Anaphoric Relations with Greek Pronouns

Christiana Christodoulou

University of British Columbia
cchristy@interchange.ubc.ca

ABSTRACT

In the present paper I study coreference relations with Greek pronouns. Two alternative analyses are compared and contrasted to decide which of the two best accounts for the behaviour of pronouns in Greek. I first ascertain that the module of grammar that determines coreference relations (i.e. Binding Theory) cannot provide an inclusive analysis on the behaviour of Greek pronouns since it does not apply to any of the data presented in this paper. Second, following an analysis based on linear precedence, initially introduced by Williams (1997), I show that anaphoric relations in Greek are determined by the positioning of the pronoun in the sentence. Specifically, the pronoun needs to either follow the antecedent**,** or when the pronoun precedes the antecedent, it *must* be in a subordinate clause with respect to the antecedent. In addition, if the pronoun preceding the antecedent is in a matrix clause, then the antecedent CANNOT receive main sentence stress. Third, I establish that Williams' generalization needs to be extended to account for not only matrix-subordinate clause sentences, but also argument-adjunct.

Keywords: backward dependence/ pronominalization; coreference; binding; linear precedence; Greek pronouns; clitics; antecedent.

1   Introduction

If two expressions refer to the same individual, they are said to co-refer. Across languages, possibilities for coreference are partly structurally determined (i.e. Binding Theory). In this paper I discuss data which suggest that coreference relations in Greek cannot be explained through the traditional module of grammar, where coreference is determined by c-command. In these Greek data, the possibility of coreference is also determined by linear precedence. Therefore, I make use of an analysis based on linear order, under which such data can best be explained.

The phenomenon of backward pronominalization identified first by Williams (1997) adequately accounts for the behaviour of Greek pronouns presented in this paper. Consider the following data:

(1)   a. *Andrew* was expecting that *he* would get arrested.
         b. That *he* would get arrested, *Andrew* was expecting (it).

(2)   a.   The fact that *she* lost the race disappointed ***Jaclyn***.
         b.   * It disappointed ***JACLYN***, the fact that *she* lost the race.

According to Williams (1997) the antecedent has to either precede the pronoun as in (1), or when the pronoun precedes the antecedent, as in (2) it *must* be in a subordinate clause with respect to the antecedent. Anaphoric relations in this model are determined by linear precedence, not c-command. Thus, while Binding Theory is not enough to provide an inclusive analysis on the behaviour of Greek pronouns, Williams' generalization is.

This paper is structured as follows: In *Section 2* I present the basic assumptions I will be making use of concerning the syntactic structure of Greek, with special reference to verbal morphology and clitic placement. In *Section 3* I attempt to explain coreference with Greek pronouns through Binding Theory and establish that there are cases where co-indexing is not structurally determined, but is instead governed by linear order. I start *Section 4* by offering a short discussion on dependence and the relations between pronouns and antecedents based on their position in a structure. I then put Greek data through Williams' (1997) model to test whether dependence can sufficiently account for coreference relations in Greek. In this section I also demonstrate that Williams' model needs to be extended to account for the behaviour of Greek pronouns. Finally, in the discussion section (*Section 5*) I present a revision of Williams' (1997) generalization and in *Section 6* I conclude.

2   The Basics of Greek Syntax

For the purpose of this study we need to have some basic concepts regarding the syntax of Greek, a *pro*-drop language.

2.1   *Complex Verbs in Greek*

In this section I briefly discuss the morphology of Greek verbal clauses. Consider the following example:

(3)   Telio   -s   a-   -me.
         finish- ASP-   TENSE   AGR.
         'We are done/ finished'.

In example (3) the verb forms a complete sentence. The verb in Greek, apart from the root, contains a number of functional suffixes. ***telio-*** is the verbal root, ***-s-*** is an aspectual marker, ***-a-*** is the past tense marker, and *–**me*** is 1st person plural, which in this case is a covert subject, i.e. a *pro*. In languages with rich morphology like Greek, agreement morphology on verbs licenses and identifies null-subjects (Philippaki-Warburton, 1987). The structural analysis developed in this paper is based on *The Mirror Principle* (Baker 1985: 375), according to which morphological derivations mirror syntactic derivations. Hence,

following Spyropoulos (1999) and Tsimpli (1990) among others, I am assuming that the verb raises to T after acquiring all functional affixes.

2.2　　Pertaining SVO Order

Greek is generally accepted to underlyingly be a VSO language (Alexiadou, 1999; Alexiadou & Anagnostopoulou, 1998; Philippaki-Warburton & Spyropoulos, 1999; Spyropoulos & Philippaki-Warburton, 2001; Tsimpli, 1995). An SVO order is also highly common:

(4)　　a.　aγapai　　o [1]　　Θomas　　tin　po∆ilasia.
　　　　　　love-PRES　theNOM　ThomasNOM　theACC　cyclingACC
　　　　　　'Thomas loves cycling.'
　　　b.　o　　　Θomas　　aγapai　　tin po∆ilasia.
　　　　　　theNOM　ThomasNOM　love-PRES　theACC　cyclingACC
　　　　　　'Thomas loves cycling.'

