INDEFINITE POLARISATION & ITS SCALAR ORIGIN
(EVIDENCE FROM JAPONIC)

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1 INTRODUCTION & OVERVIEW

Aim . . .

- to investigate the diachronic directions of indefinite semantics,
- to present a cross-genetic pool of evidence for the rise of polarity sensitivity,
- to conjecture a diachronic universal (or a loose version theoreof) in indefinite behaviour.

2 SUPERPARTICLES & BOOLEAN PRIMITIVES: FORMAL≋NATURAL-LINGUISTIC?

- It is has been well investigated by Szabolcsi (2013), and Kratzer and Shimoyama (2002), among many others, that Modern Japanese (MdJ), among other languages, constructs universal and polar terms by combining a *wh*-word and the particle *mo* (henceforth μ).
- Compositionally, the semantic role of the μ particle obtains a universal reading roughly along the following lines: in the structure $[_{\mu P}\ wh\ \mu^0]$, μ^0 obligatorily activates the alternatives of its complement (i.e., the *wh*-abstract with an existential presupposition), and asserts that all alternatives be true.
- What remains formally unexplored, however, is the historical dimension of this compositional behaviour in light of the absence of polar pattern in the earliest stage of the language, since *wh*+μ terms were negation-independent universals, i.e. terms not licensable under negation. This paper shows not only (*i*) that polarity system in Japonic is diachronically derived from scalar universals but also (*ii*) when and how this process took place by adopting Chierchia's (2013) theory of grammaticised scalar implicatures (SIs).

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- Exemplar 'superparticles' in Japanese:
  - Studied by many: Kratzer and Shimoyama (2002), Szabolcsi (2015), Mitrović (2014), Mitrović and Sauerland (2014), among many others.
- We focus on (1c).

(1) The *μ*-series (*mo*/も)

a. CONJUNCTION

ビル (**も**) メアリー **も**
Bill **mo** Mary **mo**
B *μ* M *μ*
'(**both**) Bill **and** Mary.'

b. ADDITIVITY

メアリー **も**
Mary **mo**
M *μ*
'**also** Mary'

c. ∀ QUANTIFICATION

i. 誰 **も**
dare **mo**
who *μ*
'**every-/any-**one'

ii. どの 学生 **も**
dono gakusei **mo**
INDET student *μ*
'**every/any** student'

(2) The κ-series (*ka*/か)

a. DISJUNCTION

ビル (**か**) メアリー **か**
Bill **ka** Mary **ka**
B κ M κ
'(**either**) Bill **or** Mary.'

b. QUESTION

分かる **か**?
wakaru **ka**
understand κ
'Do you understand**?**'

c. ∃ QUANTIFICATION

i. 誰 **か**
dare **ka**
who κ
'**some**one'

ii. どの 学生 **か**
dono gakusei **ka**
INDET student κ
'**some** students'

GOALS (1) show that the *μ*-series has an (anti-)exhaustive semantic core (κ left out today).

(2) explain the diachrony underlying the harmonic compositional system.

3 THEORETICAL PRELIMINARIES: A PRAGMATICS-SYNTAX CONSPIRACY

- The theory of grammaticised implicatures (Chierchia et al. 2012; Chierchia 2004; Chierchia 2013; *int. al.*) convincingly contends that the locus of some inherently pragmatic phenomena lies in narrow syntax.

