S. Chatzikyriakidis, D. Michelioudakis & G. Spathas

Greek Focus Operators and Their Associates

Abstract

This paper examines the distribution of two focus-associating operators in Greek, *mono* 'only' and additive *ke* 'too'. We establish the syntactic and prosodic factors that determine association with focus in this language. We argue that association with focus in Greek is subject to a syntactic requirement of sisterhood. We use this to probe into the properties of Greek clause structure and provide novel evidence that (i) finite verbs are subject to V-to-T movement; (ii) non-finite verb forms also move higher than *v*; (iii) the subject in VS orders is obligatorily vP-internal; (iv) the subject in SV orders is not obligatorily left-dislocated; (v) focus-associating adverbs do not occupy a fixed position on the clausal spine. Finally, we make a suggestion as to how additive *ke* might have arisen from a use of the conjunction particle *ke* as a distributive operator.

1. Introduction

Prosody and meaning can interact. The examples in [1] only differ in the placement of prosodic prominence. Still, in a situation in which John introduced Mary and no one other than Mary to Bill and Oscar, [1a] is true, whereas [1b] is false.

[1] a. John only introduced MARY to Bill.
        'John introduced no one but Mary to Bill'
     b. John only introduced Mary to BILL.
        'John introduced Mary to no one but Bill'

The item responsible for the interaction of prosody with meaning is the exclusive operator *only*. Similar effects are found with a host of other elements. In [2], prosody interacts with the presuppositions of the additive adverb *also*. In a context where John introduced Helen to Bill and no other introductions were done, [2a] can be felicitously asserted, but [2b] cannot.

[2] a. John also introduced MARY to Bill.
        Presupposition: 'John introduced someone other than Mary to Bill'
     b. John also introduced Mary to BILL.
        Presupposition: 'John introduced Mary to someone other than Bill'

The class of elements inducing such effects is Focus Associating Operators (FAO) and the mechanism responsible is called Association with Focus. The interaction of prosody and meaning is mediated by focus, an information-structural category with prosodic and interpretational effects. We assume that focus is syntactically encoded

by F-features. On the prosodic side, F-marked syntactic constituents receive major prominence. On the interpretational side, F-marking contributes to the generation of the Focus Semantic Value (FSV· Rooth 1985). The idea is that focused phrases contrast with other elements of the same semantic type; the FSV is a set of propositions that differs from the proposition that is asserted in substituting the focused part with the elements the focus contrasts with. Next to the ordinary meaning of a phrase, an alternative meaning is computed, noted as $\| \|_A$. E.g., the sentences in [3a] and [4a] have the same ordinary meaning but different FSVs, [3/4b].

[3] a. John introduced [Mary]$_F$ to Bill.
    b. $\| [3a] \|_A$ = {John introduced x to Bill}

[4] a. John introduced Mary to [Bill]$_F$.
    b. $\| [4a] \|_A$ ={John introduced Mary to x}

To derive sensitivity to focus, the meanings of FAOs are made sensitive to alternatives, by introducing a presupposition that makes reference to the FSV. In the case of *only* the effect of association is truth-conditional, whereas in the case of *also* purely presuppositional. *Only* in [5a] takes two arguments, the sentence and C, a variable over sets of propositions whose value is fixed contextually. Its presupposition requires that C is a subset of the FSV of S.[1] So, e.g., [1a] says that John introduced Mary to Bill and that all alternatives of the form 'John introduced x to Bill' are false. *also* in [5b] introduces in addition the presupposition that one of the alternative propositions in C is true. So, e.g., [2a] can only be felicitously asserted if a proposition of the form 'John introduced x to Bill' is contextually salient and true.

