Nominal Free relatives are introduced by a relative pronoun, so we are going to account for the distribution of the gap and resumption strategies by adding information on the relative pronoun (DP) node within the CP rule, as in (432):

(432) (CP rule for RRCs, NRCs and FRCs)

CP → { {DP|PP|ADVP}
¬(%TOPICPATH COMPFORM)
(↑ TOPIC)=↓
(↑ RELPRO)=(%TOPICPATH)
{ { (↑ TOPIC) = (↑ GapPath1)
| (↑ ResPath2 PRONTYPE) = c RP }
(↑ CLAUSETYPE) = RRC
| { (↑ TOPIC) = (↑ GapPath3)
| (↑ ResPath3 PRONTYPE) = c RP }
(↑ CLAUSETYPE) = NRC

| { (↑ **TOPIC**) = (↑ **GapPath5**)
| (↑ **ResPath5 PRONTYPE**) = c **RP** }
(↑ **CLAUSETYPE**) = **FRC** }

| ϵ }
{(↑ TOPIC PRED) = PRO
(ADJ ∈ ↑)

{ { (↑ TOPIC)=(↑ GapPath))
| (↑ ResPath PRONTYPE) = c RP }
(↑ CLAUSETYPE) = RRC
| { (↑ TOPIC)=(↑ GapPath4))
| (↑ ResPath4 PRONTYPE) = c RP }
(↑ CLAUSETYPE) = NRC }
|(COMP ↑) }

C
↑=↓

GapPath5 and the *ResPath5* describe the environments in which the two strategies occur in, and are de ned in (433) and (434):

(433) *ResPath5* ≡ { COMP+ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(434) *GapPath5* ≡ { (COMP* SUBJ) | (OBJ) | (OBJ2) }

A summary of the de nitions of the metacategories de ned so far is provided here for the readers convenience:

(435) (Path for resumption strategy, pu-RRCs)
ResPath ≡ { COMP+ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(436) (Path for gap strategy, pu-RRCs)
GapPath ≡ { (COMP* SUBJ) | (OBJ)}

(437) (Path for gap strategy, opios-RRCs)
GapPath1 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

(438) (Path for resumption strategy, opios-RRCs)
ResPath2 ≡ { COMP+ OBJ | COMP+ OBJ2 }

(439) (Resumption strategy distribution in pu NRCs) *ResPath4* ≡ { COMP* OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(440) (Resumption strategy distribution in opios NRCs)
ResPath3 ≡ { COMP+ OBJ | COMP+ { OBJ2 }}

(441) (Gap strategy Distribution in pu NRCs)
GapPath4 ≡ { (COMP* SUBJ)}

(442) (Gap strategy Distribution in opios NRCs)
GapPath3 ≡ { (COMP* SUBJ) | (OBJ) | OBJ2 | OBL (OBJ) | GF POSS }

(443) (Resumption strategy Distribution in opjos FRCs)
ResPath5 ≡ { COMP+ OBJ | COMP* { OBJ2 | OBL (OBJ) | GF POSS }}

(444) (Gap strategy distribution in opjos FRCs)
GapPath5 ≡ { (COMP* SUBJ) | (OBJ) | (OBJ2) }

We will have another look at the rules again in the next chapter, where we present an implementation of our analysis using the *Xerox Linguistics Environment* (XLE) parser. The c-structures and the f-structures of some of the examples are also provided in the appendix.

CHAPTER 5

XLE Implementation

This chapter presents a computational grammar of a fragment of Modern Greek, following the principles of the Lexical Functional Grammar (LFG) Parallel Grammar (ParGram) Project (P.A.R.C., 2008) a collaborative effort among researchers in industrial and academic institutions whose objective is to build wide coverage deep-parsing grammars for a wide variety of languages. The grammar is built using the *Xerox Linguistics Environment* (XLE) parser (P.A.R.C., 2009b) and covers the syntax of basic clause and word order phenomena in Modern Greek, and the syntax of Relative Clauses, with particular focus on the distribution of the gap/resumptive relativisation strategy, as described in chapter 4.

In this chapter, we present a brief overview of the XLE system, and the Parallel Grammar (*ParGram*) initiative. We present the fragment of Modern Greek, focusing on the coverage and the main assumptions underlying the current version of the grammar. We conclude by evaluating our grammar and discussing areas in need of improvement to be dealt with in future versions as well as some future development directions.

5.1 About XLE

Xerox Linguistics Environment (XLE) is a platform for developing Lexical Functional Grammars and was developed at Palo Alto Research Center (PARC). It is implemented in C and is available under Unix, Linux and MacOS operating systems.

XLE includes a parser, a generator, and a nite state morphological analyser and it can be used both for parsing and generation of natural languages. It also includes tools for other grammar development activities, such as performance analysis and test-suites and has builtin debugging, grammar maintenance and nite state tools to facilitate the job of the grammar developers.

XLE has been used for a range of Natural Language Applications from Machine translation, using the Transfer System (P.A.R.C., 2007), to Computer Assisted Language Learning (Butt and King, 2007). XLE has been used by researchers involved in the *Parallel Grammar (ParGram) project*, with academic and industrial participating members from across the world.

Some of the project s objectives include building broad coverage grammars which will parse and generate a wide range of a language s phenomena, and providing linguistically motivated analyses for the phenomena under consideration. All grammars are guided by a common set of linguistic principles and a commonly agreed-upon set of grammatical analyses and features as well as a similar treatment of core cross-linguistic phenomena. Finally, with respect to the methods used in grammar engineering, all members apply a common set of methods and evaluation strategies and at the same time try to achieve a balance between ef ciency, performance, readability and maintainability across grammars. Figure 5.1 shows the participating members locations, as well as the languages they have been working on (as of September 2009).

XLE has recently been used as the core technology employed in a novel search

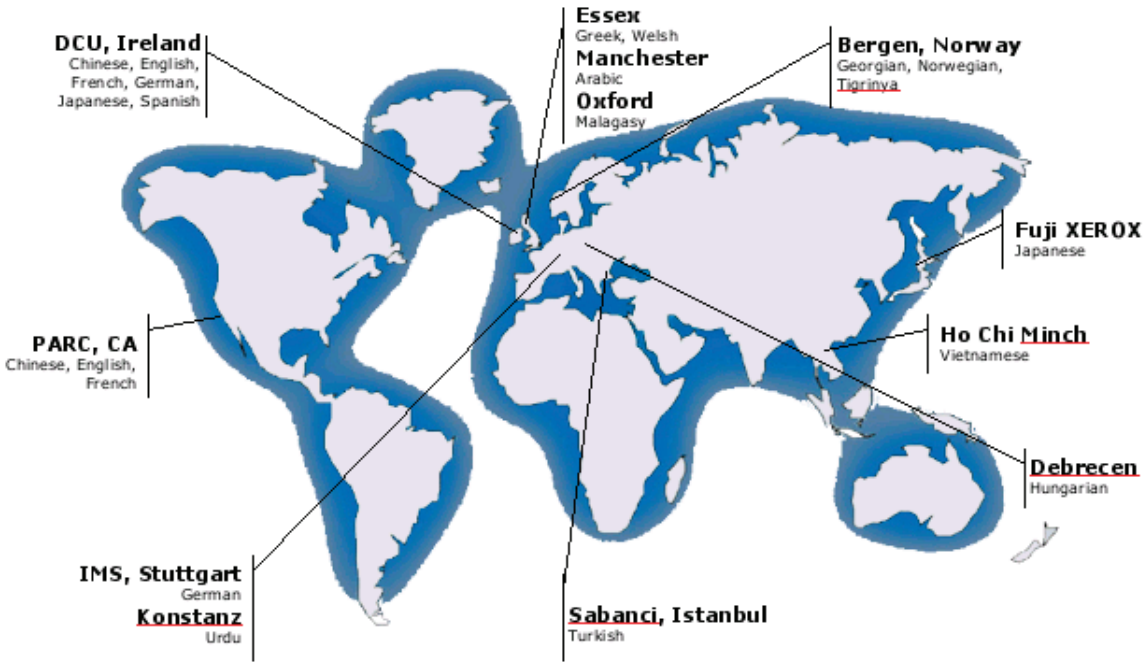


Figure 5.1: ParGram initiative participating sites

engine which aims at improving the way we nd information by enabling the user to form queries using natural language. Powerset s search engine www.powerset.com[1] aimed at improving users searching experience of Wikipedia by allowing them to type full questions/sentences in the search box as well as keywords. /On the results page, the user gets a summary of the search results compiled from different articles. Powerset is using FreeBase as its semantic knowledge database. Its technology is currently part of the improved searching experience in Microsoft s Bing (www.bing.com) search engine.

The XLE system contains a very powerful interface for inserting linguistic rules, lexical entries and their associated f-structure annotations. The grammar developer

[1]Now a sister company of Microsoft Corporation - update of February 2010

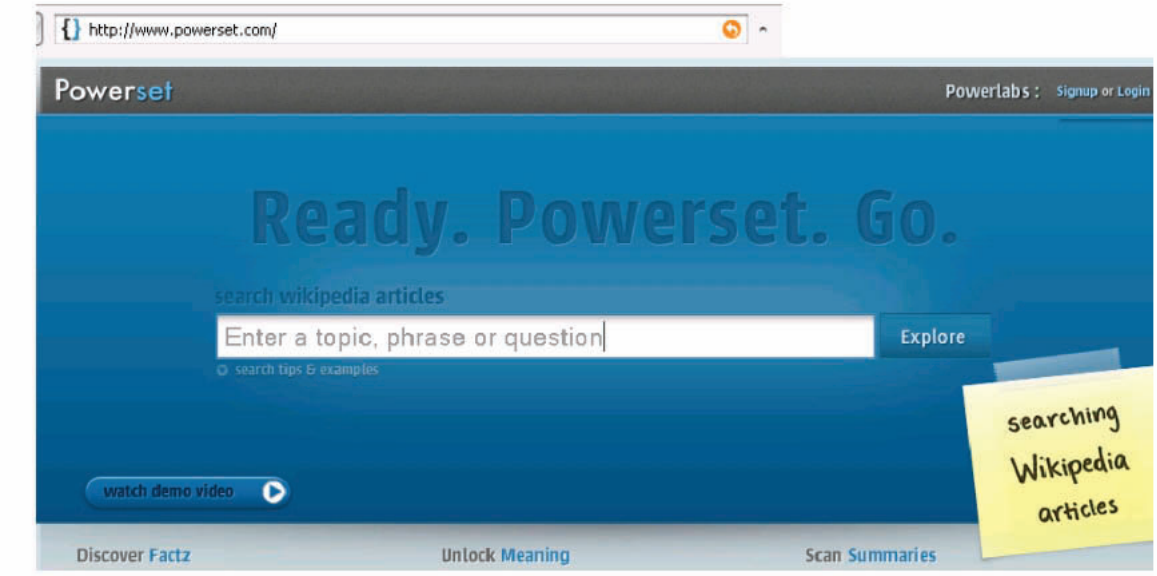


Figure 5.2: PowerSet search Engine Screenshot

will need to create a le and store in it the rules and the lexical entries of the grammar s/he is building. Then s/he will need to load that grammar into the XLE parser from which they can parse or generate sentences using appropriate command-line commands. In the section that follows, we present the typical structure of an `.lfg` le (the default extension for XLE grammar les) as well as look into how parsing a very simple sentence like *Mary likes John* works given a small demo english grammar.

5.2 Typical structure of an `.lfg` file

As we discussed in the previous section, all XLE grammar les, to be interpreted as such by the parser, need to have an `.lfg` extension in their lename. An `.lfg` grammar le may contain c-structure rules with their corresponding f-structure (or other projection) annotations as well as lexical entries (again with their c-structure or other information). an `.lfg` le may also contain other information such as templates (i.e. shortcuts to descriptions or generalisations over them) and some information about its morphology. The grammar le also contains a con guration

le which de nes which rule, template or lexicon le should be loaded.

Generally, an `.lfg` le will have the following structure:

(445)
```
DEMO    ENGLISH   CONFIG (1.0)
  ROOTCAT              S.
  FILES                .
  LEXENTRIES           (DEMO ENGLISH).
  RULES                (DEMO ENGLISH).
  TEMPLATES            (DEMO ENGLISH).
  GOVERNABLERELATIONS  SUBJ OBJ OBJ2 OBL OBL-?+ COMP XCOMP.
  SEMANTICFUNCTIONS    ADJUNCT  TOPIC.
  NONDISTRIBUTIVES     NUM PERS.
  EPSILON              e.
  OPTIMALITYORDER      NOGOOD.

----
DEMO   ENGLISH   RULES (1.0)


----
DEMO   ENGLISH   TEMPLATES (1.0)

----
DEMO   ENGLISH   LEXICON (1.0)

----
```

As we can see in (445), a XLE grammar le consists of different sections. Each section begins with a heading with placeholders for the grammar version (`DEMO`), the language (`ENGLISH`), the type of the section (`CONFIG`, `RULES`, `TEMPLATES`, `LEXICON`, `MORPHOLOGY`) and the XLE version (`(1.0)`). The grammar developer can change the names of the rst two placeholders freely (the grammar version and the language); however, they should not modify the names for the last two placeholders. Four dashes (`----`) signal the end of each section.

The `CONFIG` (configuration) section. The `CONFIG` (con guration) section of the grammar le includes information on which is the `ROOT` category in the grammar. In this example, we have assumed the `ROOT` category to be an `S` . This, however, may change depending on the focus of our grammar or fragment to any c-structure node

(phrase structure node) appearing on the left-hand-side of the rules in the RULES section.

In the FILES section, we normaly include the path and/or name of any les we would like our grammar to loac in addition to the main grammar le. This is useful especially when our grammar has grown substantially and is necessary to split tha different parts of the grammar in different les.

The LEXENTRIES, RULES and TEMPLATES speci cations show any additional le(s) that XLE needs to consult that may contains the lexical entrie, the rules and the templates. The value in the the parenthesis comes from the relevant grammar and language placeholders it needs to include. It is possible to load e.g. lexicon entries from more than one les; all it takes is adding the grammar ID and load the grammar in the FILES speci cation.

The GOVERNABLE RELATIONS speci cation de nes what attributes the parser should regard as grammatical functions for this grammar, and which may appear in the subcategorisation frame of verbs, whereas SEMANTIC FUNCTIONS de nes the discourse functions like TOPIC or ADJUNCT.

The NONDISTRIBUTIVES speci cation includes the attributes that will not distribute over two sets when for example we have a coordinate structure. The EPSILON speci cation sets the value of the symbol that will be used to denote an *empty string*, whereas the last speci cation OPTIMALITY ORDER is the place where any optimality constraints (if any) will be de ned.

The RULES section. The RULES section is where the c-structure rules and their annotations are placed. An example of a rule is given in (446):

(446)
```
S --> NP: (^ SUBJ)=!;
      VP: ^=!.
```

Despite the indescrepancy in the notation between XLE and LFG, the reader familiar with LFG, can t help but notice a lot of similarities. The XLE ^ symbol

stands for the LFG ↑, where as the XLE ! symbol, stands for an ↓. The semicolon ; is used to show where a node ends and where the next starts, and the colon : separates the c-structure node from its f-structure annotations.[2]

The TEMPLATES section. The TEMPLATES section containts the templates used in the RULES, the LEXICON or the MORPHOLOGY sections. Templates in XLE work more like shortcuts or generalisations over a set of equations consider the lexical entry in (447):

(447)
```
girl N * (^ PRED)='girl'
         (^ NUM)=sg.
```

You might find that you end up with a lot of these lexical entries that have some PRED value and singular; actually all singular nouns could fit that description. Instead of writing the same features for each lexical entry we can use templates to express this generalisation as follows:

(448)
```
DEMO ENGLISH TEMPLATES (1.0)
singN(P) = (^ PRED)='P'
           (^ NUM)=sg.

DEMO ENGLISH LEXICON (1.0)

girl N * @singN(girl).
```

The way XLE is going to interpret `@singN(girl}` is to first identify that this is a template (by the `@` prefix) and then look for a template named `singN` in the TEMPLATES section. As soon as it finds it, it will substitute the argument of `@singN(girl)` (i.e. `girl` with P in the template, so the actual lexical entry will be as in (447).

The LEXICON section. Which gets us to the Lexicon section. This section is where lexical entries reside. In the example lexical entry of the noun `girl` presented in

[2]For more XLE notations and their corresponding LFG symbols, see the appendix.

(447), the only thing that looks a bit different is the * speci cation. This stands as a placeholder for any morphology information we might need to relate the lexical entry to, from the MORPHOLOGY section, which contains the morphological paradigms of the lexical entries. Here, the * speci cation means that there is no morphology involved in this grammar.

Let s say we wanted to build a very small grammar that parses the following sentence: *Mary likes Kim*. Assuming our small grammar had the following rules in the RULES section:

(449)
```
S --> NP: (^SUBJ)=!;
      VP: ^=!.

VP --> V: ^=!;
          NP: (^ OBJ)=!.
```

and the following lexical entries in the LEXICON section.

(450)
```
Kim   NP   *   (^ PRED)='Kim'.
Mary   NP   *   (^PRED)='Mary'.
likes  V    *   (^PRED)='likes<(^SUBJ)(^OBJ)>'.
```

After loading the grammar (also provided in the appendix under simple-en-grammar.lfg) as seen in (451) below; we will try to parse the sentence using the parse command.

(451)
```
 # xle
XLE loaded from xle.
XLEPATH = /home/kakia/bin/xle-2008.08.28/.
Copyright (c) 1993-2001 by the Xerox Corporation and Copyright (c)
2002-2008 by the Palo Alto Research Center.
All rights reserved. This software is made available AS IS, and PARC
and the Xerox Corporation make no warranty about the software, its
performance or its conformity to any specification.
XLE release of Aug 28, 2008 13:04.
Type  help  for more information.

% create-parser simple-en-grammar.lfg

loading /media/EEYORE/1.Work/a.research/PhD/dissertation-drafts/
2010.03-DissDraft(all)/Chapters/ch06/simple-en-grammar/simple-en-grammar.lfg...
Grammar has 3 rules with 9 states, 6 arcs, and 6 disjuncts (6 DNF).

MORPHOLOGYCONFIGFILE = /home/kakia/bin/xle-2008.08.28//bin/default-morph-config.
```

```
Morph transducer files relative to /home/kakia/bin/xle-2008.08.28/
/bin/

0.00 CPU seconds
/media/EEYORE/1.Work/a.research/PhD/dissertation-drafts/2010.03-DissDraft(all)/
Chapters/ch06/simple-en-grammar/
simple-en-grammar.lfg loaded
Grammar last modified on Mar 06, 2010 20:54.
(Chart)0x88d25c0

% parse {Mary likes John}
parsing {Mary likes John}
1 solutions, 0.01 CPU seconds, 7 subtrees unified
1
%
```

If our grammar has no syntax errors or other mistakes, the sentence will parse and four windows will pop up as in Figure (5.3). The top-left window shows the c-structure of the current parse and the bottem-left window its f-structure. The top-right window will show all solutions in one place (in case of an ambiguity for example), whereas the bottom right window shows all the possible logical solutions (again in the case of ambiguity). If there are any problems with the parse, i.e. the parser cannot build a well-formed c-structure or f-structure representation, the parser will mark this sometimes with a dark background or bevelled button.

Let us now have a closer look at the XLE implementation of the Modern Greek grammar fragment.

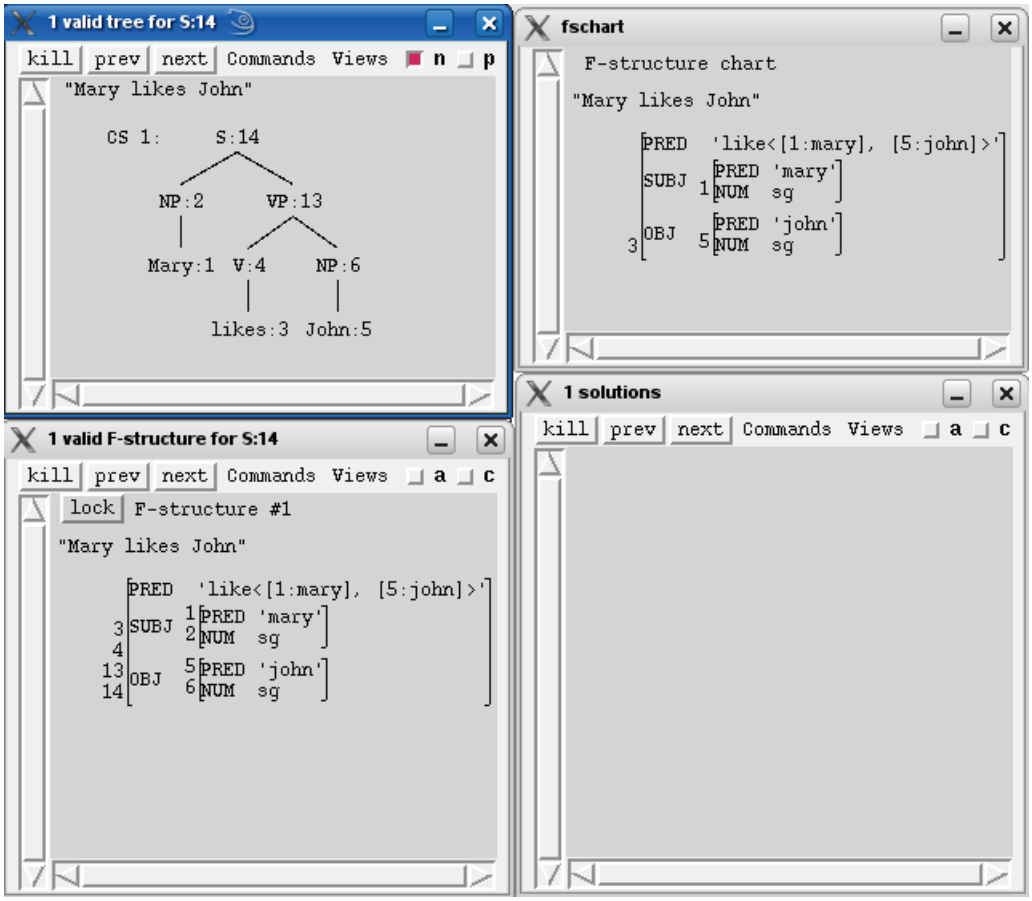


Figure 5.3: XLE parse

5.3 XLE implementation of a fragment of Modern Greek

The current version of the fragment is what we hope will be a preliminary effort to develop a large-scale LFG Computational grammar for Modern Greek. When building our fragment, we ve adhered to the principles underlying similar Parallel Grammar projects: our grammar fragment shares the objectives and principles outlined above, aiming at being parallel to similar projects for other languages as well as balancing maintainability and achieving large coverage. The current main focus is on the syntactic rules and thus the lexicon is kept minimal. We expect future

versions to focus on expanding the range of dara coverage including a morphological account using XLE s built-in Finite State Morphological analyser or other Finite State Morphological Tools.

5.3.1 Underlying assumptions

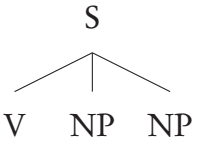
One of the main assumptions underlying the current version of the fragment concerns Modern Greek constituent order. Contrary to the standard view proposed in the literature[3], we assume just for the current fragment that all possible word orders (such as VSO, SVO, OSV and OVS) in declarative main clauses are equally acceptable and grammatical. This is rather simplifying things, since the degree of acceptability of the different word orders varies across speakers; such a simpli cation was necessary since the main focus of the implementation lied on the implementation of our account for Relative Clauses. Future versions will certainlly re ne the grammar to account for these differences.

As exempli ed in chapter 3 following recent proposals by some scholars (Alexopoulou, 1999, Tsiplakou, 1998, Tzanidaki, 1996), who have argued against a con - gurational account for Modern Greek, based on evidence from the similar status of subject and object (Tzanidaki, 1996), the absence of dummy subjects (Alexopoulou, 1999, 7) and the availability of VP ellipsis (Alexopoulou, 1999, Tsiplakou, 1998), we represent Modern Greek word order non-con gurationally, similarly to the repre-

[3] As stated elsewhere, although there seems to be an overall agreement in the literature concerning VSO as the basic constituent order of subordinate clauses (Tzartzanos, 1963, Lascaratou, 1998, Mackridge, 1985) and the rather xed constituent order within a nominal phrase (Markantonatou, 1992, Lascaratou, 1998), there seems to be great controversy with regards to constituent order in declarative sentences. As Holton et al. (1997, 426) point out, due to its rich morphological marking system, Modern Greek demonstrates a relative freedom in the way constituents are ordered within an independent clause, as seen in chapter 3, where each constituent order will produce well-formed (but not equally acceptable for all speakers) sentences.

sentation in (452):

(452)



Our grammar fragment presently focuses on building syntactic rules. We have also not accounted for the morphology of the lexical items in the lexicon section in the current version, but instead, we have introduced a separate lexical entry for each different form according to case, gender, number and person.