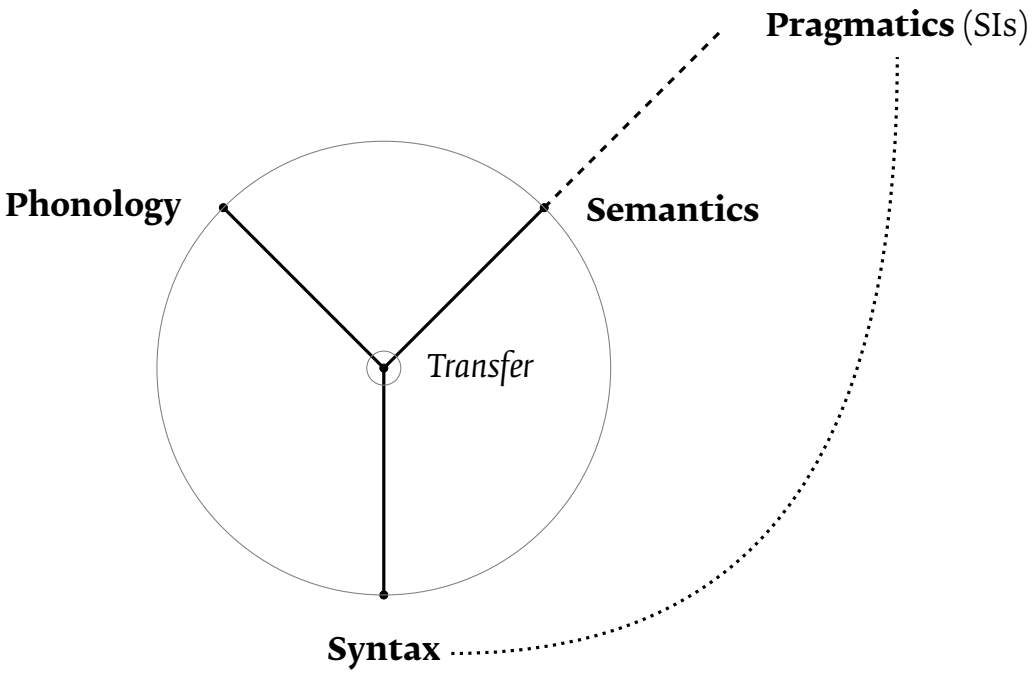


FIGURE 1: *A Y-model of linguistic modularisation, with a pragmatic extension (dashed) and a Chierchian (2013) twist (dotted).*

- In this talk, following a theory of grammati**ci**sed implicatures, I will suggest that polarity sensitivity may diachronically arise as a grammati**cali**sed implicature.
  - Novel evidence from Japonic shows that the Japanese particle-marked polarity system arose from an (existential) SI in Old Japanese (8th c. AD), which I plot as an instance of grammaticalisation in terms of a Minimalist feature system.
  - Under the assumption that such change is cross-linguistically natural, I will suggest that old Indo-European languages show the same diachronic pattern.

3.1 The system: Chierchia (2013)

- Alternative-sensitive inferential processes, such as those associated with implicatures (incl. polarity sensitivity, freedom of choice, scalar implicatures (SI)) or focus (Fox and Katzir 2011, *et seq.*), are anchored in feature specifications on syntactic terminals
- Chierchia's (2013) featural makeup: [δ] for subdomain and [*sigma*] for scalar alternatives, and triggered by virtue of an Agree relation between an exhaustification ($\mathfrak{X}$) operator and the [$\pm\delta, \pm\sigma$]-bearing lexical item.

- alternatives ($\mathfrak{A}$) are lexically grounded

[σ] scalar alternatives

[δ] sub-domain alternatives

- A root-level exhaustifier $\mathfrak{X}$ probes for one or more goals carrying unvalued $[\sigma, \delta]$ features that provide its restriction ($\sigma\mathfrak{A}$,$\delta\mathfrak{A}$)
- Scalar terms (*or, some*, etc.) carry (unvalued) $[\sigma, \delta]$ features which may be targeted by exhaustifiers

  [+] active alternatives

  [−] inactive alternatives
- some lexical items (*any, irgend-*) obligatorily activate alternatives, i.e. its feature specifications cannot be $[-\sigma, -\delta]$
- core component: a syntactically anchored exhaustification operator ($\mathfrak{X}$, or 'silent *only*')

