Resolution of Pronominal Ambiguity in Greek: Syntax and Pragmatics

Abstract

Our study explores the individual effects as well as the interaction of two variables relevant in pronominal anaphora: (a) Pronoun Type, which refers to the parametric choices of subject pronoun (null and overt) in languages like Greek and the related interpretive distinctions; and (b) Pragmatic Plausibility, which refers to whether the choice of an antecedent is highly plausible or neutral. Our aim is to investigate whether parametric choices of subject pronoun and the associated interpretive distinctions remain relevant in pronominal anaphora when factors like pragmatic plausibility are present. In the pragmatically neutral condition our results are in line with findings from similar studies: null pronouns are linked to subject antecedents, while overt pronouns to object ones. In the pragmatically biased condition, we found that although Pragmatic Plausibility affected responses, interestingly, parametric choices still affected the choice of an antecedent. In the subject biased items subject responses were chosen significantly more when the pronoun was null than overt, while in the object biased items object responses were chosen significantly more when the pronoun was overt than null. This suggests that in a language like Greek pragmatic considerations may not cancel the application of the antecedent assignment strategy which is based on the interpretive distinction between null and overt pronominal subjects.

1. Introduction

It is well known that Greek being a null-subject language (NSL) with rich subject-verb agreement features null lexical and pronominal subjects along with overt ones in both matrix and subordinate clauses. This possibility is not available for languages like English, which lack the null subject parametric option. See [1]:

[Said-3sg that will let us know]

*Said that will let us know

‘S/he said that s/he will let us know’

The distribution and interpretation of null and overt pronouns in NSLs is regulated by certain discourse constraints. Chomsky, in 1981, captured the non-optional nature of the choice between null and overt pronouns by postulating the Avoid Pronoun Principle, according to which the omission of the subject requires less effort than its overt expression and, therefore, when possible, null pronouns should be
preferred over overt ones. In the same line of thought, Cardinaletti & Starke (1994), considering *pro* a deficient pronoun argued that, when possible, deficient pronouns are preferred over overt ones.

Based on the above, it has been extensively argued that while in NSLs the null subject pronoun is the default option, the overt subject pronoun is the ‘marked option’, resorted to when focusing or topicalisation is required. In other words, a null pronoun is used in topic-continuity contexts whereas an overt pronoun is interpreted as signaling a shifted interpretation, a topic/focus shift (Cardinaletti & Starke 2001; Carminati 2002, for Italian; Mayol 2009, for Spanish; Dimitriadis 1996; Tsimpli et al. 2003; 2004; Miltsakaki 2003; 2007; Papadopoulou et al. 2007, for Greek). Overt pronouns in Greek do not necessarily mark topic-shift. They can also denote topic-continuity but with some other discourse-related feature like contrast or emphasis. The Greek pronoun is also demonstrative. Converely, in languages like English overt pronouns are obligatory and used in both unmarked contexts, i.e., overt pronoun co-referential with main subject given the universal default that the main subject is the topic, and in marked contexts where additional information cancels this universal default (see Hudson-D’Zmura & Tanenhaus 1998). Consider [2] and [3]:

[2] — Milise o Jianis stin Anna?
   Talked-3sg the-nom Jianis-nom to the-acc Anna-acc?
   ‘Did Jianis talk to Anna?’
   a. — Ne, *pro* tis milise
      yes, *pro* her talked-3sg (topic-continuity)
   b. — ??Ne, aftos tis milise
      yes, he-nom her talked-3sg (topic-shift)

[3] — Did John talk to Anna?
   — Yes, he did (a & b)

