

Primitive Functional Elements  
2-11-16, Szabolcsi  
(as of 2-7-16)

### Functional elements exhibit mismatches between form and interpretation

- Carlson 1983, 2006

Tense interpreted higher than where tense morphology is located

John wrote a paper because he had to [\*wrote a paper]

Negative concord, much ado about one thing (OE example)

Ac he ne sealde nanum nytene ne nanum fisce nane sawle  
and he not give none beasts not none fish none souls  
'and he did not give beasts or fish souls'

Latin conjunction -que a second-position clitic in second conjunct

Caesar in Italiam contendit duasque ibi legiones conscribit  
Caesar in Italy reached two-and here legions enrolled

Haplology (loss of one of two adjacent identical/similar syllables or morphemes)

Japanese no+no=no Tohono O'odham, Hale, via Abney  
Kore wa anata no no desu ka? \* 'am [g miisa] weco  
this TOP you POSS ONE be Q DET DET table underneath  
Delete g or extrapose g miisa

Plural marking on determiner/modifier

these doors vs. These have wooden doors

=> learning problem!

=> functional meanings are carried by phonologically null features

higher in the structure, in scope position

passed down to where they are expressed by meaningless morphemes

=> learnable by understanding the meanings

plus aided by some relatively weak domain-specific learning mechanism

**What headway has been made? How to proceed?**

**Two case studies**

**negative concord, (starting) today**

**particle families, subsequently**

## Negative Concord (NC)

- Background: Giannakidou 2006
- N-words are variables/indefinites, “roofed” by a null negative operator. Ladusaw 1992, Zeijlstra 2004 ... 2014, Chierchia 2013
  - Zeijlstra as a response to Carlson [so to speak] pp. 3-4
  - Chierchia embeds Zeijlstra in a grammaticized implicatures theory of NPIs pp. 9-12
- [Some] N-words are universal quantifiers right above negation. Szabolcsi 1981, Surányi 2006 (Hungarian), Giannakidou 2000 (Modern Greek), Shimoyama 2011 (Japanese).
  - Can the hybrid NC system of Hungarian be recast in Zeijlstra’s system? pp. 5-6
- N-words are negative quantifiers. Concord due to negative absorption (=polyadic quantification). Haegeman & Zanuttini 1991, de Swart & Sag 2002, Collins & Postal 2014, 2015. pp. 7-8

Carlson 1983, Marking constituents. Heny & Richards, *Linguistic categories...*, 69-98.

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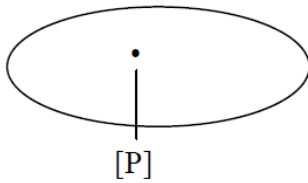
Zeijlstra 2004, *Sentential Negation and Negative Concord*. PhD, Amsterdam.

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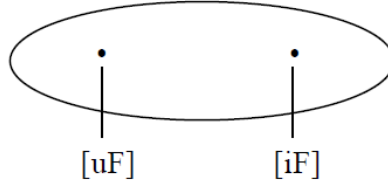
Zeijlstra 2014, The uninterpretability of interpretable features. Kosta et al., *Minimalism and Beyond*, 109-130.

Zeijlstra 2014, <b>On the uninterpretability of interpretable features</b>
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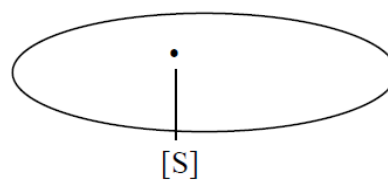
Phonological features



Formal features



Semantic features



[iF] is a purely formal feature.

Lexical items, not features, have semantic interpretations S [also referred to as F].

Learnability ensures a good, but not 1:1, match between items with [iF] and S.

Only “doubling phenomena” (=mismatches) identify formal features [iF] and [uF].

Cartography -- If a formal feature is visibly present in one language, it is present in all languages. Pollock, Beghelli&Stowell, Kayne, Rizzi, Starke, Miyagawa

Building block grammar -- WYSIWYG: ... not necessarily in all languages.

Iatridou, Grimshaw, Bobaljik&Thrainsson, Koenenman, Nilsen, Zeijlstra

### Learning algorithm

1. Assume 1:1 correspondence btw morpho-syntactic M and semantic content S (viz. F).
2. If some M manifests the presence of semantic property F, but cannot be the carrier of F, assign [uF] to M.
3. Assign [iF] to all M that introduce the semantic context manifested by [uF]. Postulate covert Op if needed.
4. Assign [iF] to all M that are responsible for the rest of the grammatical occurrences of [uF] (even if they don't really have F semantics).

Advice #1: A covert Op may be only be postulated if the grammaticality of a sentence cannot otherwise be accounted for.

Advice #2: A covert checker of [uF] must have the semantic content S, but an overt one not necessarily. All that is needed is for it to be learnable that this overt M checks [uF].

- Advice #2 probably presupposes “no homonymy” à la Kayne -- but for what size units?
- If the Zeijlstra-Penka analysis of NC is correct, then some but not all languages have formal features [iNeg]/[uNeg], and some but not all languages have a null Op with “¬” lexical semantics. But, if something with a “¬” lexical semantics automatically counts as a functional “element”, then all languages have that in one way or another.