We have classi ed items such as *ston* [= to the.msg.acc] the combination of a preposition `se` [=in, to] with the de nite article in the accusative case and the appropriate gender and number form as *prepositional items*. This choice was due to the fact that they demonstrate some properties of prepositions, but they do differ in that they are declinable and that they agree in gender, case and number with the element they modify.

Assuming certain spelling conventions concerning the graphemic representation of the lexicon was also necessary. In particular, all words are spelled similarly to what they would sound like if uttered, the only exceptions being `x` standing for [h] and `oi` for [i].

5.3.2 Fragment Coverage

In this section we present our grammar s fragment coverage. Our grammar accounts for basic word order phenomena, basic agreement patterns (like subject-verb agreement and internal DP agreement), basic subcategorization frames and account for the pro-drop character of the language. To these, we added the LFG analysis of Restrictive, Non-Restrictive and Free Relative Clauses and the distribution of the gap/resumptive strategy in local and long distance dependences presented in chapter 4. The following sections present a discussion of the phenomena implemented in

the fragment and how we went about implementing them in XLE. For a full commented code of the implementation, as well as sample parses of some examples, see the relevant sections in the appendix.

5.3.2.1 Phenomena treated in the c-structure

Our fragment accounts for all possible word orders of declarative clauses, as illustrated in examples (453) to (458):

(453) VSO

taise **i** **yineka** **ton** **papagalo**
fed.$_{3SG}$ the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

(454) SVO

i **yineka** **taise** **ton** **papagalo**
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ fed.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$

(455) OSV

ton **papagalo** **i** **yineka** **taise**
the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ fed.$_{3SG}$

(456) OVS

ton **papagalo** **taise** **i** **yineka**
the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ fed.$_{3SG}$ the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$

(457) VOS

taise **ton** **papagalo** **i** **yineka**
fed.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$

(458) SOV

i **yineka** **ton** **papagalo** **taise**
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ fed.$_{3SG}$

'The woman fed the parrot.'

These c-structures share the same f-structure, shown in (459)). The reader familiar with LFG, might find that this f-structure looks a bit different from standard

LFG notation. XLE s output f-structure has `[1:woman]`, `[7:parrot]` where one would expect (↑SUBJ)(↑OBJ). This is just a convention; `[1:woman]` points to the f-structure of the woman predicate, and is re-entrant with the SUBJect s f-structure (both have 1 as their index). Similarly, `[7:parrot]` points to the f-structure of the *parrot* predicate. Numbers indicate that the f-structures are linked.

(459) XLE f-structure for *'The woman fed the parrot.'*

```
"i yineka taise ton papagalo"

    [PRED  'feed<[1:woman], [7:parrot]>'                  ]
    [SUBJ  [PRED 'woman'                                  ]
         1 [CASE nom, DEF +, GEND f, NUM sg, PERS 3]
    [OBJ   [PRED 'parrot'                                 ]
         7 [CASE acc, DEF +, GEND m, NUM sg, PERS 3]
  5 [TENSE past                                           ]
```

This is implemented using the shuf e operator (P.A.R.C., 2009a) which shuf es the elements on the right-hand side of the S rule. The syntax of this operator is illustrated in (461)[4].

(460) `S -> DP1; V; DP2.`

[4]The S rule in (460) illustrates the ordinary XLE syntax for writing phrase structure rules and succeeds for any string of elements containing a DP1, followed by a V and a DP2 in that order. The S rule in (461), however, succeeds for any string of elements, provided that it contains a DP1, a V and a DP2 in any order. This is indicated by including the elements we wish to shuf e in square brackets ([]) and separating them with a comma (,) as opposed to separating them with a semicolon (;), as shown in (460). Thus, the rule in (461) can be satis ed by any of the following orders:

(1) DP1 - V - DP2
DP1 - DP2 - V
V - DP1 - DP2
V - DP2 - DP1
DP2 - V - DP1
DP2 - DP1 - V

(461) `S -> [ DP1 ], [ V ] , [ DP2 ].`

Modern Greek is a pro-drop language, as shown in (462):

(462) **petai**
y.3SG
'S/he flies.'

This is achieved quite straightforwardly, by making the subject-DP optional in the c-structure rules and by adding an optional equation on the lexical entry of the verbs that assigns a PRED value to the SUBJ f-structure in case this is not present otherwise, as in (464). XLE notation slightly deviates from the standard LFG representation: `^` corresponds to the ↑ arrow; `!` corresponds to the ↓ arrow. Note that the way we denote optionality of constituents in rules, marked with round brackets `( )` is different from denoting optionality of the f-structure annotations, which is marked with curly brackets . The same curly brackets denote disjunction when they appear in a rule, as in (479). $ stands for the ∈ (element) notation.

(463) *The optional subject DP in the S rule*

```
S --> [ ( DP : (^ SUBJ ) = ! ) (! CASE )=nom ] , ...
```

(464) *The lexical entry of a pro-drop verb*

```
petai V * (^ PRED)='fly<(^SUBJ)>'
          (^ SUBJ NUM) = SG
          (^ PERS) = 3
          {(^ SUBJ PRED) = 'pro'}
           (^ TENSE) = present.
```

The S rule we propose in this grammar is shown in (465):

(465)
```
S -->
      [ (DP : (^ SUBJ) = ! (! CASE)= nom )],
      [ { VP_iv_tv_dv | VP_comp }].
```

A Modern Greek main declarative sentence consists of an optional subject DP of nominal case, followed by the rest of the constituents in any order. We went for a

non-con gurational/ at representation here, but a con gurational account could be accommodated quite easily. Note that VP$_i$v$_t$v-dv and VPcomp are not actually phrase structure nodes (as they do not appear as nodes in the c-structure); they are what we referred to in chapter 2 as *metacategories*. What they stand for is what is presented in (466) and (467).

(466)
```
VP_iv_tv_dv =
              [(NP: (^ {SUBJ|OBJ|OBJ2})=!
          { (! PRONTYPE)=c rp (TOPIC ^)|
            (! PRONTYPE)=c clitic})
               V: ^=!],
              [ (DP: (^ OBJ)=!) ],
              [{ (DP: (^ OBJ2)=!)
               | (PPse: (^ OBL)=!
                   (! CASE)= acc
              (! PFORM)=c se)}].
```

Continuing from the S rule, a subject DP can be followed by (again in any order): an optional NP clitic, that can function as a SUBJ, an OBJ, an OBJ2 and can be a resumptive pronoun ((! PRONTYPE)=c rp) if there is a TOPIC present in the mother node f-structure or can be a doubling clitic. this needs to be obligatorily followed by the main V. What follows them, is an optional OBJect DP, an optional OBJ2 DP or an optional OBLique PP$_{se}$ in accusative case, in any order. This PP needs to be of se PFORM, denoted by the (! PFORM)=c se constraining equation.

The VPcomp metacategory stands for what is presented in (467):

(467)
```
VP_comp =
          V: ^=!;
          CP: (^ COMP)=!.
```

This is offered as a disjunction over the VP_iv_tv_dv node which means that alternatively a subject DP can be followed by the main verb and a CP that functions as a COMP (in that order). This is to account for *pu* Clauses that function as a complement to a verb, and which are not necessarily relative clauses.

The DP we assume is presented in (468):

```
(468)  DP -->
           { D': ^=! |
           NP: ^=! (! PRONFORM) =c opjos }
           (CP: !$(^ ADJUNCT)).

       D' -->
           D
           N.
```

According to the DP rule, a DP consists of a D or a free relative pronoun NP `NP: ^=! (! PRONFORM) =c opjos`, followed by an optional adjunct CP where Relative clauses would normally reside. The D is very simple and does not account for adjectival phrases: we assume that both D and N are co-heads and contribute information to the same f-structure.

Another rule is the PP_{se} rule, presented in (469):

```
(469)  PPse -->
           P
           N:^=!
           (! CASE)= acc.
```

A PP_{se} consists of a P followed by an N. In this account, they are co-heads (i.e. we treat stom as a contentless preposition). An alternative approach to that would be to assume that *ston* is contentful, but this will not further be pursued in here.

The current fragment also includes an implementation of the analysis of Modern Greek Restrictive, Non-Restrictive and Free Relative Clauses presented in chapter 4, where we put forward an LFG analysis of the treatment of the distribution of the gap/resumptive relativisation strategy in Modern Greek Relative Clauses.

Implementing the analysis lead us to consider certain issues when writing our XLE grammar. One of them is the internal constituent order of Modern Greek Relative Clauses. As we described in chapter 3, where we presented our data, contrary to the controversy that the same issue has raised for independent declarative clauses (Tzartzanos, 1963, Siewierska et al., 1998, Philippaki-Warburton, 1985, Tsimpli, 1996, Holton et al., 1997, Alexopoulou, 1999), it is generally agreed in the litera-

ture that the basic or underlying constituent order of relative clauses is relatively xed (Tzartzanos, 1963, Mackridge, 1985). As shown in (470) and illustrated in examples (471) and (472), Modern Greek Relative clauses can be introduced by a complementizer or a relative pronoun, optionally followed by a resumptive pronoun[5], followed by the relative clause verb, and by zero or more instances of any nominal or adverbial elements in any order.

(470) complementizer/relative pronoun + (resumptive pronoun) + V + XP*

(471) **o papagalos pu edose o andras tis**
the.MSG·NOM parrot.MSG·NOM that gave.3SG the.MSG·NOM man.MSG·NOM the.FSG·GEN
yinekas
woman.FSG·GEN
'The parrot that the man gave to the woman.'

(472) **o papagalos pu edose tis yinekas o**
the.MSG·NOM parrot.MSG·NOM that gave.3SG the.FSG·GEN woman.FSG·GEN the.MSG·NOM
andras
man.MSG·NOM
'The parrot that the man gave to the woman.'

The elements following the verb may occur in any order[6]; the complementizer, the resumptive pronoun and the verb, however, should occur in that order. We capture these two different behaviours by using the declarative clause S in the C rule, in which all elements can be shuf ed using the shuf e operator ([]) which allows for constituents to appear in free word order after the V. The complementizer, the resumptive, the verb and the antecedent DP appear in xed order. This is why they appear outside the shuf ing operator as illustrated in (473)

(473)
```
RelP=
  {DP|PP|ADVP}.

CP -->
```

[5]See Tables 3.5, 3.6 and 3.7 for a more detailed view of the distribution of the two strategies

[6]As previously explained, each of the possible orders differs in terms of their degree of markedness; we will however assume here that all these orders are equivalent.

```
      { RelP: "RCs with relative pronouns"
       |e: "RCs with complementizers"  }
      C'.

C' -->
  (C)
    S.
```

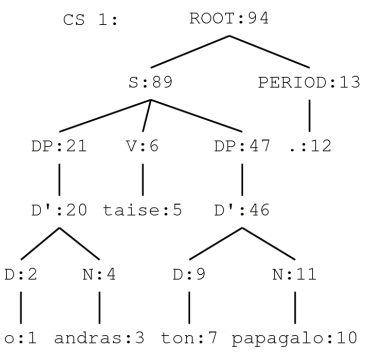
The CP rule in (473) shows the c-structure-only rule for Modern Greek Relative Clauses, as it has its f-structure annotations omitted[7]. A CP can be introduced by a relative pronoun (which can belong to any phrasal category the metacategory *RelP* is equivalent to) or by the empty string ϵ, which is reserved for Relative Clauses with complementizers such as *pu* and *oti*. These are followed by the C which contains an optional C followed by an S in which constituents can appear in any order.

In the following section we look into the phenomena we have accounted in the f-structure and discuss a more complete version for the CP rule which includes our account for the distribution of the gap and the resumption strategies.

The system accepts optional marking of punctuation at the end of a parsed sentence (period (.) and questionmark (?)) and assigns the appropriate clause type (declarative or interrogative respectively) in the f-structure, as in (474) and (476):

(474) **o andras taise ton papagalo.**
the.$_{MSG\cdot NOM}$ man.$_{MSG\cdot NOM}$ fed.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'The man fed the parrot.'

(475) c- and f-structure of (474)



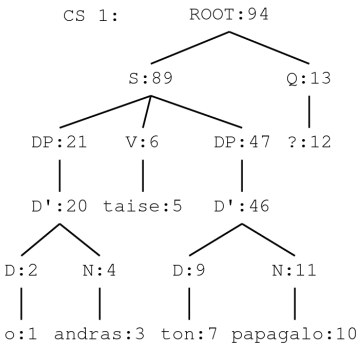
"o andras taise ton papagalo."

$$\begin{bmatrix} \text{PRED} & \text{'feed<[1:man], [7:parrot]>'} \\ \text{SUBJ} & 1\begin{bmatrix}\text{PRED 'man'} \\ \text{CASE nom, DEF +, GEND m, NUM sg, PERS 3}\end{bmatrix} \\ \text{OBJ} & 7\begin{bmatrix}\text{PRED 'parrot'} \\ \text{CASE acc, DEF +, GEND m, NUM sg, PERS 3}\end{bmatrix} \\ 5\,\text{CLAUSETYPE declarative, TENSE past} & \end{bmatrix}$$

[7]See section 5.3.2.2 for a more complete version

(476) **o andras taise ton papagalo?**
the.$_{MSG\cdot NOM}$ man.$_{MSG\cdot NOM}$ fed.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'Did the man feed the parrot?'

(477) c- and f-structure of (476)



"o andras taise ton papagalo?"

```
[PRED  'feed<[1:man], [7:parrot]>'
 SUBJ 1[PRED 'man'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
 OBJ  7[PRED 'parrot'
        CASE acc, DEF +, GEND m, NUM sg, PERS 3]
5[CLAUSETYPE interrogative, TENSE past]
```

The rule that accounts for this is de ned as a ROOT category over the S rule and is presented in (478):

(478)
```
ROOT -->
     S
     ({ PERIOD: (^ CLAUSETYPE)= declarative|
        Q: (^ CLAUSETYPE)= interrogative}).
```

5.3.2.2 Phenomena treated in the f-structure

The fragment accounts for some basic subcategorization frames (transitive, intransitive and ditransitive verbs including the realisation of indirect objects as either a genitive DP or an accusative PPse) as illustrated in examples (479) to (482):

(479) **o papagalos petai**
the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ y.$_{3SG}$
'The parrot flies.' (intransitive)

(480) **i andres taisan tus papagalus**
the.$_{MPL\cdot NOM}$ men.$_{MPL\cdot NOM}$ fed.$_{3PL}$ the.$_{MPL\cdot ACC}$ parrot.$_{MPL\cdot ACC}$
'The men fed the parrots.' (transitive)

(481) **edose i yineka ton papagalo ston andra**
gave.$_{3SG}$ the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ to.the.$_{MSG\cdot ACC}$ andra.$_{MSG\cdot ACC}$
'The woman gave the parrot to the man.' (ditransitive with PPse)

(482) **i yineka edose ton papagalo tu andra**
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ gave.$_{3SG}$ the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$ the.$_{MSG\cdot GEN}$ man.$_{MSG\cdot GEN}$
'The woman gave the man the parrot.' (ditransitive with NPgen)

The `VP_iv_tv_dv` rule below summarizes the four subcategorization frames:

(483)
```
VP_iv_tv_dv =
    [(NP: (^ {SUBJ|OBJ|OBJ2})=!
{ (! PRONTYPE)=c rp (TOPIC ^)|
  (! PRONTYPE)=c clitic})
     V: ^=!],
    [ (DP: (^ OBJ)=!) ],
    [{ (DP: (^ OBJ2)=!)
     | (PPse: (^ OBL)=!
    (! CASE)= acc
    (! PFORM)=c se)}].
```

Both the OBJ2 DP and the PP$_{se}$ are alternative manifestations of the indirect object, but they are assigned a different grammatical function: the genitive DP is an OBJ2 and the PP introduced by the *se* particle is an OBLique.

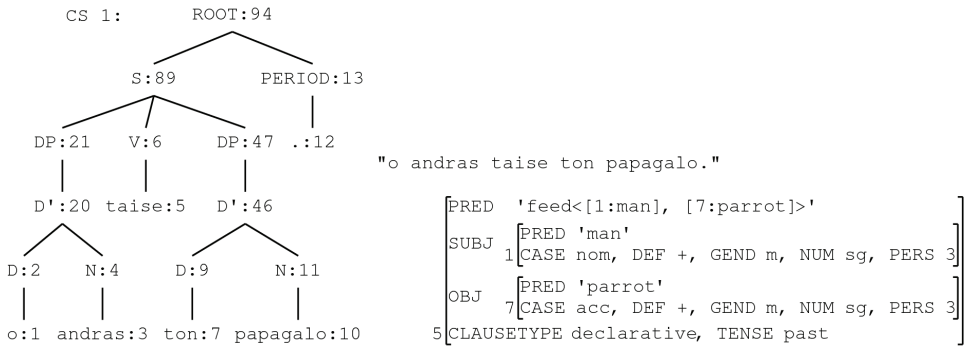
Examples like (484) are successfully ruled out by application of the coherence condition (Dalrymple, 2001, 39) using information from the lexical entry of the verb *petai* (ies), which ensures that there are no additional governable elements in the f-structure and that the presence of an extra governable grammatical function (in this case the extra OBJ) in the f-structure results in its being ruled out as incoherent:

(484) *** petai o papagalos tin yineka**
ies.$_{3SG}$ the.$_{MSG\cdot NOM}$ parrot.$_{MSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ woman.$_{FSG\cdot ACC}$
'**The parrot flies the woman.*'

The grammar successfully assigns the appropriate case to nominal elements depending on the requirements of the verb[8], as illustrated in examples (485) and (487), successfully ruling out examples like (489) by application of the consistency/uniqueness condition which ensures that "each attribute in each f-structure will have at most one value" (Dalrymple, 2001, 39):

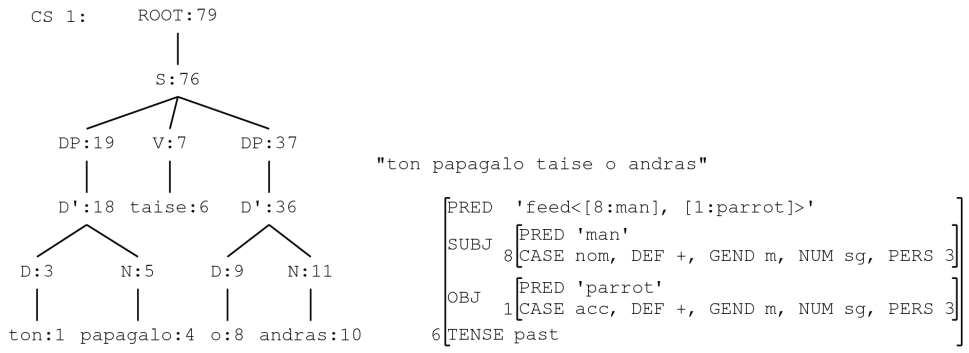
(485) **o andras taise ton papagalo**
the.MSG·NOM man.MSG·NOM fed.3SG the.MSG·ACC parrot.MSG·ACC
'The man fed the parrot.'

(486)



(487) **ton papagalo taise o andras**
the.MSG·ACC parrot.MSG·ACC fed.3SG the.MSG·NOM man.MSG·NOM
'The man fed the parrot.'

(488)

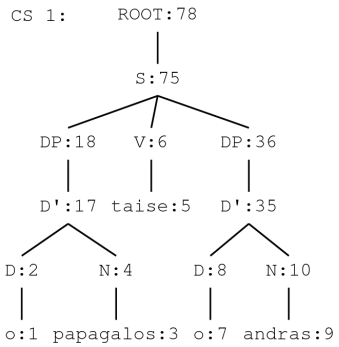


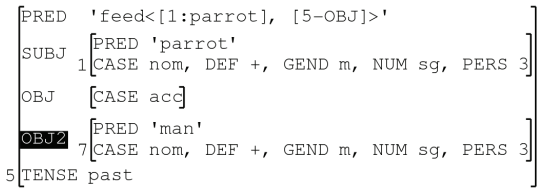
(489) *** o papagalos taise o andras**
the.MSG·NOM parrot.MSG·NOM fed.3SG the.MSG·NOM man.MSG·NOM

[8]Usually (but not always) nominative for subjects, accusative for objects or objects of the PP_{se}, genitive for indirect objects.

'The man fed the parrot.'(intended meaning)

(490)





This is accounted for lexically, on the template for each verb frame, as in the example below:

(491) Lexical entry for *edose*:

```
DEMOv12 GREEK LEXICON (1.0)

edose V * @(DTR gave) @subj-3sg (^ TENSE)=present.
```

(492) Templates

```
DEMOv12 GREEK TEMPLATES (1.0)

DTR(P) =
  { (^ PRED)='P<(^ SUBJ)(^ OBJ)(^ OBJ2)>'
    @obj2-case
   |(^ PRED)='P<(^ SUBJ)(^ OBJ)(^ OBL)>'}
  { (^ SUBJ PRED)='pro'}
  @subj-case
  @obj-case.

subj-case =
  (^ SUBJ CASE) = nom.

obj-case =
  (^ OBJ CASE)= acc.

obj2-case = (^ OBJ2 CASE)= gen.
```

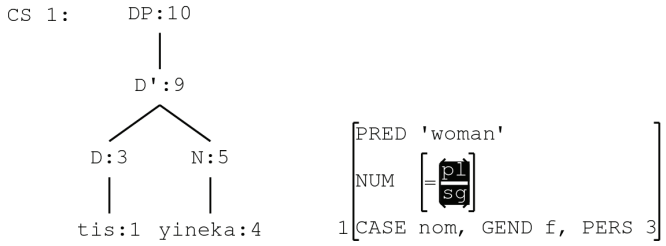
On the DP level, our grammar accounts for number, case and gender agreement within a DP or a PP, as in example (493), successfully ruling out ungram-

matical examples like (494). This is achieved again by application of the consistency/uniqueness condition as illustrated in the f-structure in (494), where the f-structure is ruled out as ungrammatical, since there are more than one values for the same feature (NUM) in a given f-structure:

(493) **tis** **yinekas**
the.FSG·GEN woman.FSG·GEN
'of the woman'

(494) ***tis** **yineka**
the.FSG·GEN woman.FSG·ACC
'of the woman'

(495) f-structure of *tis yineka



With respect to the implementation of the analysis of the gap/resumptive strategy in local and long distance dependencies in Modern Greek Relative Clauses, we opted to account for the fact that the resumptive pronoun has the same form as the unstressed monosyllabic clitic (weak form) of the personal pronoun and the de nite article in the lexicon. As shown in (496), this is treated using a disjunction (indicated by the ; notation) over the two types of lexical categories that tis can be assigned to: it can either be a D (de nite article), a resumptive pronoun (NP) or alternatively a clitic.

(496) `tis`

```
D * (^ DEF)=+ @f {@sg @gen|@pl @acc} "article";
NP * { (^ PRONTYPE)=clitic
       "no pred pro here because our approach
        treats it as an affix"
      |{(^PRED)='pro'} (^ PRONTYPE)=rp}
```

```
@third @sg @f @gen .
```

The CP rule for RRCs, NRCs and FRCs is presented in (497), with the f-structure information included:

(497)
```
RelP=
  {DP|PP|ADVP}.

CP -->
           { RelP: "RCs with relative pronouns"
                  (^ TOPIC)=!
                  (^ RELPRO)= %TOPICPATH
                  ~(%TOPICPATH COMPFORM)
                  {
                     "gapped & RP opios RRCs"
                      (^ CLAUSETYPE)=RRC
                    { (^ TOPIC)=(^ GapPath1)|
                      (^ ResPath2 PRONTYPE)=c RP}
                  |
                     "gapped & RP opios NRCs"
                      (^ CLAUSETYPE)=NRC
                    { (^ TOPIC)=(^ GapPath3)
                     |(^ ResPath3 PRONTYPE)=c RP}
           }
           |e: "RCs with complementizers"
                {
                  (^ TOPIC PRED)= PRO
                 {
                   "gapped & RP pu RRCs"
                   (^ CLAUSETYPE)=RRC
                   { (^ TOPIC)=(^ GapPath)
                    |(^ ResPath PRONTYPE)=c RP}
                 |
                   "gapped & RP pu NRCs"
                   (^ CLAUSETYPE)=NRC
                   { (^ TOPIC)=(^ GapPath4)
                    |(^ ResPath4 PRONTYPE)=c RP}
                 |
                  "gapped & RP opjos FRCs"
                   (^ CLAUSETYPE)=FRC
                   { (^ TOPIC)=(^GapPath5)
                    |(^ ResPath5 PRONTYPE)=c RP}
                 }
                |
                 (COMP ^) "for pu-RCs as complements"
            }  }
            C .

   C  -->  (C)  S.
```

A CP can be introduced by a Relative Pronoun that can be of any phrasal category as de ned by the *RelP* metacategory in (497) or an ϵ empty string, where

the information to be passed on to the complementizer Relative clauses will appear. Both of them are annotated to account for the distribution of gaps and resumptives.