Pronominal anaphora, i.e., the resolution of pronominal ambiguity, constitutes one of the most complex phenomena of natural language, an area pertaining to the interface between syntax and pragmatics. Irrespective of the complexity of the language with respect to pronominal production and interpretation (i.e., null-subject languages vs. non-null-subject languages), pronominal anaphora is a prototypical interface phenomenon cross-linguistically, since cognitive/pragmatic, grammatical (typology of pronouns, e.g., null and overt pronouns) and processing factors (e.g., default topicality for main subjects) should be taken into account. According to Accessibility approaches to reference, reference production/resolution is primarily guided by the mental accessibility of referents (Ariel 1990). More recently, the Reversed-Mapping Hypothesis of Bittner, Gagarina & Kuehnast (2008) proposes that higher degrees of cognitive saliency of referents correlate with lower degrees of formal complexity of referring expressions and vice versa. According to this hypothesis, in languages where both null and overt pronouns are available, null pronouns which represent minimal formal complexity are referenced with antecedents representing
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maximal saliency, i.e. subjects, while overt pronouns are associated with less salient antecedents, i.e. objects. At this point it must be noted that saliency of referents has been argued to depend not only on the linguistic structural features of grammatical role and syntactic structure but also on the information-structure notion of topic-hood (Grosz, Joshi & Weinstein 1995; Lambrecht 1994). From this follows that syntactic prominence and discourse prominence may not always coincide and, therefore, the terms ‘subject’ and ‘topic’ should not be conflated. However, subjects are traditionally located at the top of the grammatical role hierarchy (Givón 1983) and they also tend to be discourse prominent topics (Reinhart 1981). In the present study the anaphora resolution test items represented an SVO active voice structure and, thus, in our case, the subject is to be considered topic by default.

Closing the theoretical framework section we must note that there are studies on some NSLs which report that overt subject pronouns either do not exhibit bias towards a less prominent antecedent, i.e. the DP-object (Filiaci 2008 for Spanish), or show random behaviour in terms of antecedent preferences with no noticeable patterns being attested (Alonso-Ovalle et al. 2002; Jegerski, Van Patten & Keating 2011, for Spanish; Costa, Faria & Kail 2004, for Brazilian Portuguese; Geber 2006, for Romanian; Meridor 2006, for Hebrew). These findings point towards a more flexible procedure of antecedent assignment of overt pronouns compared to null pronouns in the languages tested.

2. Previous Studies

Carminati’s seminal work (2002) on subject pronoun interpretation with competing antecedents demonstrated that in adult Italian null pronouns prefer to link to syntactically prominent antecedents, while overt pronouns do not. This influential proposal is the Position of Antecedent Hypothesis and emphasizes the importance of considering the distinct use of null and overt pronominal subjects in models of pronominal reference in NSLs (see also Jegerski, Van Patten & Keating 2011). Carminati’s findings were replicated by Sorace & Filiaci (2006) for Italian and by Mayol (2009) for Spanish.

As regards Greek, one of the first studies was that of Dimitriadis in 1996 who, acknowledging the distinct semantic role of null and overt pronouns argued that while a null pronoun tends to take as its antecedents the highest-ranked centre that has compatible grammatical and agentivity features, an overt pronoun does not, regardless of its features. Tsimpli et al. (2003; 2004), examined attrition effects in Greek and Italian near-native learners of English and have also proposed that reference assignment of subject pronouns in NSLs rests upon their null or overt realization. The researchers argued that the discourse-related and thus interpretable (i.e., non-categorical) [topic-shift] and [focus] feature, although not parameterized (Chomsky 1995), can exploit parametric options independently available in the language by the grammar to encode interpretive effects: null pronouns for topic-continuity while overt for topic-shift. See examples in [4]:

[ 199 ]
The stressed overt subject pronoun in [4a] is marked as topic or focus, having as an antecedent either the subject or the object of the main clause. The unstressed overt subject afti ‘she’ in [4b] on the other hand, cannot refer to the main clause subject; this non-shifted interpretation is only available if a null pro subject is used. More recently, Papadopoulou et al. (2007) explored the interpretation of null and overt pronoun in Greek adults. The results of this study showed that the preferred interpretation of overt pronouns was the DP-object, while the favoured antecedent for null pronouns was the DP-subject. Miltsakaki’s study in 2007 focused on intersentential referentially ambiguous contexts, yet similarly found evidence of assignment of overt pronouns to object DPs: when the second sentence started with an overt demonstrative subject pronoun, participants continued the sentence interpreting the pronoun as referring to the object of the previous clause. These findings replicated earlier data reported by Miltsakaki (2003), which also showed that overt subject pronouns were systematically associated with less salient antecedents.

