CONSTRAINING DISJUNCTIVE AGREEMENT IN MODERN GREEK

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Abstract

Singular disjunctive coordinate nouns in Modern Greek (MG) and in a number of other languages are interesting since the verb can show either singular or plural agreement. This variation is seen as the result of an analysis of the disjunction or either as ‘inclusive’ or ‘exclusive’ in truth-conditional semantics. We will support that the variation in verb agreement is contextually motivated and therefore it is immediately related to the contextual interpretation of the disjunctive coordinate phrase either as an ‘exclusive’ (singular) interpretation or as an ‘and-coordinate’ (plural) interpretation. Our proposal will predict both verb agreement forms in singular disjunctive nouns taking into account the various discourse conditions, and combining $\lambda$ calculus and the DR T theory, known as $\lambda$-DRT.

1 Introduction

Although disjunction was discussed by a number of scholars, it has not been studied as extensively as conjunction. More recently, there has been some interest by a number of linguists including Morgan (1972, 1984, 1985), Peterson (1986), Jennings (1994), Eggert (2002), who have focused on two major issues related to disjunction. The first one concerns the semantics of disjunction. In truth-conditional semantics, logicians agree on the existence of the primary logical connective or represented as $\lor$ and known as the ‘inclusive’ or. There is disagreement, however, as to whether a secondary logical connective represented as $\bot$ and known as the ‘exclusive’ or exists. Most logicians resort to propositional logic in order to account for the existence or not of the ‘exclusive’ or (Jennings, 1966; Barret and Stanner, 1971; Hurford, 1974; Pelletier, 1978).

The second major issue concerns the agreement of the verb with the disjunctive coordinate nouns. Some of the scholars argue that verb agreement with disjunctive coordinate nouns is seen as the result of various speaker strategies, such as the PROXIMITY, the PLURAL WINS or the FIRST CONJUNCT WINS strategies (Peterson, 1986). Others claim that the actual interpretation of the disjunctive coordinate phrase is the determining factor to verb agreement (Morgan, 1985). Thus, when the disjunctive coordinate phrase has an exclusive sense then singular verb agreement is more likely, as in examples (1) and (2):

(1) John or Bill is/are going to win the race.

(2) John or Bill is/are going to come tonight.

(Morgan, 1985)

In the first example, the singular verb agreement form is preferable since in any world there must be only one winner. The plural verb agreement form is not excluded if we consider that the phrase is asserting something about a group of two

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individuals, meaning that one of the two is going to win the race (Morgan, 1985, 72). The same reasoning seems to follow in example (2). If the interpretation supposes that only one of the two people will visit the speaker tonight, then singular verb agreement is preferred. If, however, the same phrase is interpreted as claiming something about the group of individuals, then the plural verb form is assumed.

When the disjunctive coordinate phrase has an inclusive (and-coordinate) sense then the plural verb agreement is more likely (Morgan, 1985, 73), as in examples (3):

(3) I don’t think that John or Bill are/is going to win the race.¹
(Morgan, 1985, 72)

In the example above, the most likely interpretation is that both John and Bill will lose, which motivates a plural verb form (Morgan, 1985, 73).

We will argue that MG native speakers adopt a distinction similar to the one presented above and therefore the choice of the verb agreement form follows from the interpretation they assign to the coordinate phrase.

The data analysis is based on a questionnaire that was developed in order to work towards the prevalent verb agreement form in disjunctive structures. The main aim is to consider the different interpretations assigned to the coordinate structures by MG native speakers. The questionnaire consists of 20 declarative and interrogative sentences with singular disjuncts of the same or different gender and of the same or different person.

The questionnaire was issued to 15 native speakers who are all university graduates from different areas in Greece. The participants were asked to make a choice between two possible verb forms and were asked to consider both verb forms whenever they found it appropriate. Their choice depends on acceptability judgements on the basis of what they thought they would say and not on grammaticality judgements. Private conversations followed as to what motivated the choice of a singular or a plural verb agreement form in order to confirm the initial intuitions we had concerning the interpretation of the disjunctive coordinate phrase.