[5] a. $[\![only(C)(S)]\!]$ = C ⊆ $\| S \|_A$. true($\| S \|$) & $\Box q \in$ C. true(q) → q=$\| S \|$
    b. $[\![also(C)(S)]\!]$ = $\Box q$. q ∈ C & C ⊆ $\| S \|_A$ & q≠$\| S \|$ & true(q). true($\| S \|$)

So, the meaning of examples like [1] and [2] is determined by what the FSV is, which in turn is determined by what is in focus. In the case of focus-operators the focused phrase is said to be the associate of the operator. Although the meanings in [5] make no direct reference to the constituent in focus, the associate is a theoretically significant notion since there are further syntactic constraints that regulate whether a focus phrase can be the associate. As Tancredi (1990) argues for *only* and Beaver & Clark (2008) generalize to all Conventionally Associating Operators, English is subject to the Principle of Lexical Association in [6].[2]

[6] An operator like *only* must be associated with a lexical constituent in its c-command domain.

---

[1] In Rooth (1992) the requirement that C is a subset of the FSV is a presupposition of the Focus Interpretation Operator, the squiggle. We assume that all conventionally associating focus-operators interpret focus. See Singh (2008) for discussion. We also assume that the scope of FAOs is sentential. Nothing hinges on that for the data discussed in this paper.

[2] Beaver & Clark (2008) propose a typology that distinguishes between Quasi-, Free-, and Conventional-Association with focus. All operators discussed here are Conventionally-Associating operators.

The Principle derives, e.g., the fact that VP-adjoining *only* cannot associate with the trace of the moved object in [7].

[7]   *MARY₁, he only likes t₁.   (Beaver & Clark 2008, 160)

In what follows, we first define the syntactic principle that governs Association with Focus in the case of the Greek focus-operator *mono* 'only', in Section 2. Section 3 uses this principle to investigate several properties of Greek clause structure. Section 4 shows the same principle governs additive *ke* 'too' and further discusses Greek clause structure. Section 5 discusses the connection of additive *ke* with other uses of the particle.

2. The syntax of Association with Focus in Greek

The operators *mono* 'only' and additive *ke* are focus-associating. In both [8a], where the associate is the subject, and [8b], where the associate is the indirect object, *mono* and its associate form a phonological phrase (PhP) and the associate receives major prominence. What follows the associate[3] gets de-accented.[4]

[8] a. Mono   o   JANIS   edose   sti   Maria   ena   vivlio.
         only   the   John   gave   to-the   Mary   a   book
         'John and no one else gave Mary a book'
     b. O   Janis   edose   mono   sti   MARIA   ena   vivlio.
         the   John   gave   only   to-the   Mary   a   book
         'John gave Mary and no one else a book'

The Greek exclusive can associate with all types of phrases. In [9a] it associates with VP. Notice that in this case prominence inside the VP is determined by the default stress assignment rules. Still, the VP is prosodically more prominent than the subject. Crucially (and unlike English *only* in [1]), VP-adjoined *mono* cannot associate with material in the VP, even if that is prosodically most prominent. E.g., [9a] cannot associate with the direct object. Similarly, *mono* cannot associate with the indirect object in [9b].

[9] a. O   Janis   mono   edose   sti   Maria   ena   VIVLIO.
         the   John   only   gave   to-the   Mary   a   book
         'John gave Mary a book and did nothing else'
         '#John gave Mary a book and nothing else'
     b. #O   Janis   mono   edose   sti   MARIA   ena   vivlio.
         the   John   only   gave   to-the   Mary   a   book
         'John gave Mary and no one else a book'

---

[3] *mono* can also appear following its associate. All the data presented here can be reproduced with this alternative word order, which will not be discussed any further.

[4] For the prosodic correlates of focus in Greek, see Arvaniti & Baltazani (2005), Revithiadou (2004), Gryllia (2008), a.o. As far as we know the prosody of association with focus in Greek has not been investigated so far. A detailed study and a comparison between focus-association and other types of foci must be left for a future occasion.

Association with the direct and indirect objects requires that the operator attaches to the associate, as in [10].

[10] a. O   Janis   edose   sti   Maria   mono   ena   VIVLIO.
         the   John   gave   to-the Mary   only   a   book
         '#John gave Mary a book and did nothing else'
         'John gave Mary a book and nothing else'

    b. O   Janis   edose   mono   sti   MARIA ena   vivlio.
         the   John   gave   only   to-the Mary   a   book
         'John gave Mary and no one else a book'

We propose to capture the difference between English and Greek by specifying a stricter syntactic principle of association for conventionally associating focus-operators, as in [11].[5] E.g. [11] is violated in [9a] in the case of association with the direct object, but not in the case of association with the VP. Thus, only the latter is licensed.