In (4a), the verb ***aγapai*** precedes the subject ***o Θomas***, which in turn precedes the object ***tin po∆ilasia***. In (4b), the verb ***aγapai*** is preceded by the subject ***o Θomas***, and followed by the object ***tin po∆ilasia***. Thus, a VSO order in (4a) is turned into an SVO order in (4b). For the purposes of this paper I will adopt Spyropoulos' (1999) analysis (also in accordance with Panagiotidis & Tsiplakou, 2006), where a subject is generated under TopicP, heading its own projection. At Spec of *v*P we find a *pro* subject, which is linked to the overt subject via an A' –chain. The structure I assume for the subject-verb position in Greek is illustrated below:

(4b′)
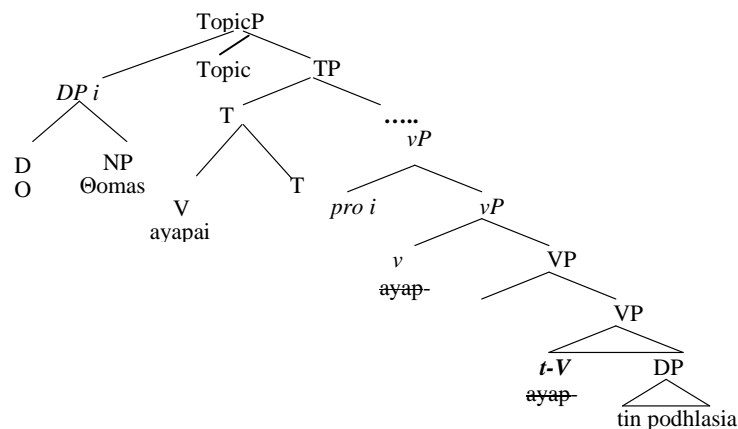
Since the pronouns used throughout this paper are strictly clitics I next examine clitic placement in Greek.

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[1] Whatever case is assigned to the noun following the determiner is also assigned to the determiner.

2.3   Clitic Placement

In Greek, pronominal objects appear as preverbal clitics in an order [cl-v] as well as following the verb inside the VP in a [v-cl] order:

(5)   a. To   forema   skistike   [sto   spiti   *tis*].
           the   dress$_{ACC}$ *rip off-*$_{PAST}$ *in-the   house   her*$_{GEN}$
           'The dress got ripped off at her house.'
       b. To   forema   [*tis*]   skistike   sto   spiti
           the   dress$_{ACC}$ *her*$_{GEN}$ *rip off-*$_{PAST}$ *in-the   house*
           'The dress got ripped off at her house.'

Hegarty (1999) proposes that if N-features on Nominals are being checked against a functional head (e.g. AgrO) the clitic stays in its base-generated position following the verb, under VP, to surface [v-cl] order. If V-features are checked on the verb, the clitic moves up under TP, surfacing a [cl-v] order. In the set of data examined in this paper, clitics are placed after the verb and the overt object. As I am only examining post-verbal clitics in this paper, below you only see the structure for postverbal clitics:
(5')
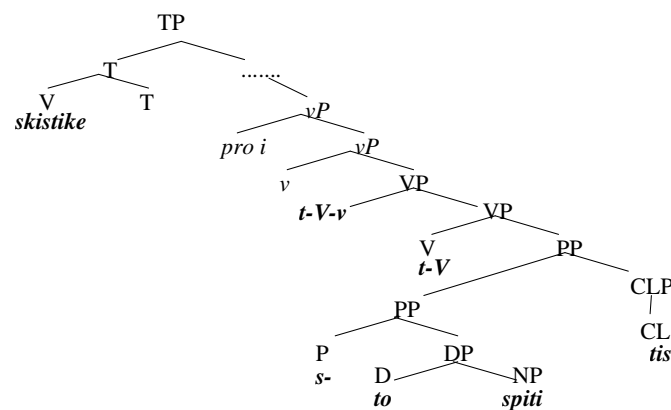
Hence, I am assuming that in these data, clitics remain in situ, following the verb and the DP-object (under PP, in this case), because N-features on the noun phrase are being checked. In the next section an analysis based on Binding Theory will be applied to account for the behaviour of Greek pronouns in terms of binding and coreference.

3   A Binding-Theoretic Analysis and its Problems

3.1   Data

The core contrast I am exploring in this paper is illustrated in (6a) – (6b):

(6) a. i Tania$_2$ omoloɣise oti [to forema   pou Δanise   ***sti   Yeorɣia$_6$***]
         the Tania   admit$_{PAST}$ that the dress$_{NOM}$ which lend$_{PAST}$ to-the Georgia$_{ACC}$
      [skistike   sto   spiti   ***tis$_{6/2}$***]
      rip off-$_{PAST}$ in-the house her$_{GEN}$
      'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

   b. i Tania$_2$ omoloɣise oti [skistike   sto   spiti   ***tis$_{2/*6}$***]
      the Tania   admit$_{PAST}$ that rip off-$_{PAST}$ in-the house her$_{GEN}$
      [to forema   pou Δanise   ***sti   Yeorɣia$_6$***]
      the dress$_{NOM}$ which lend$_{PAST}$ to-the Georgia$_{ACC}$
      'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

It appears that, with Greek pronouns, a reading and hence the possibility of coreference is not available in a structure in which the clause that contains the pronoun precedes the clause that contains the antecedent. Specifically, in structure (6a), where the subordinate clause (a relative clause contained in a DP) precedes the matrix clause, the pronoun ***tis*** can be interpreted as referring to ***Yeoryia***, i.e., coreference is allowed. In contrast, in (6b) the possibility of coreference between ***tis*** and ***sti Yeorɣia*** is excluded. In the light of these data, the following question arises: what rules out coreference between ***sti Yeorɣia*** and the pronoun (6b); what is it that allows the one in (6a)?

Given that coreference possibilities are assumed by standard to be regulated by Binding Theory (Chomsky 1981), I will first investigate whether Binding Theory can account for the pattern in (6a) and (6b). I next present some background information on Binding Theory, and on how those are described in the literature on Greek pronouns.

3.2   Binding Theory and Pronouns in Greek

In this section, before moving on to a Binding Theory analysis on the data examined in this paper, though, I present a few basic concepts on binding.