Thus, most resolution studies on NSLs provide convergent support that a topical subject antecedent is preferred as the referent of a null subject pro, while a non-topical non-subject antecedent is favoured as the referent of an overt subject. In our experiment we seek to investigate whether parametric choices of subject pronoun and the related interpretive distinction remain relevant in the presence of factors like pragmatic plausibility, which were also found to shape pronominal referencing. In particular, much earlier research showed that verb-based contextual bias affects pronoun disambiguation (Greene & McKoon 1995; McDonald & MacWhinney 1995; Garnham et al. 1996; Stewart, Pickering & Sanford 2000; Koornneef, Waaijer & Van Berkum 2002). More recently, Nieuwland & van Berkum (2006) examining the correlation of contextual bias and individual language processing skills have found that, if the bias employed in the Dutch sentences of the experiment was strong enough, then resolution of formal ambiguity was immediate. Regarding Greek, Kousta (2008) examined clitics and syntactic parallelism and found that when a clitic shares the same grammatical role with one of the potential antecedents, there is a preference for that antecedent, which becomes the unique choice when there is also contextual bias.

3. The Experiment

3.1 Subjects and Materials

The participants of the study were 67 adult speakers of Greek (40 females and 27 males, age range: 22–47) who had limited or no knowledge of English. They were tested on a pronoun resolution task which consisted of 15 items in which the choice of an antecedent was pragmatically neutral (PN items) and of 16 items in which it
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was pragmatically biased (PB items). In half of the PB items the felicitous response was the subject, whereas in the other half it was the object. Moreover, in 8 items of the PB and in 8 items of the PN type the pronoun to be referenced was overt, while in the remaining items in both types the pronoun was null. All test items were instances of forward anaphora, but the linearly first clause could be either matrix or subordinate. The conjunctions used were the subordinators ‘when/while’ (ενώ/καθώς) and ‘because’ (επειδή), as well as the coordinators ‘and’ (και) and ‘but’ (αλλά).

In each of the four conditions resulting from the variables of Pronoun Type and Pragmatic Plausibility there were two items for each conjunction making a total of 8 items per condition. Table 1 summarizes the information on the test.

<table>
<thead>
<tr>
<th>Pragmatic Plausibility</th>
<th>Pronoun</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pragmatically Neutral (PN)</td>
<td>Overt</td>
<td>1a</td>
</tr>
<tr>
<td></td>
<td>Null</td>
<td>1b</td>
</tr>
<tr>
<td>Pragmatically Biased (PB)</td>
<td>Overt</td>
<td>2a</td>
</tr>
<tr>
<td></td>
<td>Null</td>
<td>2b</td>
</tr>
</tbody>
</table>

Table 1: Conditions of the test

Sentences in [5a] and [5b] provide examples of conditions [1a] and [1b] respectively:

    *Maria called her mother because pro was ill.
  b. Kathos i Katerina miluse me tin kiria afti skontapse se mia petra.
    While Katerina was talking to the lady, she tripped over a stone.

Sentences in [6a] and [6b] provide examples of conditions [2a] and [2b] respectively. In [6a] the pragmatically felicitous response is the higher-clause object, while in [6b] the felicitous response is the higher-clause subject.

    *Lina was cooking soup for her sister because pro was sick.
  b. Kathos o jiatros miluse me ton astheni aftos sintaghografuse.
    While the doctor was talking to the patient, he was making up the prescription

Participants were instructed in Greek to indicate their answer by circling one of the three choices which encode the possible referents for the subject pronoun of the second clause: the first clause subject, the first clause object or either. The task was not timed but participants were asked to give their intuitive responses by circling the first answer that struck them as correct. They were not allowed to go back and change their answers. Chi-Square tests were applied to test for independence between the experimental variables and the Response. Additionally, multinomial logistic regression analyses were applied in order to examine how the main effect contrasts were spread among Response categories. The same procedure enabled us to test for

2 Except for the PN, overt pronoun condition, where there was only 1 item with ‘when/while’ resulting in 7 items.
interactions of the involved variables as well as to examine the parallel effect of the variables on Response.