[11]   Conventionally associating operators must be associated with their sister constituent.

3. Greek clause structure and *mono*

Having established the principle that regulates focus-association in the case of *mono*, we can use it to investigate properties of Greek clause structure. Greek clause structure has generally been investigated by the use of word-order variation. The strategy employed here is to not simply check word-order, but to check word-order relative to a specific interpretation. What we gain is the fact that interpretation fixes the position of *mono* on the clausal spine. The position of other elements can thus be checked relative to the position of the adverb.[6]

Consider, for example, [12]. Under the given interpretation, *mono* associates with the VP. Given [11], *mono* must attach to the VP. However, it appears post-verbally. [12] can be readily explained if the observed word-order is derived by movement of the verb out of the verbal domain (Philippaki-Warburton 1987; Tsimpli 1990; Alexiadou & Anagnostopoulou 1998, a.o.). Rather than being counter-evidence to [11], then, [12] is new evidence for head movement of V in Greek, as shown in [13]. We assume here that V moves to T, although it is also possible that it moves to some functional projection below T (but higher than vP).

[12]   O   Janis   penepse   mono   ti   MARIA.
         the   John   praised   only   the   Mary
         'John praised Mary and did nothing else'

[13]   [$_{TP}$ [T-V penepse] [$_{vP}$ v [$_{vP}$ mono [$_{vP}$ V [$_{DP}$ ti Maria]]]]]

Independent evidence that post-verbal *mono* does not necessarily attach to a

---

[5] The data discussed in this section can be replicated with additive *ke*.

[6] The same strategy has been employed by Barouni (2012) in her investigation of the aspectual adverbs *molis* 'just', *kiolas* 'already', *idhi* 'already'.

projection inside the VP, comes from its interaction with VP-adjuncts. If it did, VP-adjuncts would never be part of its associate. Example [14], however, is ambiguous, depending on whether the locative PP is part of the associate of *mono*, as in [14a], or not, as in [14b]. Given [11] and that the PP is adjoined at the VP, the reading in [14a] requires that *mono* attaches at the VP-level. The readings of [14] can be taken to be determined by order of attachment; if the PP is in the sister of *mono*, as in [15], then it is part of the associate, as in [14a], if not, as in [16], it is not part of the associate, as in [14b]. The syntactic difference correlates with a difference in prosody; in [15] the string *penepse mono ti Maria sti sinandisi* forms a PhP and *sinandisi* receives major prominence by the rules of default-stress assignment. In [16], on the other hand, the PP is not part of the same PhP.

[14]   O   Janis   penepse   mono   ti   Maria   sti   sinandisi.
       the   John   praised   only   the   Mary   at-the   meeting
   a.   'John praised Mary at the meeting and did nothing else'
   b.   'John praised Mary and did nothing else at the meeting'

[15]   [TP [T-V penepse] [vP v [VP [VP mono [VP [VP V [DP ti Maria]] [PP sti sinandisi]]]]]

[16]   [TP [T-V penepse] [vP v [VP [VP mono [VP V [DP ti Maria]]] [PP sti sinandisi]]]]

The interpretation of *mono* can also provide novel evidence for the position of arguments in various word-orders. In [17] the subject appears post-verbally, which has been claimed to mean that it stays within the vP (Alexiadou & Anagnostopoulou 1998, a.o.). Under the given prosody, the associate of *mono* in [17a] cannot exclude the subject.[7] Assuming that the subject is located in Spec, vP, *mono* must necessarily be attached to vP, and not VP, as shown in [17b]. If so, post-verbal subjects are obligatorily part of the associate of *mono*.[8]

[17]   a.   Penepse   mono   o   Janis   ti   MARIA.
           praised   only   the   John   the   Mary
           'John praised Mary and nothing else happened'
           '#John praised Mary and did nothing else'
       b.   [TP [T-V penepse] [vP mono [vP [DP o Janis] [v' v [VP V [DP ti Maria]]]]]]

Having said this, it must be noted that the subject in VSO orders is not necessarily vP-internal, as it may linearly precede *mono* and still be interpreted as part of the

[7] Since the whole string is part of the associate of *mono*, prosody in [17] is determined by default-stress assignment. Crucially, there is no prosodic realization of [17] that would allow association with the VP in the exclusion of the subject. As expected, stress-shift to *Janis* indicates association with the subject only.