3.2.1   Basics on Binding

In a structure, α binds β if, and only if, α c-commands β and α and β carry the same index:

(7)
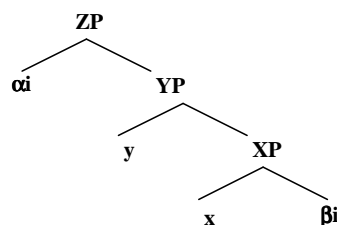
There are three binding conditions that determine coreference. *Binding Condition A* concerns reflexives and necessitates that a reflexive pronoun must be bound within its co-

argument domain. This condition however, is inconsequential to the present study because reflexives are not explored here. *Binding Condition B* requires that a non-reflexive pronoun be free in its co-argument domain (the smallest maximal projection XP that contains the NP, and the NP's case assigner (Büring, 2005:55, 120). Finally, for *Binding Condition C*, a full NP **must** be free in the root domain (i.e. the entire sentence) (Büring, 2005:112). For example, in the structural representation in (8), *Katie*, the full NP is the binder and the pronoun *her* is the "bindee." *Katie* binds the pronoun *her* because the two are co-indexed and the antecedent *Katie* c-commands the pronoun *tis*:
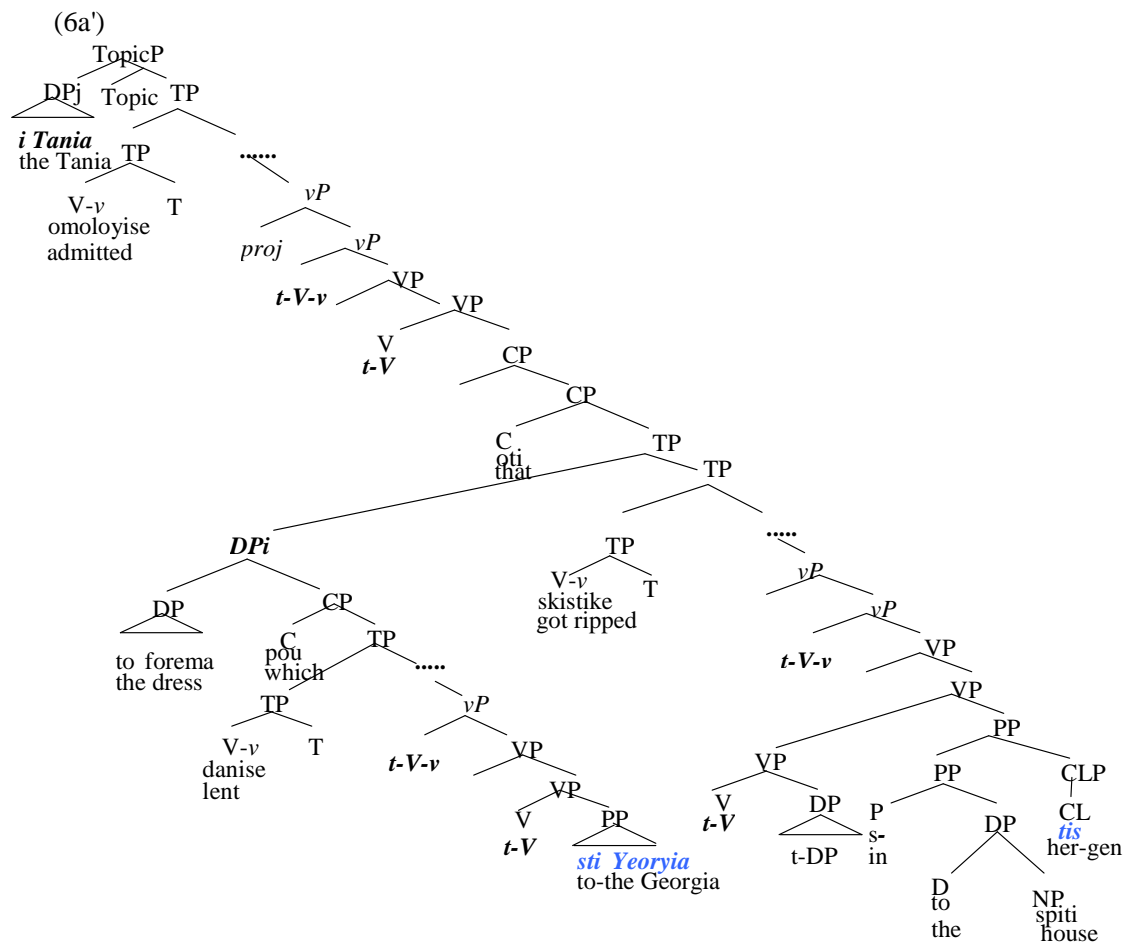
(8)
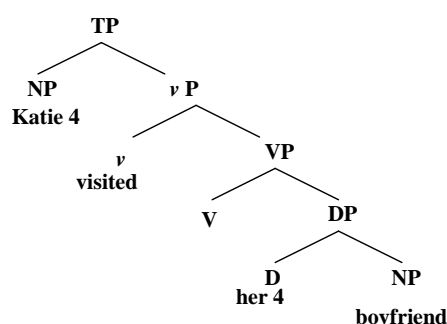
3.2.2 Data Analysis through Binding Theory

In this section I show that the data under investigation in this paper cannot adequately be analyzed in terms of Binding Theory. Pronouns in Greek have traditionally been analysed as conforming to the Binding Theory in terms of anaphoric reference (Iatridou, 1988; 1986). Iatridou makes use of the same definitions as above to determine Binding relations with pronouns in Greek. Through this research I now demonstrate that Binding Theory has nothing to say about examples (6a) and (6b), since neither Condition B nor C apply to either of the examples above. Since binding can only be established under c-command, Binding Theory cannot explain why coreference in (6b) is not available, while it is (allowed) in (6a). Following the definitions used in *3.2.1*, I explain why neither Condition B nor C is relevant to the data examined in this paper. Starting with the sentence in (6a):

(6)   a. i   Tania₂   omoloγise   oti [to   forema   pou   Δanise   ***sti   Yeorγia₆***]
      the   Tania   admit_PAST   that   the   dress_NOM   which   lend_PAST   to-the   Georgia_ACC
      [skistike   sto   spiti   ***tis₆ₘ₂***]
      rip off-_PAST   in-the   house   her_GEN
      'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

Below is a structural representation for example (6a):

(6a')