Let us consider the first three lines first:

(498)
```
(^ TOPIC)=!
(^ RELPRO)= %TOPICPATH
~(%TOPICPATH COMPFORM)
```

The first equation ensures that any information from the current node becomes part of the TOPIC s f-structure, whereas the second ensures that there is no COMPFORM feature in this path. To prevent complementizers from appearing in this position. This is done by using a constraining equation. The following two sets of equations present a constraint to specify the type of relative clause involved (RRC, NRC, FRC) using the (^ CLAUSETYPE) feature, as well as the path (i.e. the environment they can appear in) for the gap strategy and the resumptive strategy.

The GapPath and ResPath metacategories for each rule stand for a path presented in (499):

(499)
```
"The Paths"

"path for resumption strategy, pu-RRCs"
   ResPath={ COMP+ OBJ|COMP* {OBJ2|OBL(OBJ)| GF POSS}}.
"Path for resumption strategy, opios-RRCs"
   ResPath2= { COMP+ OBJ| COMP+ OBJ2}.
"Resumption Distribution in pu-NRCs"
   ResPath4={ COMP* OBJ| COMP* {OBJ2| OBL (OBJ)| GF POSS}}.
"Resumption distribution in opios-NRCs"
   ResPath3={ COMP+ OBJ| COMP+ OBJ2}.
"Resumption distribution in opjos FRCs"
   ResPath5 = { COMP+ OBJ| COMP* {OBJ2| OBL (OBJ)|GF POSS}}.

"path for gap strategy, pu RRCs"
   GapPath = { (COMP* SUBJ)|(OBJ)}.
"Path for gap stratey, opios-RRCs"
   GapPath1 = { (COMP* SUBJ)|(OBJ)|OBJ2|OBL (OBJ)|GF POSS}.
"Path for gap strategy, pu-NRCS"
   GapPath4=(COMP* SUBJ).
"Gap distribution in opios-NRCs"
   GapPath3={ (COMP* SUBJ)|(OBJ)|OBJ2|OBL (OBJ)| GF POSS}.
```

```
"Gap distribution in opjos FRCs"
   GapPath5 = { (COMP* SUBJ)| (OBJ) | (OBJ2)}.
```

What about the (COMP ^) speci cation that is offered as an alternative to the empty string speci cations on the CP rule? This is to enable the grammar to parse grammatical examples as in (500), where *pu* Relatives are embedded within one or more *oti* complement clauses. This constraint is an inside-out existential constraint which will check that going out from the current f-structure there is a feature COMP. We will also need to add the appropriate lexical entry in the LEXICON section, to allow for a verb that subcategorised for an oti complement clause. An example of such a verb is shown in (501):

(500) **i yineka pu o Petros ipe oti taise**
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ that the.$_{MSG\cdot NOM}$ Peter said.$_{3SG}$ that fed.$_{3SG}$
ton papagalo.
the.$_{MSG\cdot ACC}$ parrot.$_{MSG\cdot ACC}$
'The woman Peter said she fed the parrot.'

(501)
```
ipe        V * @(oti-CMP said) @subj-3sg (^ TENSE)=past.

oti-CMP(P) =
  (^ PRED)='P<(^ SUBJ)(^ COMP)>'
  "(^ SUBJ)= ( ^ COMP SUBJ)"
  { (^ SUBJ PRED)='pro'}
  @subj-case.

subj-case =
  (^ SUBJ CASE) = nom.
```

5.3.3 Evaluation

The XLE system comes with a built-in set of test-suite tools that assist grammar developers in checking their grammar progress and detect any bugs or areas for improvement. For the purposes of evaluating our fragment, we built two test les testing the coverage of our grammar as described in the previous section.

The testsuite presented (in `demo-gre-basictestfile.tfl`) (provided in the appendix) contains some sample test items testing the basic declarative word order, subject-verb agreement, agreement within the DP, the pro-drop character of the language, some basic subcategorization frames for verbs, and optional punctuationas well as test items relevant to the coverage of restrictive, non-restrictive and free relatives with focus on the distribution of the gap/resumptive strategy in local and long distance dependencies.

Out of a total 176 items, 108 grammatical test items had 1 parse, 67 ungrammatical test items had 0 parses and 1 item had 2 parses. Although the accuracy of the system might appear too arti cial and constructed, it is worth noting that the current version of Modern Greek Grammar is a fragment. As such, it covers a restricted range of phenomena and it is only natural that the test items have been built to suit the phenomena under investigation.

So why would it be useful to build a fragment of a grammar in the rst place if both the set of phenomena is limited and the testsuites are especially built to match them? Mainly because it allows us to implement smaller pieces of grammar and test that they are robust and ef cient and that they produce the expected output before attempting to incorporate them in a larger grammar. Another advantage is that simultaneous development of complex phenomena in the same grammar may in uence both the accuracy of description of the phenomenon as well as the effectiveness of the system. Our choice of implementing a fragment of Modern Greek grammar was due not only to the above advantages but also to the fact that since this was our rst attempt to build a computational grammar using the XLE platform, we were also interested in understanding the process of building a grammar and we intended to use this fragment as a starting point for future larger-scale implementations of Modern Greek.

Of course, being a fragment grammar can only mean that there is room for

further development. Some directions are presented in the following section.

5.4 Future Development Directions

This chapter presented a computational grammar fragment for Modern Greek, built following the principles of the LFG ParGram Project and included among others a basic grammar, covering simple word order phenomena, simple agreement phenomena as well as an implementation of an LFG account of the gap/resumption strategy in Modern Greek Relative Clauses. It goes without saying that the current fragment of Modern Greek grammar is at its preliminary stage and it is only natural that there are a lot of phenomena not yet been accounted for. It is expected that future versions will build upon the current fragment of Modern Greek grammar to account for the semantics of Restrictive, Non-Restrictive and Free Relative Clauses, examples of which are shown in (502), (503) and (504) respectively:

(502) **i yineka tin opia vrike o andras ine sto nosokomio.**
the.$_{FSG\cdot NOM}$ woman.$_{FSG\cdot NOM}$ the.$_{FSG\cdot ACC}$ who.$_{FSG\cdot ACC}$ found.$_{3SG}$ the.$_{MSG\cdot NOM}$ man.$_{MSG\cdot NOM}$ is to the.$_{NSG\cdot ACC}$ hospital.$_{NSG\cdot ACC}$
'The woman whom the man found is at the hospital.' (o opios restrictive relative clause)

(503) **i Kiki, pu tin agapai o Stelios, ine arosti.**
the.$_{FSG\cdot NOM}$ Kiki that her.$_{FSG\cdot ACC}$ love.$_{3SG}$ the.$_{MSG\cdot NOM}$ Stelios, is.$_{3SG}$ ill.$_{FSG\cdot NOM}$
'Kiki, that Stelios loves, is ill.' (pu-Non-Restrictive RC)

(504) **opjos irthe efige.**
whoever.$_{MSG\cdot NOM}$ came.$_{3SG}$ left.$_{3SG}$
'Whoever came, left.' (Free Relative RC)

Another area for improvement of the current version is making our declarative structure more aware of differences in acceptability and markedness in topicalised positions. This could be achieved by incorporation of the use of Discourse Functions or of a treatment of the phenomena at the information structure, where ap-

propriate, to account for the different degrees of markedness and acceptability of the different word orders. Word orders like SOV, VOS, OVS and OSV are usually taken as alternatives to the two basic word orders (SVO and VSO). Their rst element is usually taken to be a topicalised/focused element (marked with small capital font in the examples below). An example of an SVO and its corresponding OSV order is given in (505) and (506):

(505) SVO

i yineka taise ton papagalo
the.FSG·NOM woman.FSG·NOM fed.3SG the.MSG·ACC parrot.MSG·ACC

'The woman fed the parrot.'

(506) OSV

TON PAPAGALO i yineka taise
the.MSG·ACC parrot.MSG·ACC the.FSG·NOM woman.FSG·NOM fed.3SG

'It was the parrot that the woman fed.'

We also intend to enrich our lexicon as appropriate to re ect the phenomena under investigation, as well as expanding out grammar to cover other constructions such as coordination, examples of which are shown in (507) and (508):

(507) **i Kiki vrike ton papagalo ke o Stelios**
the.FSG·NOM Kiki found.3SG the.MSG·NOM parrot.MSG·NOM and the.MSG·NOM Stelios
ti filise.
her.FSG·ACC kissed.2SG
'Kiki found the parrot and Stelios kissed her.'

(508) **i yineka ke o andras agapun ton**
the.FSG·NOM woman.FSG·NOM and the.MSG·NOM man.MSG·NOM love.3PL the.MSG·ACC
papagalo
parrot.MSG·ACC
'The woman and the man love the parrot.'

Summary

In this chapter we presented a computational grammar of a fragment of Modern Greek using the Xerox Linguistic Environment (XLE). We presented an overview of the XLE platform and some background about the ParGram project, as well as some applications of the system in real-life commercial products. Following this, we presented an overview of our grammar discussing some of the assumptions and limitations of the current fragment. Finally, we discussed our implementation and its coverage and presented some possible development directions.

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XLE vs. LFG Notations

XLE uses only ascii for characters (so that up arrow is represented by `^` and the down arrow by `!`). Here is a table that gives LFG notations and their XLE equivalents[9]. This list has been adapted to the `demo-gre-v.1.2.lfg` grammar i.e. if it has not been used, it will not be mentioned here:

LFG notation	X LE-equivalent	Description
$\uparrow$	`^`	f-structure metavariable
$\downarrow$	`!`	f-structure metavariable
$=$	`=`	de ning equality
$\equiv$	`=`	meta-category de nition
$=_c$	`=c` or `=C`	constraining equality
$\in$	`$`	set membership
$\neg$	`~`	negation (complementation)
$\leftarrow$	`<-`	off-path constraint
$\rightarrow$	`->`	off-path constraint
(a)	`{ a }`	optional f-structure constraint (in the lexical entries)

[9] from http://www2.parc.com/isl/groups/nltt/xle/doc/notations.html#NoA

Code Listing

.1 demo-gre-v.1.2.lfg

```
          "------------------------------------------------
             Implementing a fragment of MG grammar in XLE
            ------------------------------------------------
                                Kakia Chatsiou
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History of changes:

* (v.0.9a) all possible MG word orders (VSO,SVO,OVS, OSV,VOS,SOV)
  - (2DO)  treatment of acceptability and topicalised elements
* (v.0.9a) subject pro-drop
* (v.0.9a) intransitive, ditransitive with genNP, transitive,
           ditransitive with PP
* (v.0.9a) subject-verb agreement
* (v.0.9a) exclusion of incorrect subcat frames
* (v.0.9a) punctuation (period, questionmark)
* (v.0.9b) ambiguity arising due to overlapping case forms (e.g.
      ta agoria (nom,acc))
* (v.0.9a) number gender case agreement within DP/PP
* (v.0.9b) make lexicon management easier by introducing templates
* (v.0.9c) incorporation of analysis of pu-RRCs
* (v.1.0)  incorporation of analysis of opios-RRCs, NRCs
* (v.1.1)  incorporation of analysis of FRCs
* (v.1.2)  embedding
* (v.1.2)  pu complement subordinate clauses
* (v.1.2)  UDCs

Stuff within quotes are comments.
"


DEMOv12 GREEK CONFIG (1.0)
ROOTCAT               ROOT.
FILES                 .
LEXENTRIES            (DEMOv12 GREEK).
```

```
RULES                  (DEMOv12 GREEK).
TEMPLATES              (DEMOv12 GREEK).
GOVERNABLERELATIONS    SUBJ OBJ OBJ2 OBL OBL-?+  COMP XCOMP.
SEMANTICFUNCTIONS      ADJUNCT TOPIC.
NONDISTRIBUTIVES       NUM PERS.
EPSILON                e.
OPTIMALITYORDER        NOGOOD.

----

DEMOv12 GREEK RULES (1.0)

   ROOT -->
  "the root category, umbrella node for decla-
  rative and interrogative clauses. We distin-
  guish between the two using punctuation as
  a starting point "
    S
    ({ PERIOD: (^ CLAUSETYPE)= declarative|
       Q: (^ CLAUSETYPE)= interrogative}).


   S -->
 "an S (of Modern Greek) consists of an optional
 subject DP of nominative case, followed by the
 rest of the constituents in any order. we went
 for a non-configurational (flat) representation
 here, but a configurational account can be easily
 accommodated. VP_iv_tv_dv and VP_comp are not
 actual nodes, but metacategories - see below"
   [ (DP : (^ SUBJ) = ! (! CASE)= nom )],
   [ { VP_iv_tv_dv | VP_comp }].

   VP_iv_tv_dv =
  "continuing from the S rule, the subject DP can
  be followed by (again in any order) :
  * an optional NP clitic, that can function as
  a SUBJ, OBJ, OBJ2 and can be a resumptive
  pronoun (if there is a TOPIC present in the
  mother f-structure) or a doubling clitic,
  obligatorily followed by the main V
  * followed by an optional Object DP
  * followed by either an optional OBJ2 DP or an
  optional OBLique PPse in accusative case"
    [(NP: (^ {SUBJ|OBJ|OBJ2})=!
{ (! PRONTYPE)=c rp (TOPIC ^)|
  (! PRONTYPE)=c clitic})
     V: ^=!],
    [ (DP: (^ OBJ)=!) ],
    [{ (DP: (^ OBJ2)=!)
     | (PPse: (^ OBL)=!
    (! CASE)= acc
    (! PFORM)=c se)}].
```

```
   VP_comp =
        "continuing from the S rule, the subject DP can
 be followed by the main verb, and a CP that
 functions as a COMP. This is to account for pu-RRCs as
 complements to a verb"
    V: ^=!;
    CP: (^ COMP)=!.



   DP -->
       "a DP consists of a D  or a free relative pronoun NP
 followed by an optional adjunct CP where Relative
 clauses would normally appear"
    { D : ^=! |
    NP: ^=! (! PRONFORM) =c opjos }
    (CP: !$(^ ADJUNCT)).

   D  -->
  "a D  consists of a D followed by an N. These are
  coheads."
    D
    N.


   PPse -->
  "A se (to the) PP consists of a P followed by an
  NP. In our current account, they are treated as
  co-heads, (i.e ston is treated as a contentless
  preposition), but an alternative analysis is also
  possible "
    P
    N:^=!
    (! CASE)= acc.

   RelP=
"a metacategory for the types of standing for the
different types of phrasal category that a relative
pronoun introducing relative clauses can belong to"
  {DP|PP|ADVP}.

   CP -->
  "    The CP rule for RRCs, NRCs and FRCs. A CP consists
  of a Relative pronoun (which can be of any phrasal
  category as above) with the relevant annotations to
  account for the distribution of gaps and resumptives.
  The first three lines ensure that the discourse
  function is coindexed with a grammatical function,
  and that there is no COMPFORM feature in this path
  (to prevent complementizers from appearing in this
  position).
       For each type of relative clause, we include an
  constraint to specify the type of relative clause, as
```

```
  well as the distribution of the gap and resumption
  strategy"
    { RelP: "RCs with relative pronouns"
  (^ TOPIC)=!
  (^ RELPRO)= %TOPICPATH
  ~(%TOPICPATH COMPFORM)
  {
    "gapped & RP opios RRCs"
    (^ CLAUSETYPE)=RRC
    { (^ TOPIC)=(^ GapPath1)|
      (^ ResPath2 PRONTYPE)=c RP}
   |
    "gapped & RP opios NRCs"
    (^ CLAUSETYPE)=NRC
    { (^ TOPIC)=(^ GapPath3)
     |(^ ResPath3 PRONTYPE)=c RP}

    }
     |e: "RCs with complementizers"
       {
 (^ TOPIC PRED)= PRO
 "(ADJ $ ^)"
 {
   "gapped & RP pu RRCs"
   (^ CLAUSETYPE)=RRC
   { (^ TOPIC)=(^ GapPath)
    |(^ ResPath PRONTYPE)=c RP}
 |
   "gapped & RP pu NRCs"
   (^ CLAUSETYPE)=NRC
   { (^ TOPIC)=(^ GapPath4)
    |(^ ResPath4 PRONTYPE)=c RP}
  |
   "gapped & RP opjos FRCs"
   (^ CLAUSETYPE)=FRC
   { (^ TOPIC)=(^GapPath5)
    |(^ ResPath5 PRONTYPE)=c RP}
 }
|
 (COMP ^) "for pu-RCs as complements"
    }
    }
    C .




   C  -->
  "a C  consists of an optional C followed by an S.
  Here we have opted for a simplified account of the
  internal constituent order of the Srel. Future
  versions will hopefully be more information structure
  aware"
  (C)
```

```
    S.

"The Paths"

"path for resumption strategy, pu-RRCs"
   ResPath={ COMP+ OBJ|COMP* {OBJ2|OBL(OBJ)| GF POSS}}.
"Path for resumption strategy, opios-RRCs"
   ResPath2= { COMP+ OBJ| COMP+ OBJ2}.
"Resumption Distribution in pu-NRCs"
   ResPath4={ COMP* OBJ| COMP* {OBJ2| OBL (OBJ)| GF POSS}}.
"Resumption distribution in opios-NRCs"
   ResPath3={ COMP+ OBJ| COMP+ OBJ2}.
"Resumption distribution in opjos FRCs"
   ResPath5 = { COMP+ OBJ| COMP* {OBJ2| OBL (OBJ)|GF POSS}}.

"path for gap strategy, pu RRCs"
   GapPath = { (COMP* SUBJ)|(OBJ)}.
"Path for gap stratey, opios-RRCs"
   GapPath1 = { (COMP* SUBJ)|(OBJ)|OBJ2|OBL (OBJ)|GF POSS}.
"Path for gap strategy, pu-NRCS"
   GapPath4=(COMP* SUBJ).
"Gap distribution in opios-NRCs"
   GapPath3={ (COMP* SUBJ)|(OBJ)|OBJ2|OBL (OBJ)| GF POSS}.
"Gap distribution in opjos FRCs"
   GapPath5 = { (COMP* SUBJ)| (OBJ) | (OBJ2)}.

   "Another metacategory which stands for the different
    types of grammatical functions in a functional uncertainty
    path"
   GF= { SUBJ|OBJ|OBJ2|OBL}.

----

DEMOv12 GREEK TEMPLATES (1.0)


"templates for the verbs  subcategorization frames"

   ITR(P) =
  (^ PRED)= P<(^ SUBJ)>
  { (^ SUBJ PRED)= pro }
  @subj-case.
   TR(P) =
  (^ PRED)= P<(^ SUBJ)(^ OBJ)>
  { (^ SUBJ PRED)= pro }
  @subj-case
  @obj-case.
   DTR(P) =
  { (^ PRED)= P<(^ SUBJ)(^ OBJ)(^ OBJ2)>
    @obj2-case
   |(^ PRED)= P<(^ SUBJ)(^ OBJ)(^ OBL)> }
  { (^ SUBJ PRED)= pro }
  @subj-case
  @obj-case.
```

```
   TRorITR(P) =
  { @(TR P)
   |@(ITR P)}.
   oti-CMP(P) =
  (^ PRED)= P<(^ SUBJ)(^ COMP)>
  "(^ SUBJ)= ( ^ COMP SUBJ)"
  { (^ SUBJ PRED)= pro }
  @subj-case.

"case templates"
   nomacc =
  { (^ CASE)= acc
  | (^ CASE)= nom}.
   nom = (^ CASE)= nom.
   acc = (^ CASE) = acc.
   gen = (^ CASE) = gen.

"subj/obj features templates"
   subj-3sg = (^ SUBJ NUM)= sg
  (^ SUBJ PERS)=3.
   subj-3pl = (^ SUBJ NUM)= pl
  (^ SUBJ PERS)=3.
   subj-case =
  (^ SUBJ CASE) = nom.
   obj-case =
  (^ OBJ CASE)= acc.
   obj2-case = (^ OBJ2 CASE)= gen.

"number templates"
   N_pl(P) =
  (^ PRED)= P
  (^ NUM)= pl
  (^ PERS)= 3.
   N_sg(P) =
  (^ PRED)= P
  (^ NUM)= sg
  (^ PERS)= 3.
   sg = (^ NUM) = sg.
   pl = (^ NUM) = pl.

"gender templates"
   m = (^ GEND)=m.
   f = (^ GEND)=f.
   n = (^ GEND)=n.

"person templates"
   first = (^ PERS)=1.
   second = (^ PERS)=2.
   third = (^ PERS)=3.

----

DEMOv12 GREEK LEXICON (1.0)
```

```
"Verbs"

taise    V * @(TR feed)      @subj-3sg (^ TENSE)=past.
tsibise   V * @(TR bit )      @subj-3sg (^ TENSE)=past.
agapai    V * @(TR love)      @subj-3sg (^ TENSE)=present.
petai    V * @(ITR fly)      @subj-3sg (^ TENSE)=present.
edose    V * @(DTR gave)     @subj-3sg (^ TENSE)=past.
vrike     V * @(TR find)      @subj-3sg (^ TENSE)=past.
epsahnan  V * @(TR seek)      @subj-3pl (^ TENSE)=past.
ipe       V * @(oti-CMP said) @subj-3sg (^ TENSE)=past.
kseri     V * @(oti-CMP know) @subj-3sg (^ TENSE)=present.
kathise   V * @(ITR sat)      @subj-3sg (^ TENSE)=past.


"Nouns"

papagalos N * @(N_sg parrot) @m @nom.
papagalu  N * @(N_sg parrot) @m @gen.
papagalo  N * @(N_sg parrot) @m @acc.
papagali  N * @(N_pl parrot) @m @nom.
papagalon N * @(N_pl parrot) @m @gen.
papagalus N * @(N_pl parrot) @m @acc.

Petros    N * @(N_sg Peter) @m @nom.
Petru    N * @(N_sg Peter) @m @gen.
Petro    N * @(N_sg Peter) @m @acc.


Kostas    N * @(N_sg Kostas) @m @nom.
Kosta    N * @(N_sg Peter)  @m {@gen|@acc}.

Ilias    N * @(N_sg Kostas) @m @nom.
Ilia    N * @(N_sg Peter)  @m {@gen|@acc}.

Kiki    N * @(N_sg Kostas) @f {@nom|@acc}.
Kikis    N * @(N_sg Peter)  @f @gen .

andras    N * @(N_sg man) @m @nom.
andra    N * @(N_sg man) @m {@gen|@acc}.
andres    N * @(N_pl man) @m @nomacc.
andron    N * @(N_pl man) @m @gen.

yineka    N * @(N_sg woman) @f @nomacc.
yinekas   N * @(N_sg woman) @f @gen.
yinekes   N * @(N_pl woman) @f @nomacc.
yinekon   N * @(N_pl woman) @f @gen.

Maria    N * @(N_sg Mary) @f @nomacc.
Marias    N * @(N_sg Mary) @f @gen.

Sofia    N * @(N_sg Sophie) @f @nomacc.
Sofias    N * @(N_sg Sophie) @f @gen.
```

```
biskoto   N * @(N_sg biscuit) @n @nomacc.
biskotu   N * @(N_sg biscuit) @n @gen.
biskota   N * @(N_pl biscuit) @n @nomacc.
biskoton  N * @(N_pl biscuit) @n @gen.

agori    N * @(N_sg boy) @n @nomacc.
agoriu    N * @(N_sg boy) @n @gen.
agoria    N * @(N_pl boy) @n @nomacc.
agorion   N * @(N_pl boy) @n @gen.

"Determiners/clitics/resumptives"

o    D * (^ DEF)=+ @m @sg @nom. "article"

i    D * (^ DEF)=+ {@f@sg|@m@pl|@f@pl} @nom. "article"

tu    D * (^ DEF)=+ {@m|@n} @sg @gen "article";
  NP * { (^ PRONTYPE)=clitic
 "no pred pro here because our approach
 treats it as an affix"
|{(^PRED)= pro } (^ PRONTYPE)=rp}
       { @m|@n} @sg @gen.
ton    D * (^ DEF)=+ {@m @sg @acc | @pl @gen} "article";
  NP * { (^ PRONTYPE)=clitic
 "no pred pro here because our approach
 treats it as an affix"
|{(^PRED)= pro } (^ PRONTYPE)=rp}
       @m @acc @third .

tis    D * (^ DEF)=+ @f {@sg @gen|@pl @acc} "article";
  NP * { (^ PRONTYPE)=clitic
 "no pred pro here because our approach
 treats it as an affix"
|{(^PRED)= pro } (^ PRONTYPE)=rp}
       @third @sg @f @gen .

tin    D * (^ DEF)=+ @f @sg @acc "article";
  NP * { (^ PRONTYPE)=clitic
 "no pred pro here because our approach
 treats it as an affix"
|{(^PRED)= pro } (^ PRONTYPE)=rp}
       @third @sg @f @acc.

to    D * (^ DEF)=+ @n @sg @nomacc. "article"
ta    D * (^ DEF)=+ @n @pl @nomacc. "article"

ston    P * (^ DEF)=+ @m @sg @acc (^ PFORM)= se.
stin    P * (^ DEF)=+ @f @sg @acc (^ PFORM)= se.

"Punctuation"
.    PERIOD *.
?    Q *.

"complementizers"
```

```
pu    C * (^ COMPFORM)=pu
      { (^ CLAUSETYPE)=RRC
       |(^CLAUSETYPE) =NRC}.
oti    C * (^ COMPFORM)=oti.

"RRC/NRC relative pronouns"

opios    N * (^ PRED)= PRO
      @m @sg @nom
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".

opiu    N * (^ PRED)= PRO
      @m @sg @gen
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".

opio    N * (^ PRED)= PRO
      @m @sg @acc
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".
opii    N * (^ PRED)= PRO
      @m @pl @nom
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".

opion    N * (^ PRED)= PRO
      {@m|@f|@n} @pl @gen
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".
opius    N * (^ PRED)= PRO
      @m @pl @acc
      (^ PRONFORM)= opios
      (^ PRONTYPE)=REL
      { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
      ~( ^ $ ADJ)
      "ensures that *o omorfos opios is ungrammatical".

opia    N * (^ PRED)= PRO
```

```
       {@f @sg|@n @pl} {@nom|@acc}
       (^ PRONFORM)= opios
       (^ PRONTYPE)=REL
       { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
       ~( ^ $ ADJ).
opias    N * (^ PRED)= PRO
       @f @sg @gen
       (^ PRONFORM)= opios
       (^ PRONTYPE)=REL
       { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
       ~( ^ $ ADJ).
opies    N * (^ PRED)= PRO
       @f @pl {@nom|@acc}
       (^ PRONFORM)= opios
       (^ PRONTYPE)=REL
       { ((GF ^) CLAUSETYPE)=RRC|((GF^) CLAUSETYPE)=NRC}
       ~( ^ $ ADJ).



"FRC relative pronouns"

opjos    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       "In LFG it is (^ ADJUNCT $ FOO), XLE seems to
       complain about it though..."
       @m @sg @nom.
opju   NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       @m @sg @gen.
opjon    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       {@m @sg @acc|@f @pl @gen}.
opji    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       @m @pl @nom.
opjus   NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       @m @pl {@gen|@acc}.


opja    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       @f @sg {@nom|@acc}.

opjas    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
```

```
       @f @sg @gen.
opjes    NP * (^ PRED)=  PRO
       (^ PRONFORM) = opjos
       (^ ADJUNCT CLAUSETYPE)= FRC
       @f @pl {@nom|@acc}.

----
```