Zeijlstra-Penka analyses (see Appendix for Chierchia 2013)

not NC <u>Dutch (SAE)</u>	non-strict NC (negative spread)		strict NC <u>Czech (Russian)</u>
	<u>Italian</u>	<u>French</u>	
niet $\neg$	non [iNeg] $\neg$	pas $\neg$	ne [uNeg]
niemand $\neg \exists$	nessuno [uNeg]( $\exists$ )	rien [uNeg]( $\exists$ )	nikdo [uNeg]( $\exists$ )
	Op [iNeg] $\neg$	Op [iNeg] $\neg$	Op [iNeg] $\neg$
		ne npi	

[I'll write N for Neg]

- (1) Gianni non [iN]  $\neg$  ha telefonato  
 (2) Gianni non [iN]  $\neg$  ha telefonato a nessuno [uN]  
 (3) Op [iN]  $\neg$  nessuno [uN] ha telefonato  
 (4) Op [iN]  $\neg$  nessuno [uN] ha telefonato a nessuno [uN]  
 (5) Chi ha telefonato? -- Op [iN]  $\neg$  Nessuno [uN] (vs. \*Alcuno=npi)
- (6) # Molto non ha mangiato Gianni (unless  $\wedge$ ) # `Gianni didn't eat much'  
 (7) # Nessuno molto ha mangiato # `Nobody ate much'
- (8) Op [iN]  $\neg$  Ivan ne [uN] pozvonil  
 (9) Op [iN]  $\neg$  Ivan nikomu [uN] ne [uN] pozvonil  
 (10) Op [iN]  $\neg$  nikto [uN] ne[uN] pozvonil  
 (11) Op [iN]  $\neg$  nikto [uN] nikomu [uN] ne[uN] pozvonil  
 (12) Kto pozvonil? -- Op [iN]  $\neg$  Nikto[uN]
- (13) Op [iN]  $\neg$  mne {dve shljapy/mnogo} ne [uN] nuzhny `I don't need two hats/much'  
 (14) Op [iN]  $\neg$  nikomu [uN] {dve shljapy/mnogo} ne[uN] nuzhny `Nobody needs...'

Why is sentential negation ne obligatory in strict NC? Z and P don't have a good answer.

Zeijlstra: The issue is independent and probably morphological.

Penka: Negative marker must be used as long as compatible with intended meaning.

Discrepancies between  $\neg$  and [iN]

- (15) bez nikoho (16) % bez nikogo (17) \* senki nélkül  
 Cz. without n-body Ru. without n-body Hu. n-body without
- (18) mange pas: $\neg$  (19) ne:npi mange pas: $\neg$   
 (20) \*mange pas: $\neg$  rien [uN] (21) Op [iN]  $\neg$  ne:npi mange pas: $\neg$  rien [uN]
- (27) {dudo [iN] que / prohibieron [iN] que} ... nada [uN]  
 {la última [iN] vez que / más [iN] tarde que} ... nunca [uN]

Penka 2011, 2012: N-words are indefinites. Their licensing is purely syntactic, not unselective binding of variables or Hamblin alternatives. Intervening operators don't disturb it, as seen from split scope. C-command by the negative is the only necessary condition.

- Upward or downward? A debate that I'm not qualified to go into

Preminger & Polinsky 2015, **Agreement & semantic concord: a spurious unification**

Downward valuation (Kayne, Koopman, Merchant, Wurmbrand, Zeijlstra) is not agreement.

Bjorkman & Zeijlstra 2014, **Upward Agree is superior**, response to P&P

HZ p.c., "P&P argue that valuation must always proceed in a top-down way, witnessed by long-distance agreement effects. What we argue is that even in cases of long-distance agreement there is always a higher checker of the probe (a checker that c-commands the probe), but that this checker cannot fully value the probe, and that the complementary valuation can be done by a second, lower goal (provided that this lower goal independently agrees with the probe)."

### A second approach to strict NC: N-words are universals scoping immediately above negation

The common thread in Szabolcsi 1981:528-535, Suranyi 2006 (Hungarian); Giannakidou 2000, 2006 (Modern Greek); and Shimoyama 2011 (Japanese):

N-words fall under the same generalizations concerning linear order and prosody that apply to other quantifiers in the given language. If the position and stress of N-words suggests that they are scoping right above sentential negation, they must be universals; they cannot be existentials within the scope of negation.

Example. Two descriptive generalizations about Hungarian (discounting contrastive topics):

- (i) In the preverbal field, left-to-right order maps to c-command and to scopal order.
- (ii) A stressed operator scopes over a de-stressed one.

NC items precede or follow "sentential negation" nem; in both cases the NC item is stressed.

- |  |  |  |
|--|--|--|
| (a) SENKI nem szólt.<br>noone not spoke                | (b) Nem szólt SENKI.<br>not spoke noone                | (c) SENKI nem szólt SEMMIT.<br>noone not spoke nothing |
| (d) SENKI SEMMIT nem szólt.<br>noone nothing not spoke | (e) Nem szólt SENKI SEMMIT.<br>not spoke noone nothing |  |
| (f) * MINDENKI nem szólt.<br>everyone not spoke        | (g) * Nem szólt MINDENKI.<br>(h) NEM szólt mindenki.   |  |

Conclude: Senki, semmi are  $\forall > \neg$ . They fill the gap left by minden-, \*  $\forall > \neg$ .

### Three difficulties for all theories of “strict NC items as universals”

- Fragments require Merchant-style ellipsis. -- While the obligatoriness of sentential negation is a puzzle for Zeijlstra, its absence from fragments is a puzzle for this theory.

(i) Kit látta? Vagy Mari tudja, vagy SENKI. Kit nem látta?  
 whom saw.2sg or Mari know.3sg or noone whom not saw.2sg  
 Senkit (sem). `Either M knows it, or no one' Senkit (??sem).  
 `I saw no one' `I saw no one'

- Non-specific indefinite N-words, e.g. Itt nincs SEMMI `There's nothing here'.  
 (A possible universal analysis: Every kind is such that it has no realization here.)