[8] If we allow *mono* to attach to the VP, we need to exclude a derivation in which *mono* vacuously moves from VP to vP. In this case, the subject would not be part of the associate, contrary to fact. This is a real problem, since, as we shall see in the discussion of examples [22–24], vacuous movement of *mono* must be allowed in other cases. One can either disallow VP-attachment of *mono* altogether, as we chose to do in the main text, or allow it, but restrict the movement possibilities of the particle. One possible way to do so, is to only allow movement of *mono* when it is semantically vacuous, i.e. when it has no effect on what the associate is.

associate, i.e. as having moved from Spec,vP leaving an LF-interpretable copy behind, as in [18] where *mono* associates with the whole sentence.

[18]   Penepse   o   Janis   mono   ti   Maria
       praised   the   John   only   the   Mary
       'John praised Mary and and nothing else happened'

Examples with pre-verbal subjects like, e.g., [12], allow both readings; next to a reading that excludes the subject from the associate, as indicated in [12], there exists a reading in which mono associates with the whole clause, so that [12] means 'John praised Mary and nothing else happened'. There exist two main competing analyses of pre-verbal subjects in Greek. Alexiadou & Anagnostopoulou (1998) claim that they are necessarily left-dislocated DPs that sit at Spec, TopP and take widest scope. On the other hand, Philipakki-Warburton (1987) a.o. claims that the subject A-moves to Spec, TP. The reading in which the subject is part of the associate cannot be predicted if left-dislocation is the only option for deriving pre-verbal subjects, since the reading requires the subject to reconstruct to Spec, vP. Two options are available to derive the two readings; either pre-verbal subjects are always the result of A-movement and A-movement optionally reconstructs, or A-movement reconstructs obligatorily and both derivations are available in the language (as in Roussou & Tsimpli 2006).

Notice also that, if *mono* cannot attach to the VP, we need to revise our account of the ambiguity of [14]; if *mono* attaches to the vP and the PP to the VP, it is wrongly predicted that the PP should necessarily be part of the associate. We propose that the reading that excludes the PP from the associate is the result of rightward dislocation of the adjunct PP, as in [19]. Since dislocated elements are base-generated at peripheral positions, the PP is outside of the sister constituent of *mono*.

[19]   [TopP [TopP Top [TP [DP o Janis]ı [T-V penepse] [vP mono [vP tı [v' v [VP V [DP ti Maria]]]]]
       [PP sti sinandisi]]

Supporting evidence for this analysis comes from leftward dislocation of the PP, where movement of the PP is visible on the word-order. In example [20], the PP is necessarily outside the sister constituent of *mono* and, hence, not part of the associate. As expected, the pre-verbal subject can be part of the associate or not. In case the subject precedes the dislocated PP, this ambiguity disappears; the subject is necessarily not part of the associate. If the subject had moved from Spec, TP to the left-periphery, we would expect [21] to be ambiguous, since A'-movement can optionally reconstruct. The unavailability of the reading in [21b], then, can be taken as evidence that left-dislocation is a real option for Greek pre-verbal subjects.