TopicP

DPj Topic TP

i Tania
the Tania TP

V-*v* T
omoloyise
admitted

······

vP

proj *vP*

t-V-v VP

V VP
t-V

CP

CP

C TP
oti
that TP

TP ·····
V-*v* T
skistike
got ripped *vP*

DPi *vP*

DP CP *t-V-v* VP

to forema C TP VP
the dress pou
which ····· PP

TP *vP* VP PP CLP

V-*v* T *t-V-v* VP V DP P DP CL
danise *t-V* *tis*
lent VP t-DP s- her-gen
in
V PP D NP
t-V to spiti
sti Yeoryia the house
to-the Georgia

The matrix clause construction is passive. Therefore, the DP [to forema pou Δanise *sti Yeorɣia*] is base-generated under VP, as a DP-object. Hence, the left-dislocated topic subject started off as an object of *skistike* 'got ripped off'. The antecedent *Yeorɣia* under *t-DP object* does not c-command the clitic *tis* under PP, though it precedes it. Thus, a c-command relation is not established because even though neither *Yeorɣia* dominates *tis* nor *tis* dominates *Yeorɣia*, the maximal projection that dominates *Yeorɣia* does not dominate *tis*. According to the Binding theory definition, binding can only occur when an NP phrase both c-commands and binds another. Therefore, neither Binding Condition B nor C applies in this case. Thus, the antecedent *Yeorɣia* is free in the root domain. Moreover, *Tania* c-commands the pronoun *tis*, because the maximal projection that dominates *Tania* also dominates *tis*, and neither of the two dominates each other.

I now examine whether the change in the positioning of the two clauses also alters the coreference relation between pronoun and antecedent, and thus Binding Theory can indeed explain why coreference in (6b) is eliminated.

(6)   b. i   Tania$_2$ omoloγise   oti [skistike   sto   spiti   *tis$_{2/*6}$*]
       the   *Tania*   *admit$_{PAST}$*   *that*   *rip off-$_{PAST}$*   *in-the*   *house*   *her$_{GEN}$*

[to forema   pou Δanise   **sti**   **Yeorγia$_6$**]
the dress$_{NOM}$ which lend$_{PAST}$ to-the Georgia$_{ACC}$
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

Next is a structural representation for (6b):

(6b')
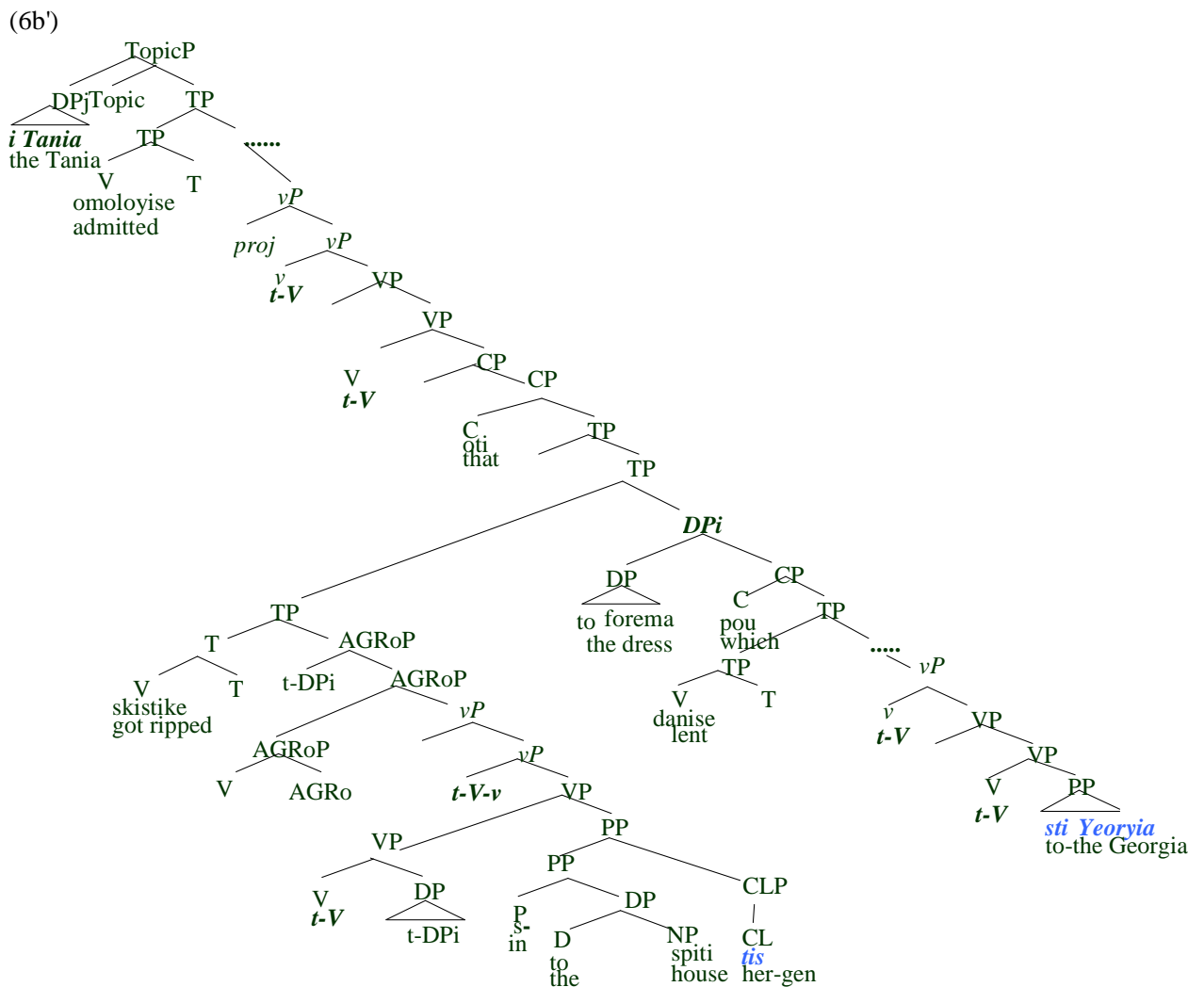
Following the same argumentation as above, c-command between **Yeorγia** and **tis** does not apply because despite the fact that neither of the two dominates the other, similarly to