.2 simple-en-grammar.lfg

```
          "------------------------------------------------
             Implementing a fragment of MG grammar in XLE
           ------------------------------------------------
                                Kakia Chatsiou
                              achats@essex.ac.uk
                          PhD Student in Linguistics
                       Dept. of Languagea and Linguistics
                             University of Essex, UK
                            (http://kakiachatsiou.tk)
Last updated: 28.02.2010 - A very simple grammar used to exemplify how XLE works."
DEMO ENGLISH CONFIG (1.0)
ROOTCAT               S.
FILES                 .
LEXENTRIES            (DEMO ENGLISH).
RULES                 (DEMO ENGLISH).
TEMPLATES             (DEMO ENGLISH).
GOVERNABLERELATIONS   SUBJ OBJ OBJ2 OBL OBL-?+  COMP XCOMP.
SEMANTICFUNCTIONS     ADJUNCT TOPIC.
NONDISTRIBUTIVES      NUM PERS.
EPSILON               e.
OPTIMALITYORDER       NOGOOD.
----
DEMO ENGLISH RULES (1.0)

S -->   NP: (^ SUBJ)=!;
VP: ^=!.

VP -->  V: ^=!;
NP: (^ OBJ)=!.

NP -->  D: ^=!;
N: ^=!.

----
DEMO ENGLISH TEMPLATES (1.0)

singN(P)= (^ PRED)= P  (^ NUM)=sg.

----
DEMO ENGLISH LEXICON (1.0)

Mary NP * @(singN mary).
John NP * @(singN john).
girl N  * @(singN girl).

likes V * (^ PRED)= like<(^SUBJ)(^OBJ)> .

the D *.

----
```

.3 demo-gre-basictestfile.tfl (with stats)

```
 #      ------------------------------------------------
#         Implementing a fragment of MG grammar in XLE
#      ------------------------------------------------
#                            Kakia Chatsiou
#                          achats@essex.ac.uk
#                      PhD Student in Linguistics
#                 Dept. of Languagea and Linguistics
#                       University of Essex, UK
#                      (http://kakiachatsiou.tk)
#       Last updated: 28.02.2010

# sample testfile

# 1

DP: o papagalos (1 0.01 5)

# 2

DP: tu papagalos (0 0.01 4)

# 3

o andras taise ton papagalo (1 0.00 19)

# 4

ton papagalo o andras taise (1 0.02 23)

# 5

o papagalos petai (1 0.01 13)

# 6

i yineka edose to biskoto tu papagalu (1 0.01 26)

# 7

epsahnan ton papagalo (1 0.01 10)

# 8

o Petros kseri oti i yineka edose to biskoto tu
papagalu (1 0.01 39)

# 9

o Kostas agapai tin yineka i opia i Maria ipe oti
vrike ton papagalo. (4 0.03 69)

#10
```

```
o Kostas agapai tin yineka tin opia  tsibise o
papagalos. (2 0.02 69)

# 11

o Kostas agapai tin Sofia pu  vrike ton papagalo.
(2 0.02 35)

# 12

o Kostas agapai tin Sofia pu i Maria ipe oti
vrike ton papagalo (2 0.02 46)

# 13

o Kostas agapai tin Sofia pu tin tsibise o
papagalos (1 0.01 35)

# 14

o Kostas agapai tin Sofia i opia  vrike ton
papagalo. (2 0.02 82)

# 15

o Kostas agapai tin Sofia i opia i Maria ipe
oti vrike ton papagalo. (4 0.03 69)

# 16

o Kostas agapai opjon  agapai tin Sofia.
(1 0.01 60)

# 17

o Kostas agapai opjon i Maria ipe oti agapai
tin Sofia. (1 0.03 74)

# 18

o Kostas agapai opjon agapai i Sofia.
(1 0.02 59)

# 19

o Kostas agapai tin yineka pu tin tsibise
o papagalos (1 0.01 35)

# 20

o Kostas agapai opjon tin agapai tin Sofia.
(1 0.02 100)
```

```
# 21

o Kostas agapai opjon i Maria ipe oti tin
agapai tin Sofia. (1 0.03 86)

# 22

o Kostas agapai opjon ton agapai i Sofia.
(1 0.02 100)


# some ungrammatical sentences


# 23 *

o Kostas agapai tin yineka pu i Kiki  edose
ton papagalo. (0 0.02 45)

# 24 *

o Kostas agapai tin yineka i opia tin vrike
ton papagalo (0 0.02 90)

# 25 *

o Kostas agapai tin yineka i opia i Maria ipe
oti tin vrike ton papagalo. (0 0.03 71)

# 26 *

o Kostas agapai tin yineka tin opia tin tsibise
o papagalos. (0 0.02 75)

# 27 *

o Kostas agapai tin yineka stin opia i Kiki
tis edose ton papagalo. (0 0.02 48)

# 28 *

o Kostas agapai tin Sofia pu tin vrike ton
papagalo. (0 0.01 37)

# 29 *

o Kostas agapai tin Sofia pu i Maria ipe oti
tin vrike ton papagalo (0 0.02 48)

# 30 *

o Kostas agapai tin Sofia pu i Maria ipe oti
tsibise o papagalos (0 0.02 46)
```

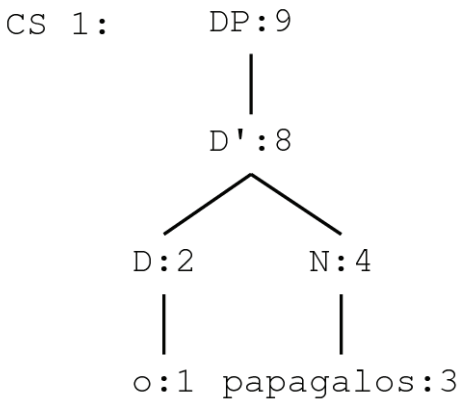
```
# 31 *

o Kostas agapai tin Sofia pu i Kiki edose
ton papagalo (0 0.01 43)

# 32 *

o Kostas agapai tin Sofia pu i Maria ipe
oti i Kiki  edose ton papagalo. (0 0.02 58)

# 33 *

o Kostas agapai tin Sofia i opia tin vrike
ton papagalo. (0 0.03 92)

# 34 *

o Kostas agapai tin Sofia i opia i Maria ipe
oti tin vrike ton papagalo. (0 0.02 71)

# 35 *

o Kostas agapai tin yineka pu i Maria ipe oti
i Kiki edose ton papagalo. (0 0.02 58)

# 36 *

o Kostas agapai tin yineka pu tin vrike ton
papagalo. (0 0.01 37)

# 37 *

o Kostas agapai tin yineka pu i Maria ipe
oti tin vrike ton papagalo (0 0.02 48)

# 38 *

o Kostas agapai opjon i Kiki edose ton
papagalo. (1 0.03 98)

# 38 sentences, 0.69 CPU secs total,
0.03 CPU secs max (03/01/10)
```

.4 Statistics LogFile

```
XLE release of Aug 28, 2008 13:04.
Grammar = /media/EEYORE/1.Work/a.research/PhD/dissertation-drafts/2010.02-DissDraft(all)/
Chapters/ch06/demo-gre-v.1.2/demo-gre-v.1.2.lfg.
Grammar last modified on Feb 01, 2010 00:50.
Host machine is linux-qb1s.
176 sentences, 0 errors, 0 mismatches
67 sentences had 0 parses
1 sentences had 2 parses
108 sentences had exactly one grammatical parse
timeout = 100
max_xle_scratch_storage = 100 MB
prune_subtree_location = 1
max_new_events_per_graph_when_skimming = 500
maximum raw subtrees per sentence = 706 (#25)
maximum event count per sentence = 17923
average event count per graph = 124.56
morph = 4.8%, lex = 3.2%, chart = 38.1%, unifier = 47.6%,
completer = 6.3%, solver = 0.0%, output = 0.0%
0.69 CPU secs total, 0.03 CPU secs max
elapsed time = 1 seconds
  range parsed failed  words   seconds  subtrees     optimal  suboptimal
   1-10     16      3   7.06      0.01     48.06        1.19    0.00E+00
  11-20      6     13  12.50      0.02     63.83        2.17    0.00E+00
    all     22     16   8.55      0.02     52.36        1.45    0.00E+00
0.51 of the variance in seconds is explained by the number of subtrees
```

.5 C- and f-structures of parsed sentences in demo-gre-testfile.tfl

```
# 1 DP: o papagalos
```



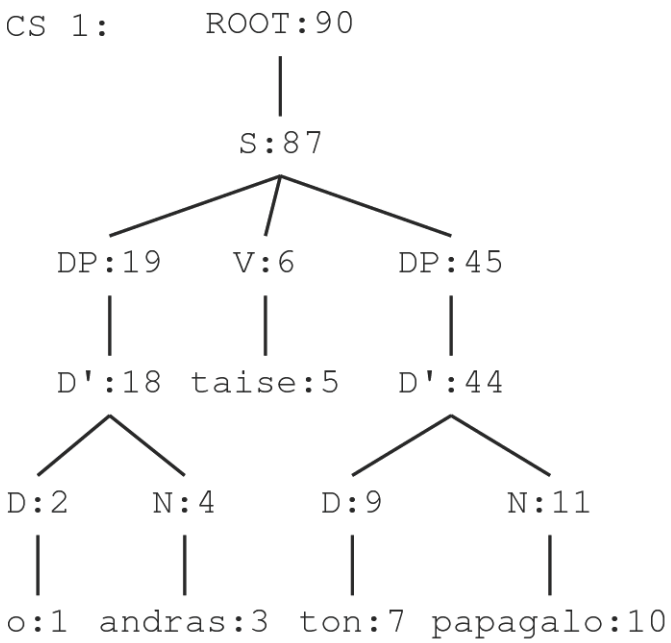

```
"o papagalos"
```

$$1\begin{bmatrix}\text{PRED 'parrot'}\\ \text{CASE nom, DEF +, GEND m, NUM sg, PERS 3}\end{bmatrix}$$

```
# 2 DP: tu papagalos
```

$$1\begin{bmatrix}\text{PRED 'parrot'}\\ \text{CASE} \left[=\begin{Bmatrix}\text{gen}\\ \text{nom}\end{Bmatrix}\right]\\ \text{GEND m, NUM sg, PERS 3}\end{bmatrix}$$

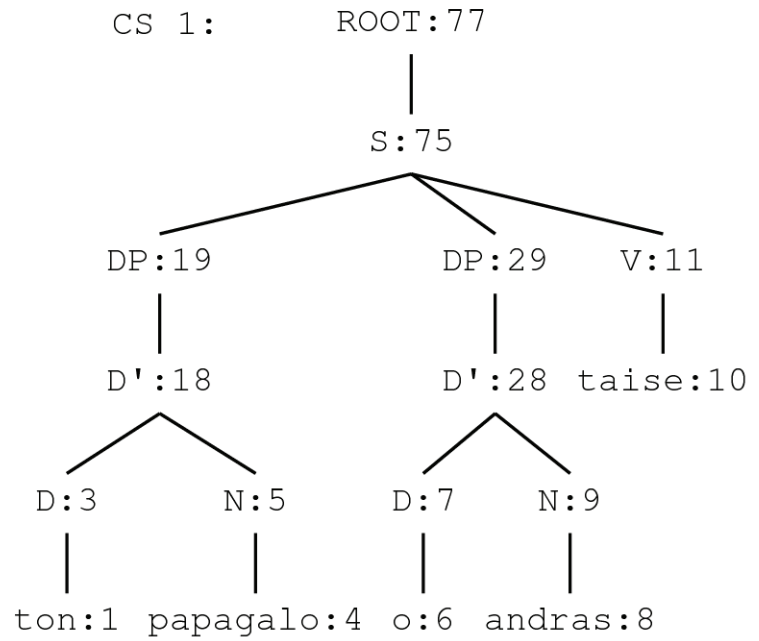
```
# 3 o andras taise ton papagalo
```



"o andras taise ton papagalo"

$$\begin{bmatrix} \text{PRED} & \text{'feed<[1:man], [7:parrot]>'} \\ \text{SUBJ}\ 1 & \begin{bmatrix} \text{PRED} & \text{'man'} \\ \text{CASE nom, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ \text{OBJ}\ 7 & \begin{bmatrix} \text{PRED} & \text{'parrot'} \\ \text{CASE acc, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ 5\ \text{TENSE} & \text{past} \end{bmatrix}$$

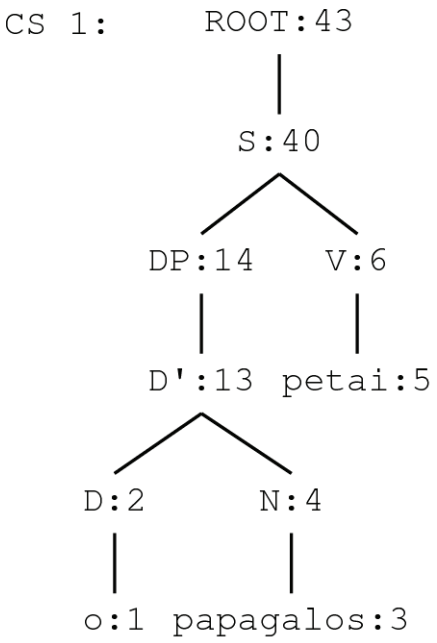
```
# 4 ton papagalo o andras taise
```



"ton papagalo o andras taise"

$$\begin{bmatrix} \text{PRED} & \text{'feed<[6:man], [1:parrot]>'} \\ \text{SUBJ}\ 6 & \begin{bmatrix} \text{PRED} & \text{'man'} \\ \text{CASE nom, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ \text{OBJ}\ 1 & \begin{bmatrix} \text{PRED} & \text{'parrot'} \\ \text{CASE acc, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ 10\ \text{TENSE past} \end{bmatrix}$$

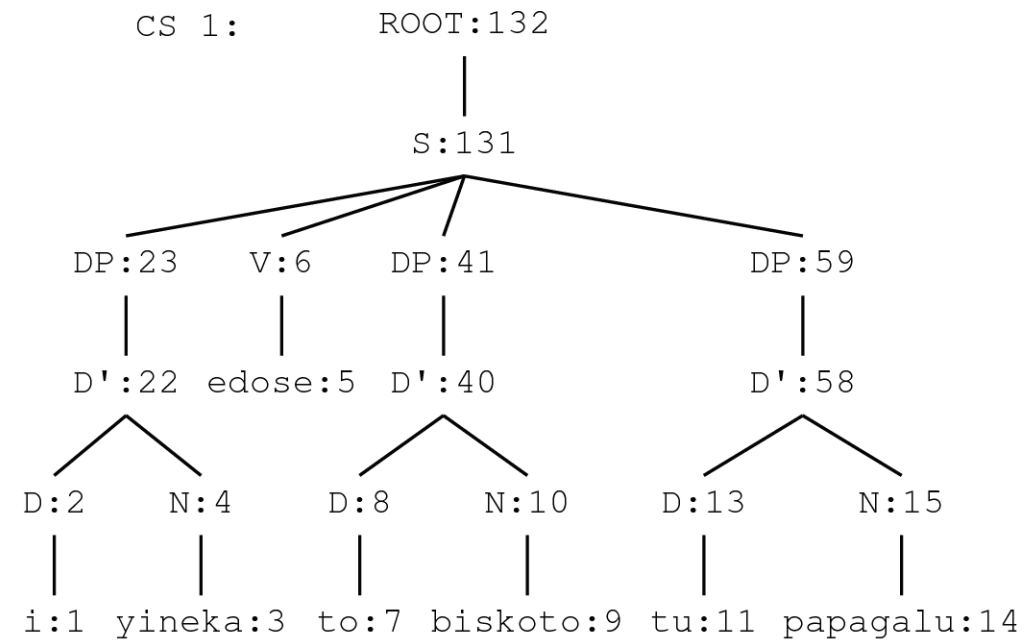
```
# 5 o papagalos petai
```



"o papagalos petai"

$$\begin{bmatrix} \text{PRED} & \text{'fly<[1:parrot]>'} \\ \text{SUBJ} & 1\begin{bmatrix} \text{PRED} & \text{'parrot'} \\ \text{CASE nom, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ 5\begin{bmatrix} \text{TENSE} & \text{present} \end{bmatrix} \end{bmatrix}$$

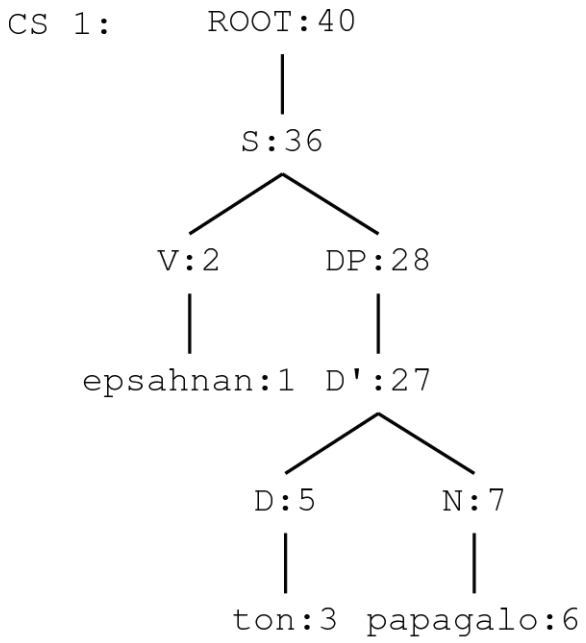
```
# 6 i yineka edose to biskoto tu papagalu
```



"i yineka edose to biskoto tu papagalu"

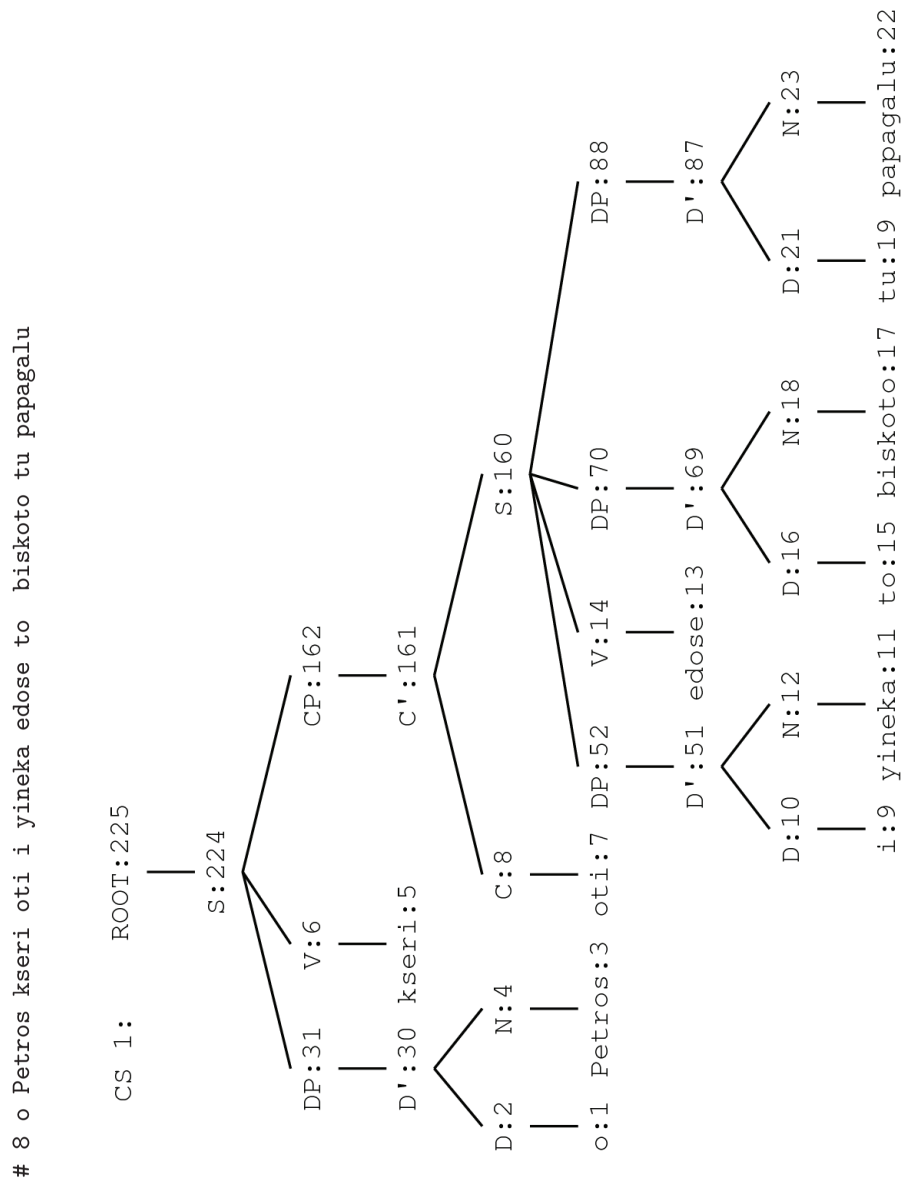
$$\begin{bmatrix} \text{PRED} & \text{'gave<[1:woman], [7:biscuit], [11:parrot]>'} \\ \text{SUBJ} & 1\begin{bmatrix}\text{PRED 'woman'} \\ \text{CASE nom, DEF +, GEND f, NUM sg, PERS 3}\end{bmatrix} \\ \text{OBJ} & 7\begin{bmatrix}\text{PRED 'biscuit'} \\ \text{CASE acc, DEF +, GEND n, NUM sg, PERS 3}\end{bmatrix} \\ \text{OBJ2} & 11\begin{bmatrix}\text{PRED 'parrot'} \\ \text{CASE gen, DEF +, GEND m, NUM sg, PERS 3}\end{bmatrix} \\ 5\begin{bmatrix}\text{TENSE} & \text{past}\end{bmatrix} \end{bmatrix}$$

```
# 7 epsahnan ton papagalo
```