[20]   Sti   sinandisi,   o   Janis   penepse   mono   ti   Maria
       at-the   meeting   the   John   praised   only   the   Mary
   a. 'John praised Mary and did nothing else at the meeting'
   b. 'John praised Mary and nothing else happened at the meeting'
   c. #John praised Mary at the meeting and nothing else happened'

[21]   o   Janis   sti   sinandisi   penepse   mono   ti   Maria
        the   John   at-the   meeting   praised   only   the   Mary
   a. 'John praised Mary and did nothing else at the meeting'
   b. '#John praised Mary and nothing else happened at the meeting'
   c. '#John praised Mary at the meeting and nothing else happened'

A remaining issue concerns pre-verbal *mono*. Under the indicated interpretation, *mono* in [22] attaches to the vP. If V movement is obligatory, this word-order is not predicted. We assume that *mono* can move at least as high as the projection that the verb moves to. This movement has no effect on the interpretation; i.e. the associate is determined based on the base-position of *mono*. Evidence for this assumption comes from the fact that we can reproduce all the examples in [12–21] with pre-verbal *mono*. It is not clear how high *mono* can move. It is somewhat degraded when it precedes auxiliaries, which are taken to be under T, as in [23]. On the other hand, it must obligatorily precede the future marker *tha*, which is taken to be located higher than T (Philippaki-Warburton 1998; Roussou 2000), as in [24].[9]

[22]   O   Janis   mono   penepse   ti   Maria
        the   John   only   praised   the   Mary
        'John praised Mary and did nothing else'

[23]   O   Janis   (?mono)   exi   (mono)   penepsi   ti   Maria
        the   John   only   has   only   praised   the   Mary
        'John has praised Mary and has done nothing else'

[24]   O   Janis   mono   tha   penepsi   ti   Maria. / *O Janis tha mono penepsi ti Maria.
        the   John   only   will   praised   the   Mary
        'John will praise Mary and do nothing else'

4. Greek clause structure and additive *ke*

The distribution and interpretation of additive *ke* can also be shown to be regulated by [11]. Like *mono* (and unlike *only*), it associates with the whole constituent it attaches to, not just any constituent in its c-command domain. So, for instance, in [25] the set of alternatives is defined on the basis of a variable ranging over (at least) objects bearing some color, never colors alone.

[25]   O   Janis   evapse   ke   tin   porta   KOKINI
        the   John   painted   also   the   door   red
        #Presupposition: 'John painted the door some color other than red'
        Presupposition: 'John painted something other than the door another color'

---

[9] This paradoxical contrast between tha and perfect auxiliaries disappears if we treat compound tenses such as the Greek perfect as biclausal, as suggested to us by Anna Roussou (p.c.); *mono* may indeed move to any clausal projection, but only within the same clause. It may then be that pre-Aux *mono* attaches directly to (and therefore associates with) the upstairs vP/TP, which does not allow it to get quite the same interpretation as post-Aux *mono*. Note also that when *tha* is present, *mono* does not have the option of adjoining to T, due to the phonological, clitic-like properties of *tha* which needs to be part of the same phonological word as the rest of the verb complex.

Narrow focus on *kokini* would only be possible if *ke* immediately preceded it, while of course narrow focus on *tin porta* is also possible:

[26]   O   Janis   evapse   [ke   tin   PORTA]   kokini
       the   John   painted   also   the   door   red
       Presupposition: 'John painted something (other than the door) red'

However, *ke* differs from *mono* in two crucial respects. First, as noted above, *mono* can precede the finite verb (complex) when the associate is the vP [22–24]. This is impossible with *ke* associating with the vP [27].

[27]   O   Janis   (*ke)   penepse   (ke)   ti   Maria
       the   John   also   praised   also   the   Mary
       'John praised Mary and he also did something other than praising Mary'

This striking difference from *mono* also differentiates additive *ke* from the connective/conjunction *ke*. In SMG, when used emphatically, *ke* can appear in front of both/all conjuncts, including conjoined vPs/TPs, and it can thus immediately precede finite verbs:

[28]   O   Janis   KE   penepse   ti   Maria   KE   prosevale   ton   Kosta
       the John   and   praised   the   Mary   and   insulted   the   Kostas
       'John both praised Mary and insulted Kostas'

We take this contrast to suggest that the two uses of *ke* correspond to separate lexical items, at least synchronically. Thus, the relation of the two meanings is not pragmatically derivable (*pace* Tsiplakou 2005), but possibly due to a diachronic development of the sort discussed in Section 5.