- Stressed minimizers preceding nem, compare mnogo `much' in (13)-(14):

(j) Egy SZÓT nem szóltam. (k) SENKI egy SZÓT nem szólt.  
 one word-acc not said.1sg noone one word-acc not spoke  
 `I didn't say a word' `No one said a word'

- Hungarian in fact has a hybrid system, argues Surányi 2006:

	Strict NC items ( <u>s</u> -words)	e.g. <u>senki</u>	[these
<b>NEW</b>	Non-strict NC items ( <u>sem</u> -expressions)	e.g. <u>senki sem</u>	co-occur]

“N-words in Hungarian can be semantically negative or non-negative, and both types are lexically ambiguous between a universally quantified and a non-quantificational interpretation.”

- Can the hybrid system be accommodated in a Zeijlstra-esque theory? Some steps:

Mimic Zeijlstra's Italian	+	Modify Zeijlstra's Slavic
<u>nem</u> [iN]¬		<u>nem</u> is never [uN], always [iN]¬;
<u>senki sem</u> [uN](∃)		<u>senki</u> [uN](∃), unlike <u>senki sem</u> , doesn't make Op "visible";
Op [iN]¬		when it precedes <u>nem</u> , it is in [Spec, NemP], possibly remnant-moved, not in a higher position.

(l) Op [iN]¬ senki sem [uN] szólt { semmit sem [uN] / semmit [uN] / egy szót }

(m) nem [iN]¬ szólt { semmit sem [uN] / semmit [uN] / egy szót }

(n) [NemP (senki egy szót ... [nem [szólt \_\_\_ ]]]

Nem is obligatory in (k)=(n), because it licenses senki and egy szót (Zeijlstra's problem solved). Scope generalization is by and large preserved (preV senki, egy szót do not c-command nem). Fragment answers with s-words require more work.

Main remaining task: Build s-words and sem-expressions compositionally.

**A third approach to the mismatches between N-words and semantic negation:  
(Almost) all N-words are semantic negatives and form polyadic quantifiers**

- **de Swart & Sag 2002: Negation and negative concord in Romance**

Nobody loves no one / Personne (n')aime personne.

- |  |   |
|--|---|
| <p>a. no one is such that they love no one<br/>(everyone loves someone, double negation reading)</p> <p>b. no people stand in the love-relation<br/>(negative concord reading, resumption)</p> | <p>no x [ no y [ x loves y ] ]</p> <p>no &lt;x,y&gt; [ x love y ]</p> |
|--|---|

- **Szabolcsi 2004, PPI--NPI, Section 8: Postal meets de Swart and Sag**

“I propose to identify NPI-licensing with the absorption of the licenser negation and the pertinent negative component of the NPI into a binary resumptive quantifier:<sup>26</sup>

(108) no<x,y> [ [licenser ... x ....] ... [NPI ...y ...] ]

This construal may even help assimilate Postal’s proposal to standard feature checking. It is generally assumed in minimalist theory that features come in interpretable--uninterpretable pairs; one is carried by a head and the other by an XP. Feature checking is effected when the two enter into a specifier--head relation and the uninterpretable member of the pair is deleted. In the present case, both negations are semantically significant, therefore feature checking is effected by binary resumption... Treating negative polarity and negative concord with the same semantic device seems quite natural. After all, they are variations on the same meaning.

<sup>26</sup> I owe the crucial idea to interpret NPI-licensing via n-ary quantification to Dorit Ben-Shalom (p.c.). Ben-Shalom’s own suggestion was to analogize on Moltmann’s (1995, Section 4) treatment for sentences like the following:

[i] No man danced with any woman except with Mary.

[ii] John didn’t see any woman except Mary.

The puzzle that Moltmann addresses is this. Certain exceptives modify only universal or negative quantifiers (*no one but Mary, everyone but Mary, \*some people but Mary, \*most people but Mary*); though see Horn 2000 for some problematic examples. On the standard view, *any woman* is an existential; if so, the above sentences are predicted to be ungrammatical, contrary to fact. Moltmann proposes to form negative (universal) n-ary quantifiers <*no man, any woman*> and <*not, any woman*> and let the exceptive modify these. Although Moltmann never intended this to be a proposal for NPI-licensing, Ben-Shalom suggests that we might assume that in fact the relation between *any woman* and the negative is always established by n-ary quantification. Given my general concerns, however, I will be opting for a different kind of n-ary quantification than Moltmann. This allows me to preserve Postal’s idea that *any*-phrases modifiable by exceptives are underlyingly negative quantifiers.”

(Szabolcsi 2004: 435-6, 438)

- **Collins & Postal 2014, Classical Neg-raising, adopts the Moltmann--Ben-Shalom--Szabolcsi polyadic quantification analysis for NPI licensing.**
- **Collins & Postal 2015, A typology of negative polarity items**

“Parameter A distinguishes whether a language permits or requires the raising of the NEG of a unary NEG NPI of the form  $[_{DP} [_D \text{ NEG SOME}] \text{ NP}]$ . Standard English evidently falls into the first class, and SC, Hungarian, Russian and Ewe fall under the second class.

(104) Parameter A

Standard English: NEG optionally raises from a unary NEG structure.

SC/Ewe: NEG obligatorily raises from a unary NEG structure.

A second parameter, Parameter B, is only defined for languages either requiring or permitting the raising of the NEG of unary NEG NPIs. This parameter distinguishes whether or not such raising leaves a copy NEG.

(105) Parameter B

Standard English: NEG raising (from a unary NEG NPI) does not leave a copy.

SC/Ewe: NEG raising (from a unary NEG NPI) leaves a copy.

A third parameter, Parameter C, distinguishes those languages which allow reversal NEG NPIs of the form  $[_{DP} [_D \text{ NEG} [_D \text{ NEG SOME}]] \text{ NP}]$  from those which do not. Standard English, SC, Russian and Hungarian fall into the first category; Ewe falls into the second.