(3) $\mathfrak{X}(p) = p \wedge \forall q \in \mathfrak{A}(p)\Big[[p \nvdash q] \rightarrow \neg q\Big]$
(p is true and no (non-entailed) alternatives (q) to p are true)

3.1.1 An example of t he system in action: ambiguous disjunction

- A disjunctive sentence in English always carries an implicature: either an ignorance implicature (4a) or a scalar implicature (SI) (4b):

(4) Mary saw John **or** Bill.

a. IGNORANCE IMPLICATURE

i. $\mathfrak{X}_{[\varnothing]}$ [Mary saw John **or**$_{[-\sigma,-\delta]}$ Bill.]

ii. $\Diamond[j] \wedge \Diamond[b] \wedge \Diamond[j \vee b] \wedge \Diamond[j \wedge b]$

iii. 'The speaker doesn't know whether Mary saw John and the speaker doesn't know whether Mary saw Bill and the speaker doesn't know whether Mary saw John and Bill.'

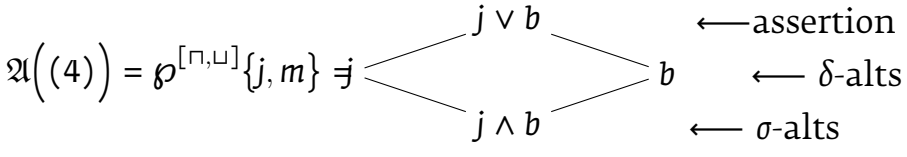
b. SCALAR IMPLICATURE

i. $\mathfrak{X}_{\sigma\mathfrak{A}}$ [Mary saw John **or**$_{[+\sigma,-\delta]}$ Bill.]

ii. $[j \vee b] \wedge \neg[j \wedge b]$

iii. 'Mary saw John or Bill **but not both**.

(5) Two ways of calculating the SI of (4) and deriving the exclusive component:



i. XOR INCARNATION #1 (*global calculation via* $\mathfrak{X}_\sigma$)
$\mathfrak{X}_{[\sigma\mathfrak{A}]}(j \vee b) = [j \vee b] \wedge \neg[j \wedge b]$

ii. XOR INCARNATION #2 (*local calculation via* $\mathfrak{X}_\delta$)
$\mathfrak{X}_{[\delta\mathfrak{A}]}(j \vee b) = \mathfrak{X}(j) \vee \mathfrak{X}(b) \vdash \neg[j \wedge b]$

4 OLD JAPANESE SCALAR SYSTEM

4.1 Obligatory scalarity in the Old Japanese period

- In the earliest OJ corpus (*Man'yōshū* MYS, 8th c.), the [*wh*+*μ*] quantificational expressions were confined to inherently scalar (*σ*) complements, as first noticed by Whitman (2010) .
- Old Japanese: not only is the polar construction absent from the *μ*-system, but μ^0 subcategorised for scalar hosts only.

(6) 以都母 々々々 於母加 古比 須々
itu-**mo** **itu**-**mo** omo-ga kwopi susu
when-*μ* **when**-*μ* mother-GEN yearning by
'I **always, always** think of my mother [i.e. at all times]'
(MYS, 20.4386; trans. by Vovin 2013: 146)

(7) 佐祢斯 [欲能 伊久陀 母] 阿羅祢婆
sa-ne-si [ywo-no **ikuda** **mo**] ara-**neba**
PRE-sleep-PAST [night-SUB **how many** *μ*] exist-NEG-COND
'As there have been **few** nights in which we slept together . . . '
(MYS 5.804a, ll. 46–47)

	# of attestations
SCALAR [*wh*+*μ*]	total 24
itu mo 'when *μ*'	12
iku mo 'how much/many *μ*'	11
NON-SCALAR [*wh*+*μ*]	total 0
ado/na/nado mo 'what/why *μ*'	0
ika mo 'how *μ*'	0
ta mo 'who *μ*'	0

