Revisiting the secrets of BEFORE: lessons from Modern Greek

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Introduction

- English BEFORE-clauses (**BC**s) can yield a factual (1), a non-factual (2) and a non-committal (3) inference about the instantiation of the eventuality they describe:

  (1) John ate the salad BEFORE he had dessert.
  $\Longrightarrow$ John had desert. **(factual)**

  (2) The police defused the bomb BEFORE it exploded.
  $\Longrightarrow$ The bomb did **not** explode. **(non-factual)**

  (3) John left the country BEFORE anything **ever** happened.
  $\not\Longrightarrow$ Something did (not) happen. **(non-committal)**

- Do words whose meaning is akin to that of English BEFORE exhibit similar semantic behavior? **Yes**. These patterns are crosslinguistically robust: Italian [2], German [9, 11], Catalan [3], Russian [11] and Japanese [8, 7, *inter alia*], among other languages.
- BEFORE licenses weak Negative Polarity Items (NPIs) in the **BC** (3).
- Two additional phenomena from **Greek BC**s:
  - **Greek BC**s sporadically allow strong NPIs à la [13], that is NPIs which need to be in the scope of an (at least) ANTIADDITIVE operator (4); and
  - they forbid PAST tense marking on their verb and only allow it to surface in the PERFECTIVE NON-PAST (PNP) form (5), a tense-aspect combination that is only sanctioned in NONVERIDICAL contexts in **Greek**, as argued in [6].

  (4) O Iordánis péthane PRIN di / *íde **kanéna**$_{\text{F}}$ egóni tu.
  the Jordan died BEFORE see.PNP / saw **nobody** grandchild his
  'Jordan died before seeing **any at all** of his grandchildren.'

  (5) I Fédra éfige ÓTAN/AFÚ *ftási / éftase i Natasa.
  the Phaedra left WHEN/AFTER arrive.PNP / arrived the Natasha
  'Phaedra left when/after Natasha arrived.'

- This poster aims to address three questions:

(a) How do the inferences in (1) – (3) arise and what is their truth-conditional status?
(b) How is the PNP verbal form in **Greek** related to BEFORE?
(c) How does the licensing of (strong) NPIs take place in **Greek BC**s?

Previous Proposals

Condoravdi (2010)

- The intentional account of [1] relies on STRAWSON DOWNWARD ENTAILMENT (SDE) to account for NPI-licensing in **BC**s.
- [5]: SDE problematic for Greek NPIs.

  (6) Páre **kanéna** milo.
  take.IMP.2SG any.NPI apple.
  'Take some apple or other.' (non-SDE; NPI licensed)

- SDE not necessary condition for licensing of Greek NPI licensing. Imperatives, future tense, modals and exclusive disjunction are not SDE but license NPIs (in Greek).

Krifka (2010)

- Employs a denotation of BEFORE that renders it ANTI-ADDITIVE.
- Problematic! According to [12] predicts licensing of strong NPIs in all **BC**s:

  (7) *I Avgeriní éfage mesimerjanó PRIN meletísi **kanéna**$_{\text{F}}$ máthima.
  the Avgerini ate lunch BEFORE study.PNP none lesson
  (Greek)

A disjunctive proposal

Assumptions

- I restrict my attention to BEFORE when it conjoins two untensed clauses; I ignore BEFORE with a nominal complement.
- Verbs require a time-interval argument of the form $[a, b]$. The type of time intervals will be i and of untensed sentences (temporal properties) $\langle i, t\rangle$.
- The untensed clause $[\mathcal{A}$ BEFORE $\mathcal{B}]$ composes intersectively, i.e. $[\![\mathcal{A} \text{ BEFORE } \mathcal{B}]\!] = [\![\mathcal{A}]\!] \wedge [\![\text{BEFORE } \mathcal{B}]\!]$.
- There is one tense operator scoping above both clauses $\mathcal{A}, \mathcal{B}$.
- Denote by "$\prec$" the relation of temporal precedence and by "inf" the greatest lower bound of a non-empty set of $\mathbb{R}$, with the additional premise that there exists an isomorphism between $\mathbb{R}$ and the set of moments of time $\mathcal{T}$.