"epsahnan ton papagalo"

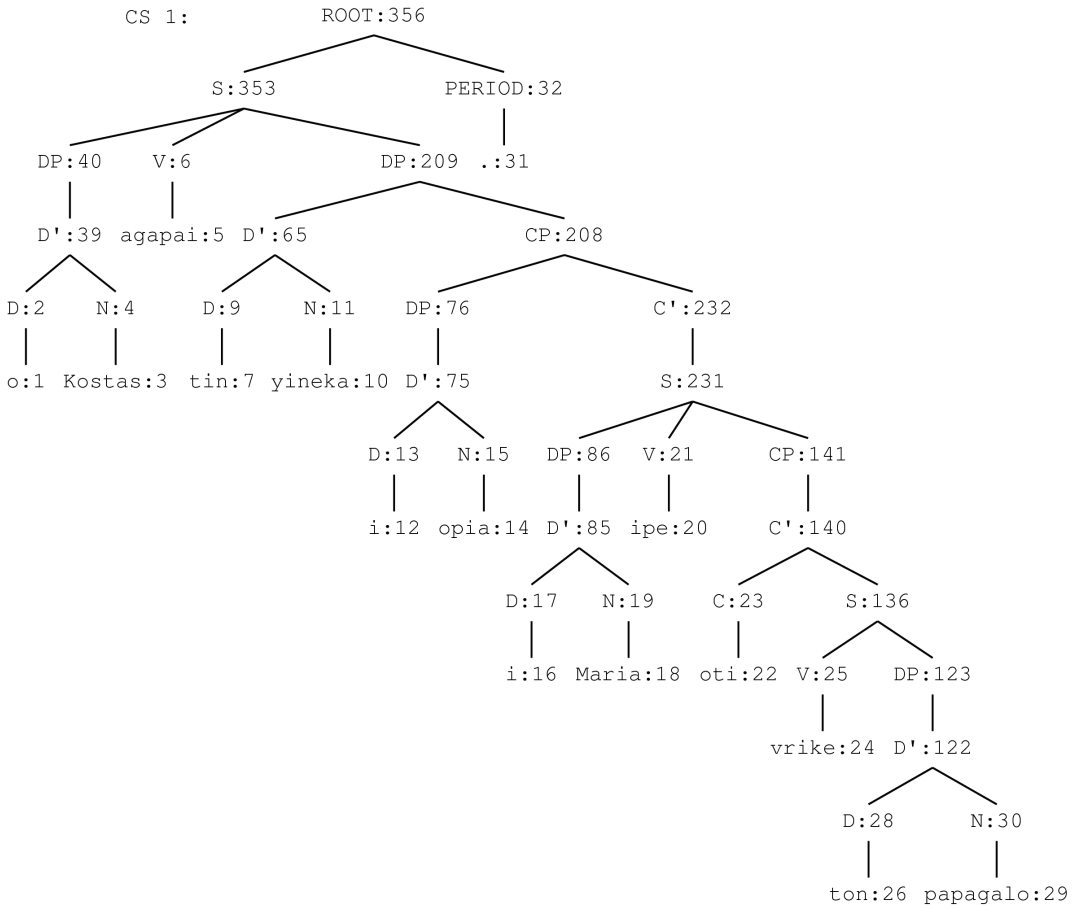
$$\begin{bmatrix} \text{PRED} & \text{'seek<[1-SUBJ:pro], [3:parrot]>'} \\ \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{'pro'} \\ \text{CASE nom, NUM pl, PERS 3} \end{bmatrix} \\ \text{OBJ} & 3\begin{bmatrix} \text{PRED} & \text{'parrot'} \\ \text{CASE acc, DEF +, GEND m, NUM sg, PERS 3} \end{bmatrix} \\ 1\,\text{TENSE} & \text{past} \end{bmatrix}$$


8 o Petros kseri oti i yineka edose to biskoto tu papagalu
CS 1: ROOT:225
S:224
DP:31 V:6 CP:162
D:2 N:4 D':30 kseri:5 C':161
o:1 Petros:3 C:8 S:160
oti:7 DP:52 V:14 DP:70 DP:88
D':51 edose:13 D':69 D':87
D:10 N:12 D:16 N:18 D:21 N:23
i:9 yineka:11 to:15 biskoto:17 tu:19 papagalu:22

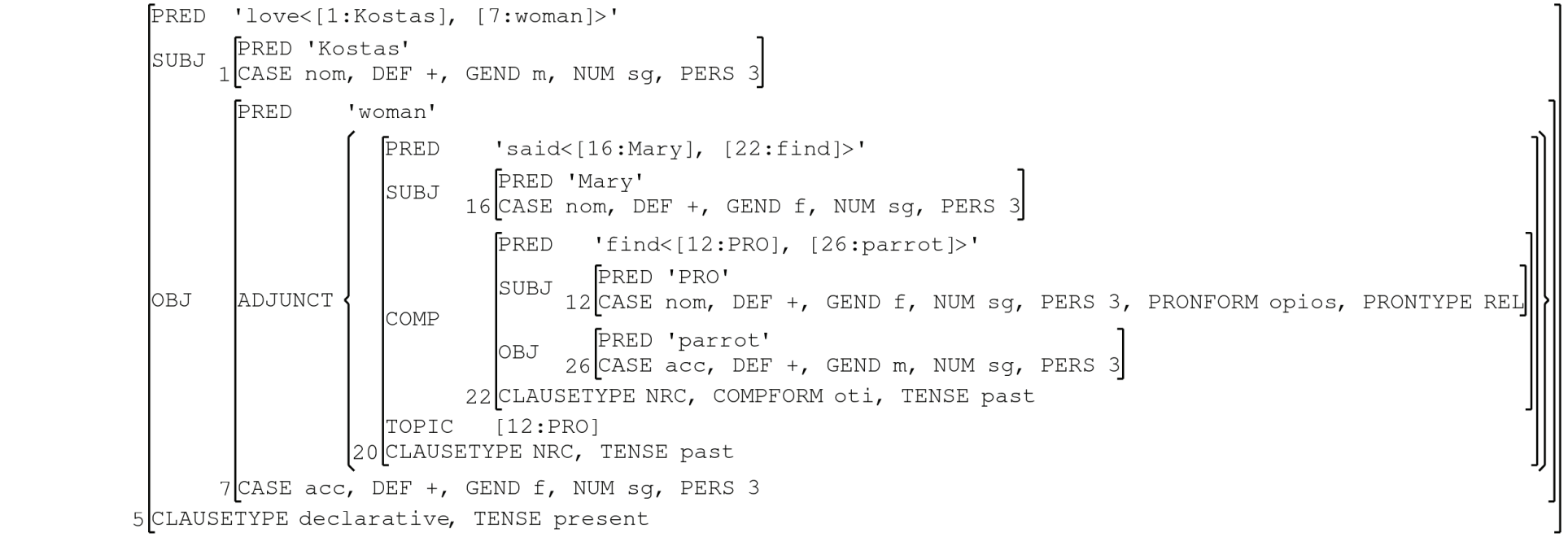
"o Petros kseri oti i yineka edose to biskoto tu papagalu"

```
[PRED  'know<[1:Peter], [7:gave]>'                                          ]
[SUBJ  1[PRED 'Peter'                                                      ]]
[      [CASE nom, DEF +, GEND m, NUM sg, PERS 3                            ]]
[      [PRED   'gave<[9:woman], [15:biscuit], [19:parrot]>'                ]]
[      [SUBJ    9[PRED 'woman'                                            ]]
[      [        [CASE nom, DEF +, GEND f, NUM sg, PERS 3                  ]]
[COMP  [OBJ    15[PRED 'biscuit'                                           ]]
[      [        [CASE acc, DEF +, GEND n, NUM sg, PERS 3                  ]]
[      [OBJ2   19[PRED 'parrot'                                           ]]
[      [        [CASE gen, DEF +, GEND m, NUM sg, PERS 3                  ]]
[     7[COMPFORM oti, TENSE past                                           ]]
[5[TENSE present                                                           ]]
```

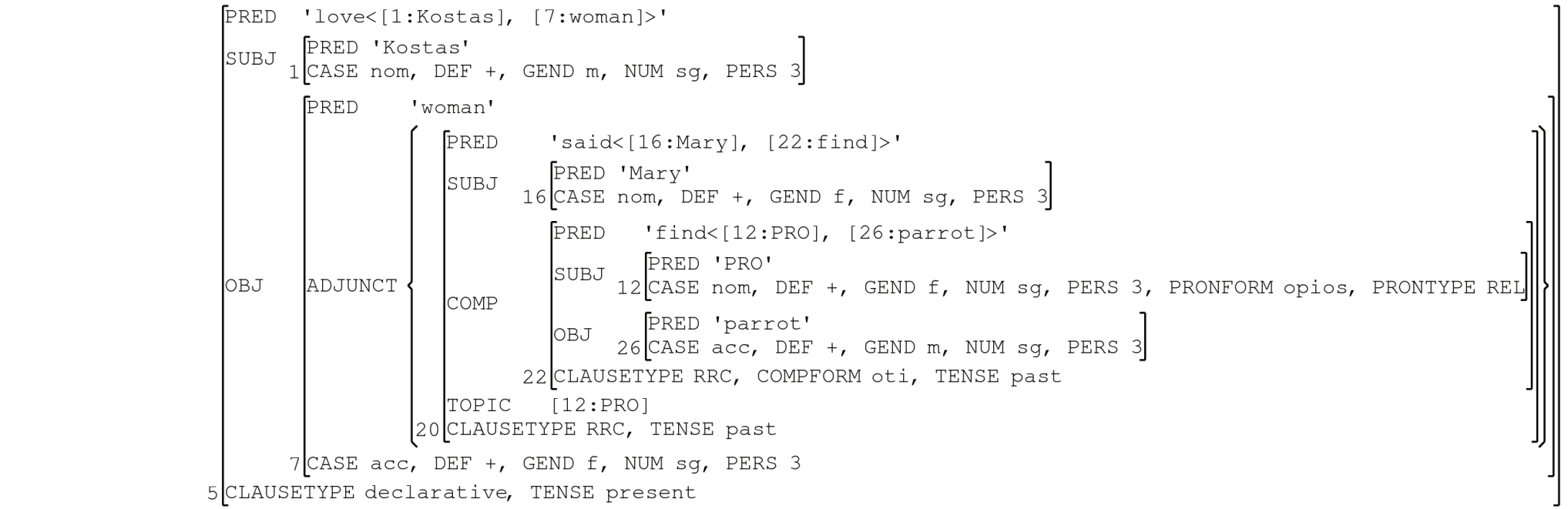
```
# 9 o Kostas agapai tin yineka i opia i Maria ipe oti vrike ton papagalo.
```



"o Kostas agapai tin yineka i opia i Maria ipe oti vrike ton papagalo."

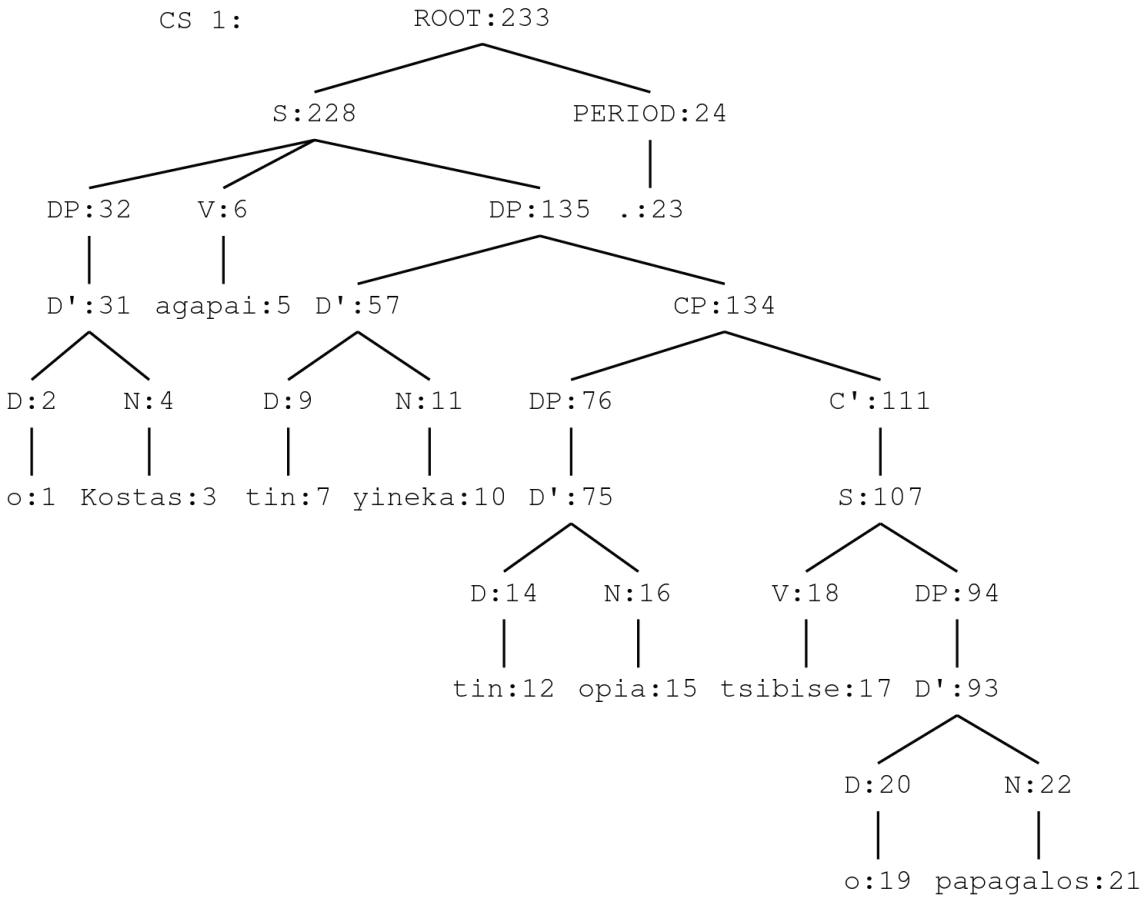


"o Kostas agapai tin yineka i opia i Maria ipe oti vrike ton papagalo."

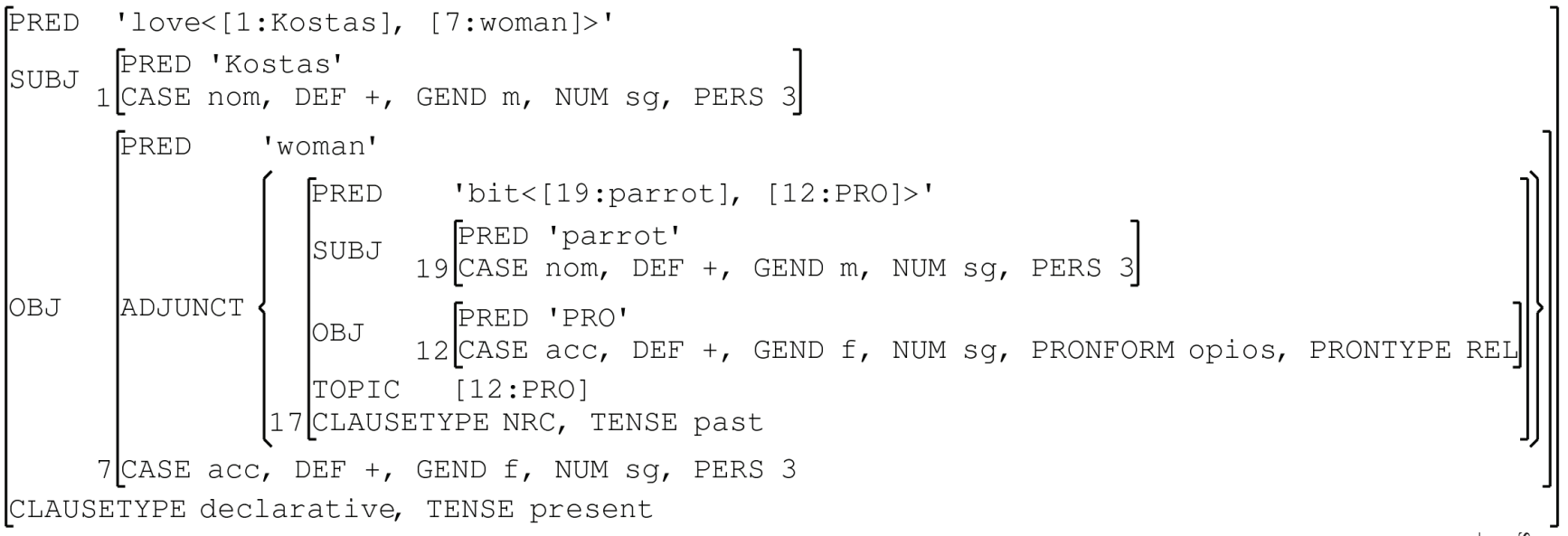


ICCS
in demo-gre-testfile.tfl

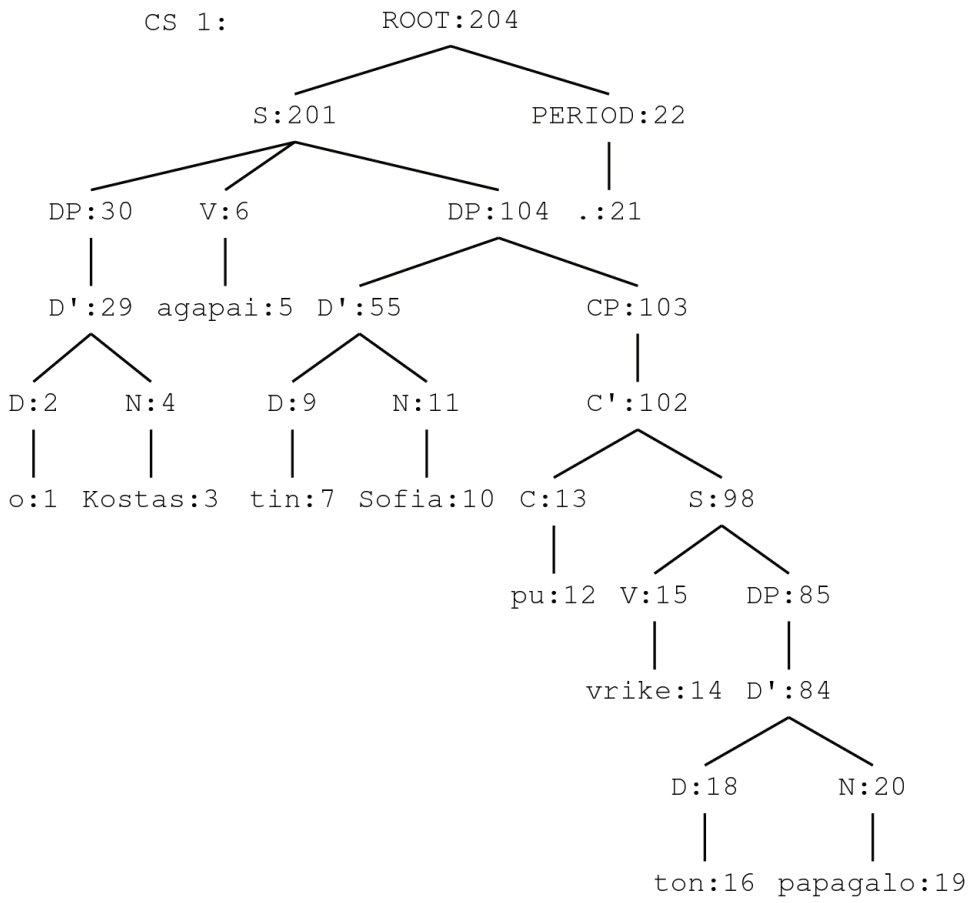
```
# 10 o Kostas agapai tin yineka tin opia tsibise o papagalos.
```



"o Kostas agapai tin yineka tin opia tsibise o papagalos."



```
# 11 o Kostas agapai tin Sofia pu  vrike ton papagalo.
```



"o Kostas agapai tin Sofia pu vrike ton papagalo."

```
⎡PRED  'love<[1:Kostas], [7:Sophie]>'                                                
```

"o Kostas agapai tin Sofia pu vrike ton papagalo."

```
⎡PRED  'love<[1:Kostas], [7:Sophie]>'                                                
```

```
# 12 o Kostas agapai tin Sofia pu i Maria ipe oti vrike ton papagalo.
```

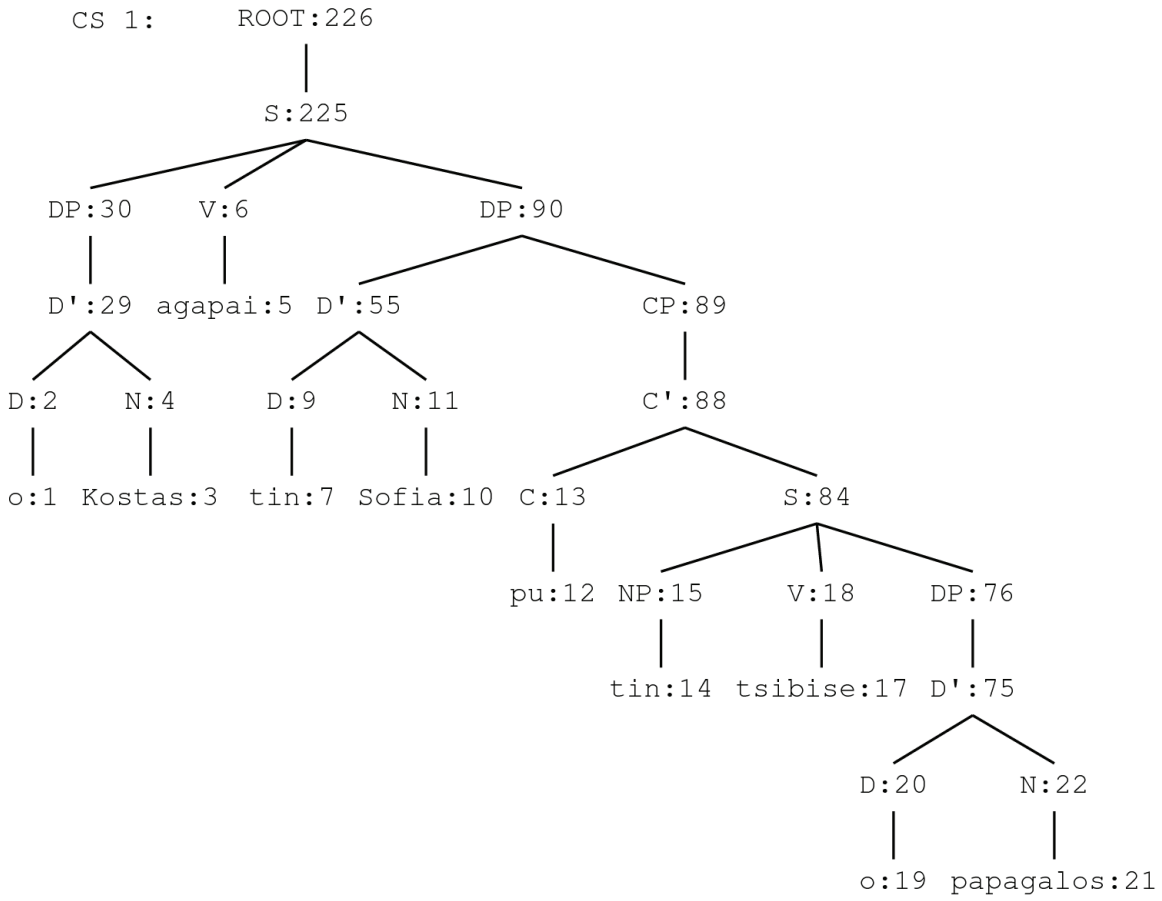
"o Kostas agapai tin Sofia pu i Maria ipe oti vrike ton papagalo"

```
[PRED  'love<[1:Kostas], [7:Sophie]>'
 SUBJ  1[PRED 'Kostas'
         CASE nom, DEF +, GEND m, NUM sg, PERS 3]
 OBJ   7[PRED    'Sophie'
         ADJUNCT {[PRED   'said<[14:Mary], [20:find]>'
                   SUBJ  14[PRED 'Mary'
                            CASE nom, DEF +, GEND f, NUM sg, PERS 3]
                   COMP  20[PRED  'find<[20-SUBJ:PRO], [24:parrot]>'
                            SUBJ  [PRED 'PRO'
                                   CASE nom, NUM sg, PERS 3]
                            OBJ  24[PRED 'parrot'
                                    CASE acc, DEF +, GEND m, NUM sg, PERS 3]
                            COMPFORM oti, TENSE past]
                   TOPIC  [20-SUBJ:PRO]
                  12[CLAUSETYPE NRC, COMPFORM pu, TENSE past]}
         CASE acc, DEF +, GEND f, NUM sg, PERS 3]
 5[TENSE present]]
```