(106) Parameter C

SC/Standard English: Allows binary NEG NPIs.

Ewe: Disallows binary NEG NPIs.

The typology just described raises various questions which only extensive cross-linguistic research can answer. At issue is the extent to which the logical combinations of the properties at issue can actually be attested. For example, are there languages lacking binary NEG NPIs but which have unary NEG structures whose NEGs cannot raise. This would be a language with negative quantifiers like *nobody*, but no NPIs. Or are there languages lacking binary NEG NPIs where unary NPI NEGs do raise but without leaving a copy. We currently know of no such languages, but we can see no reason why they could not exist. In general then, research is needed to determine the existence or not of languages manifesting the various logical possibilities of the NPI properties characterized by Parameters A, B and C.”



**Appendix, Chierchia 2013, Logic in Grammar (similar to Zeijlstra, with implicatures)**

But if *any* comes with obligatorily active alternatives, they must always be factored into meaning through alternative sensitive operators. Furthermore, if *O*, the null counterpart of *only*, is a standard device for exhaustifying along the lines argued above, then it follows that the semantics for *any* must **always** involve *O*. Let us see what this may mean, starting with grammatical examples such as (27b) repeated here:

exhaustification  
in DE vs. UE

- (41) a. There aren't any <sub>E,D</sub> cookies left  
b.  $O_C$  [There aren't any <sub>E,D</sub> cookies left]

The logical form of (41a) must be (41b), where *O* targets the alternatives associated with *any*. As discussed above, the assertion has the truth-conditional import in (42a), while the alternatives are as in (42b), in virtue of the lexical constraint on *any*:

- (42) a.  $\neg \exists x \in D[\text{cookies}(x) \wedge \text{left}(x)]$   
b.  $\{\neg \exists x \in D'[\text{cookies}(x) \wedge \text{left}(x)]: D' \subseteq D\}$

It is a matter of elementary logic that all the members of the alternative set in (42b) are entailed by the assertion. The entailments of a proposition are part of its truth-conditional content: they cannot be severed from it. This is reflected in the fact that *only/O* can never “exhaustify away” entailments. Thus the result of exhaustifying (42a) is simply equivalent to the plain assertion:

- (43)  $O_C$  [There aren't any <sub>E,D</sub> cookies left] = [There aren't any <sub>E,D</sub> cookies left]  
=  $\neg \exists x \in D[\text{cookies}(x) \wedge \text{left}(x)]$

The situation, however, is very different whenever *any* does not occur within the scope of a DE operator, as for example is the case in a simple positive sentence like:

- (46) a.  $O_C$  [There are any<sub>D</sub> cookies left] =  
b. There are cookies left in the kitchen but  
there are no cookies left in the cupboard and  
there are no cookies left on the kitchen table  
there are no cookies left in the oven . . .

This is clearly contradictory. So our semantics predicts that sentence (45a) is a contradiction. Contradictions are communicatively useless.

So far as implementation goes, we may assume that SNPIs carry a feature that can be checked only by  $O_{ALT}$ , i.e. an exhaustification operator whose restriction includes the whole set ALT of grammatically determined alternatives. I'll notate this feature as  $[[+\sigma, +D]]$ , with double square brackets. The LFs of sentences with strong vs. weak NPIs come to:

strong vs. weak NPIs  
feature checking

- (64) a. i.  $O_{\sigma A} O_{DA}$  [Few $_{[+\sigma, +D]}$  people saw any $_{[+\sigma, +D]}$  movies recently]  
 ii. #  $O_{ALT}$  [Few $_{[+\sigma, +D]}$  people saw Mary in weeks $_{[[+\sigma, +D]]}$ ]  
 b. i.  $O_{\sigma A} O_{DA}$  [No $_{[+\sigma, +D]}$  people saw any $_{[+\sigma, +D]}$  movies recently]  
 ii.  $O_{ALT}$  [No $_{[+\sigma, +D]}$  people saw Mary in weeks $_{[[+\sigma, +D]]}$ ]

The idea is that weak NPIs allow for “separate” exhaustification of D- and  $\sigma$ -alternatives. In (64a.i) and (64b.i) we first exhaustify relative to the D-alternatives. The result is fine, because when this occurs the prejacent is DE with respect to the position of the NPI. Then the scalar implicature is added.<sup>22</sup> Strong NPIs do not have this option;  $O_{ALT}$  must be used, which activates the relevant feature on any intervening XP. This forces exhaustification of both  $\sigma$ - and D-alternatives, which only works with end-of-scale XPs. We assume, furthermore, that  $O_{ALT}$  always factors in presuppositions as in (61a) above. So, from now on:  $O_{ALT}^S = O_{ALT}$  and  $O_{ALT}^W = O_{\sigma A}/O_{DA}$ . The former looks at presupposition +assertion, the latter just at the assertive component.

#### 4.5.2 NC as an overt manifestation of exhaustification

negative concord

- (88) a.  $\|Nessuno_{[[n-D]]}\| = \lambda P \exists x \in D[\text{person}(x) \wedge P(x)]$   
 b.  $\|Nessuno_{[[n-D]]}\|^{ALT} = \{\lambda P \exists x \in D'[\text{person}(x) \wedge n(x) \wedge P(x)]: D' \subseteq D \wedge n \in \text{Num}\}$   
 c.  $[[n-D]]$  is checked by  $O_{ALT}$   
 d. Example:  $O_{ALT}$  [pro non ho visto nessuno $_{[[+n-D]]}$ ]

Modulo the fact that *nessuno* is strong (and that its  $\sigma$ -alternatives are the numerals), its entry is identical to that of *any*. In (88d), we consider a simple example.  $O_{ALT}$  is required in this structure to check *nessuno*'s unvalued feature  $[[n-D]]$ . Negation is required for reasons of semantic coherence; without it, exhaustification would be contradictory. Clearly, more than one N-word can occur in the scope of O, their respective features checked by O in a multiple agree manner. No differences of substance so far with *any*.