(6a'), the maximal projection VP that dominates *tis*, does not also dominate the antecedent *Yeorγia*, nor does the maximal projection PP that dominates *Yeorγia* also dominate *tis*[2]. Thus, Binding Condition B does not apply for the pronoun, nor does Binding Condition C apply for the antecedent. Since there is no offending binder to block the coreference between *tis* and *Yeorγia* Binding Theory cannot explain why the relation is excluded in (6b). To sum up, Binding is not able to account for the distinction between (6a) and (6b), in which the same conditions should apply. After considering the structural configurations above the following questions arises: what else could be responsible for the observed pattern? If Binding Theory cannot account for the contrast between (6a) and (6b), then what else could be responsible for this contrast?

A search for an alternative which can determine coreference relations established in these examples is called for. Based on the assumption that all co-reference possibilities are structurally conditioned, Greek data were examined under such analysis (i.e. Binding Theory). However, that possibility is excluded by the argumentation on the structural representations (6a') and (6b') above.

Observing the data above, I suggest that coreference is made available in terms of linear precedence. An analysis in terms of precedence can explain the co-indexing between the pronoun and its antecedent in (6a) and the unavailability of co-indexing in (6b). In (6a) the full NP precedes the pronoun; hence, the pronoun gets its reference from the antecedent that comes earlier in the sentence. In (6b) the pronoun precedes its antecedent, and therefore the pronoun does not have a referent since precedence requires a full NP to always precede a pronoun in order for the two to be co-indexed. However, this hypothesis also makes the wrong prediction; precedence is not enough to explain the availability of a grammatical co-indexing in the following example:

(9)   i   Tania$_2$ omoloγise   oti [to forema   pou   ***tis***$_{2/6}$ Δanise]
    the   Tania   admit$_{PAST}$ that   the dress$_{NOM}$ which   her$_{GEN}$ lend$_{PAST}$

    skistike   sto   spiti   ***tis   Yeorγias***$_6$]
    rip off-$_{PAST}$ in-the house   the Georgia$_{GEN}$
    'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

In (9) the antecedent follows the pronoun, and yet the co-indexing of the two surfaces as grammatical. After considering a Binding Theory as well as a precedence analysis, it seems that in these Greek examples relations are neither established in terms binding/ c-command, nor a general analysis based on precedence. In conclusion, binding cannot explain the discrepancy observed between (6a) and (6b). Moreover, precedence alone can indeed account for the pattern in (6a) – (6b), but not the availability of co-indexing in (9). Thus, since Binding Theory which traditionally modifies coreference possibilities cannot explain the

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[2] Coreference between ***Tania*** and ***tis*** is not discussed here because the relation between the two is parallel to the one discussed above.

phenomenon exhibited in (6a), (6b) and (9), an alternative analysis based on linear precedence is pursued.

4   Alternative Analysis: Backward Dependence/ Pronominalization
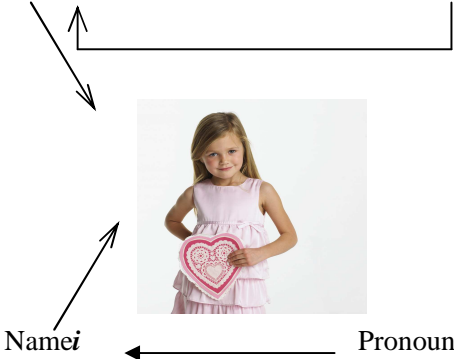
Williams (1997) discusses English data comparable to (6a) and (6b) and analyzes them in terms of anaphoric dependence. He clarifies that while dependence is defined in terms of linear precedence, coreference is governed by c-command and licensed based on the Binding Theory (1997:589).

4.1   What is dependence?

Concerning pronouns and antecedents, a pronoun gets its meaning by ***depending*** on an antecedent, before any reference to the actual individual is made. Hence, in an example like:

(10)   a. Laura $_i$ saw   herself $_i$ [3]

the reflexive initially gets its reference from the antecedent, which *must* be a proper name, or a full DP with a common N, which then in turn refers to the actual person:

(10)   b. Laura $_i$ saw   herself $_i$

Name***i***   Pronoun***i***

4.2   Forward vs. Backward Dependence and important details

Williams (1997) suggests two types of dependence: forward and backward dependence. With forward dependence any structural relation is permitted. The pronoun can either be in a

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[3] A reflexive, instead of a non-reflexive pronoun is used here because it is easier to demonstrate dependence. Dependence, though, operates, the same way for non-reflexives in Greek, as the reflexive here.

matrix (11a)[4] or subordinate clause (11b) with respect to the antecedent, so long as the clause with the antecedent precedes the clause with the pronoun.

(11) a. Anyone can turn *his term paper$_6$* in to me now [who has written *it$_6$*].
      b. Anyone [who has written *his term paper$_6$*] can turn *it$_6$* in to me now.

In the case of backward dependence, the pronoun must be in a *subordinate* clause relative to the antecedent, and the subordinate clause has to precede the clause which contains the antecedent. Backward dependence has also been described as backward pronominalization because the antecedent is "pronominalized backward" to provide a referent to a pronoun[5]:

(12)   Anyone [who has written *it$_6$*] can turn *his term paper* in to me now.

Furthermore, if the pronoun is within a matrix clause and the antecedent following is in a subordinate clause and is additionally focused, then co-indexing is not applicable, and in most cases it results to an ungrammatical structure (Williams, 1997:588):

(13)   *Anyone can turn it$_6$ in to me now [who has written his TERM PAPER$^6_6$].