The rest of the paper is organised as follows. In part 2, we will present a series of MG data that illustrate cases of disjunctive coordinate nouns interpreted as ‘and-coordinate’ (plural) or as ‘exclusive’ (singular). In part 3, we will present the proposal developed by Eggert (2002) couched within the DRT framework and, in part 4, we will present an analysis of our own proposal, which follows Dalrymple (2001) and Kokkonidis (2005) within the theory of λ-DRT.

2 The Modern Greek Data

The disjunctive coordinate phrases that will be discussed in MG include conjoined singular nouns. The first group of data presents examples with singular verb agree-

¹In English, disjunctively conjoined nouns with the predisjunction and disjunction either...or show similar agreement patterns according to Morgan (1985).
ment and the second group of data focuses on phrases with plural verb agreement.

In the first group of examples, the majority of native speakers assigned an exclusive interpretation in the coordinate phrase and therefore chose a singular verb agreement form, as seen below:

(4) O  Kostas i i Maria tha me parei me to The.SG Kostas.SG or the.SG Maria.SG will me pick-up with the autokinito. car
   ‘Kostas or Maria will pick me up with the car’

(5) O  Kostas i o Giorgos ine xadelfos tis Marias. The.SG Kostas.SG or the.SG Giorgos.SG is.SG cousin of-the Maria
   ‘Kostas or Giorgos is Maria’s cousin’

(6) O  adelfos su i i adelfi su irthe exthes. The.SG brother.SG your or the.SG sister.SG your arrived.SG yesterday
   ‘Your brother or your sister arrived yesterday’

In the above examples, the informants showed that they seem to conceive the action as performed by the individuals separately and this is why they prefer the exclusive interpretation. Thus, in example (4) the informants assume that only one of the people mentioned is able to pick-up the speaker and not both. Also, in example (5), one of the two people must be Maria’s cousin otherwise they are all related to each other, which is not the intended meaning. Similarly, in example (6) the speaker confirms that it must be only one of the two “the brother or the sister” who arrived yesterday and not both.

The exclusive interpretation is confirmed by the presence of modifiers, such as separately, individually, only, etc. that make the exclusive sense even stronger in the sentence. Thus, examples (4), (5) and (6) can be written as follows:

(7) O  Kostas i i Maria tha me parei me to The.SG Kostas.SG or the.SG Maria.SG will me pick-up with the autokinito, ohi kai i dio. car, not and the both
   ‘Kostas or Maria will pick me up with the car, not both’

(8) O  Kostas i o Giorgos ine xadelfos tis Marias, ohi The.SG Kostas.SG or the.SG Giorgos.SG is.SG cousin of-the Maria, not kai i dio. and the both
   ‘Kostas or Giorgos is Maria’s cousin, not both’

(9) O  adelfos su i i adelfi su irthe exthes, ohi The.SG brother.SG your or the.SG sister.SG your arrived.SG yesterday, not kai i dio. and the both
‘Your brother or your sister arrived yesterday, not both’

Therefore, in the above cases MG native speakers have a tendency towards an exclusive interpretation and that interpretation leads to the choice of a singular verb agreement form.

In the second group of data, native speakers showed a preference towards an and-coordinate interpretation in the disjunctively conjoined nouns and therefore the verb agreement form that they chose was the plural one. Some examples are illustrated below:

(10) O giatros i o odontiatros mporoun na grapson
    The.SG doctor.SG or the.SG dentist.SG can.PL to write
    farmaka.
    prescriptions
    ‘The doctor or dentist can write prescriptions’

(11) Kafes i tsai servirontai dorean meta to geuma.
    Coffee.SG or tea.SG are-served.PL for-free after the dinner
    ‘Coffee or tea are served for free after the dinner’

(12) I eggios gineka i to pedi hriazonte to embolio
    The pregnant.SG woman.SG or the child.SG need.PL the immunisation
    kata tis neas gripis.
    against the swine flu
    ‘The pregnant woman or child need immunisation against swine flu’

All the examples are perceived by most native speakers as actions carried out or applied to both conjuncts and thus are cases of and-coordinate interpretation. In example (10), both the doctor and the dentist are able to write prescriptions and therefore the plural verb agreement form is chosen by the speakers. In example (11), the emphasis is on the fact that both drinks are offered with the meal and not necessarily on the fact that a choice needs to be made. Finally, in the third example, both conjuncts are perceived as high risk groups that need the immunisation and therefore the interpretation is the and-coordinate.