Let us now turn to what differentiates N-words from NPIs. As mentioned above, the main peculiarity of N-words is that they can support an abstract form of negation  $\text{NEG}_{[n-D]}$ . I assume that  $\text{NEG}_{[[n-D]]}$  is a functional head governed by the following simple axioms, parallel to those of Zeijlstra (2009):

- (91)  $\text{NEG}_{[[n-D]]}$  must
- i. co-occur with a C-commanding contentful, abstract negative operator  $\neg$  (adjoined, say, at the left edge of its projection);
  - ii. enter an agreement relation in its Spec position with  $\text{DP}_{[[n-D]]}$ .
- (92) a. \*Gianni ha visto nessuno  
Gianni saw N-body
- i.  $\text{O}_{\text{ALT}} [\text{Gianni saw N-body}_{[[+n-D]]}]$
  - ii.  $\text{O}_{\text{ALT}} \neg [\text{Gianni } \text{NEG}_{[[+n-D]]} \text{ saw N-body}_{[[+n-D]]}]$
- b. Nessuno ha telefonato  
N-body called
- i.  $\text{O}_{\text{ALT}} \neg [\text{Nessuno}_{[[+n-D]]} \text{ NEG}_{[[+n-D]]} \text{ called}]$
- (93) a. \* $\text{O}_{\text{ALT}} [\text{Solo Gianni ha visto nessuno}_{[[+n-D]]}]$   
Only Gianni saw N-body
- b. \* $\text{O}_{\text{ALT}} [\text{Non tutti}_{[+\sigma, +D]} \text{ hanno visto nessuno}_{[[+n-D]]}]$   
Not everybody saw N-body
- c.  $\text{O}_{\text{ALT}} [\text{dubito che Gianni abbia visto nessuno}_{[[+n-D]]}]$   
(I) doubt that Gianni saw N-body  
'I doubt John saw anybody'
- d. \* $\text{O}_{\text{ALT}} [\text{dubito} [\text{che ogni}_{[+\sigma, +D]} \text{ ragazzo abbia visto nessuno}_{[[+n-D]]}]]$   
(I) doubt that every body saw N-body

Sentence (93a) is syntactically well formed: the  $[n-D]$  feature is properly checked. However, the result is semantically incoherent due to the fact that *nessuno* is a strong NPI, and hence is sensitive to the presence of presuppositions that disrupt the DE character of the context. Similarly for (93b), a case of intervention. In this case, *not all* generates the implicature that somebody did see someone, which again disrupts the DE character of the context. Turning next to (93c), the verb *dubito* 'doubt' is neg raising (Gajewski 2007) and hence creates an anti-additive environment, which results in a coherent interpretation.<sup>30</sup>

<sup>30</sup> We must assume that in these cases the clausemateness condition on  $\text{O}^S$  is suitably weakened.

- (94) a. i. NIENTE ho mangiato t [non-DN reading]  
 N-thing (pro-I) have eaten  
 ‘I haven’t eaten anything’  
 ii.  $O_{ALT} [\neg [_{FocP} niente_{[[+n-D]]}, i [_{FocP} NEG_{[[+n-D]]} [_{VP} pro$   
 $ho mangiato t_i]]]]$
- b. i. NIENTE non ho mangiato [DN reading only]  
 N-thing (pro-I) not have eaten  
 ‘I have eaten everything’ (lit. ‘Nothing is such that  
 I didn’t eat it’)  
 ii.  $[O_{ALT} [\neg [_{FocP} niente_{[[+n-D]]}, i [_{FocP} NEG_{[[+n-D]]} [_{NegP} pro$   
 $non [_{VP} ho mangiato t_i]]]]]$

more on null NEG  
and  $\neg$

A well-known further difference between N-words and NPIs has to do with constituent answers:

- (97) A: Cosa hai comprato?      B: Niente      B’: \*Alcuna cosa  
 What did you buy?      Nothing      Anything

N-words are acceptable as constituent answers, while NPIs are not. This is presumably to be related to the capacity of N-words of supporting abstract negation. Constituent answers like (97) can be analyzed as elliptical structures of the form:<sup>31</sup>

- (98)  $O^S \neg [ niente_{[n-D]}, i NEG_{[n-D]} [_{VP} \text{pro you bought } t_i] ]$

Summing up, N-words are NPIs that can induce the presence of an abstract form of negation. By “abstract negation” we mean a phonologically null negative operator  $\neg$  associated with an abstract negative head that enters a local agreement relation with N-words. Since N-words, *qua* NPIs, must in turn associate with O, this whole process overtly manifests a form of agreement that is covert when pure NPIs are involved. The main assumptions that tie together NPIs and N-words can be summarized as follows:

- (100) a. N-words are checked by (i.e. agree with) O. [like NPIs]  
 b. A (strong) overt or covert negative operator [like NPIs]  
 C-commanding an NPI/N-word is necessary  
 for semantic coherence.  
 c. Covert negative operators agree with [specific to N-words]  
 N-words.