According to Williams (1997) focus can block the co-indexing of a pronoun with its referent.   If the antecedent is focused it means that it is new information. When the antecedent is stressed, it furthermore implies that a previously established discourse referent is not available, since the one in the structure (following the pronoun) receives focus or main sentence stress because it is introduced in the structure for the first time. However, if the antecedent is de-accented and the verb next to it receives main sentence stress, the reading becomes available:

(14)   Anyone can turn *it$_6$* in to me now [who has WRITTEN his *term paper$_6$*].

As stated by Selkirk's (1984) anaphoric destressing analysis, when a verb receives stress, it is because the nominal element, the complement of the verb, has been destressed. This is observed above where co-indexing of pronoun and antecedent is "unblocked" once stress is shifted to the verb. This change presupposes that there is an antecedent within context (i.e. discourse referent) that is exactly the same as the one in the structure, following the pronoun (Williams, 1997). The de-accenting rule applies to all the data presented in this paper and provides the same results as the ones illustrated above. In sum, Williams formulates the *general pattern of anaphoric dependence* (hereinafter, GPAD) to capture how in a pronoun-antecedent relation, in five patterns where c-command is not available, forward as well as

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[4] Examples (11) through (14) are all taken from Williams (1997).
[5] Henceforth, the two terms backward dependence and backward pronominalization will be used interchangeably.
[6] Hereafter capitalization of the antecedent indicates that it receives main sentence stress.

backward pronominalization is. Five possible combinations of pronoun and antecedent in either a matrix or subordinate clause are summarised in the structural configurations below.

(15) a. […pro …] $_{subord}$ […antec …] $_{matrix}$
     b. […antec …] $_{matrix}$ […pro …] $_{subord}$
     c. […antec …] $_{subord}$ [… pro…] $_{matrix}$
     d.* [… pro ..] $_{matrix}$ […ANTEC…] $_{subord}$
     e. [… pro ..] $_{matrix}$ […antec…] $_{subord}$[7]

As seen from the Binding Theory analysis above, c-command does not play any role to the phenomenon in question, but rather, linear precedence is the basis of anaphoric relations (Williams, 1997:589).

4.3   Testing the GPAD with Greek Data

As deduced in *Section 3*, anaphoric relations for the Greek data in (6a) and (6b) are determined in terms of linear order. Considering all the prerequisites set above that need to be fulfilled in order for backward and forward dependence to occur, it is hypothesised that the data in (6a) and (6b) exhibit forward and backward dependence. More specifically, (6a) is a case of forward dependence, in which co-indexing of the pronoun and its antecedent in any clause combination is allowed, whereas (6b) is a case of backward pronominalization where the co-indexing of pronoun-antecedent is excluded because the pronoun preceding the ***antecedent*** is positioned in the matrix clause instead of the subordinate one, and is furthermore stressed.

4.3.1   The GPAD with matrix – subordinate clause sentences

In this section I demonstrate that the GPAD can account for the contrast in (6a) (re-numbered as (16a)) and (6b) (re-numbered as (16b)), and moreover that it makes the right predictions for the other three configurations the pattern describes:

(16) a.   [… antec …]$_{subord}$ $_{matrix}$ [… pro …]
i Tania$_2$ omoloγise oti [to forema   pou Δanise ***sti   Yeorγia***$_6$] skistike   sto spiti ***tis***$_{6/2}$.
the Tania   admit$_{PAST}$ that the dress$_{NOM}$ which lend$_{PAST}$ to-the Georgia$_{ACC}$ rip off-$_{PAST}$ in-the house her$_{GEN}$
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'
     b.   *   [… pro ..] $_{matrix}$ $_{subord}$ [… ANTEC …]
i Tania$_2$ omoloγise oti [skistike   sto spiti ***tis***$_{2/*6}$] to forema pou Δanise ***STI YEORYIA***$_6$.
the Tania   admit$_{PAST}$ that rip off-$_{PAST}$ in-the house her$_{GEN}$ *the dress$_{NOM}$ which lend$_{PAST}$ to-the Georgia$_{ACC}$*
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

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[7] Though Williams (1997) does not report the dependence combinations exactly as it's done here, the information as well as the general idea for the structuring of the GPAD is taken exclusively from the aforesaid article.

I now apply the other two configurations of the GPAD to these data. I expect that all five structural configurations of the GPAD with Greek pronouns surface parallel to English.

(16) c.   […pro …] subord   matrix […antec…]
i   Tania₂ omoloɣise oti [to forema pou *tis*₂/₆ Δanise] skistike sto spiti *tis Yeorɣias*₆]
the Tania   admit_PAST   that the dress_NOM which her_GEN lend_PAST rip off-_PAST in-the house the Georgia_GEN
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'
     d.   […antec …]_matrix   […pro…]_subord
i   Tania₂ omoloɣise oti [skistike sto spiti *tis Yeorɣias*₆] [to forema pou *tis*₂/₆ Δanise]
the Tania   admit_PAST   that rip off-_PAST in-the house the Georgia_GEN   the dress_NOM which her_GEN lend_PAST
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

The five structures in (16) illustrate that both forward (16a & d) and backward (16c) dependence are also observed in Greek. As expected from the generalization of anaphoric dependence formed in Williams (1997), (16b) yields an ungrammatical co-indexing of *tis* and *sti Yeoryia* because the pronoun apart from preceding the antecedent is in a matrix clause, not a subordinate one, it is furthermore stressed. By de-accenting the antecedent, and placing main sentence stress on the verb next to it, as in (14), the reading becomes available. The same is also observed with (16e) below:

(16) e.   [… pro ..] matrix   subord [… antec …]
i   Tania₂ omoloɣise oti [skistike sto spiti *tis*₂/*₆] to forema pou Δanise *sti Yeoryia*₆.
the Tania   admit_PAST   that rip off-_PAST in-the house her_GEN the dress_NOM which lend_PAST to-the Georgia_ACC
'Tania admitted that the dress she had lent to Georgia got ripped in her house.'

It appears from the examples above that forward and backward pronominalization can explain the behaviour of Greek pronouns, with which co-indexing is determined in terms of linear order and not c-command relations.