TABLE 1: *Distribution of ±scalar μ-hosts in OJ*

(8) $[\![$[not [all nights]]$]\!]$ = $\begin{cases} \rightsquigarrow \text{some nights} & \text{(scalar reading)} \\ \not\rightsquigarrow \text{no nights} & \text{(polar reading)} \end{cases}$

- the OJ μ-system: $\boxed{\mu[\mu\sigma]}$

4.2 Two changes

4.2.1 The loss of scalarity & the rise of polarity sensitivity in the Classical Japanese period

- change (#1): LOSS OF OBLIGATORILY SCALAR COMPLEMENTATION:

(9) たれ も 見おぼさん事
tare mo mi-obos-an koto
who μ see.INF-think.HON-TENT/ATTR matter
'the fact that **everybody** wanted to see' (HM II:226/2; Vovin 2003: 128)

- change (#2): RISE OF POLARITY SENSITIVITY:

(10) いま は なにの 心 も なし
ima fa **nani**-no kokoro **mo** **na**-si
now TOP **what**-GEN idea μ NEG-FIN
'I do not have **any thoughts** [but of meeting you] now'
(IM XCVI: 168.9; Vovin 2003: 424)

- the Classical (early middle) Japanese μ-system: $\boxed{\mu[\varnothing]}$
  - non-scalar hosts with $[\delta]$ specification ⟶ polarity system kicks in automatically as per Chierchia's (2013) system
- Change in inferential procedure due to featural change (grammaticalisation):

(11) a. $[\![[\neg\ \mu\text{P}]_1]\!] \rightsquigarrow$ SI: $\mathfrak{X}_{\sigma\not\exists}\Big[\neg\big[\ldots\big[_{\mu\text{P}}\quad \exists_{[+\sigma]}\quad \mu\big]\big]\Big] = \neg > \forall \vdash \neg\forall$

b. $[\![[\neg\ \mu\text{P}]_2]\!] \rightsquigarrow$ NPI: $\mathfrak{X}_{\text{D}\not\exists}\Big[\neg\big[\ldots\big[_{\mu\text{P}}\quad \exists_{[+\text{D}]}\quad \mu\big]\big]\Big] = \forall > \neg \vdash \neg\exists$

5 AN EXCURSUS: INDO-EUROPEAN ADDENDUM

- Table 2 suggests that a quantificational split took place in early IE with regards to the interpretation of the expression containing an indefinite *wh*-word and a conjunctive particle like $^{\star}k^{w}e$.
- There existed two interpretations for the indefinite-particle expression:

  - in one group: ⟦*wh*-term+μ⟧ = polar-sensitive ('any');
  - in another group: ⟦*wh*-term+μ⟧ = universal distributive ('every/each')

- consequently, two groups of IE languages:
  - the universal group with Hittite, Celtic, Tocharian, Germanic and Latin, on the one hand, and
  - the polar group with the rest of the IE families on the other.

- even within a single language, Hittite (which was the first to split off the IE core), there is a semantic split:
  - ⟦**-ki**$_{\mu}$⟧(⟦*wh*-term⟧) = polar-sensitive (19a)
  - ⟦**-(y/m)a**$_{\mu}$⟧(⟦*wh*-term⟧) = universal distributive (12)

- no way of knowing which one was the primary function of bare $^{\star}k^{w}e$ and $^{\star}k^{w}e$-like μ particles

(12) 
nu kuitt-**a** arhayan kinaizz[i
J what-μ = ∀ seperately sifts
'She sifts **everything** seperately.' (KUB XXIV.11.III.18)

- Using comparative diachrony, we compare and time the IE quantificational split in light of the evidence from Japonic and conclude that universal form was original and that the first (universal) group of languages is thus more archaic and retentive.

- Using Chierchia's (2013) model of grammaticised implicatures, we will relegate the semantic change from the universal to polar expression to featural semantic change.