The above examples can be paraphrased with a collective meaning, as follows:

(13) O giatros ke o odontiatros mporoun na grapson
    The.SG doctor.SG and the.SG dentist.SG can.PL to write
    farmaka.
    prescriptions
    ‘The doctor and dentist can write prescriptions’

(14) Kafes ke tsai servirontai dorean meta to geuma.
    Coffee.SG and tea.SG are-served.PL for-free after the dinner
    ‘Coffee and tea are served for free after the dinner’
(15) I eggios gineka ke to pedi hriazonte to embolio
   The pregnant.sg woman.sg and the child.sg need.pl the immunisation
   kata tis neas gripis.
   against the swine flu
   ‘The pregnant woman and child need immunisation against swine flu’

   Such examples, where the sense is clearly as and-coordinate, do not accept easily
   modifiers which assign distributivity, such as separately or individually, since
   the meaning conveyed with the presence of distributive modifiers is different from
   the one perceived by the native speakers and does not necessarily correspond to a
   true situation. The following examples include modifiers of distributivity:

(16) ??? O giatros i o odontiatros mporoun na grapsoun
   The.sg doctor.sg or the.sg dentist.sg can.pl to write
   farmaka, ohi kai i dio.
   prescriptions, not and the both
   ‘The doctor or dentist can write prescriptions, not both’

(17) ??? Kafes i tsai servizontai dorean meta to geuma, ohi kai
   Coffee.sg or tea.sg are-served.pl for-free after the dinner, not and
   the both
   ‘Coffee or tea are served for free after the dinner, not both’

(18) ??? I eggios gineka i to pedi hriazonte to
   The pregnant.sg woman.sg or the child.sg need.pl the
   embolio kata tis neas gripis, ohi kai i dio.
   immunisation against the swine flu, not and the both
   ‘The pregnant woman or child will need immunisation against swine flu,
   not both’

   Example (16) does not really apply to reality since both a doctor and a dentist
   can write prescriptions. Similarly, in example (17) the statement is not true if
   one wants to convey the meaning that there are two available drinks after dinner.
   Finally, example (18) cannot be true considering the fact that both groups are of
   high risk and need to be immunised.

   In both groups of data, however, we argue that there is a preference towards
   a specific interpretation either ‘exclusive’ or ‘and-coordinate’. Different discourse
   conditions may result in a different interpretation of the same example, as in the
   case of “Coffee or tea is/are served after dinner”, which results in an ‘exclusive’
   (singular) sense when a choice is made and in an ‘and-coordinate’ (plural) when
   the availability is what matters.

   To conclude, the MG data showed that native speakers assume two different in-
   terpretations for the disjunctive coordinate noun phrases, either as ‘and-coordinate’
   where verb agreement is plural or ‘exclusive’ where verb agreement is singular.
This forms the central notion for the theory that we will adopt and the analysis that we will propose in the following sections.

3 Eggert’s theory of disjunction

Eggert (2002) formulates an analysis for coordination, whose main characteristic is that it accounts for agreement phenomena. This analysis has the following advantages:

- accounts for sub-propositional coordination
- takes discourse factors into consideration when determining an argument’s semantic number
- represents semantic number of coordinative arguments in a straightforward way

Traditionally the logical connectors and and or are treated as boolean meet and join (or in some cases set-intersection and set-union) and are propositional operators. This treatment, however, faces problems when sub-propositional coordination needs to be accounted for where non-distributive conjunctions are involved. In (19), there is coordination between the propositions Grant ran and Abigail ran but not in (20), where we can not infer the reading Grant met and Abigail met.

(19) Grant and Abigail ran.
(20) Grant and Abigail met.

Similarly with disjunction the interpretation of (21) is not The environment is a depressing choice or the economy is a depressing choice.

(21) The environment or the economy is a depressing choice.

To overcome these problems Eggert (2002) favours a unified analysis for each of the two connectors and and or that allows them to operate over conjunct sets of any type and of any number and not as binary propositional connectors, as has been done in the past.

To achieve this he supports that:

1. or is a subset function that has common characteristics with the existentials
2. distributivity and collectivity factors are contextually explained.