4.3.2   The GPAD with V– argument – adjuncts

In this section I demonstrate that the GPAD also applies to adjunct-argument structures and not exclusively to matrix – subordinate clauses, for which the GPAD is originally designed. The original idea of the GPAD as presented in Williams (1997) applies only to bi-clausal sentences in which one clause serves as the matrix clause, and the second as the subordinate or embedded clause. Here I show that the GPAD must be broadened to include argument-adjuncts besides bi-clausal sentences. The following examples illustrate that the generalization above holds and the GPAD in addition to bi-clausal sentences, can also extend to sentences in which pronoun and antecedent are not located in clauses, but rather a V-argument and an adjunct. As with (16) the sentences below include two antecedents[8]:

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[8] Similarly to the examples in (16), a Binding Theoretic analysis was attempted for (17) as well, but as with (16) Binding cannot be applied to account for the coreference relations between pronoun and antecedent here either.

Context: Lisa met Martina once before at a gallery exhibition.

(17) a.   [… antec …]$_{adjunct}$ [… pro …]$_{argument}$
i   Liza$_8$ [vrike [sto   portofoli tis **Christinas$_6$**] [mia   fotoγrafia   **tis** $_{8/6/4}$]]
the Lisa$_{nom}$ find$_{Past}$ in-the wallet$_{acc}$ the   Christina$_{Gen}$ one$_{acc}$ picture$_{acc}$ her$_{Gen}$
'Lisa found a picture of her in Christina's wallet.'

(17) b.   […pro …]$_{adjunct}$ […antec…]$_{argument}$
i   Liza$_8$ vrike [sto   portofoli **tis**] [mia   fotoγrafia   **tis**   **Christinas$_6$**]
the Lisa$_{nom}$ find$_{Past}$ in-the wallet$_{acc}$ her$_{Gen}$ one$_{acc}$ picture$_{acc}$ the   Christina$_{Gen}$
'Lisa found a picture of Christina in her wallet.'

(17) c.   […antec …]$_{argument}$ […pro…]$_{adjunct}$
[i Liza$_8$ vrike [mia   fotoγrafia **tis**   **Christinas$_6$**] [sto   portofoli   **tis**]
the Lisa$_{nom}$ find   one$_{acc}$ picture$_{acc}$ the   Christina$_{Gen}$ in-the wallet$_{acc}$ her$_{Gen}$
'Lisa found a picture of Christina in her wallet.'

(17) d.   * [… pro ..]$_{argument}$ [… antec …]$_{adjunct}$
[i Liza$_8$ vrike mia [fotoγrafia **tis** $_{8/4/*6}$ [sto   portofoli   tis **CHRISTINAS$_6$.**]]]
the Lisa$_{nom}$ find$_{Past}$ one$_{acc}$ picture$_{acc}$ her$_{Gen}$ in-the wallet$_{acc}$ the   Christina$_{Gen}$
'Lisa found a picture of her in Christina's wallet.'

As the data set in (17) demonstrates, the GPAD is also observe d with argument-adjuncts in addition to sentences with matrix and embedded clauses. Specifically, both ***Lisa*** and ***Christinas*** can be co-indexed and thence serve as referents to the pronoun ***tis*** for all three of (17a), (17b) and (17c). In the case of (22d), the co-indexing of the antecedent ***CHRISTINAS*** and clitic ***tis*** is barred, as predicted by the GPAD. However, as with the bi-clausal sentences, when the antecedent is de-accented co-indexing is possible:

(17) e.   [… pro ..]$_{argument}$ [… antec …]$_{adjunct}$
i   Liza$_8$ vrike [MIA   FOTOYRAFIA **tis** $_{8/4/6}$ [sto   portofoli   tis **Christinas$_6$.**]]
the Lisa$_{nom}$ find$_{Past}$ one$_{acc}$ picture$_{acc}$ her$_{Gen}$ in-the wallet$_{acc}$ the   Christina$_{Gen}$
'Lisa found a picture of her in Christina's wallet.'

V-argument–adjunct sentences such as the preceding are comparable to a matrix-subordinate clause sentences in terms of the GPAD. In order for the GPAD to apply grammatically to argument-adjunct sentences, the pattern needs to be reformed in the following way: the V-argument that is necessary for the grammaticality of the sentence, serves as the "matrix clause." This part of the sentence carries the meaning which is paramount to the grammaticality of the structure. The adjunct functions in the same way as an embedded clause, such that it provides supplementary information to the sentence. Thus, the five configurations with matrix-subordinate sentences set up by Williams, presented in *section 4.2,* surface comparatively to V-argument –adjuncts. Therefore, it is concluded that

an extended GPAD modified in this section can be applied to Greek pronouns in V-argument-adjunct structures as well. In the table below I summarise the two environments the GPAD is found:

Table 1

The General Pattern of Anaphoric Dependence with Greek Pronouns

Williams (1997)		C	Extended (present paper)		C
[pronoun] subord	[antecedent] matrix	✓	[pronoun] adjunct	[antecedent]argument	✓
[antecedent] subord	[pronoun] matrix	✓	[antecedent]adjunct	[pronoun]argument	✓
[antecedent] matrix	[pronoun] subord	✓	[antecedent]argument	[pronoun]adjunct	✓
[pronoun]matrix	[ANTECEDENT] subord	✗	[pronoun]argument	[ANTECEDENT]adjunct	✗
[pronoun]matrix	[antecedent] subord	✓	[pronoun]argument	[antecedent] adjunct	✓
C: Co-indexing allowed					

5   Discussion and Implications

5.1   *Analyses Compared*

In *Section 3* I established that Binding Theory, the module of grammar that determines coreference relations, is not sufficient to account for the Greek data presented in this paper. Though binding can be applied in many other cases with Greek pronouns, it is nevertheless not enough to explain the entire extent of all pronouns and their anaphoric relations. After applying Binding Theory to the Greek data examined in this paper, I have demonstrated that neither *Binding Condition C* nor *Binding Condition B* apply to exclude the reading in (6b). In addition, the fact that coreference in (6a) is not excluded, though it occurs in the same environment as in (6b), drove this research to consider an alternative based on precedence.