The second difference between *mono* and *ke* concerns the ability of the former but not the latter to follow its associate, when it associates with DPs (cf. [29]). Interestingly, postposed *mono* appears to have the same distribution as (other) floating quantifiers:

[29]   O   Janis   (mono)   irthe   (mono)   sto   party   (mono)
       the   John   only   came   only   to-the   party   only
       'Only John came to the party, no one else did'

[30]   Ta   pedja   (ola)   irthan   (ola)   sto   party   (ola)
       the   kids   all   came   all   to-the   party   all
       'All the kids came to the party'

[31]   O   Janis   (*ke)   irthe   (*ke)
       the   John   also   came   also
       'John (too) came, among others'

It must then be concluded that, as opposed to *mono*, *ke* only surfaces in its base-generated position, as a sister to its associate. Therefore, whatever moves out of the associate of *ke* necessarily precedes it, a fact that makes *ke* an even more straightforward diagnostic for clause structure. [27] already demonstrates the obligatoriness

of verb movement to T, while vP-association in [32] shows that even the non-finite/ non-agreeing verb form used in perfect tenses actually obligatorily moves outside the vP (cf. Alexiadou 1994), arguably to a projection below T, probably Aspect. This is indeed in line with the general consensus that the extended projection of the Greek verb is 'Tense>Aspect>Voice/v>V'.

[32] O   Janis   exi   (*ke)   penepsi   (ke)   ti   Maria
      the   John   has   also   praised   also   the   Mary
      'John has also praised Mary, among the other things he has done'

Then, the fully grammatical version of [23] above in fact involves movement of *mono*, like in [22] and [24].

As far as the interaction of additive *ke* with the subject is concerned, unsurprisingly, in V-initial orders *ke* may associate with the verb phrase, in which case it cannot exclude the external argument, thus again confirming the obligatorily vP-internal status of postverbal subjects:

[33] ?Istera   penepse   ke   o   Janis   ti   Maria
      later   praised   also   the   John   the   Mary
      Presupposition: 'Something other than John praising Mary happened'
      #Presupposition: 'John did something other than praising Mary'

However, in SV-*ke* orders there appears to be no optionality regarding the interpretation of the subject, of the sort observed in [12] and [20]. The preverbal subject is never interpreted as part of the associate. We suspect that this difference between *ke* and *mono* will ultimately be explained by their different prosodic properties, but we have to leave this as an open issue at this point.

[34] Istera   o   Janis   penepse   ke   ti   Maria
      later   the   John   praised   and   the   Mary
      #Presupposition: 'Something other than John praising Mary happened'
      Presupposition: 'John did something other than praising Mary'

Further to its potential usefulness in probing into clause structure, *ke* may also provide us with a novel argument for syntactic decomposition, as it can clearly scope over constituents such as result phrases:

[35] Se afto to garaz to parathiro xtistike anixto / xoris kufomata ke beni panta aeras. Xtes omos ekane tosi zesti pu...
      'In this garage the window was built open / with no casing and always lets fresh air in. Yesterday however it was so hot that...'
      aniksa   ke   tin   porta   ja   na   kani   revma
      opened   also   the   door   for   to   does   draft
      'I also opened the door to create a draft'
      Presupposition: 'Something other than the door was open'

Given its compatibility with all possible heights of attachment within verbal projections, *ke* can be a useful tool for the event structure of different classes of predi-

cates, e.g. verbs with causative alternations, ditransitives but also others, as it appears, for example, to reveal the existence of a 'know' component in the verb *matheno* 'learn':

[36] Kapnizo apo dodeka xronon ala to iksera mono ego…
'I have been smoking since I was twelve, but only I knew it…'

Simera	to	emathe	ki	i	mana	mu.
today	it	learned	also	the	mother	my

'Today my mother learned it too'

To sup up, the generalisation that the associate is determined on the basis of sisterhood is shared by both *mono* and *ke*, with the latter being less flexible in terms of surfacing in positions other than the base-generated one. As such, it is a clear diagnostic for movement out of its associate and, therefore, for the underlying/fine structure of clausal and verbal constituents.