5.1 Indo-European superparticles

- Polar group (Indo-Iranian and Slavonic) and the distributive group (rest):

(13) *Vedic & Classical Sanskrit (Indo-Iranian)*

a. न यस्य कश्च तितिरति माया
na yasya [kaś-**ca**] tititarti māyā?
NEG whom.GEN [who.M.SG-μ] able to overcome illusions.PL
'No one [=not **anyone**] can overcome that (=the Supreme Personality of Godhead's) illusory energy.' (*Bhāgavatapurāṇa*, 8.5.30)

(14) *Old Church Slavonic (Slavonic)*

a. ⱀⰻⱍⰵⱄⱁⰶⰵ ⱁⱅⱏⰲⱑⱋⱅⰰⰲⰰⰰⱎⰵ
n-**i**-česo-že otŭvěštavaaše
NEG-μ-WH-REL=nothing answer.IMPF.3.SG
'He answered nothing.' (CM Mt. 27:12)

(15) *Latin (Italic)*

a. auent audire quid quis-**que** senserit
want hear what what-μ think
'they wish to hear what **each** man's (everyone's) opinion was' (Cic. *Phil.* 14,19)

(16) *Gothic (Germanic)*

a. 𐌾𐌰𐌷 𐍈𐌰𐌶 𐌿𐌷 𐍃𐌰𐌴𐌹 𐌷𐌰𐌿𐍃𐌴𐌹𐌸 𐍅𐌰𐌿𐍂𐌳𐌰 𐌼𐌴𐌹𐌽𐌰
jah [hvaz- **uh**] saei hauseiþ waurda meina
and who.M.SG and *pro*.M.SG hear.3.SG.IND words.ACC.PL mine
'And **every** one that heareth these sayings of mine . . . ' (*Codex Argenteus*, Mt. 7:26)

- Superparticle meanings consistent throughout early Indo-European:

LANGUAGE (FAMILY)	μ MARKER	CONJ.	ADDITIVE	DISTR.	NPI	FCI
Old Church Slav. (Slavonic)	*i*	+	+	−	+	−
Ṛgvedic (Indo-Iranian)	*-ca*	+	+	−	+	+
Gothic (Germanic)	*-uh*	+	(+)	+	−	+
Latin (Italic)	*-que*	+	(+)	+	−	+
Hittite (Anatolian)	*-(y/m)a*	+	+	+	−	+
Tocharian B (Tocharian)	*-ra*	+	+	+	−	+
Old Irish (Celtic)	*-ch*	+	(+)	+	−	+
Homeric (Greek)	-τε	+	(+)	−	−	(+)

TABLE 2: *Semantic distribution of the meanings of μ markers across early Indo-European*

- Clearly two groups (shaded), with respect to $[\![wh+\mu]\!]$:
  - $[\![wh+\mu]\!]$ = NPI
  - $[\![wh+\mu]\!] = \forall$

6 TOWARDS THE MEANING OF μ

- CLAIM: μ invokes exhaustification
- essentially comes with two semantic functions:
  i. alternative ($\mathfrak{A}$) activations
  ii. obligatory exhaustification via a silent (Chierchian) exh. operator ($\mathfrak{X}$)

(17) Lexical entry for $[\![\mu^0]\!]$

$$\left[\!\!\left[\begin{array}{c} \mu\text{P} \\ \mu^0 \quad\quad \text{XP} \end{array}\right]\!\!\right] = [\![\mu]\!]^{M,g,w}\Big([\![\text{XP}]\!]\Big)$$
$$= \{[\![\text{XP}]\!]\}^{\mathfrak{A}}$$
$$\rightarrow \mathfrak{X}\Big([\![\text{XP}]\!]\Big)\Big(\{[\![\text{XP}]\!]\}^{\mathfrak{A}}\Big)$$

- the recursive (R above, and below) character of subdomain alternative exhaustification via $\mathfrak{X}$ defined in line with Fox (2007):

(18) $$\mathfrak{X}_{[\delta_{\mathfrak{A}}]}(p) = \begin{cases} \text{polarity reading} & \text{if under } \neg \\ \text{FC reading} & \text{if under } \diamond \\ \text{additive reading} & \text{if } \mathfrak{X} \text{ is iterative } (\mathfrak{X}^2) \\ \bot & \text{otherwise} \end{cases}$$

- Here, we only look at polar and distributive meanings.