He treats and and or as quantifiers based on the observation that both operators get involved in the same types of scopal ambiguities as quantified NPs since the conjunction and and the disjunction or resemble semantically the quantifier all and the existentials, respectively.

As is well known, all and a interact in sentences and produce scope ambiguities, such as the ones below:
(22) a. All of his friends belong to a band.
   b. ‘all of his friends are band members’
   c. ‘there is a band that all of his friends belong to’
   (Eggert, 2002, 78)

Similar, interaction takes place in example (23a) with and a, being ambiguous between (23b) and (23c):

(23) a. Grant and Jacob are members of a band.
   b. ‘Grant and Jacob are band members’
   c. ‘there is a band that Grant and Jacob are members of’
   (Eggert, 2002, 79)

The same takes place with all and or:

(24) a. All of his friends are members of Sunset Valley or Sketchy Afterdeal.
   b. ‘All of his friends belong to one of the two bands’
   c. ‘All of his friends belong to Sunset Valley or all of his friends belong to Sketchy Afterdeal’
   (Eggert, 2002, 79)

In coordination, however, discourse factors also seem to play an important role in the determination of the semantic number triggered by the conjuncts.

### 3.1 Discourse factors in Agreement

Eggert (2002) shows that apart from the strict semantic factors, there are also discourse factors involved when determining the ‘semantic number’ of an argument in coordinate phrases. Thus, he claims that “‘semantic agreement’ should be analysed as a discourse phenomenon which is informed by the semantics” (Eggert, 2002, 92). Characteristic cases of discourse factors mediating in coordinate NPs and determining verb agreement are cases of “appositive conjunction” (Hoeksema, 1988, 36) and “deferred reference” (Nunberg, 1995, 115).

In example (25), which is a case of appositive conjunction, the conjuncts denote the same referent and they trigger singular agreement. A semantic theory can capture that. Appositive conjunction is allowed with descriptions as in example (25), but not with proper nouns (Hoeksema, 1988, 36), as in (26):

(25) Grant’s former wife and his mother’s present girlfriend was on the Jerry Springer show.

(26) ?? Cassius Clay and Muhammed Ali has/have always been my father’s favorite boxer.
   (Eggert, 2002, 93)
However, Hoeksema (1988) records cases with proper nouns that can occasionally be conjoined; in these the verb admits plural verb agreement since the phrase introduces two distinct individuals that correspond to the same real-world entity. These cases cannot be captured by semantic theories since intentionality determines verb agreement. A characteristic example is below:

(27) Cassius Clay and Muhammed Ali are the same person.

In Hungarian, there is also evidence of discourse factors in cases where agreement seems to be mediated by some peculiar conception of the referent. For instance cross-linguistically there are cases where the conjunctive subject triggers singular or plural agreement according to how high in the animacy hierarchy the conjuncts are. There is singular agreement triggered when the conjuncts are non-human in (28) and plural when they are human in (29).

(28) Csilla és Gabor itt van-nak.
      csilla and gabor here be-3.pl
      ‘Csilla and Gabor are here’

(29) A konyv-ed és a kalap-od itt van.
      the book-your and the hat-your here be
      ‘your book and your hat are here’ (Hungarian)

Also, in cases of “deferred reference” agreement is only with the intended referent. Thus, demonstratives or verbs show singular or plural agreement depending on the intended referent, not the demonstratum:

(30) [In a restaurant:]
      That/*those french fries is/*are getting impatient.

A similar case is found in (31), where there is agreement with the intended referent: wedding and not with the subject conjunct: Grant and Gertrude.

(31) There have been lots of weddings recently. Grant and Gertrude makes the fifth one this year.

Therefore, Eggert (2002) shows that such cases cannot be handled by purely semantic theories and thus a discourse based account should be considered.

3.2 An analysis for disjunction

To capture the discourse and semantic factors in agreement, Eggert (2002) proposes an analysis of coordinate phrases based on Discourse Representation Theory (Kamp and Reyle, 1993). The main advantage of DRT is that it uses a discourse structure that is mapped off of grammatical structure. Such a discourse structure allows the effective incorporation of any discourse-pragmatic features into the meaning of sentences when the latter are uttered in a particular discourse context. DRT
analysis is advantageous since it takes both discourse and semantic factors into consideration when determining the semantic number of an argument. Thus, considering a given argument, its semantic number is determined by whatever discourse conditions apply to the discourse referent that corresponds to the argument.