Semantics

- With the given assumptions at hand, we provide the semantic denotation for BEFORE:

$$[\![\text{BEFORE}]\!] = \lambda\mathcal{X}_{\langle i,t\rangle}\lambda t_i\Big[\Big((\exists t'' \neq \emptyset)\big[(\inf(t) \prec \inf(t'')) \wedge \mathcal{X}(t'')\big]\Big) \trianglerighteq \Big(\forall t'\big[\neg\mathcal{X}(t')\big]\Big)\Big] \tag{B0}$$

$$[\![\text{BEFORE } \mathcal{B}]\!] = \lambda t_i\Big[\Big((\exists t'' \neq \emptyset)\big[(\inf(t) \prec \inf(t'')) \wedge \mathcal{B}(t'')\big]\Big) \trianglerighteq \Big(\forall t'\big[\neg\mathcal{B}(t')\big]\Big)\Big] \tag{B1}$$

- As a temporal property, [B1] intersectively combines with $\mathcal{A}$ to yield the truth conditions in [B2]:

$$[\![\mathcal{A} \text{ BEFORE } \mathcal{B}]\!] = \lambda t_i\Big[\mathcal{A}(t) \wedge \Big(\Big((\exists t'' \neq \emptyset)\big[(\inf(t) \prec \inf(t'')) \wedge \mathcal{B}(t'')\big]\Big) \trianglerighteq \Big(\forall t'\big[\neg\mathcal{B}(t')\big]\Big)\Big)\Big] \tag{B2}$$

- Denoting the underlined portion of [B2] by $\mathcal{E}$, the utterance time by t_{UT}, the contextually restricted relevant time interval by $\mathcal{T}_c$ and the least upper bound of a set of $\mathbb{R}$ by "sup" we obtain the truth conditions in [B3]:

$$[\![\text{PAST}]\!]\Big([\![\mathcal{A} \text{ BEFORE } \mathcal{B}]\!]\Big) = \exists t \subset \mathcal{T}_c\Big(\big(t \neq \emptyset \wedge \sup(t) \preceq t_{\text{UT}}\big) \wedge \mathcal{E}\Big) \tag{B3}$$

- Informally, this approach, similar in spirit to [10], claims that a sentence $[\mathcal{A}$ BEFORE $\mathcal{B}]$ is true either if event $\mathcal{B}$ occurs at a time after $\mathcal{A}$ or if it is not instantiated at all in the contextually relevant interval.

Inferences

- The default inference is the non-committal. In situations in which there is no discourse-specific information added to the CONTEXT, the exclusive disjunction does not allow resolution in favour of any of the two disjuncts.
- The factual and non-factual inferences arise as contextual entailments from the disjunction elimination rule [DE] below:

$$\frac{\mathcal{X} \trianglerighteq \mathcal{Y} \quad \neg\mathcal{X}}{\mathcal{Y}} \vee E \tag{DE}$$

- In particular, if the meaning of the **BC** is $\mathcal{A} \trianglerighteq \mathcal{B}$ and we can deduce $\neg\mathcal{B}$ from the set of premises containing the common ground and the main clause with its presuppositions and entailments, then by [DE], $\mathcal{A}$ can be concluded.

Perfective Non-Past

- The PNP form of the verb is a weak NPI, per [4], as its presence is parasitic to he presence of a subclass of NONVERIDICAL environments: the future, the subjunctive, the conditional and the optative.
- Caution: NONVERIDICALITY is merely a necessary condition for the licensing of the PNP.
- For example, NEGATION, a prototypical NONVERDICAL operator does not license the PNP.
- This is because of selectional restrictions and additional semantic requirements of the PNP [6].

Negative Polarity Items

- The denotation of BEFORE contains (exclusive) DISJUNCTION, a NONVERIDICAL operator.
- Interestingly, exclusive disjunction does sanction weak NPIs in **Greek** [8]:

  (8) I bíke **kanénas** sto spíti i afísame ta fota anichtá.
  or entered.3SG **anyone** at.the house or left.1PL the lights switched-on.PL
  'Either **someone or other** entered the house or we left the lights on.'

- Strong NPIs: posit that strong NPIs are sanctioned in the presence of strictly nonveridical operators if a negative inference is contextually entailed.

Conclusions

- This paper has reconsidered two analyses of the semantics of **BC**s in light of two phenomena in **Greek BC**s : licensing of strong NPIs and the anti-PAST restriction on the verb.
- I showed that [1] and [10] cannot be extended to **Greek** (at least without modifications) and that a new approach is necessary.
- The proposal in this poster advances a disjunctive semantics for BEFORE that makes **BC**s non-committal by default and renders the factual and non-factual inferences contextual entailments
- The disjunctive semantics makes BEFORE a NONVERIDICAL environment and explains the licensing of weak NPIs in **BC**s and the emergence of the PNP as the tense-aspect combination of the verb of **BC**s.
- The licensing of strong NPIs is achieved through a rescuing mechanism similar to that of [5].

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