A unified analysis of the semantics and pragmatics of Greek polydefinites

Introduction. Adjectivally modified definite noun phrases in Greek can appear with a second definite determiner between the noun phrase and the modifying adjective, as in (1). The standard assumption w.r.t the semantic interpretation of such polydefinites is that they give rise to a restrictive interpretation of the modified NP (Alexiadou and Wilder 1998, Campos and Stavrou 2004, Kolliakou 2004, Lekakou and Szendrői 2012, Chatzikyriakidis 2015) so that, e.g. (1), signals that there are other cats in the context of the utterance that are not big, as, e.g., in (2).

(1) I mavres i jates itan anisixes.
the black the cats were anxious.
'The black cats were anxious.'

(2) Context: George had six black cats and two gray ones. When he went on a trip, he left the cats in the care of his neighbor.

Even though counterexamples shown to violate this interpretation occasionally do appear (Manolessou 2000, Panagiotidis and Marinis 2011, Lekakou and Szendrői 2012) almost all analyses are built to exclusively derive a restrictive interpretation (but see Tsiakmakis et al. 2021 for a recent attempt to derive both restrictive and non-restrictive readings based on an ambiguity account.) This paper presents (i) the first systematic empirical study of the availability of non-restrictive interpretation, and (ii) proposes the first unified account of Greek polydefiniteness based on the idea that polydefinites are markers of prominence (see von Heusinger and Schumacher, 2019 for a recent overview), in that their pragmatic contribution is to signal out prominence. Under this view, the restrictive interpretation is just a special case of marking prominence.

The pilot. The study involved 35 native speakers of Greek. Subjects were presented with a context sentence(s), followed by a sentence that either (exclusive interpretation) involved a polydefinite construction or a monadic. The subjects are asked to judge this last sentence according to their felicitousness given the context and on a scale from 1 (totally infelicitous) to 10 (totally felicitous). Sentences are designed to test semantic felicitousness of polydefinites in contexts where a restrictive interpretation is not possible.

Non-restrictive uses. The results of the pilot, which we will present in more detail during the talk, are summarized as follows:

- Polydefinites can readily appear in a number of contexts where a restrictive interpretation is not possible.
- Even when monadics are preferred in these contexts, the mean difference in judgments between monadics and polydefinites is small.
- Polydefinites like (1) are dispreferred in contexts where there is no relative alternative to the referent of the polydefinite, as in (3).

(3) Context: George had six cats, all of them black. When he went on a trip, he left them in the care of his neighbor.

- Polydefinites improve significantly when there are more relevant individuals in the discourse, as in (4), and out-score monadics when they seem to signal topic-shift, as in (5).

(4) Context: George had two parrots and six black cats. When he went on a trip, he left all his pets in the care of his neighbor.

(5) Context: George has two parrots and six black cats. The two parrots are always very quiet.

Analysis. We argue that although polydefinites have no distinct semantic contribution (i.e. they receive the same semantics as the corresponding monadic definites), they give rise to the dynamic pragmatic effect of singling-out the referent of the definite phrase among a list of relevant individuals. We adopt the view (based on Centering Theory, Bittner 2014 a.o., Stojnic' et al. 2017 for a recent formalization) that relations of relative prominence can be formalized as a list; i.e. a sequence of individuals ranked by prominence. The first individual in the list is the most prominent one. The list changes as new individuals are introduced in the course of a discourse and grammatical mechanisms can have the effect of altering the list in a dynamic fashion. We assume a context Γ that contains discourse referents among other things and progressively adds referents as discourse unfolds. A relevant list L_{rel} keeps track of the relevant referents and adds and removes referents that are not relevant accordingly. An operator P_{ord} of type *list e* $\rightarrow$ *list e* takes a list and returns the same list ranked according to prominence. We then assume L_{pr} to be $P_{ord}(L_{rel})$. Let us assume that the definite has the usual uniqueness semantics:

(6) $\lambda P: e \rightarrow t.\ \lambda Q: e \rightarrow t.\ \exists x: e,\ P\ x \wedge Q\ x \wedge (\forall y: e, P\ y \wedge Q\ y \rightarrow x = y)$.

