THE TYPOLOGY OF MORPHOSEMANTIC INGREDIENTS OF EXCLUSIVE DISJUNCTIONS

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Background. Uegaki (2013) among others, cited therein, proposes to treat alternative disjunctions, at least in Japanese, as disjunctions of polar questions. This paper resumes

The spirit of this paper is strongly decompositional and its aim to meditate on the idea that natural language conjunction and disjunction markers do not necessarily (directly) incarnate Boolean terms like '$\wedge$' and '$\vee$', respectively. Drawing from a rich collection of (mostly dead) languages (Ancient Anatolian, Homeric Greek, Tocharian, Old Church Slavonic, and North-East Caucasian), I examine the morphosemantics of exclusive disjunction (XOR) markers and demonstrate that the morphology of the XOR marker does only contain the (true) disjunction marker with otherwise interrogative meaning (I dub it κ, following Mitrović and Sauerland 2014), as one would expect on the null (Boolean hypothesis), but that the XOR-marker also contains the conjunction marker (I dub it μ).

Superparticles μ and κ. Among others, Mitrović and Sauerland (2014) and Szabolcsi (2015) have recently shown that many languages to employ two morphemes, I call them superparticles, μ and κ (after Japanese *mo* and *ka*), which feature in (a) conjunctive/disjunctive, (b) additive/interrogative and constructions, and (c) universal/existential quantificational respectively, as (1&2) below show.

(1) The μ-series (*mo*)

a. Bill **mo** Mary **mo**
B μ M μ
'(**both**) Bill **and** Mary.'

b. Mary **mo**
M μ
'**also** Mary'

c. dare **mo**
who μ
'**every-/any-**one'

(2) The κ-series (*ka*)

a. Bill **ka** Mary **ka**
B κ M κ
'(**either**) Bill **or** Mary.'

b. wakaru **ka**
understand κ
'Do you understand**?**'

c. dare **ka**
who κ
'**some**one'

Following Mitrović (2014), who tries to unify the syntax and semantics of superparticles μ and κ, I assume that the μ morpheme is an alternative-triggering operator, which also ensures recursive exhaustification of its hosts (structurally, complement/sister). On the other hand, κ is assumed to an interrogative operator, analogous to the inquisitive closure operator (cf. Szabolcsi 2015) in the framework of Ciardelli and Groenendijk (2012), *et seq.*

Morphemic ingredients of strong disjunction. The paper presents novel evidence of complex disjunction marking, which features both μ and κ particles, as the two pairs of examples from Tocharian A and Old Church Slavonic (OCS) show.

(3) **pe** klośäm nāñi
μ ears.DU 1.GEN
'**also** my ears'
(TA 5: 53, b3/A 58b3 in Zimmer 1976, 90)

(4) ckācar **e-pe** śäṃ **e-pe**
sister κ-μ wife κ-μ
'(**either**) sister **or** wife'
(TA 428: a4, b2; Carling 2009, 74)

(5) **i** dšǫ **i** tělo
μ soul (J) μ body
'both body and soul' (CM. Mt. 10:28)

(6) **i-li** otca **i-li** mater'
μ-κ father.ACC (J) μ-κ mother.ACC
'either father or mother' (*CM.* Mk. 7:10)

Given below is the proposed morphosyntactic analysis of the bisyndetic exclusive disjunction, where κ is OCS *-li* / Toch. A *e-* and mu corresponds to OCS *i* and Toch. A *pe*.

(7) $\underbrace{\left[_{\text{JP}} \left[_{\kappa\text{P}} \ \kappa^0 \ \overbrace{\left[_{\mu\text{P}} \ \mu^0 \ \text{coordinand}_1 \ \right]}^{\textit{quantification/NPI/additive}}\right] \left[\ \text{J}^0 \ \left[_{\kappa\text{P}} \ \kappa^0 \overbrace{\left[_{\mu\text{P}} \ \mu^0 \ \text{coordinand}_2 \ \right]}^{\textit{quantification/NPI/additive}}\right]\right]\right]}_{\textit{coordination}}$

Analysis. After making the case for a fine-structure of the Junction Phrase (JP), a common structural denominator for *con-* and *dis-junction* (following den Dikken 2006), the paper proposes a new syntax for XOR constructions involving five functional heads (two pairs of κ and μ markers, forming the XOR-word and combining with the respective coordinand, and a J-head pairing up of coordinands). I then move on to compose the semantics of the syntactically decomposed structure by providing a compositional account obtaining the exclusive component, *qua* the semantic/pragmatic signature of these markers. To do so, I heavily rely on an exhaustification-based system of grammaticised implicatures (Chierchia, 2013) in assuming silent exhaustification operators ($\mathfrak{X}$) in the narrow syntax, which (in tandem with the presence of alternative-triggering κ- and μ-operators) trigger local exclusive implicature computation. The presence of the alternative-triggering and exhaustification inducing μ operator, combined with J and κ, will generate a wide set of alternatives, which yields inconsistent alternative set. To eliminate inconsistencies, I adopt innocent exclusion ($\heartsuit$), assuming to also include Hurford:1974 constraint (HC). We also assume disjunctions have an existential constraint ($\exists$C), which eliminates non-existential disjunct denotata. Assuming disjunctions correspond to alternative sets (Alonso-Ovalle, 2006), then the exclusive component is the only available computational result that the five operators yield (8).

(8) $[\![\text{JP}^+]\!] = \left\{ \begin{array}{ll} [p \wedge \neg\mathfrak{X}(p)], & [\neg p \vee \mathfrak{X}(p)], \\ [q \wedge \neg\mathfrak{X}(q)], & [\neg q \vee \mathfrak{X}(q)] \end{array} \right\}$

a. $\Big\{[p \wedge \neg\mathfrak{X}(p)], [q \wedge \neg\mathfrak{X}(q)]\Big\}$. $\times^{[\because \text{HC}]}$

b. $\Big\{[\neg p \vee \mathfrak{X}(p)], [\neg q \vee \mathfrak{X}(q)]\Big\}$

i. $\{\{\neg p\}, \{\neg q\}\}$ .... $\times^{[\because \exists\text{C}]}$

ii. $\{\{\mathfrak{X}(p)\}, \{\mathfrak{X}(q)\}\}$ .... ✓

We assume that, since the entire set (8) is inconsistent, one of the two maximal consistent subsets is the resulting denotation. The only maximal consistent subset is the one containing two exhaustified disjuncts, delivering the exclusive signature. The full mathematical proof is excluded for reasons of space.

Predictions & summary. Typological evidence from a wide array of languages (Hittite, Tochanian A, (Old Church and modern) Slavonic, Avar (NE Caucasian), Dargi (NE Caucasian), Homeric Greek) will be shown to exhibit the complex morphological ingredients of XOR. This paper will try to make sense out of complex morphology for, what seems to be, a rather simple meaning of 'or' or '$\vee$'. I will not only demonstrate that five operators (heads) are present in the morphosyntactic expression of exclusive disjunction, but will also provide a working analysis of deriving the exclusive component as a computational consequence of five-head/operator ($1 \times \text{J}^0, 2 \times \kappa^0, 2 \times \mu^0$) composition and alternative elimination via a $\heartsuit$-like procedure (including HC) that handles inconsistencies in the generated alternative set.

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