3.2 Results

3.2.1 Pragmatically Neutral

Figure 1 depicts participant responses in the pragmatically neutral items grouped by the variable of Pronoun Type.

![Figure 1: Responses by Pronoun Type](image)

The analysis showed that there is a main effect of Pronoun Type on Response ($\chi^2 = 206.481$, df = 2, $p < 0.0001$). When the subject pronoun is null, Greek speakers significantly favor the Subject antecedent over the Object and Either options. By contrast, when the subject pronoun is overt, the Object antecedent choice is preferred over the Subject and Either options at a significant rate. In order to examine how the contrasts inflicted by Pronoun Type are spread among the possible responses (Subject/Object/Either), multinomial regression tests were applied. Thereby, it was shown that the ratio of null/overt items is statistically different in the Object/Either responses (Wald test = 66.909, $p < 0.001$), as well as in the Subject/Object responses (Wald test = 173.389, $p < 0.001$), but not in the Subject/Either responses (Wald test = 38.605, $p > 0.05$). This demonstrates that although an overall main effect of Pronoun Type on Response was found, Either is less affected by the null/overt realization of the pronoun, given that the ratio of null/overt pronoun item types does not differ in the Either choice. Additionally, the multinomial regression analysis has interestingly revealed that overt pronouns are more strongly correlated with object referents than null pronouns with subject referents ($p < 0.05$). This is a finding not attested in previous pronoun resolution studies on Greek.

3.2.2 Pragmatically Biased Items

Figure 2 presents responses organized by Pragmatic Plausibility, irrespective of the type of pronoun.
The analysis showed a main effect of Pragmatic Plausibility (bias for the subject/object) on the Response ($\chi^2 = 742.402$, df = 2, $p < 0.001$). Greek speakers conform to the pragmatic bias over the subject or object antecedent, incorporated in the tests items through the experimental design, and respond accordingly: in the subject biased items they overwhelmingly give a subject response, while in the object biased items they clearly opt for the object antecedent. This finding also shows that our judgments, with respect to which the pragmatically felicitous response is, were correct and thus the items are suitable for testing the factor of pragmatic plausibility. Multinomial regression tests showed that the ratio of subject/object biased items is significantly different in all response ratio cases: Subject/Object (Wald Test = 163.671, $p < 0.001$), Subject/Either (Wald test = 12.309, $p < 0.001$) and Object/Either (Wald test = 42.414, $p < 0.001$). Therefore, Pragmatic Plausibility influences Greek speaker responses across all possible antecedent options in the same way. Next, we provide responses grouped by Pronoun Type, irrespective of which the pragmatically felicitous response is:
Interestingly, the analysis yielded a main effect of Pronoun Type on Response ($\chi^2 = 26.374$, df = 2, $p < 0.001$). Greek speakers, irrespective of the pragmatic bias towards the one or the other antecedent, significantly prefer the Subject response over the Object (and Either) response when the pronoun is null, whereas they opt for the Object significantly more than for the Subject when the pronoun is overt. Multinomial regression tests applied on the results revealed that the ratio of null/overt items is significantly different in the Subject/Object responses (Wald test = 41.104, $p < 0.001$), as well as in the Object/Either responses (Wald test = 14.616, $p < 0.001$), but not in the Subject/Either responses (Wald test = 1.311, df = 1, $p > 0.05$). This finding indicates that the null/overt type of the subject pronoun affects less Either responses, something also found in the pragmatically neutral items.