An attempt to explain the data in (6a) and (6b) through general precedence terms was made. I illustrated that in (6a), where the antecedent precedes the pronoun, coreference is indeed allowed. On the other hand, in (6b) where the pronoun precedes the antecedent, the reading is excluded. I have shown that, though precedence is initially perceived as adequate to provide a satisfactory description for the Greek pronouns in these data, it later becomes clear that precedence alone is insufficient to explain examples like (9), where the antecedent precedes the pronoun and co-indexing is yet allowed. The general conclusion for *Section 3* and the Binding Theory analysis is that only an alternative approach, based on linear precedence, is suitable for determining co-indexing with *these data*.

The alternative approach selected for the analysis of Greek pronouns follows Williams (1997), where he explains English data comparable to (6a) and (6b) in terms of anaphoric dependence. Hence, in *Section 4* I demonstrated that the *General Pattern of Anaphoric Dependence* and the analysis on accented and de-accented clauses can satisfactorily determine anaphoric relations with data examined in this section. While binding has nothing to say about (6a) and (6b), dependence does. (6a) is perceived as forward dependence such

that if a pronoun precedes an antecedent (whether in a matrix or subordinate clause), co-indexing is allowed. (6b) is explained in terms of backward dependence, which states that if a pronoun in a subordinate clause precedes an antecedent in a matrix clause, co-indexing is available. If, however, the antecedent is focused and positioned in a subordinate clause preceding the pronoun in a matrix clause as in (6b), then co-indexing is excluded. The "de-accenting rule" accompanying this analysis predicts that by de-accenting the antecedent in the second case of backward pronominalization mentioned above and applying main sentence stress on the *verb* instead of the antecedent, co-indexing becomes available. Williams (1997) and Selkirk (1984) explain that stress shift from the antecedent to the verb makes the reading described above grammatical/available. De-accenting of the antecedent makes the reading available because it presupposes the existence of an antecedent in discourse which has been introduced before the pronoun *and* the antecedent in the structure.

5.2   Implications of Williams' (1997) GPAD model

Backward dependence does not necessarily occur exclusively with matrix and subordinate clauses. In *Section 4* of this paper I have established that Williams' GPAD model as is, does not apply to all sentences that backward dependence is found. Therefore, the model needs to be extended to include a greater variety of data. Since the same phenomenon is observed with V-argument-adjuncts, the GPAD needs to be revised to include data like in (17). The five configurations for the revised version of the model now are:

(18)   a. $[\ldots \text{pro} \ldots]_{\text{subord-XP}}$ $[\ldots \text{antec} \ldots]_{\text{primary}-\text{XP}}$
       b. $[\ldots \text{antec} \ldots]_{\text{primary -XP}}$ $[\ldots \text{pro} \ldots]_{\text{subord-XP}}$
       c. $[\ldots \text{antec} \ldots]_{\text{subord-XP}}$ $[\ldots \text{pro}\ldots]_{\text{primary}-\text{XP}}$
       d. *$[\ldots \text{pro} ..]_{\text{primary -XP}}$ $[\ldots \text{ANTEC}\ldots]_{\text{subord-XP}}$
       e. $[\ldots \text{pro} ..]_{\text{primary -XP}}$ $[\ldots \text{antec}\ldots]_{\text{subord-XP}}$

The clauses, adjuncts and V-arguments should be considered as primary and secondary (or embedded) XPs. A Primary XP is comparable to Williams' matrix clause as well as (17)'s V-argument. A secondary or embedded XP is comparable to (17)'s adjunct, in addition to Williams' subordinate clause. By extending the model and revising the terminology used by Williams (1997), the *Revised General Pattern of Anaphoric Dependence (R-GPAD)* is able to cover more data exhibiting backward as well as forward dependence. Below is the revised definition for backward dependence/ pronominalization:

Backward Pronominalization (revised): if a pronoun is in a secondary XP (i.e. a subordinate clause or an adjunct), and the antecedent follows in a primary XP (i.e. a matrix clause or a verb complement, the two can be co-indexed. However, if the pronoun preceding the antecedent is positioned in a primary XP and receives main sentence stress, then co-indexing is excluded.

6   Conclusions

The research developed in this paper establishes that a Binding Theory analysis is not adequate to account for the behaviour of the entire extent of pronouns in Greek or English as Williams (1997) demonstrates. Instead, coreference relations for the data presented in this paper are determined in terms of linear precedence, not c-command. Therefore, it is not too bold to suggest that, after considering the data examined in this paper, a revision of how coreference relations are decided in Binding Theory is called for.

Concerning Williams' (1997) anaphoric dependence model, this paper establishes that an extension is needed in order to include the whole extent of pronoun behaviour. In particular, in Greek co-indexing is not limited to pronouns and antecedents in (matrix and subordinate) clauses. In addition to those, a pronoun and an antecedent in a verb argument and adjunct can also exhibit forward and backward dependence.

In further research it can also be tested whether backward pronominalization and the *R-GPAD* in general, extends to sentences with strong pronouns in Greek as well as a covert pronoun (i.e. *pro*) and an overt antecedent, not only for Greek, but other *pro*-drop languages.

In conclusion, this paper makes three main contributions. First, it confirms that Binding Theory cannot account for all antecedence/anaphoric relations between pronouns (or *pro*) and NPs. Second, Williams' (1997) GPAD was found to be more specific than anaphoric relations in Greek require a model that determines dependence relations to be. Thus, this research offered sufficient information and has broaden the model so it covers a greater extent of data. Finally, it has made a contribution to the literature on Greek pronouns, which have thus far been perceived only in terms of binding and c-command. As evident from the lack of literature, the phenomenon of backward pronominalization is a considerably understudied phenomenon, not only in Greek, but also other languages. This research has therefore also added to the literature on backward pronominalization and dependence relations in general.

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