Eggert (2002) develops a uniform theory for and and or in order to capture the wide range of data and also introduce a straightforward definition for plurality. He treats and as a type-specific operator meaning that it is a generic operator that is identified with “whatever operator is defined for the domain of the conjoined terms” (Eggert, 2002, 92) and not with meet per se, the Boolean approach proposed by Keenan and Faltz (1985).2

In his analysis of or, he clearly shows that or is not and’s dual but rather it must be treated as a subset function, which means a function that moves from sets to subsets. In other words, the subset function picks up either one (i.e. resulting in SG agreement) or both (i.e. resulting in PL agreement) members of the set, being polysemous between two meanings. Thus, he completely rejects the possibility of analysing or as the Boolean or clausal, and therefore having the same meaning as distributive and.

Formally the subset function is “a function \( f \) such that for any non-empty set \( A \), \( f(A) \) is a non-empty subset of \( A \).

\[
\text{SUB} = \{ f : (\forall X : X \neq \emptyset) f(X) \subset X \land f(X) \neq \emptyset \} \quad \text{(Eggert, 2002, 110)}
\]

Eggert (2002) presents a proposal for verb agreement with disjunctive coordinate nouns, formulated within DRT where agreement phenomena can be incorporated, and following a similar analysis to the DRT analysis of existentials. An important difference, however, between disjunction and existentials is that disjunction does not introduce a discourse referent as the existentials do. This becomes clear from examples like the following, where the continuation of the discourse does not assume that a discourse referent is introduced, i.e. she.

\[\begin{align*}
\text{(33)} & \quad \text{Gertrude or Abigail is singing tonight.} \\
& \quad \text{?She might dance too.}
\end{align*}\]

He rather supports that the disjuncts in (33) form a set and or selects a member of that set i.e. either Gertrude or Abigail. There is no introduction, however, for a referent for Gertude or Abigail in the DRS but rather the predicate sing combines directly with the function on the set that consists of the discourse referents standing for Gertrude and Abigail. The denotation of this disjunction is the union of the subset of the disjuncts.

\[\text{For more discussion see Eggert (2002).}\]
In the following example there are two interpretations: the ‘exclusive’ or interpretation (e.g. ‘Grant is taller than Abigail or Grant is taller than Gertrude’ and the ‘and-coordinate’ or interpretation, which states that for “all choice functions $f$ Grant is taller than $f\{\text{Gertrude,Abigail}\}$” (Eggert, 2002, 111).

(35) Grant is taller than Abigail or Gertrude. (Eggert, 2002, 110)

Both of these interpretations have the following DRS:

(36)

<table>
<thead>
<tr>
<th>$x, y, f$</th>
</tr>
</thead>
<tbody>
<tr>
<td>gertrude($x$)</td>
</tr>
<tr>
<td>abigail($y$)</td>
</tr>
<tr>
<td>$SUB(f)$</td>
</tr>
<tr>
<td>sing($x, f \cup {x, y}$)</td>
</tr>
</tbody>
</table>

(Eggert, 2002, 135)

Depending on the assignment of $f(y, z)$, the DRS can be interpreted either way. The first interpretation follows from:

(37) $f(y, z) = \{\{\text{abigail}\}\}$
$f(y, z) = \{\{\text{gertrude}\}\}$

which are both subsets of $f(y, z) = \{\{\text{abigail}\}, \{\text{gertrude}\}\}$. The second interpretation follows from $f(y, z) = \{\{\text{abigail}\}, \{\text{gertrude}\}\}$, which is a possibility since $\{\{\text{abigail}\}, \{\text{gertrude}\}\} \subseteq \{\{\text{abigail}\}, \{\text{gertrude}\}\}$.

The difference in interpretations is achieved by adopting the partition analysis of plurals (Schwarzschild, 1996), which claims that the collective and distributive semantic difference in sentences comes from a contextually determined variable, a partition on the universe of discourse (Schwarzschild, 1996). In the example above, the variable partitions abigail and gertrude into one cell in which case we get the collective reading in the second case, whereas in the first reading the variable partitions abigail and gertrude into two separate cells.
4 Analysing Verb Agreement in Disjunctive Coordinate Nouns

We formalise the above concepts in lambda-DRT and Glue Semantics, following Dalrymple (2001) and Kokkonidis (2005). The different λ-DRT expressions which correspond to the meaning parts will be combined together using the glue language.