Now, what the second definite is doing is to provide the same uniqueness semantics plus the extra condition that x has to be the head in the prominence list $L_{pr.}$ If this condition is not met then x is made the first element in the list (done by the $make_{fst}$ function):

(7) $\lambda A: (e \rightarrow t) \rightarrow (e \rightarrow t) \rightarrow t.\ \lambda P: e \rightarrow t.\ \lambda Q: e \rightarrow t.\ \exists x: e,\ P\ x \wedge Q\ x \wedge (\forall y: e, P\ y \wedge Q\ y \rightarrow x = y) \wedge fst(L_{pr}) \neq x \rightarrow make_{fst}(x)(L_{pr})$[1]

Note that in the above account the second polydefinite acts as a large functor taking three arguments (the regular definite and the two sets) and returns uniqueness semantics plus the prominence condition. The list relevant for each update can be affected not only by what are usually taken to be extra-grammatical factors (like Coherence, Stojnic' et al. 2017), but also by grammatical factors. For example, since (1) involves the pluralized predicate *itan anisixes* 'were anxious' the relevant list will only include plural individuals. In the context of (3) where the only relevant and contextually available list includes a single individual (the black cats), the reduced availability of the polydefinite can be attributed to redundancy. When the list includes more than one individual, as in (2), (4), and (5), the polydefinite has the effect of placing the referent of the noun phrase (the black cats) on the top of the prominence list. We propose that the increased

[1] The account has been formalized in the Coq proof-assistant. Please check the appendix for the code.

felicitousness in contexts like (5) is due to the fact that the context forces a re-ordering of the black cats above the two parrots. To explain the slight contrast between (4) and (5), we assume that in (4), the P_{ord} operator, lacking prominence ranking information, takes the relevant list, L_{rel}, puts all its elements in a new list, ending up with a list that contains as its sole element a list with all the relevant entities (a list within a list).[2] In (5) on the other hand, where the two parrots occupy the first position in L_{rel}, applying (7) forces a re-ordering, where the black cats are put on the top of the list. This is the case of topic-shift. In this set-up the so-called restrictive interpretation of (1) in (2) is just a case in which the relevant list only includes different cat-individuals. Notice that nothing we have said so far explains the fact that (1) achieves higher ratings in the context of (2) than in the context of (4). In both cases the list includes two individuals (the black and the gray cats in (2) and the cats and the parrots in (4)). We show that (1) only achieves higher ratings in (2) than in (4), when the adjective *anisixes* 'anxious' is narrowly focused, as in *I MAVRES I gates itan anisixes*. The contextually relevant set of alternatives for focus interpretation (a subset of the Alternative Semantic Value of *anisixes gates* 'anxious cats') is identified with the relevant prominence list, streamlining all the relevant pragmatic effects of (1).

Conclusions. In a sharp divergence from previous literature, this paper focuses on the dynamic pragmatic effects of Greek polydefiniteness arguing that they are markers of prominence. This move allows a unified analysis of all uses of polydefinites and corrects a serious under-generation problem faced by previous analyses. What remains to be seen, is to what extend this account can be generalized to cover all prominence sensitive phenomena.

References

Artemis Alexiadou and Chris Wilder. Adjectival modification and multiple determiners. Possessors, Predicates and Movement in the DP, pages 303–332, 1998.

Bittner, M. (2014). *Temporality: Universals and variation*. John Wiley & Sons.

Hector Campos and Melita Stavrou. Polydefinite constructions in Modern Greek and Aromanian. *Balkan syntax and semantics*, 67:137, 2004.

Stergios Chatzikyriakidis. Polydefinites in Modern Greek: the missing link. *Proceedings of ICGL11*, 2015.

Dimitra Kolliakou. Monadic definites and polydefinites: their form, meaning and use. *Journal of Linguistics*, 40, pages 263–323, 2004.