Primitive Functional Elements  
2-18-16, Szabolcsi  
(as of 2-13)

### Particle Families

Szabolcsi, Whang, and Zu 2014, **Quantifier words and their multi-functional(?) parts**  
Szabolcsi 2015, **What do quantifier particles do?**

#### • The MO family (Hu, Ja, Ma)

- |    |                       |                    |                  |                              |
|----|-----------------------|--------------------|------------------|------------------------------|
| a. | <b>minden-ki</b>      | <b>dare-mo</b>     | <b>aar-um</b>    | everyone/anyone              |
| b. | <b>mind A mind B</b>  | } <b>A-mo B-mo</b> | <b>A-um B-um</b> | both A and B, A as well as B |
|    | <b>A is (és) B is</b> |                    |                  |                              |
| c. | <b>A is</b>           | <b>A-mo</b>        | <b>A-um</b>      | A too/also/as well, even A   |

#### • The KA family (Hu, Ja, Ma)

- |    |                            |                         |                                   |                                     |
|----|----------------------------|-------------------------|-----------------------------------|-------------------------------------|
| a. | <b>vala-ki</b>             | <b>dare-ka</b>          | <b>aar-oo</b>                     | someone                             |
| b. | <b>(vagy) A vagy B</b>     | <b>A-ka B(-ka)</b>      | <b>A-oo B-oo</b>                  | (either) A or B                     |
| c. | <b>vagy száz</b>           | <b>hyaku-nin-toka</b>   | ?                                 | some 100                            |
| d. | <b>val-, vagy-</b>         | --                      | ?                                 | [there-] be                         |
| e. | --                         | <b>dare-ga V...-ka</b>  | --                                | S <sub>wh-q</sub>                   |
| f. | <b>S-e</b>                 | <b>S-ka</b>             | <b>S-oo</b>                       | S <sub>polar-q</sub>                |
| g. | <b>vajon S<sub>q</sub></b> | <b>S<sub>q</sub>-na</b> | <b>S<sub>q</sub>-oo (Kannada)</b> | S <sub>q</sub> , I wonder [adjunct] |

Slade  
2011

	Mod. Sinh	Old Mal	Mod Mal	Tlin	Jap
y/n-ques.	də	-oo	-oo	gé	ka, no, kai, kadooka
wh-ques.	də	-oo	—	sá	ka, no, ndai
wh-indef.	də (aff.), hari (aff.), vat(neg.)	-oo	-oo	sá	ka
decl. disj.	hari (aff.), vat (neg.)	-oo	-oo	khach'u	ka
interr. disj.	də	-oo	-oo	gé... gwáa	[ka]

Distribution of Q-particles in Sinhala, Malayalam, Tlingit, and Japanese

- **More particle families**, well-known or less known -- all call for further research!

	<b>Want-type Free Choice</b>		<b>Concessive Free Ch.</b>		<b>Negative Concord (2 sets)</b>
a.	<b>akár</b> -ki	anyone	<b>bár</b> -ki	anyone	<b>se</b> -n-ki (se) no one
b.	<b>akár</b> A, <b>akár</b> B	either A or B	--		<b>se</b> A, <b>se</b> B neither A nor B A se, B se
c.	<b>akár</b> S is	might even S	<b>bár</b> S	although S	A <b>se</b> ( <b>se</b> A) nor A
d.	<b>akar</b>	want	<b>bár</b> S <sub>cond</sub>	if only S <sub>cond</sub>	

**Progression on a scale** (Löbner, Krifka, Umbach, Feng-hsi Liu, Linmin Zhang; Lucas C. pc)  
 New observation, Szabolcsi: Cross-linguistic parallels wrto stress patterns and optional / obligatory helpers

				<u>as in</u>
e.	még (MINDIG)	hai (SHI)	noch (IMMER)	still raining, still in Saxony, still okay
f.	még MINDIG	hai SHI	noch IMMER	still better (although bad)
g.	MÉG	<b>HAI</b>	NOCH	some more/another beer
h.	MÉG + comp	HAI + comp	NOCH + comp	even taller
i.	(még) "X is	hai "X	noch "X	furthermore (even) a beer
j.	még "X is	--	"X auch noch	even raining (adding insult to injury)
k.	mégis	hai (shi)	--	still/nonetheless/yet, she left
l.	(még) csak	hai zhi	noch	as yet only a toddler (but will grow)
m.	--	haishi	--	tea or coffee? (alternative Q disj.)
n.	<b>meg, megint</b>	--	--	you <b>and</b> I, 2+3, raining <b>again</b>

### • Questions

- (1) Do the roles of each particle form a natural class with a stable semantics? => pp. 3-4
- (2) Are the particles aided by additional elements, overt or covert, in fulfilling their varied roles? If yes, what are those elements? => p. 5
- (3) Why do "particle families" sometimes have gaps (=no overt particle in a role)? => pp. 5-6
- (4) Why are some roles played by etymologically unrelated elements?
- (5) Why do some languages employ etymologically unrelated elements in almost all the roles?
- (6) What other "particle families" are attested? (Ask the same questions about them.)
- (7) Is the set of particles, or the set of associated meanings, in some way coherent?  
 Answer in terms of expressive power?

Re (1), **Do the roles of each particle form a natural class with a stable semantics?**

### First stab

KA expresses lattice-theoretic join ( $\cup$ ) -- cf. union, disjunction,  $\exists$  quantification

MO expresses lattice-theoretic meet ( $\cap$ ) -- cf. intersection, conjunction,  $\forall$  quantification

Kate dances

[[Kate dances]] = powerset of {w: Kate dances in w}, as per InqB

common core of Who dances?, Someone dances, Kate or Mary or Joe dances

[[Kate dances]]  $\cup$  [[Mary dances]]  $\cup$  [[Joe dances]]

whether Kate dances

[[Kate dances]]  $\cup$  [[Kate doesn't dance]]

Everyone dances

[[Kate dances]]  $\cap$  [[Mary dances]]  $\cap$  [[Joe dances]]

Kate doesn't dance

{ $\beta$ : disjoint( $\beta$ ,  $\cup$ [[Kate dances]])}

### Problem: MO and KA aren't two-place operators

See reiterated A-MO/KA B-MO/KA and unary A-MO/KA

John MO Mary MO danced.