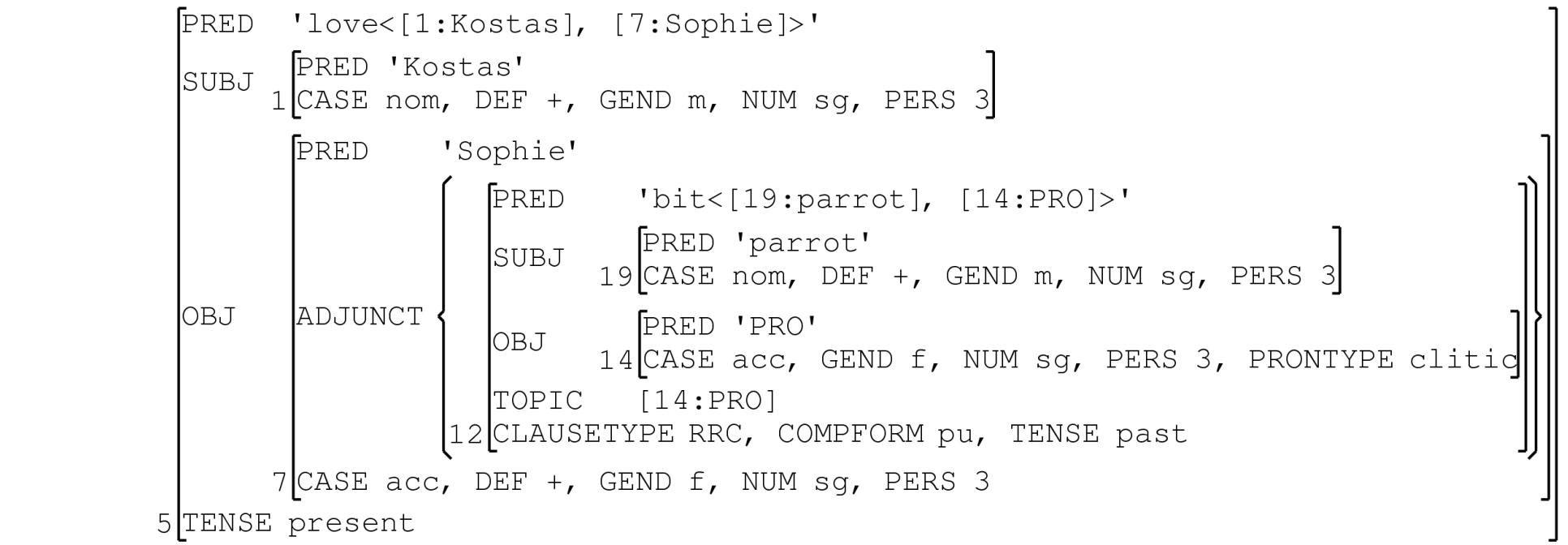
"o Kostas agapai tin Sofia pu i Maria ipe oti vrike ton papagalo"

```
[PRED  'love<[1:Kostas], [7:Sophie]>'
 SUBJ 1[PRED 'Kostas'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
 OBJ   7[PRED    'Sophie'
         ADJUNCT {[PRED   'said<[14:Mary], [20:find]>'
                  SUBJ 14[PRED 'Mary'
                          CASE nom, DEF +, GEND f, NUM sg, PERS 3]
                  COMP 20[PRED  'find<[20-SUBJ:PRO], [24:parrot]>'
                          SUBJ  [PRED 'PRO'
                                 CASE nom, NUM sg, PERS 3]
                          OBJ 24[PRED 'parrot'
                                 CASE acc, DEF +, GEND m, NUM sg, PERS 3]
                          COMPFORM oti, TENSE past]
                  TOPIC  [20-SUBJ:PRO]
                 12[CLAUSETYPE RRC, COMPFORM pu, TENSE past]}
        CASE acc, DEF +, GEND f, NUM sg, PERS 3]
 5[TENSE present]
```

```
# 13 o Kostas agapai tin Sofia pu tin tsibise o papagalos
```

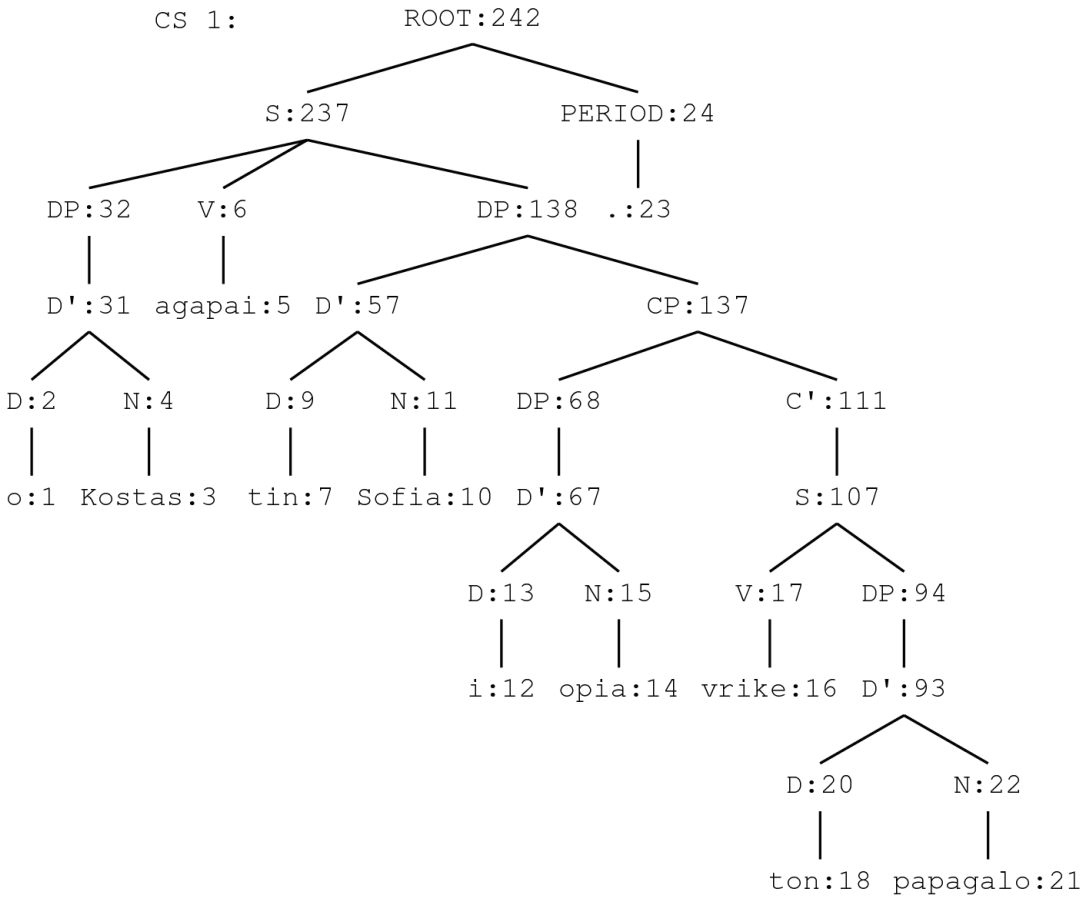


"o Kostas agapai tin Sofia pu tin tsibise o papagalos"

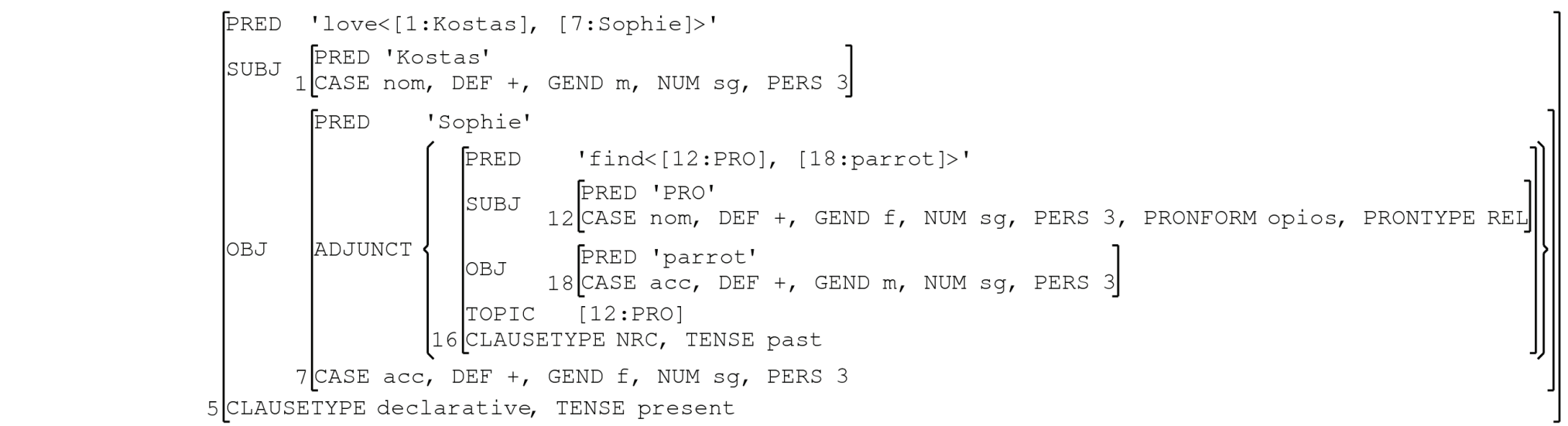


in demo-gre-testfile.tfl

```
# 14 o Kostas agapai tin Sofia i opia  vrike ton papagalo.
```

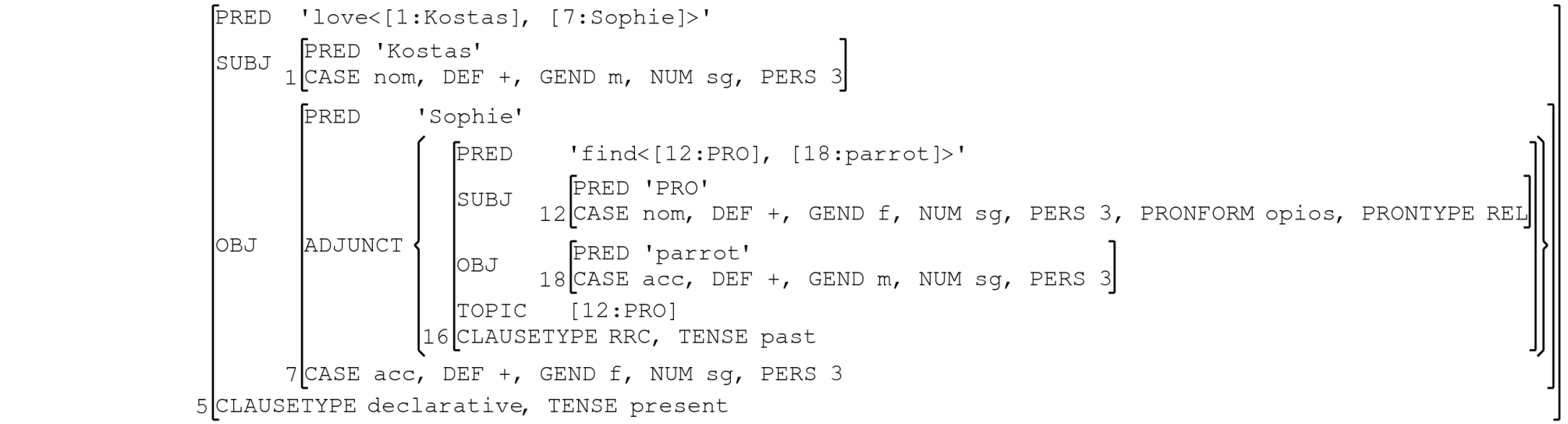


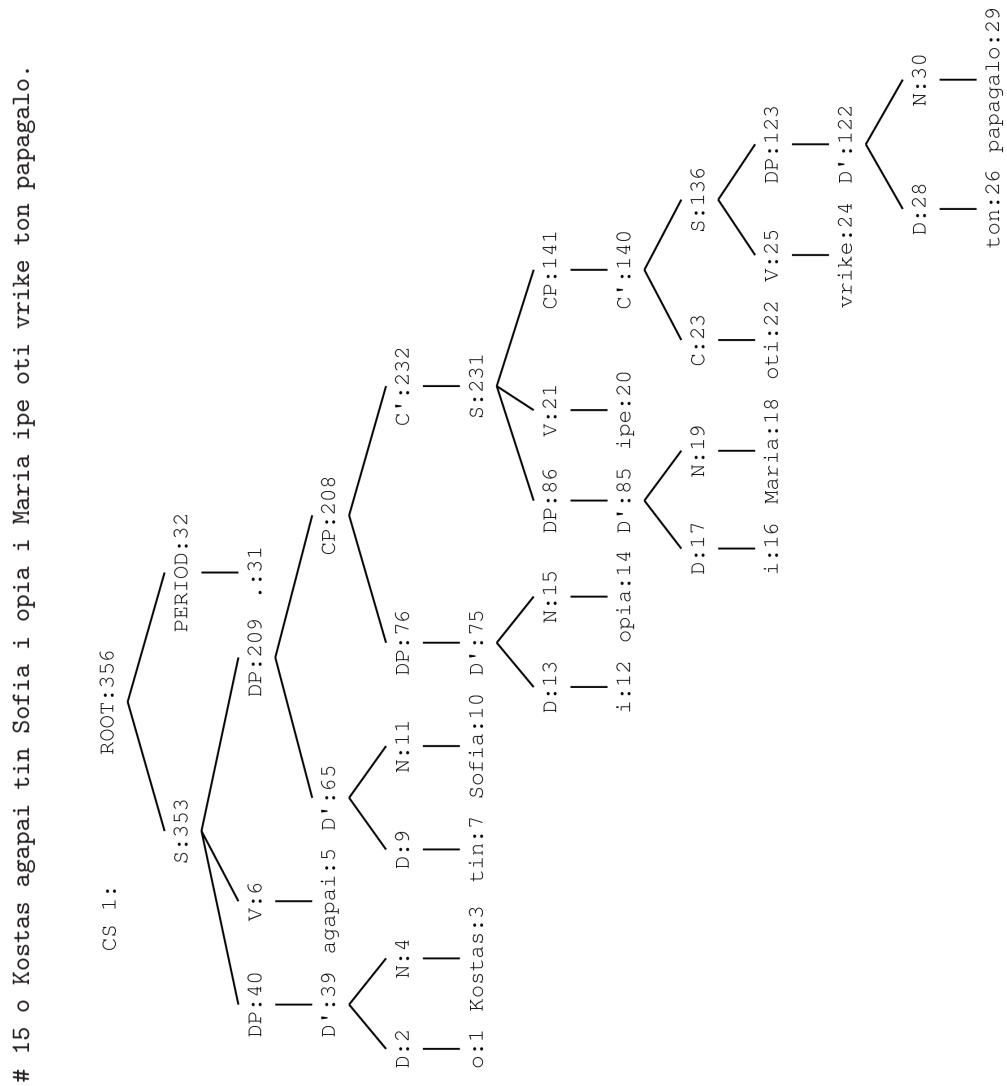
"o Kostas agapai tin Sofia i opia vrike ton papagalo."



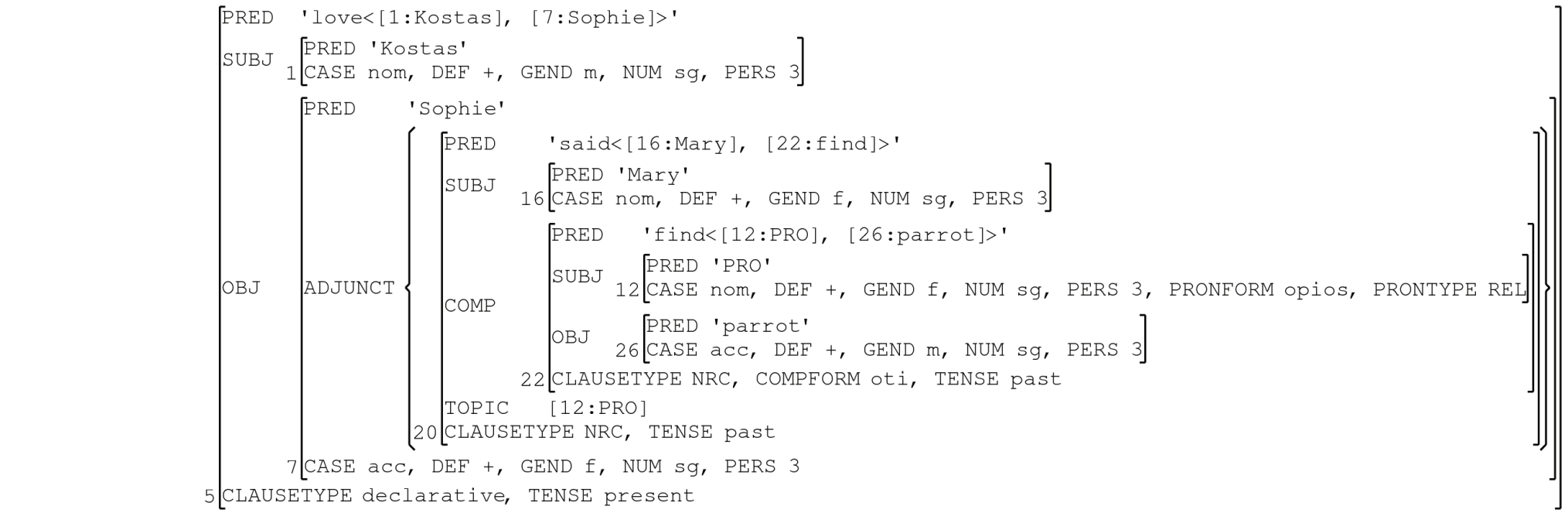
rsed sentences
in demo-gre-testfile.tfl

"o Kostas agapai tin Sofia i opia vrike ton papagalo."

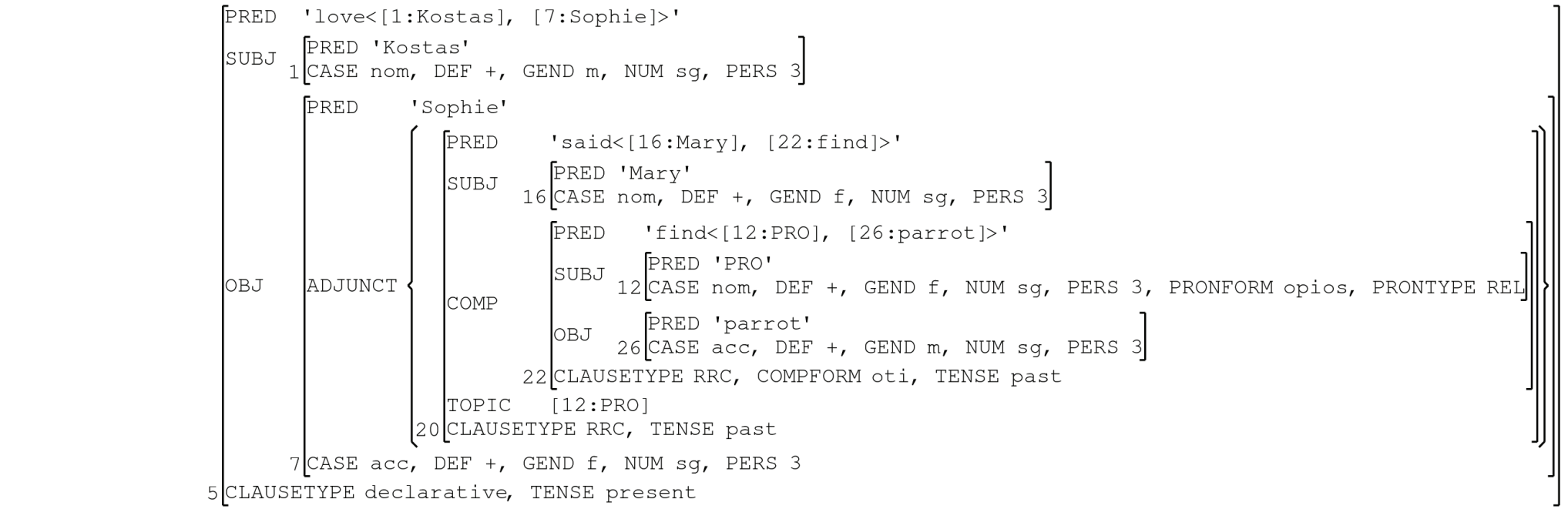



15 o Kostas agapai tin Sofia i opia i Maria ipe oti vrike ton papagalo.
CS 1:
ROOT:356
S:353
PERIOD:32
DP:40
V:6
DP:209
.:31
D':39
agapai:5
D':65
CP:208
D:2
N:4
D:9
N:11
DP:76
C':232
o:1
Kostas:3
tin:7
Sofia:10
D':75
S:231
D:13
N:15
DP:86
V:21
CP:141
i:12
opia:14
D':85
ipe:20
C':140
D:17
N:19
C:23
S:136
i:16
Maria:18
oti:22
V:25
DP:123
vrike:24
D':122
D:28
N:30
ton:26
papagalo:29

"o Kostas agapai tin Sofia i opia i Maria ipe oti vrike ton papagalo."

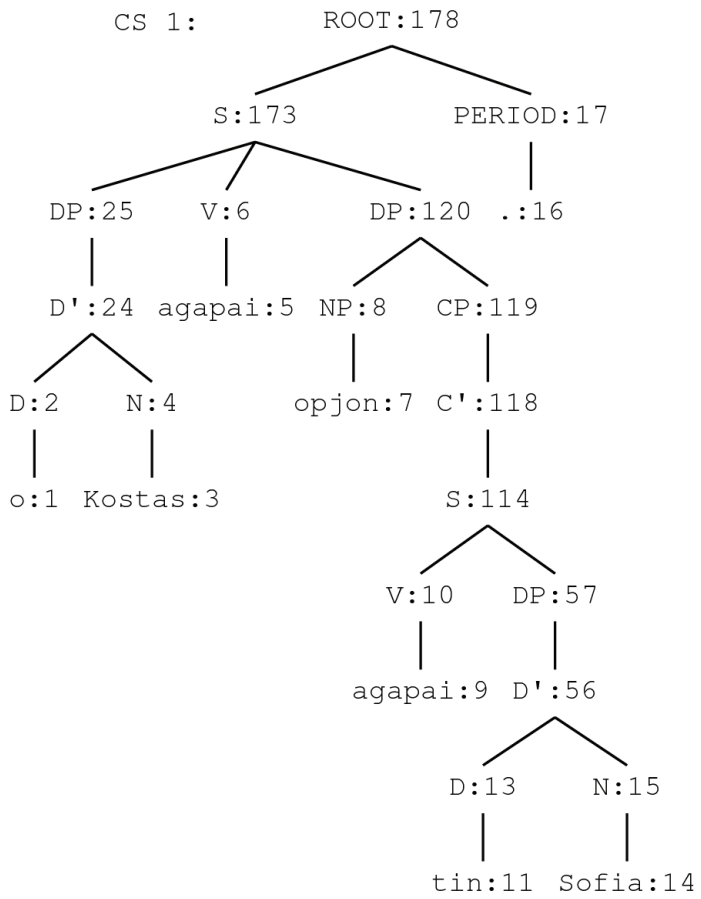


"o Kostas agapai tin Sofia i opia i Maria ipe oti vrike ton papagalo."