We take the following simple example which shows either singular or plural verb agreement:

(38) Jane or Mary is/are singing.

We treat or as a subset function, which ranges over the set of disjuncts. Or is represented with the complex type $e \rightarrow (e \rightarrow e)$ since it functions over individuals and has the following lexical entry with the relevant DRS.

(39) $(↑\text{CONJ}) = \text{‘or’}$
    or: $e↑\text{subj} \rightarrow [e↑\text{subj} \rightarrow e↑\text{subj}]$

\[
\lambda x.\lambda y
\begin{array}{c}
  SUB(f) \\
  f \cup \{x, y\}
\end{array}
\cup y \cup x
\]

The important remark in the DRS side is that there is no introduction of a new referent introduced by $f\{x, y\}$ but only the subset function is introduced. The glue side states that two semantic resources are required of type $e$, which are members of the set and they are represented by the $(↑ \in_{σ<e>})$ symbol which corresponds to each argument. Once these are found, they are consumed and therefore we can deduce the semantic resource of the whole coordinate phrase, represented as $↑σ<e>.$

The lexical entries for the proper names, which are also of type $e$, and the verbal one-place predicate, which is of type $e \rightarrow t$, are the following:

(40) $(↑\text{PRED}) = \text{‘jane’}$
    jane: $e↑\text{subj}$

\[
\lambda x.\begin{array}{c}
jane(x)
\end{array}
\]

(41) $(↑\text{PRED}) = \text{‘mary’}$
    mary: $e↑\text{subj}$

\[
\lambda y.\begin{array}{c}
mary(y)
\end{array}
\]

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(42) \((\uparrow \text{PRED}) = '\text{sing}'\)
\(\text{sing}: e_{\{\text{SUBJ}\} \rightarrow t}\)

\[
\lambda x'. \quad \text{sing}(x')
\]

If we do the union of or with \(\text{Jane}\) we get:

(43)
\[
\lambda y. \quad \text{SUB}(f) \cup y \cup x \quad : e_{\text{label}} \rightarrow e_{\text{label}}
\]

If we do the union of or \(\text{Jane}\) with \(\text{Mary}\) we get:

(44)
\[
\text{SUB}(f) \cup \{x, y\} \cup y \cup x \quad : e_{\text{label}}
\]

If we do the DRS unions, we get:

(45)
\[
\text{SUB}(f) \cup \{x, y\} \quad : e_{\text{label}}
\]

Next we need to apply the verb \(\text{sing}\) to the disjunctive coordinate phrase to get the desired result:

(46)
\[
\text{sing}(f \cup \{x, y\}) \quad : t
\]
The above DRS represents the whole sentence which is of type $t$.

This simple approach, which uses $\lambda$-DRT, accounts for a simple disjunctive phrase which results in singular or plural verb agreement and which treats individuals of type $e$ necessarily. Further work is required to account for disjunctive phrases with more than two disjuncts and include other types.

5 Conclusion

The current paper has presented an analysis of verb agreement in disjunctive coordinate nouns. The analysis has focused on the hypothesis that verb agreement in such phrases depends strictly on interpretation factors and this is why agreement is relatively unpredictable. Our field work shows that MG native speakers interpret disjunctive coordinate phrases in two ways, as ‘exclusive’, admitting singular verb agreement, and as ‘and-coordinate’, admitting plural agreement. The same hypothesis applies to other languages too. A similar assumption is found in Eggert (2002), who supports that there are discourse factors in determining the ‘semantic number’ of an argument in a coordinate phrase. Thus, following Eggert (2002), we also assume that or is a subset function which means that it is a function from sets to subsets, and we propose an analysis on $\lambda$-DRT, a discourse-based framework. Although the current analysis captures disjunctive coordinate nouns of type $e$, there is room for more research in order to extend the analysis to other types (i.e. nouns with in/definite determiners or predicates) and also to disjunctive phrases with more than two disjuncts.

References