5. On the rise of additive *ke*

The parcicle *ke* in its prototypical use is the conjunction particle in SMG. One of the issues that still remains unresolved as regards additive *ke* concerns its relationship to the regular conjunction particle. The question is whether *ke* has developed out of the semantics for regular conjunction and, if yes, in what sense. We provide a partial answer to this question by suggesting that additive *ke* has developed out of a use of *ke* as a distributive operator.

Besides regular conjunction shown in [37], one finds an alternative conjunctive structure in SMG which involves two uses of the particle *ke*, one attaching to the first and one to the second conjunct, as in [38].

[37]	O	Giorgos	ke	i	Maria	sikosan	to	trapezi
	the	George	and	the	Mary	lift	the	table

[38]	Ke	o	Giorgos	ke	i	Maria	sikosan	to	trapezi
	and	the	George	and	the	Mary	lift	the	table

'George and Mary lifted the table'

The two structures are not equivalent semantically. NP conjunction using regular conjunction can give rise to both a collective as well as a distributive reading. In effect [37] can be interpreted as either [39] or [40].

[39] sikosan(GEM)(T) (where E stands for the sum type· Krifka 1990)

[40] ^{DIST}sikosan(GEM)(T)

In the first instance, what we get is a collective interpretation where the verb is applied to a sum type, in effect the plural entity created out of the individual NPs. In the second instance, a distributive operator applies to the interpretation in [39], providing the distributive semantics via the definition of the ^{DIST} operator shown in [41].

[41] $^{DIST}P = \lambda X_{<sum>}[\forall x_{<e>}[x \in X \land ATOM(x) \rightarrow P(x)]]$

The above definition says that $^{\text{DIST}}$P applies to a sum type, and for every atomic part x of the sum type X, P is true of x. Given these semantics, [40] is transformed to [42].

[42] $^{\text{DIST}}$sikosan(G⊕M)(T)→sikosan(G)(T)∧sikosan(M)(T)

On the other hand, double conjunction seems to be compatible only with a distributive reading. This is easily shown by the unavailability of double conjunction with collective predicates. The collective predicate *antrogino* 'husband and wife' is well compatible with regular conjunction [43a] but infelicitous with double conjunction [43b].

[43] a. O   Giorgos   ke   i   Maria   ine   androgino
         the   George   and   the   Mary   are   husband-and-wife
     b. #Ke   o   Giorgos ke   i   Maria   ine   androgino
         and   the   George and   the   Mary   are   husband-and-wife
         'George and Mary are husband and wife'

The idea we wish to pursue is that the first instance of the particle *ke* in the double conjunction construction is in fact the distributive operator. The overt presence of the operator will then predict that distributive interpretation is obligatory in the case of double conjunction according to fact.

The first thing to note at least for cases where the additive associates with NP arguments, is that the alternative semantics needed are by definition distributive. Let us explain by looking at example [44].

[44]   Ke   o   Giorgos   sikose   to   trapezi
         and   the   George   lifted   the   table
         Presupposition: 'Someone else besides George lifted the table'

Simplifying a little bit, the semantics of the first of the two interpretations where *ke* associates with the subject NP are as follows:

[45]   ‖ [44] ‖ = ∃x. x ∈ ‖ [$_{\text{DP}}$ Giorgos] ‖$_{\text{A}}$. sikose(G)(T)

In effect what we have is a distributive interpretation where the second conjunct is presupposed. The idea is that [44] is not felicitous in a context where the associate and one of its alternatives form a sum. This follows from the Alternative Semantics, given that the two do not interact compositionally. Thus, the associate and its alternative must always be interpreted as a separate propositional conjunction (and not as a sum).