ICCS
in demo-gre-testfile.tfl

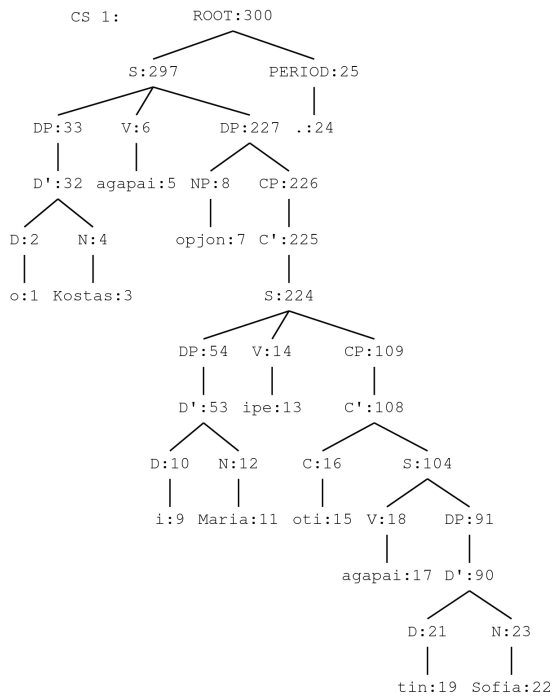
```
# 16 o Kostas agapai opjon  agapai tin Sofia.
```



"o Kostas agapai opjon agapai tin Sofia."

```
[PRED  'love<[1:Kostas], [7:PRO]>'
SUBJ  1[PRED 'Kostas'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
OBJ    [PRED    'PRO'
        ADJUNCT {[PRED  'love<[9-SUBJ:PRO], [11:Sophie]>'
                 SUBJ  [PRED 'PRO'
                        CASE nom, NUM sg, PERS 3]
                 OBJ  11[PRED 'Sophie'
                         CASE acc, DEF +, GEND f, NUM sg, PERS 3]
                 TOPIC [9-SUBJ:PRO]
                9[CLAUSETYPE FRC, TENSE present]}
       7[CASE acc, GEND m, NUM sg, PRONFORM opjos]
5[CLAUSETYPE declarative, TENSE present]]
```

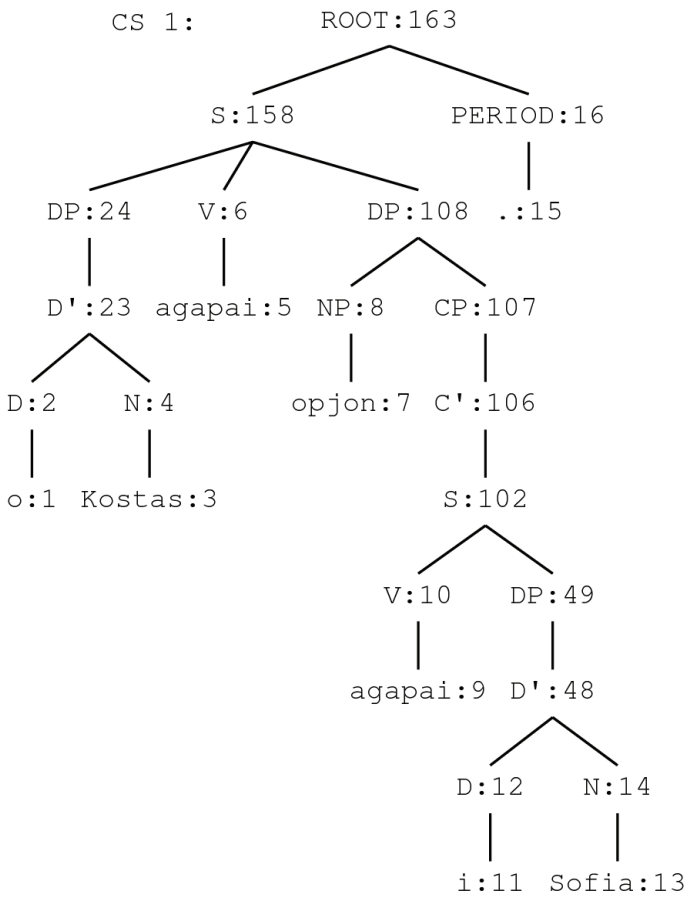
```
# 17 o Kostas agapai opjon i Maria ipe oti agapai tin Sofia.
```



"o Kostas agapai opjon i Maria ipe oti agapai tin Sofia."

```
[PRED  'love<[1:Kostas], [7:PRO]>'
 SUBJ 1[PRED 'Kostas'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
 OBJ   7[PRED    'PRO'
         ADJUNCT {[PRED   'said<[9:Mary], [15:love]>'
                  SUBJ  9[PRED 'Mary'
                          CASE nom, DEF +, GEND f, NUM sg, PERS 3]
                  COMP •[PRED  'love<[15-SUBJ:PRO], [19:Sophie]>'
                         SUBJ [PRED 'PRO'
                               CASE nom, NUM sg, PERS 3]
                         OBJ 19[PRED 'Sophie'
                                CASE acc, DEF +, GEND f, NUM sg, PERS 3]
                        15[COMPFORM oti, TENSE present]
                  TOPIC  [15-SUBJ:PRO]
                 13[CLAUSETYPE FRC, TENSE past]}
        CASE acc, GEND m, NUM sg, PRONFORM opjos]
 5[CLAUSETYPE declarative, TENSE present]
```

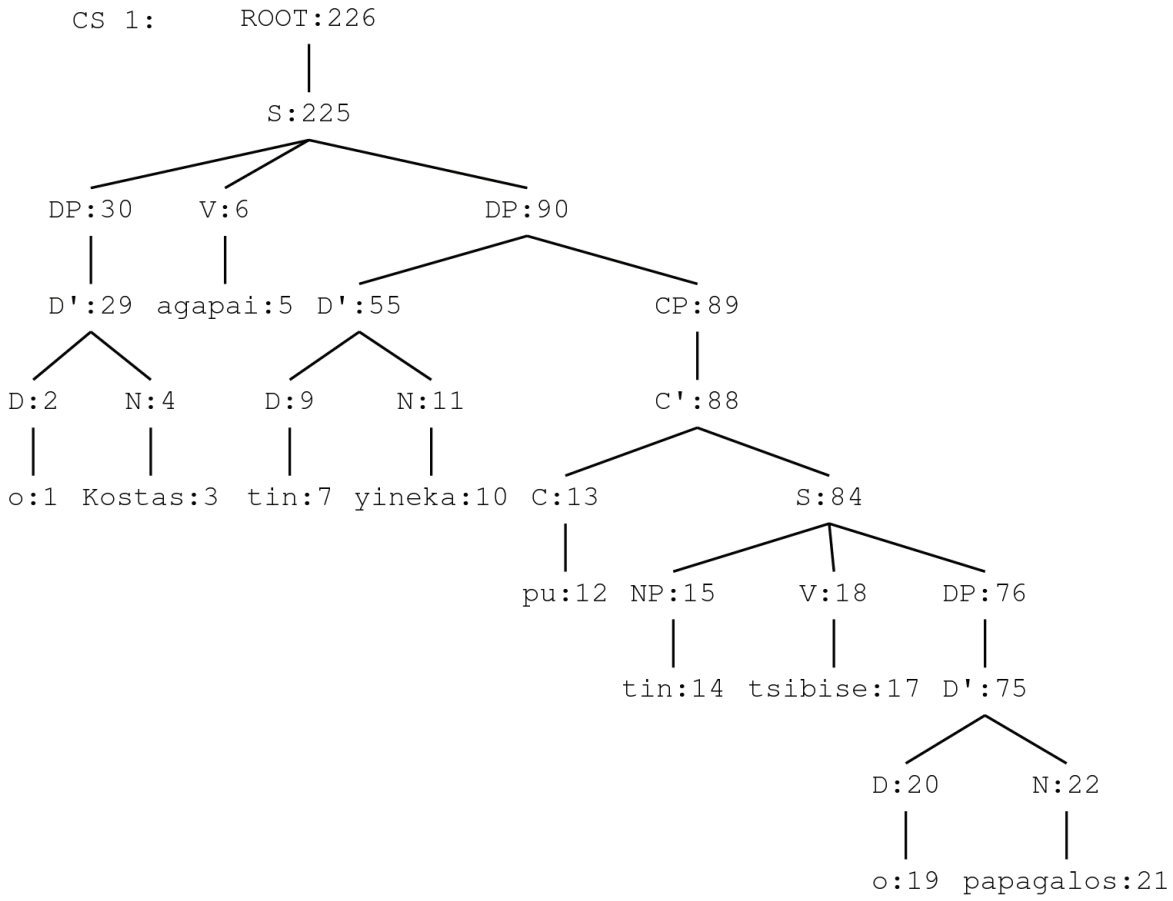
```
# 18 o Kostas agapai opjon agapai i Sofia.
```



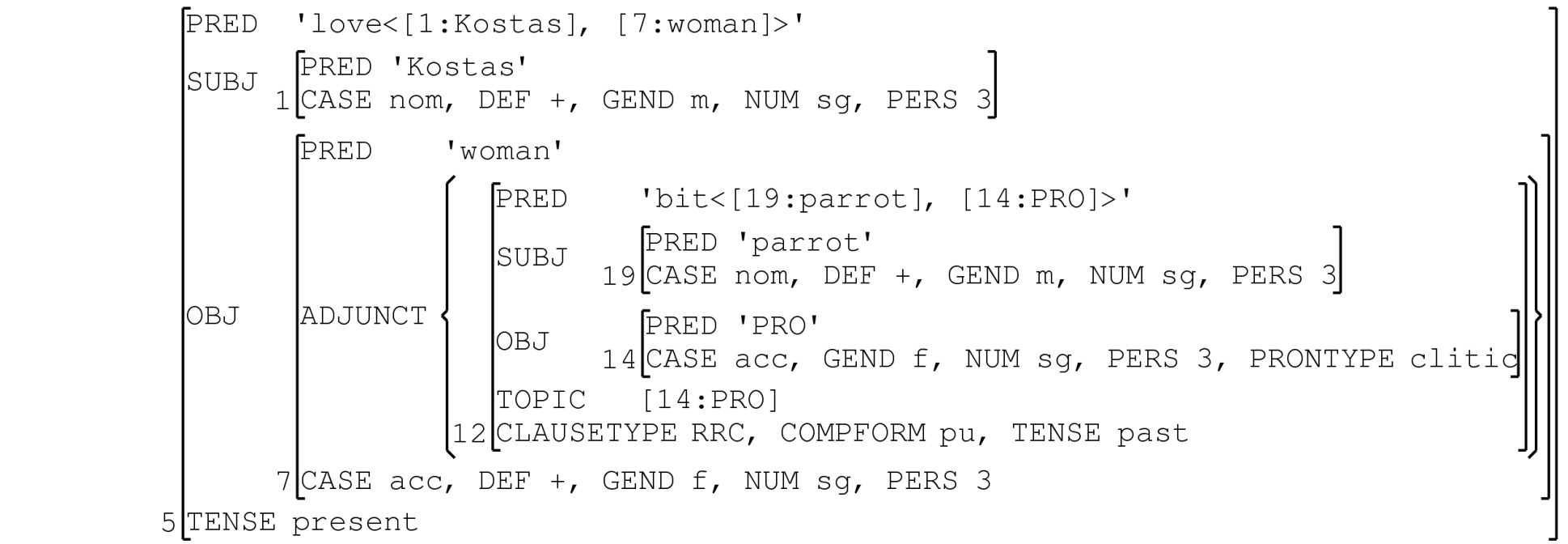
"o Kostas agapai opjon agapai i Sofia."

```
[PRED  'love<[1:Kostas], [7:PRO]>'
SUBJ  1[PRED 'Kostas'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
OBJ    [PRED    'PRO'
        ADJUNCT {[PRED   'love<[11:Sophie], [9-OBJ:PRO]>'
                 SUBJ  11[PRED 'Sophie'
                          CASE nom, DEF +, GEND f, NUM sg, PERS 3]
                 OBJ      [PRED 'PRO'
                           CASE acc]
                 TOPIC   [9-OBJ:PRO]
                9[CLAUSETYPE FRC, TENSE present]}
        7[CASE acc, GEND m, NUM sg, PRONFORM opjos]
 5[CLAUSETYPE declarative, TENSE present]]
```

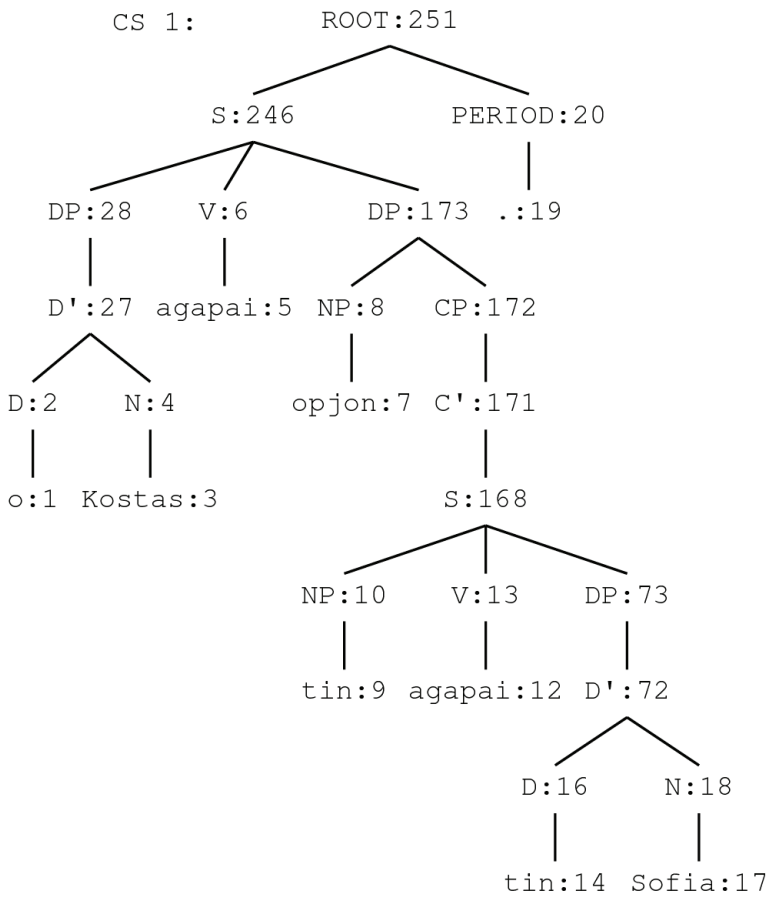
```
# 19 o Kostas agapai tin yineka pu tin tsibise o papagalos
```



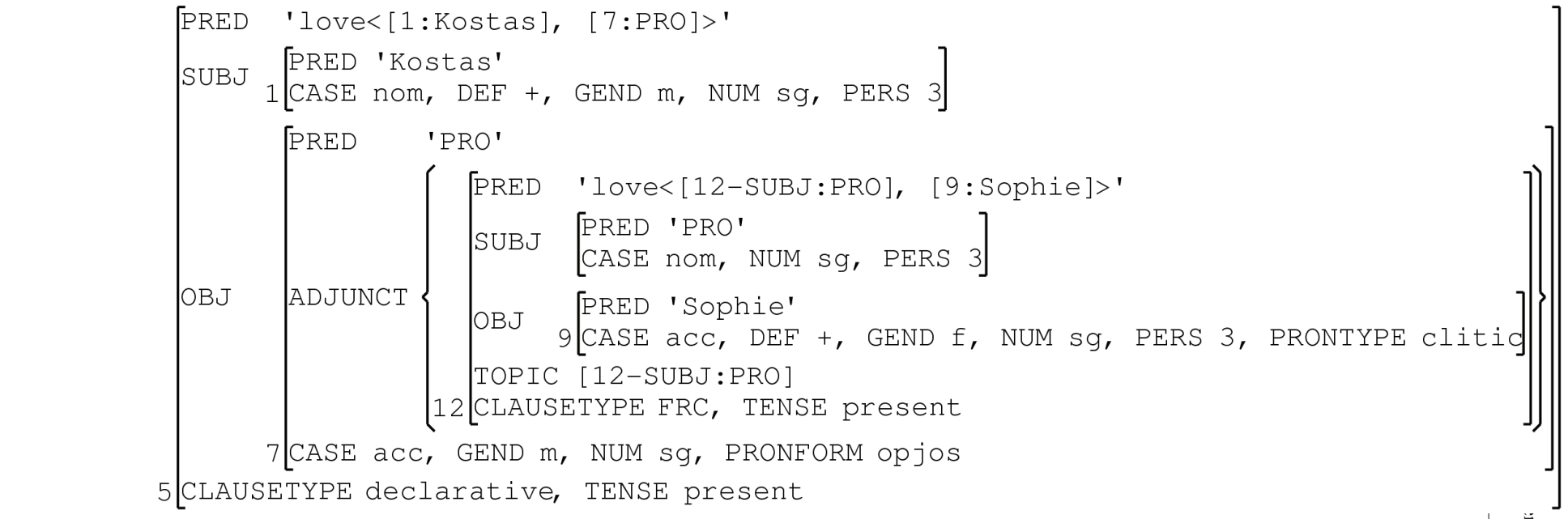
"o Kostas agapai tin yineka pu tin tsibise o papagalos"



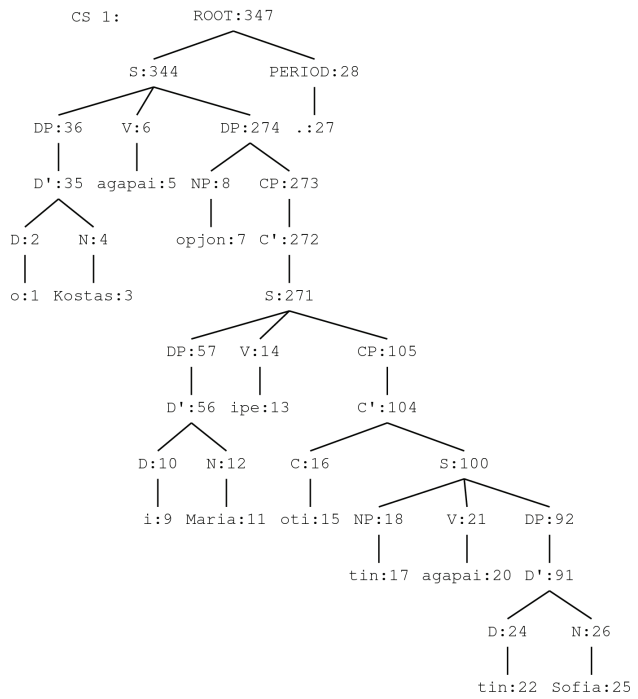
```
# 20 o Kostas agapai opjon tin agapai tin Sofia.
```



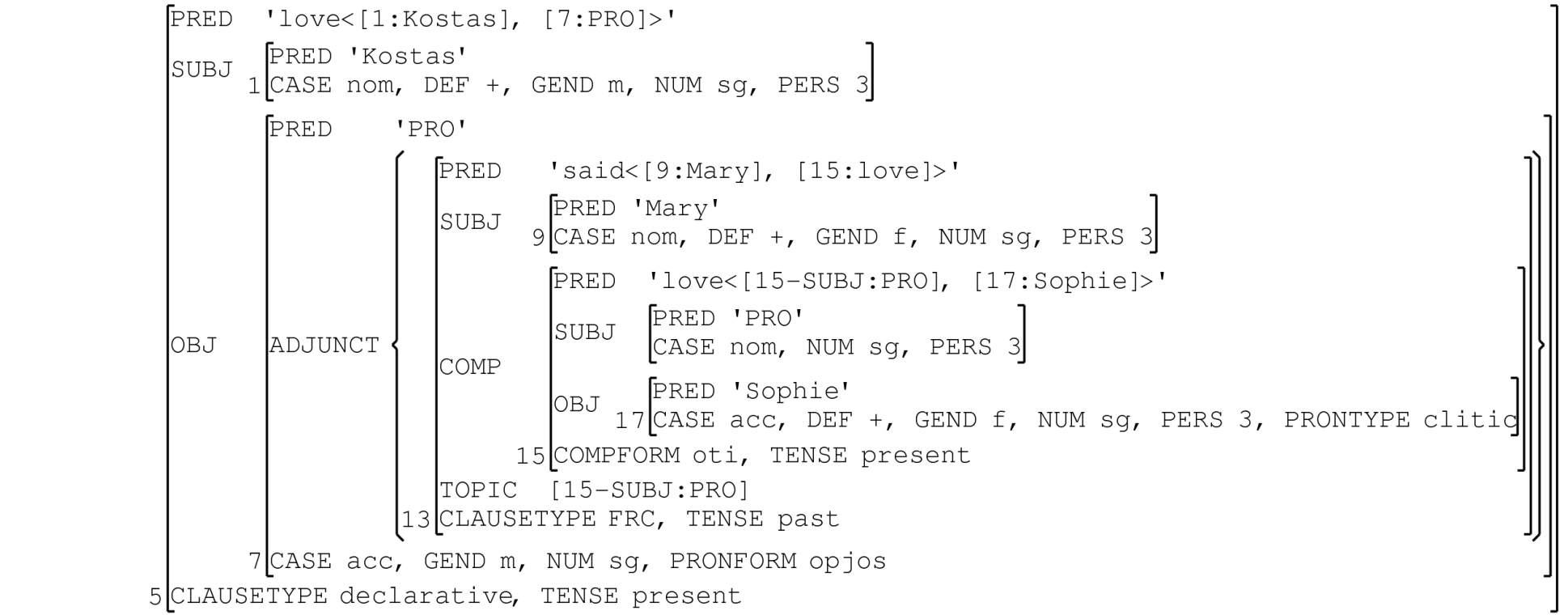
"o Kostas agapai opjon tin agapai tin Sofia."



```
# 21 o Kostas agapai opjon i Maria ipe oti tin agapai tin Sofia.
```



"o Kostas agapai opjon i Maria ipe oti tin agapai tin Sofia."



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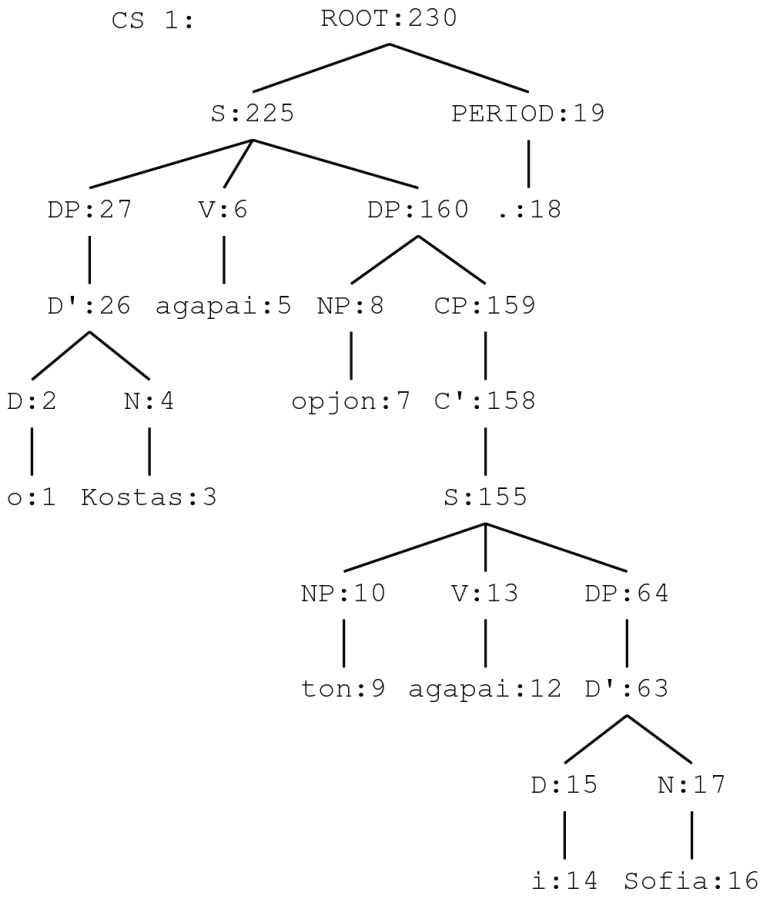
```
# 22 o Kostas agapai opjon ton agapai i Sofia.
```



"o Kostas agapai opjon ton agapai i Sofia."

```
[PRED  'love<[1:Kostas], [7:PRO]>'
SUBJ  1[PRED 'Kostas'
        CASE nom, DEF +, GEND m, NUM sg, PERS 3]
OBJ    [PRED    'PRO'
        ADJUNCT {[PRED   'love<[14:Sophie], [9:PRO]>'
                 SUBJ 14[PRED 'Sophie'
                         CASE nom, DEF +, GEND f, NUM sg, PERS 3]
                 OBJ   9[PRED 'PRO'
                         CASE acc, GEND m, PERS 3, PRONTYPE clitic]
                 TOPIC  [9:PRO]
                12[CLAUSETYPE FRC, TENSE present]}
         7[CASE acc, GEND m, NUM sg, PRONFORM opjos]
 5[CLAUSETYPE declarative, TENSE present]]
```

Abbreviations and Symbols

In Text

XLE	Xerox Linguistics Environment
LFG	Lexical Functional Grammar
MG	Modern Greek
RRCs	Restrictive Relative Clauses
NRCs	Non-Restrictive Relative Clauses
FRCs	Free relative Clauses
LDDs	Long Distance Dependencies
UDCs	Unbounded Dependency Construtions
ParGram	Parallel Grammar (project)

Glosses

SUBJ	Subject
OBJ	Object
XCOMP	X Complement
COMP	Complement
GF	Grammatical Function
NUM	Number
PRED	Predicate
SG	Singular
PL	Plural

Feature Structures

MSG	Masculine singular
FSG	Feminine singular
NSG	Neuter singular
MPL	Masculine plural
FPL	Feminine Plural
NPL	Neuter Plural
NOM	Nominative (case)
GEN	Genitive (case)
ACC	Accusative (case)
1SG	1st person singular
2SG	2nd person singular
3SG	3rd person singular
1PL	1st person plural
2PL	2nd person plural
3PL	3rd person plural
ø	gap
PRES	Present
PAST	Past

Survey on the distribution of gap and resumptive strategies

In this section, we present a more detailed account of the of ine questionnaire survey that we based our distribution tables in chapter 3. The questionnaire survey was informal and collected grammaticality judgements of 15 informants, all native speakers of Modern Greek between 20 and 40 years old, of mixed gender and permanent residents of Athens, Greece for at least the 5 past years. The collection of data occurred by asking the participants to judge the grammaticality of a given set of sentences by lling in an online questionnaire/form.