`John danced and Mary danced'

János **is**, Mari **is** táncolt.

`John danced and Mary danced'

John KA Mary KA danced.

`John or Mary danced'

Sinhala (Slade 2011; inclusive OR)

Gunəpālə **hari** Chitra **hari** gaməṭə giyā.

`G or C went to the village'

Mary danced. John MO danced.

`John, too, danced'

János **is** táncolt.

`John, too, danced'

John bought 100 KA books.

`John bought some 100 books'

János vett **vagy** száz könyvet.

`John bought some 100 books'

Who came to the party?

John-KA came to the party.

`John or someone'

John-toka-ga paati-ni kita.

John-TOKA-nom party-to came

`For example John came -- I don't want to be specific'

Karttunen 1977

**if/whether** Mary danced                    { {w: dance<sub>w</sub>(m)}, {w: not dance<sub>w</sub>(m)} }  
**if/whether** Mary danced **or** not            { {w: dance<sub>w</sub>(m)}, {w: not dance<sub>w</sub>(m)} }

(...) Mary danced KA                            (Azt kérdelem, hogy) táncoltál-e  
 (...) Mary danced or(=KA) not                (Azt kérdelem, hogy) táncoltál vagy nem  
 (...) Mary danced KA or(=KA) not            (Azt kérdelem, hogy) táncoltál-e vagy nem  
 'Did M dance or not?' and                    'Did you dance or not?' and  
 'whether M danced or not'                    '(I'm asking) whether you danced or not'

## Second stab

MO and KA inhabit contexts interpreted as meets and joins,  
 but they are not meet and join operators themselves. Carlson's problem!  
 Instead, MO and KA impose semantic requirements that are satisfied when their contexts are  
 interpreted, respectively, as the meet (greatest lower bound) and the join (least upper  
 bound) of the contribution of their hosts and something else.

## Basic idea

The unary version is fundamental; exhibits the particle's characteristic behavior.  
 In reiteration cases, each particle does the same thing; they play together,  
 symmetrically. (Kobuchi-Philip 2009 on Japanese mo)

The semantic requirements are **postsuppositions**,  
 = tests or definedness conditions whose checking is delayed until after the at-issue content is  
 established (delay delimited by any externally static operator).  
 The postsuppositions of reiterated particles are checked simultaneously.  
 If nothing in the at-issue content satisfies such a definedness condition, it is imposed on the  
 input context and emerges as a traditional presupposition. (Brasoveanu & Szabolcsi 2013)

Let **X** be the expression hosting **MO/KA**, and **Y** the immediately larger context.

MO requires that another proposition parallel to  $[[X]]$  hold in  $[[Y]]$ .

KA requires that the alternatives in  $[[X]]$  be preserved and boosted in  $[[Y]]$ .

## Formal core of the requirements

MO requires  $[[Y]] < [[X]]$  and KA requires  $[[X]] < [[Y]]$ ,  
 where  $[[C]] < [[D]]$  is one-way inquisitive and informative entailment,  
 $[[C]] \subset [[D]]$  plus  $\text{info}(C) \subset \text{info}(D)$ .

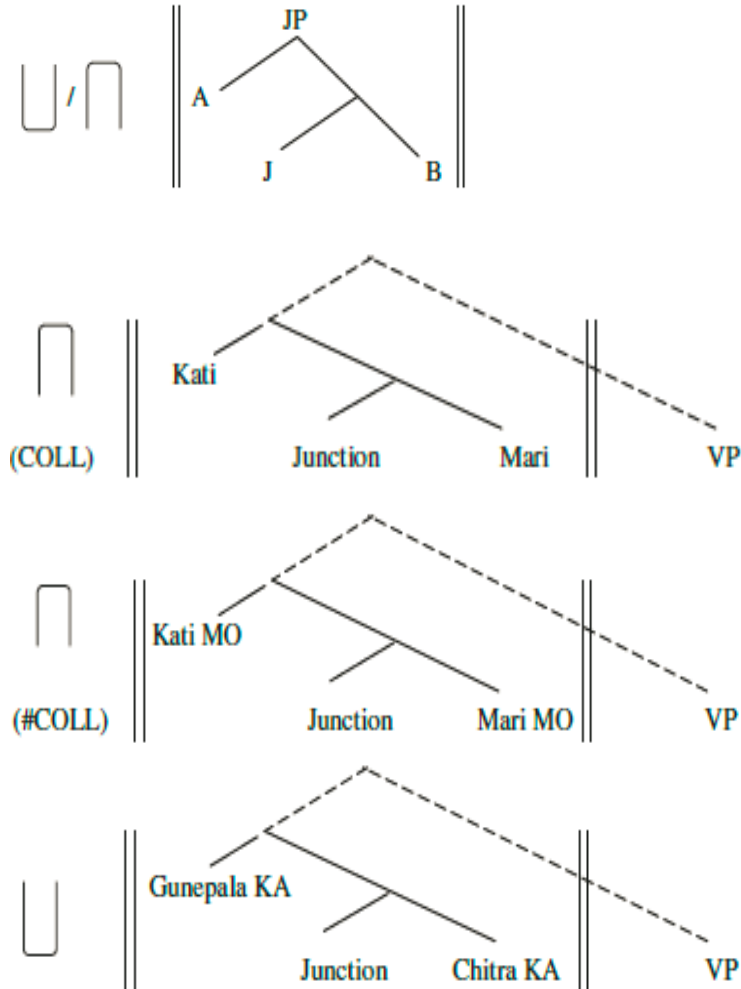
- High-placed null  $Op_{\cap}$  and  $Op_{\cup}$ , similarly to Zeijlstra's  $Op_{\neg}$ ?  
 Possibly, but that wouldn't naturally cover some of the cases, below. => p.6



- Re questions (2) and (3), for the case of pairs

J is Junction (den Dikken 2006), interpreted as a mere pair-former (Winter 1995).