One possible way that additive *ke* might have arisen out of the distributive *ke* is the following. In order for the distributive operator to take effect a plural argument is needed. Now, it might be the case that additive *ke* has arisen out of the incorrect application of distributive *ke* to singular arguments. Thus, in an example like [46], the distributive operator cannot apply, given that we are not dealing with a plural entity:

[46]   #Ke o Giorgos sikose to trapezi (on the distributive *ke* interpretation)

It is perhaps cases like these that gave rise to additive *ke*. In effect, the difference between distributive and additive *ke* is that the former needs a plural entity which then decomposes into its atomic parts and distributes it over the predicate, while in the additive case, distribution is done between an argument, potentially singular, and an alternative of this argument. In effect, the need for distributivity in cases of singular arguments is saved by the introduction of alternatives, thus giving rise to additive *ke* from an earlier distributive operator. The development of the additive *ke*, has the further consequence that in cases of plural arguments we can get ambiguity. Thus, example [47] can be interpreted with *ke* being either distributive or additive.

[47]   Ida   ke   ta   tria   aderfia   su
       saw   and   the   three   brothers   your
       'I saw all three brothers of yours / I saw the three brother of yours too'

Data on the early attestations of the different structures in SMG are needed in order to see whether the assumption put forth here can be further backed empirically. For the moment however, this must be left as a subject for future research.

References

Alexiadou, A. 1994. "Issues in the Syntax of Adverbs". Ph.D. diss. University of Potsdam.

Alexiadou, A. & A. Anagnostopoulou. 1998. "Parametrizing AGR: Word-Order, V-Movement and EPP Checking", *Natural Language and Linguistic Theory* 16, 491–539.

Arvaniti, A. & M. Baltazani. 2005. "Intonational Analysis and Prosodic Annotation of Greek Spoken Corpora", in S.-A. Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*. Oxford: Oxford University Press, 84–117.

Barouni, M. 2012. "Επιρρήματα όψης και μετακίνηση του ρήματος στην ελληνική", *Studies in Greek Linguistics* 32, 267–80.

Beaver, D. & B. Clark. 2008. *Sense and Sensitivity*. Wiley & Blackwell.

Gryllia, S. 2008. *On the Nature of Preverbal Focus in Greek* (LOT dissertation series). Utrecht: LOT.

Krifka, M. 1990. "Four Thousand Ships Passed through the Lock: Object-Induced Measure Functions on Events", *Linguistics and Philosophy* 13, 487–520.

Philippaki-Warburton, I. 1987. "The Theory of Empty Categories and the Pro-Drop Parameter in Modern Greek", *Journal of Linguistics* 23, 289–318.

—. 1998. "Functional Categories and Modern Greek Syntax", *The Linguistic Review* 15, 159–86.

Philippaki-Warburton, I. & V. Spyropoulos. 1999. "On the Boundaries of Inflection and Syntax: Greek Pronominal Clitics and Particles", *Yearbook of Morphology 1998*, 45–72.

Revithiadou, A. 2004. "Prosodic Phrasing and Focus in Greek Declaratives", in G. Catsimali, E. Anagnostopoulou, A. Kalokerinos & I. Kappa (eds), *Proceedings of the 6th International Conference of Greek Linguistics*. Rethymnon: University of Crete. [www.philology.uoc.gr/conferences/6thICGL]

Rooth, M. 1985. *Association with Focus*. Ph.D. diss. University of Massachusetts.

—. 1992. "A Theory of Focus Interpretation", *Natural Language Semantics* 1, 75–116.

Roussou, A. 2000. "On the Left Periphery: Modal Particles and Complementizers", *Journal of Greek Linguistics* 1, 65–94.

Roussou, A. & I. Tsimpli 2006. "On Greek VSO Again", *Journal of Linguistics* 42, 317–54.

Singh, R. 2008. *VP-Deletion, Obligatory* too*, and Focus Semantics*. Ms. MIT.

Tancredi, C. 1990. *Not only* even, *but even* only. Cambridge, Ma.: MIT Press.

Tsimpli, I. M. 1990. "The Clause Structure and Word Order in Modern Greek", *UCL Working Papers in Linguistics* 2, 226–55.

Tsiplakou, S. 2005. "The Greek Connective *ke*: Towards a Unitary Radical Pragmatic Account", *Proceedings of the 28th Annual Penn Linguistics Colloquium*. Philadelphia: University of Pennsylvania, 293–304.