As we can see from Table 1, of 15 the participants who participated in the survey, 8 were male and 7 female. 11 were in their twenties, whereas 4 were in their thirties.

Table 1: Age range distribution of participants

Age	No. of participants
20–25	6
26–30	4
31–35	3
36–40	1

The questionnaire included 28 sets of 5 items, grammatical and ungrammatical and were presented to the participants one set at a time. The participants were asked

to judge the grammaticality of these sentences by selecting whether they judge the sentence to be acceptable (if they would say it), ungrammatical (if they wouldn t say it) or neither (if they were not sure). The form was administered in such a way that the participants had plenty of time to judge the sentences, but once they proceeded with the next set, they could not go back. A training set was included in the beginning to help them understand better the task and get used to the procedures.

The questionnaire and the test sentences included in it , as well the results from their answers are presented at the end of this section. The test items are presented here in transliterated form, preceded by the number of the example in the main thesis which contains their glosses and the translation. Here we present a translated version of the questionnaire, but the reader can nd the original version (in Greek) on http://lfg-mg-rcs-questionnaire.tk. *(New Screen)* indicates that the participants were presented with a new screen (and that they could not go back to the previous view).

Questionnaire

Many thanks for taking part in our research. We are looking into the behaviour of relative clauses in Modern Greek and we would like your help in nding out which of the sentences in our list sounds good to you!

The questionnaire consists of 28 sets of 5 sentences. For each set, you will be asked to mark each sentence as *natural/acceptable*, *unnatural/unacceptable* or *neither acceptable nor unacceptable*. You are going to see each set of sentences once; you can work on each set at your leisure, but you cannot go back and change your results, once you have clicked on the NEXT button. Please do not click on your browser *Back* button, as this will mess up the questionnaire and provide us with the wrong results.

[Next]

(New screen)

Personal Information

Inspite of the fact that this questionnaire is anonymous, we would be really grateful if you could provide us with some information about you. The information are only collected for statistical purposes and will help us ensure that we have selected the appropriate range of participants.

Please select as appropriate:

1. Are you ⊙ male ⊙ female?
2. Your age is ⊙ 20-25 ⊙ 26-30 ⊙ 31-35 ⊙ 36-40 ⊙ none of the above
3. What is your mother tongue? ⊙ Greek ⊙ Other
4. What other languages can you speak? (you can select more than one) ⊙ English ⊙ French ⊙German ⊙ Italian ⊙ Other(which?)
5. What is the level of education you have achieved? ⊙ primary/junior high school ⊙ hign school ⊙ undergraduate studies ⊙ postgraduate studies
6. Where have you lived for the last 5 years? ⊙ Athens ⊙ Elsewhere
7. Have you been abroad during the last 5 years? For how long? ⊙ 0-6 months ⊙ 7-12 months ⊙ over 12 months

[Next]

(New screen)

Thanks! Let s proceed with the main questionnaire!

You will be presented with 28 sets of 5 sentences, which might differ slightly. For each of the sentences, select whether they are acceptable (if they sound like natural Greek), unacceptable (if they do not sound like natural Greek) or neither (if you cannot decide).

There is no limitation on the time you can dedicate to work on each; we suggest however that you stick with your rst choice. When you are done with the set, click on [Next] to see the next set. From the moment you see the next set, you will not be able to change your answers. Please do not use the *Back* button of your browser, as this will mess up your answers at our end and you might need to start over again.

Here is an example for you to try:

Set 0 (training set)

(509) (see ex. 53)

a. O Kostas lise tin Eleni
b. Filise o Kostas tin Eleni
c. Filise tin Eleni o Kostas
d. TIN ELENI lise o Kostas
e. O Kostas tin Eleni lise
f. TIN ELENI o Kostas lise

Ready? Click on [Next] to start the Questionnaire!

[Next]

(New screen)

Set 1

(510) (see ex. 265) O Kostas agapai ti yineka pu tin vrike ton papagalo.

(511) (see ex. 266) O Kostas agapai ti yineka o opia vrike ton papagalo.

(512) (see ex. 267) O Kostas agapai ti So a pu vrike ton papagalo.

(513) (see ex. 268) O Kostas agapai ti So a i opia tin vrike ton papagalo.

(514) (see ex. 269) O Kostas agapai opjon tis agapai ti Sofia.

[Next]

(New screen)

Set 2

(515) (see ex. 265) O Kostas agapai ti yineka pu vrike ton papagalo.
(516) (see ex. 266) O Kostas agapai ti yineka o opia tin vrike ton papagalo.
(517) (see ex. 267) O Kostas agapai ti So a pu tin vrike ton papagalo.
(518) (see ex. 268) O Kostas agapai ti So a i opia vrike ton papagalo.
(519) (see ex. 269) O Kostas agapai opjon agapai ti Sofia.

[Next]

(New screen)

Set 3

(520) (see ex. 271) O Kostas agapai ti yineka pu tin tsibise o papagalos.
(521) (see ex. 272) I Kiki edose to biskoto ston papagalo pu ton tsibise ti Maria.
(522) (see ex. 273) I yineka pu konta kathise o Petros ine thia mu.
(523) (see ex. 274) O Kostas agapai ti So a pu tin vrike ton papagalo.
(524) (see ex. 275) O Kostas agapai ti So a pu tsibise o papagalos.

[Next]

(New screen)

Set 4

(525) (see ex. 271) O Kostas agapai ti yineka pu tsibise o papagalos.
(526) (see ex. 272) I Kiki edose to biskoto ston papagalo pu tsibise ti Maria.
(527) (see ex. 273) I yineka pu konta tis kathise o Petros ine thia mu.
(528) (see ex. 274) O Kostas agapai ti So a pu vrike ton papagalo.
(529) (see ex. 275) O Kostas agapai ti So a pu tin tsibise o papagalos.

[Next]

(New screen)

Set 5

(530) (see ex. 276) I Kiki edose to biskoto ston Ilia pu harise i Eleni ena amaksi.
(531) (see ex. 277) O Kostas agapai ti yineka i opia i Maria ipe oti vrike ton papagalo.
(532) (see ex. 278) O Kostas agapai ti yineka tin opia i Maria ipe oti tin tsibise o papagalos.
(533) (see ex. 279) O Kostas agapai ti So a i opia vrike ton papagalo.
(534) (see ex. 280) O Kostas agapai ti So a tin opia i Maria ipe oti tsibise o papagalos.

[Next]

(New screen)

Set 6

(535) (see ex. 276) I Kiki edose to biskoto ston Ilia pu tu harise i Eleni ena amaksi.

(536) (see ex. 277) O Kostas agapai ti yineka i opia i Maria ipe oti tin vrike ton papagalo.

(537) (see ex. 278) O Kostas agapai ti yineka tin opia i Maria ipe oti tsibise o papagalos.

(538) (see ex. 279) O Kostas agapai ti So a i opia tin vrike ton papagalo.

(539) (see ex. 280) O Kostas agapai ti So a tin opia i Maria ipe oti tin tsibise o papagalos.

[Next]

(New screen)

Set 7

(540) (see ex. 281) O Kostas agapai ti yineka konta stin opia tis kathise o Petros.

(541) (see ex. 282) O Petros kathise dipla sti yineka tis opias i aderfi tis dulevi me ton Ilia.

(542) (see ex. 283) O Kostas agapai ti So a stin opia i Kiki edose ton papagalo.

(543) (see ex. 284) O Petros kathise dipla sti So a tis opias i aderfi tis dulevi me ton Ilia.

(544) (see ex. 285) i yineka tis opias i aderfi dulevi me ton Kosta ine thia mu.

[Next]

(New screen)

Set 8

(545) (see ex. 281) O Kostas agapai ti yineka konta ston opia kathise o Petros.

(546) (see ex. 282) O Petros kathise dipla sti yineka tis opias i aderfi dulevi me ton Ilia.

(547) (see ex. 283) O Kostas agapai ti So a stin opia i Kiki tis edose ton papagalo.

(548) (see ex. 284) O Petros kathise dipla sti So a tis opias i aderfi dulevi me ton Ilia.

(549) (see ex. 285) i yineka tis opias i aderfi tis dulevi me ton Kosta ine thia mu.

[Next]

(New screen)

Set 9

(550) (see ex. 286) i So a, tis opias i aderfi tis dulevi me ton Ilia, ine thia mu.

(551) (see ex. 287) i yineka pu tsibise o papagalos ine thia mu.

(552) (see ex. 288) i So a, pu tsibise o papagalos ine thia mu.

(553) (see ex. 289) O Kostas agapai ti yineka pu tsibise o papagalos.

(554) (see ex. 290) O Kostas agapai ti yineka pu i Maria ipe oti tsibise o papagalos.

[Next]

(New screen)

Set 10

(555) (see ex. 286) i So a, tis opias i aderfi dulevi me ton Ilia, ine thia mu.

(556) (see ex. 287) i yineka pu tin tsibise o papagalos ine thia mu.

(557) (see ex. 288) i So a, pu tin tsibise o papagalos ine thia mu.

(558) (see ex. 289) O Kostas agapai ti yineka pu tin tsibise o papagalos.

(559) (see ex. 290) O Kostas agapai ti yineka pu i Maria ipe oti tin tsibise o papagalos.

[Next]

(New screen)

Set 11

(560) (see ex. 291) O Kostas agapai ti yineka pu i Kiki tis edose ton papagalo.

(561) (see ex. 292) O Kostas agapai ti yineka pu konta tis kathise o Petros.

(562) (see ex. 293) O Kostas agapai ti yineka pu i aderfi dulevi me ton Ilia.

(563) (see ex. 294) O Kostas agapai ti yineka i opia tin vrike ton papagalo.

(564) (see ex. 295) O Kostas agapai ti yineka tin opia tsibise o papagalos.

[Next]

(New screen)

Set 12

(565) (see ex. 291) O Kostas agapai ti yineka pu i Kiki edose ton papagalo.

(566) (see ex. 292) O Kostas agapai ti yineka pu konta kathise o Petros.

(567) (see ex. 293) O Kostas agapai ti yineka pu i aderfi tis dulevi me ton Ilia.

(568) (see ex. 294) O Kostas agapai ti yineka i opia vrike ton papagalo.

(569) (see ex. 295) O Kostas agapai ti yineka tin opia tin tsibise o papagalos.

[Next]

(New screen)

Set 13

(570) (see ex. 296) O Kostas agapai ti yineka tin opia i Maria ipe oti tsibise o papagalos.

(571) (see ex. 297) O Kostas agapai ti yineka stin opia i Kiki edose ton papagalo.

(572) (see ex. 298) O Kostas agapai ti yineka stin opia i Maria nomizi oti i Kiki edose ton papagalo.

(573) (see ex. 299) O Kostas agapai ti yineka konta stin opia kathise o Petros

(574) (see ex. 300) O Kostas agapai ti yineka tis opias i aderfi dulevi me ton Ilia.

[Next]

(New screen)

Set 14

(575) (see ex. 296) O Kostas agapai ti yineka tin opia i Maria ipe oti tin tsibise o papagalos.

(576) (see ex. 297) O Kostas agapai ti yineka stin opia i Kiki tis edose ton papagalo.

(577) (see ex. 298) O Kostas agapai ti yineka stin opia i Maria nomizi oti i Kiki tis edose ton papagalo.

(578) (see ex. 299) O Kostas agapai ti yineka konta stin opia tis kathise o Petros

(579) (see ex. 300) O Kostas agapai ti yineka tis opias i aderfi tis dulevi me ton Ilia.

[Next]

(New screen)

Set 15

(580) (see ex. 301) O Kostas agapai ti So a pu vrike ton papagalo.

(581) (see ex. 302) I Kiki edose to biskoto ston Ilia o opios tsibise ti Maria.

(582) (see ex. 303) I Kiki edose to biskoto ston Ilia, pu ton taise i Maria

(583) (see ex. 304) I Kiki edose to biskoto ston Ilia, pu harise i Eleni ena amaksi.

(584) (see ex. 305) I Kiki edose to biskoto ston Ilia pu konta kathotan o Petros.

[Next]

(New screen)

Set 16

(585) (see ex. 301) O Kostas agapai ti So a pu tin vrike ton papagalo.

(586) (see ex. 302) I Kiki edose to biskoto ston Ilia o opios ton tsibise ti Maria.

(587) (see ex. 303) I Kiki edose to biskoto ston Ilia, pu taise i Maria

(588) (see ex. 304) I Kiki edose to biskoto ston Ilia, pu tu harise i Eleni ena amaksi.

(589) (see ex. 305) I Kiki edose to biskoto ston Ilia pu konta tu kathotan o Petros.

[Next]

(New screen)

Set 17

(590) (see ex. 306) I Kiki edose to biskoto ston Ilia pu i aderfi dulevi me tin Eleni.

(591) (see ex. 307) I Kiki edose to biskoto ston Ilia pu i aderfi tu dulevi me tin Eleni.

(592) (see ex. 308) I Kiki edose to biskoto ston Ilia ton opio taise i Maria.

(593) (see ex. 309) I Kiki edose to biskoto ston Ilia ston opio harise i Eleni ena amaksi.

(594) (see ex. 310) O Petros kathise konta sti So a pano stin opia stirizete oli i epihirisi.

[Next]

(New screen)

Set 18

(595) (see ex. 306) I Kiki edose to biskoto ston Ilia pu i aderfi tu dulevi me tin Eleni.

(596) (see ex. 307) I Kiki edose to biskoto ston Ilia pu i aderfi dulevi me tin Eleni.

(597) (see ex. 308) I Kiki edose to biskoto ston Ilia ton opio ton taise i Maria.

(598) (see ex. 309) I Kiki edose to biskoto ston Ilia ston opio tu harise i Eleni ena amaksi.

(599) (see ex. 310) O Petros kathise konta sti So a pano stin opia tis stirizete oli i epihirisi.

[Next]

(New screen)

Set 19

(600) (see ex. 311) O Kostas agapai ti So a, tis opias i aderfi tis dulevi me ton Ilia

(601) (see ex. 312) I Kiki edose to biskoto ston Ilia ton opio i Eleni ipe oti taise i Maria.

(602) (see ex. 313) I Kiki edose to biskoto ston Ilia ston opio i Maria nomizi oti harise i Eleni ena amaksi.

(603) (see ex. 314) I Kiki edose to biskoto ston Ilia tu opiu i ader tu dulevi me tin Eleni.

(604) (see ex. 315) I Kiki edose to biskoto ston Ilia tu opiu i Maria pistevi oti i aderfi tu dulevi me tin Eleni.

[Next]

(New screen)

Set 20

(605) (see ex. 311) O Kostas agapai ti So a, tis opias i aderfi dulevi me ton Ilia

(606) (see ex. 312) I Kiki edose to biskoto ston Ilia ton opio i Eleni ipe oti ton taise i Maria.

(607) (see ex. 313) I Kiki edose to biskoto ston Ilia ston opio i Maria nomizi oti tu harise i Eleni ena amaksi.

(608) (see ex. 314) I Kiki edose to biskoto ston Ilia tu opiu i ader dulevi me tin Eleni.

(609) (see ex. 315) I Kiki edose to biskoto ston Ilia tu opiu i Maria pistevi oti i aderfi dulevi me tin Eleni.

[Next]

(New screen)

Set 21

(610) (see ex. 316) I Kiki edose to biskoto sti yineka pu konta kathotan o Petros.

(611) (see ex. 317) I Kiki edose to biskoto sti yineka konta stin opia kathotan o Petros.

(612) (see ex. 318) I Kiki edose to biskoto ston Ilia pu konta tu kathotan o Petros.

(613) (see ex. 319) I Kiki edose to biskoto ston Ilia konta ston opio tu kathotan o Petros.

(614) (see ex. 320) i yineka konta stin opia i Maria ipe oti tis kathise o Petros ine thia mu.

[Next]

(New screen)

Set 22

(615) (see ex. 316) I Kiki edose to biskoto sti yineka pu konta tis kathotan o Petros.

(616) (see ex. 317) I Kiki edose to biskoto sti yineka konta stin opia tis kathotan o Petros.

(617) (see ex. 318) I Kiki edose to biskoto ston Ilia pu konta kathotan o Petros.

(618) (see ex. 319) I Kiki edose to biskoto ston Ilia konta ston opio kathotan o Petros.

(619) (see ex. 320) i yineka konta stin opia i Maria ipe oti kathise o Petros ine thia mu.

[Next]

(New screen)

Set 23

(620) (see ex. 321) O Petros kathise konta sti yineka pano stin opia i Maria ipe oti tis stirizete i epihirisi.

(621) (see ex. 322) i yineka pu i Maria ipe oti kontakathise o Petros ine thia mu.

(622) (see ex. 323) i yineka pu i aderfi tis dulevi me ton Kosta ine thia mu.

(623) (see ex. 324) i yineka pu i Maria ipe oti i aderfi dulevi me ton Kosta ine thia mu.

(624) (see ex. 325) i yineka tis opias i aderfi dulevi me ton Kosta ine thia mu.

[Next]

(New screen)

Set 24

(625) (see ex. 321) O Petros kathise konta sti yineka pano stin opia i Maria ipe oti stirizete i epihirisi.

(626) (see ex. 322) i yineka pu i Maria ipe oti konta tis kathise o Petros ine thia mu.

(627) (see ex. 323) i yineka pu i aderfi dulevi me ton Kosta ine thia mu.

(628) (see ex. 324) i yineka pu i Maria ipe oti i aderfi tis dulevi me ton Kosta ine thia mu.

(629) (see ex. 325) i yineka tis opias i aderfi tis dulevi me ton Kosta ine thia mu.

[Next]

(New screen)

Set 25

(630) (see ex. 326) i yineka tis opias i aderfi i Maria ipe oti dulevi me ton Kosta ine thia mu.

(631) (see ex. 327) O Kostas agapai opjon i Kiki edose enan papagalo.

(632) (see ex. 328) O Kostas agapai ti yineka pu i Kiki edose ton papagalo

(633) (see ex. 329) O Kostas agapai opjon agapai i Sofia.

(634) (see ex. 330) O Kostas agapai opjon i Kiki edose ena papagalo.

[Next]

(New screen)

Set 26

(635) (see ex. 326) i yineka tis opias i aderfi tis i Maria ipe oti dulevi me ton Kosta ine thia mu.

(636) (see ex. 327) O Kostas agapai opjon i Kiki tu edose enan papagalo.

(637) (see ex. 328) O Kostas agapai ti yineka pu i Kiki tis edose ton papagalo

(638) (see ex. 329) O Kostas agapai opjon ton agapai i Sofia.

(639) (see ex. 330) O Kostas agapai opjon i Kiki tu edose ena papagalo.

[Next]

(New screen)

Set 27

(640) (see ex. 331) O Kostas agapai opjon konta kathise i Sofia.

(641) (see ex. 332) O Kostas agapai opjon i aderfi dulevi me ton Ilia.

(642) (see ex. 333) I Kiki edose to biskoto se opjon agapai ti Sofia.

(643) (see ex. 334) I Kiki edose to biskoto se opjon agapai i Sofia.

[Next]

(New screen)

Set 28

(644) (see ex. 331) O Kostas agapai opjon konta tu kathise i Sofia.

(645) (see ex. 332) O Kostas agapai opjon i aderfi tu dulevi me ton Ilia.

(646) (see ex. 333) I Kiki edose to biskoto se opjon tin agapai ti Sofia.

(647) (see ex. 334) I Kiki edose to biskoto se opjon ton agapai i Sofia.

[Next]

(New screen)

That was the end of the questionnaire! Many thanks for your time and help with it!

This questionnaire is part of research carried out by Kakia Chatsiou, as part of her PhD dissertation project entitled *A Lexical Functional Grammar (LFG) approach to Modern Greek Relative Clauses* funded with an ESRC 1+3 Quota Award from the Economic and Social Research Council, support which is hereby gratefully acknowledged. More information on the project is available on http://kakiachatsiou.tk

Table 2: Grammaticality judgements of the Questionnaire participants

Sentence	Acceptable/Natural	Unacceptable/Unnatural	Neither
(510)	0	15	0
(511)	15	0	0
(512)	15	0	0
(513)	0	15	0
(514)	0	15	0
(515)	15	0	0
(516)	0	15	0
(517)	0	15	0
(518)	15	0	0
(519)	15	0	0
(520)	15	0	0
(521)	0	15	0
(522)	0	15	0
(523)	0	15	0
(524)	5	6	4
(525)	15	0	0
(526)	15	0	0
(527)	15	0	0
(528)	15	0	0
(529)	15	0	0
(530)	10	4	1
(531)	15	0	0
(532)	15	0	0
(533)	15	0	0
(534)	15	0	0
(535)	15	0	0
(536)	0	15	0
(537)	10	2	3
(538)	0	15	0
(539)	15	0	0
(540)	0	15	0
(541)	0	15	0
(542)	15	0	0
(543)	9	4	2
(544)	15	0	0
(545)	15	0	0
(546)	15	0	0
(547)	2	12	1
(548)	15	0	0
(549)	0	15	0

Sentence	Acceptable/Natural	Unacceptable/Unnatural	Neither
(550)	10	2	3
(551)	15	0	0
(552)	0	15	0
(553)	15	0	0
(554)	15	0	0
(555)	15	0	0
(556)	0	15	0
(557)	15	0	0
(558)	11	2	2
(559)	15	0	0
(560)	15	0	0
(561)	15	0	0
(562)	0	15	0
(563)	0	15	0
(564)	15	0	0
(565)	0	15	0
(566)	0	15	0
(567)	15	0	0
(568)	15	0	0
(569)	15	0	0
(570)	15	0	0
(571)	15	0	0
(572)	15	0	0
(573)	15	0	0
(574)	15	0	0
(575)	15	0	0
(576)	0	15	0
(577)	12	1	2
(578)	0	14	1
(579)	2	11	3
(580)	12	0	3
(581)	15	0	0
(582)	15	0	0
(583)	0	15	0
(584)	0	14	1
(585)	0	15	0
(586)	0	15	0
(587)	2	9	4
(588)	15	0	0
(589)	15	0	0
(590)	0	15	0
(591)	15	0	0
(592)	15	0	0
(593)	15	0	0
(594)	15	0	0

Sentence	Acceptable/Natural	Unacceptable/Unnatural	Neither
(595)	15	0	0
(596)	13	0	2
(597)	15	0	0
(598)	0	13	2
(599)	0	15	0
(600)	6	8	1
(601)	15	0	0
(602)	15	0	0
(603)	5	9	1
(604)	9	3	3
(605)	15	0	0
(606)	14	0	1
(607)	15	0	0
(608)	14	0	1
(609)	12	1	2
(610)	2	11	2
(611)	15	0	0
(612)	15	0	0
(613)	0	15	0
(614)	0	14	1
(615)	15	0	0
(616)	0	13	2
(617)	0	15	0
(618)	15	0	0
(619)	15	0	0
(620)	0	14	1
(621)	1	10	4
(622)	15	0	0
(623)	0	14	1
(624)	15	0	0
(625)	15	0	0
(626)	15	0	0
(627)	0	13	2
(628)	15	0	0
(629)	3	7	5
(630)	3	5	7
(631)	0	15	0
(632)	1	12	2
(633)	15	0	0
(634)	0	13	2
(635)	14	0	1
(636)	15	0	0
(637)	15	0	0
(638)	3	11	1
(639)	13	1	1

Sentence	Acceptable/Natural	Unacceptable/Unnatural	Neither
(640)	0	15	0
(641)	0	15	0
(642)	15	0	0
(643)	15	0	0
(644)	14	0	1
(645)	14	0	1
(646)	8	6	1
(647)	12	1	2