Marika Lekakou and Kriszta Szendrői. Polydefinites in Greek: Ellipsis, close apposition and expletive determiners. *Journal of Linguistics 48*, pages 107–149, 2012.

Io Manolessou. Greek Noun Phrase Structure: *A Study in Syntactic Evolution*. PhD thesis, University of Cambridge, 2000.

E Phoevos Panagiotidis and Theodore Marinis. Determiner spreading as DP-predication. *Studia Linguistica, 65(3):*268–298, 2011.

[2] Applying (7) in this case will result in the fst operator looking into the contents of this new list within $L_{rel,}$ taking the most prominent element of that list out and putting it at the head of $L_{rel.}$

Stojnić, U., Stone, M., & Lepore, E. (2017). Discourse and logical form: Pronouns, attention and coherence. Linguistics and Philosophy, 40, 519-547.
Tsiakmakis, E., Borràs-Comes, J., & Espinal, M. T. (2021). Greek polydefinites revisited: Polydefiniteness as resumed relative clause modification. Journal of Greek Linguistics, 21(1), 151-190.
Klaus Von Heusinger and Petra B Schumacher. Discourse prominence: Definition and application. *Journal of Pragmatics*, 154:117–127, 2019.

Appendix (Coq Code)

```
Require Import Coq.Lists.List.
Require Import Le.
Require Export Classical. Require Export Description. Require Import ChoiceFacts.
From Coq Require Import Utf8 List.

Definition PTYPE:= Type.
Variable A : Set.
Definition hd  (l:list Set) :=
    match l with
      | nil => A
      | x :: _ => x
    end.
Set Implicit Arguments.
 Parameter e: Type.

Import ListNotations.
(**P_ORD and L_rel. L_pr takes a type e argument and states that the head of the P_ORD(L_rel) list is
x**)
Parameter  P_ORD: forall  A :   PTYPE,   list   A -> list A.
Parameter L_rel:   list ( e).
Definition L_pr:= fun x: option e => head(P_ORD(L_rel)) = x.
Parameter Mavres: (option e -> Prop).
Definition mavres:= fun P : option e -> Prop => fun x :option  e => P x /\ Mavres(x).
Parameter gates: option  e -> Prop.
Parameter to_eskasan: option e -> Prop.
(**this adds an argument to the head of P_ORD(L_rel)**)
Definition add_to_head_of_P_ORD (x: option e) : list e :=
  match x with
  | None => P_ORD(L_rel)
  | Some x' => x' :: (P_ORD(L_rel))
  end.
(**Regular definite**)
Definition iota:= fun P:option  e -> Prop => fun Q: option  e -> Prop=> exists x: option e, P x /\ Q x
/\  forall z : option e,  P z /\ Q z -> x = z.
Axiom decide_L_pr : forall x: option e, {L_pr x} + {~ L_pr x}.
(**Polydefinite**)
Definition pol := fun F: (option e -> Prop) -> (option e -> Prop) -> Prop =>
  fun P: option e -> Prop =>
  fun Q: option e -> Prop =>
    exists x: option e,
    P x /\ Q x /\
    forall z: option e, P z /\ Q z -> x = z /\ head( add_to_head_of_P_ORD x) = head(P_ORD(L_rel)).

(**Two theorems: second states that if the polydefinite holds then there is an x such that x is a black
cat that ran away and the list resulting from adding x to P_ORD is the same as taking the head of
P_ORD(L_Rel)**)
Theorem polydefinite: pol iota (mavres(gates)) to_eskasan -> exists x: option e, head(
add_to_head_of_P_ORD x)= head(P_ORD(L_rel)). cbv. firstorder.
Qed.
Theorem polydefinite2: pol  iota (mavres(gates)) to_eskasan ->  exists x: option e, (mavres(gates)) x
/\ to_eskasan x/\ head( add_to_head_of_P_ORD x)= head(P_ORD(L_rel)). cbv. firstorder. Qed.
```