POLARITY

(19) *Hittite (Anatolian)*

a. nu-wa ÚL [kuit **ki**] sakti
and-QUOT NEG [who μ] know.2.SG.PRES
'You know *nothing* (=not *anything*)' (KUB XXIV.8.I.36)

(20) $\Big[\mathfrak{X}_{[\delta_{\mathfrak{A}}]}\big[$ You do**n't** know [*what*-μ] $\big]\Big]$ ..... =(19a)

a. ASSERTION: $(= p)$
$\forall x \in \mathfrak{D}\big[\text{THING}(x) \wedge \neg\text{KNOW}(\text{YOU}, x)\big]$

b. $\mathfrak{A}(p) = \Big\{\forall x \in \mathfrak{D}'\big[\text{THING}(x) \wedge \neg\text{KNOW}(\text{YOU}, x)\big] \mid \mathfrak{D}' \subset \mathfrak{D}\Big\}$

c. $\mathfrak{X}_{[\delta_{\mathfrak{A}}]}(p) = p$ ($\because$ all alts. entailed under neg.)

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(21) $[\![\text{who}]\!] = [\![\text{someone}]\!] = \exists x \ldots = a \vee b \vee \ldots$

(22) a. ACTIVE δ-ALTERNATIVES: ..... =(16a)

b. EXHAUSTIFICATION:
$\mathcal{X}^{R}_{[\delta_{\mathfrak{A}}]}(a \vee b) = a \wedge b \quad (\vdash \forall)$

- For a similar implementation and independent arguments, see Bowler (2014) who derives [[and]] from [[or]] in Warlpiri also using recursive exhaustification.

7 CONCLUSION

(23) The μ system of multi-meaningful morphemes shows a uniform semantic core *and* apart from showing a synchronic (cross-linguistic and, indeed, cross-genetic) homogeneity, they seem to exhibit uniform diachronic directional processes and patterns of change.

(24) THE DEVELOPMENT OF THE μ SYSTEM IN IE, as suggested by the history of Japonic:
$\Big[[\forall] \longrightarrow [\text{NPI}]\Big] \longrightarrow \Big[\text{conjunction}\Big]$

- This suggests that the 'distributive group' (Tab. 2) is more archaic.

- Independently compatible with phylogenetic evidence. (Fig. 2)

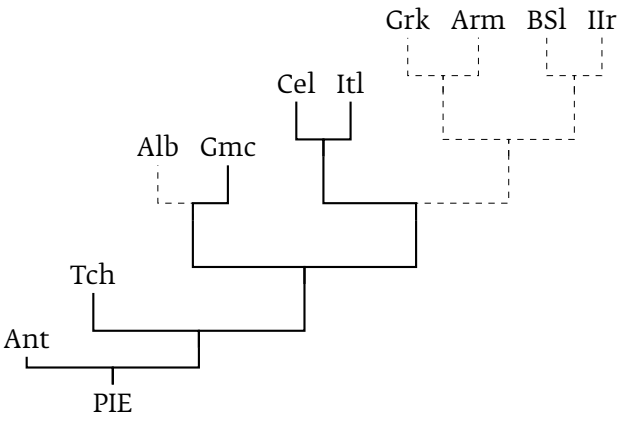

FIGURE 2: *Plotting the phylogeny of the quantificational split of wh-μ terms in IE using the Pennsylvania Tree (Ringe et al., 2002)*

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