Turning next to the interaction between the two variables, this was found to be significant (Wald test = 231.012, $p < 0.001$). Figures 4a and 4b present responses organized both by Pronoun Type and Pragmatic Plausibility. Figure 4a presents rates in the subject biased items and Figure 4b in the object biased ones:

Multinomial regression tests showed that the responses given in the subject and in the object biased items differed significantly with respect to the ratio of overt/null items (Wald test = 5.716, $p < 0.05$). This finding is in line with the data and the analysis presented for Figure 3 and means that despite the preponderance of the Subject responses in the subject biased type and of the Object responses in the object biased type, the type of pronominal subject (overt/null) inflicted statistically significant distinct preference rates. In the subject biased type the Subject response was favored significantly more when the pronoun to be referenced was null than when it was overt. Accordingly, in the object biased items the Object response was opted for at a significantly higher rate when the pronoun to be referenced was overt than null.
4. Discussion

Beginning our discussion with the Pragmatically Neutral items, we found that null pronouns are more strongly associated with subject antecedents, while overt pronouns with object antecedents. This finding is in line with the data presented by the studies of Tsimpli et al. (2003; 2004), Papadopoulou et al. (2007) and Miltsakaki (2007) on Greek and support Carminati’s Position of Antecedent Hypothesis. In the absence of contextual bias Greek speakers observe the semantic distinction between null and overt subject pronouns interpreting the former as co-referential with the subject, while associating the latter with the object. However, our findings have also shown that the strength for attachment of a null pronoun to a subject antecedent was weaker than the strength for attachment of an overt pronoun to an object antecedent. This data is in contrast with the results attested for languages like Spanish, Brazilian Portuguese, Romanian or Hebrew where overt pronouns exhibit a more random pattern of antecedent assignment (see Filiaci 2008; Alonso-Ovalle et al. 2002; Jegerski et al., 2011; Costa et al. 2004; Geber 2006; Meridor 2006). We argue that what we found indicates that for Greek the null vs. overt option may not completely correspond to subject vs. object antecedent respectively, instead overt pronouns are inherently marked as [+ topic-shift] (Tsimpli et al. 2003; 2004), while null pronouns are presumably the default option at the grammatical level. The implication is that null subject pronouns are underspecified with respect to the interpretive options, i.e., they are less sensitive to parametric differences between null-subject and non-null-subject languages. In this respect, coreference between the matrix and the embedded subject pronoun instantiates topic-continuity across languages (Brennan et al. 1987; Grosz et al. 1995; Dimitriadis 1996; Carminati 2002; Tsimpli et al. 2003; 2004, Filiaci 2008; Miltsakaki 2007). In null-subject languages the most underspecified option is compatible with the default topic-continuity interpretation. Developmental evidence that null subject pronouns in Greek are underspecified for reference while overt are marked is also found in Paradopoulou et al. (2007) a study of 10–11 year-old monolingual children.

Turning to the Pragmatically Biased items, we found that Pragmatic Plausibility had an effect on shaping interpretive preferences, in that subject antecedents were favored in subject biased items while object antecedents in object biased items, verifying our judgmentst for the task. However, crucially, we have also found that Pronoun Type had a main effect on Response and that it interacted significantly with the variable of Pragmatic Plausibility. In particular we found that, overall and irrespective pragmatic plausibility, more subject responses were given when the pronoun to be referenced was null than overt and more object responses when the pronoun was overt than null. When the relevant rates were analyzed separately for the subject and the object biased type, we also found that although the pattern dictated by pragmatically possibility was not overridden (i) in the subject biased type more subject responses were given when the pronoun was null than overt and (ii) in the ob-
ject biased type more object responses were given when the pronoun was overt than null. In other words, despite bias towards the subject antecedent overt pronoun were more strongly associated with object antecedents. Accordingly, despite bias towards the object antecedent, null pronouns preferred subject antecedents than object ones.

Observing the above we argue that the impact of Pragmatic Plausibility on the subject vs. object antecedent preference was one that did not cancel the effect of the Pronoun Type variable, as this is described for Greek by studies like that of Tsimpli et al. (2003; 2004). Parametric choices of subject pronoun (i.e. null and overt) remain relevant in the choice of the subject vs. object antecedent even in the presence of contextual bias over the one or the other choice. An interesting line of investigation would be to test how other factors like syntactic or discourse clause linking interact with the factors of pronoun type and pragmatic plausibility and whether the semantic differentiation between null and overt pronouns in Greek which in the approach of Tsimpli et al. (2003; 2004) represents the exploitation of a syntactic option by discourse would still be relevant in pronominal resolution.

References


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Key-words: pronominal anaphora, null/overt pronouns, pragmatic plausibility.