$\cup$  and  $\cap$  are “disembodied semantic operations”.



How do we know which of  $\cap$  and  $\cup$  applies in the interpretation of a given construction? The answer rests on the default status of  $\cap$  in pairs.

**Pairs: default  $\cap$ , KA, and MO**

a. The presence of KA requires that the alternatives in the host proposition  $[[X]]$  be preserved and boosted in  $[[Y]]$ .

b. The presence of MO requires that the host proposition  $[[X]]$  and a parallel  $[[Z]]$  be entailed by  $[[Y]]$ .

c. Elsewhere  $\cap$  applies to pairs.

The default status of  $\cap$  makes the presence of an overt indicator necessary if the pair is to avoid undergoing  $\cap$ . KA **bleeds**  $\cap$ , because  $\cap$  would eliminate possibilities in  $[[X]]$ . KA's requirement is satisfied if the pair undergoes  $\cup$ .

Asyndetic conjunctions exist and are prevalent. Asyndetic disjunctions don't exist.

But crucially, **the only case** in which KA seems cross-linguistically mandated is in **its role as OR**.

- Re two other typical roles of KA, marking **indefinite pronouns** and **wh-questions**.

In many languages KA is either optional or non-existent in one or both of these roles, e.g. in Mandarin (Cheng 1991, Bhat 2000) and German (Gärtner 2009).

- |                                 |                                   |                      |
|---------------------------------|-----------------------------------|----------------------|
| a. zheli que-le <b>shenme</b> . | b. Wer mag <b>was</b> ?           | c. Hänsel Gretel     |
| i. `Something is missing here'  | i. `Who likes <b>something</b> ?' | # `Hansel or Gretel' |
| ii. `What is missing here?'     | ii. `Who likes <b>what</b> ?'     |                      |

**Indeterminate pronouns and default  $\cup$ , counteracted by MO**

- a. If join semantics arises without KA's ministrations, then KA can be absent.
- b. If KA particles are nevertheless present in such cases, then either
- (i) they are more or less redundant, but legitimate because their  $[[X]] < [[Y]]$  requirement is satisfied; or
  - (ii) they compose with further semantic actors, in addition to imposing their  $[[X]] < [[Y]]$  requirement.
- c. The interpretation of expressions with indeterminate pronouns yields a  $\cup$  semantics by default. Therefore MO (or some other indicator) is necessary to avoid  $\cup$  and obtain  $\cap$  for universals. If the choice is MO, it will contribute "distribution to the conjuncts" to the interpretation of the universal it builds.

In Kratzer&Shimoyama (2002) and Shimoyama (2006), the join interpretation of sentences with indefinites and of wh-questions is an automatic product of the Hamblinian alternative-generator analysis of indeterminate pronouns in combination with pointwise functional application. (Inquisitive Semantics replicates this result.)

For all possible worlds  $w$  and variable assignments  $g$ ,

- a. If  $\alpha$  is a branching node with daughters  $\beta$  and  $\gamma$ , and  $[[\beta]]^{w,g} \subseteq D_{\langle\sigma,\tau\rangle}$  and  $[[\gamma]]^{w,g} \subseteq D_\sigma$ , then  $[[\alpha]]^{w,g} = \{f(x) \in D_\tau : f \in [[\beta]]^{w,g} \text{ and } x \in [[\gamma]]^{w,g}\}$ .
- b.  $[[\text{dare-ga odorimasu}]]^{w,g} = \{f(x) \in D_\tau : f \in [[\text{odorimasu}]]^{w,g} \text{ and } x \in [[\text{dare}]]^{w,g}\}$   
 $= \{\lambda w' [\text{dance}(x)(w')]: \text{person}(x)(w)\}$  (when  $k, m, j$  are the persons)  
 $= \{\{w' : \text{dance}_{w'}(k)\}, \{w' : \text{dance}_{w'}(m)\}, \{w' : \text{dance}_{w'}(j)\}\}$   
 $= \{\{w' : \text{dance}_{w'}(k)\}\} \cup \{\{w' : \text{dance}_{w'}(m)\}\} \cup \{\{w' : \text{dance}_{w'}(j)\}\}$

• **Why just require  $\cap$  and  $\cup$  flavored meanings, and not have null  $\text{Op}_\cap$  and  $\text{Op}_\cup$  in syntax?**

For  $\cap$ : Do cross-sentential and cross-speaker conjunctions involve  $\text{Op}_\cap$  in syntax?

A man walks in the park.  $\boxed{? \text{Op}_\cap}$  He whistles.

I'm tired. --  $\boxed{? \text{Op}_\cap}$  I'm tired too.  $\boxed{? \text{Op}_\cap}$  Et tu, Brute? Then fall, Caesar.

For  $\cup$ : Compare indefinites and wh-questions, above; sets are formed w/o  $\cup$ -step.

Kayne & Szabolcsi, Primitive Functional Elements  
3-10-16 Szabolcsi (as of 3-1)

### (How) Are Universal Quantifiers Built From Indefinites?

- **Some working hypotheses considered so far**

Words are not morpho-syntactic building blocks, nor compositional semantic primitives.

No homonymy in functional elements, unless shape identity is provably(?) accidental.

Every language has the same inventory of primitive functional elements.

Every primitive functional element must be pronounced in at least one language.

Functional elements exhibit 'mismatches' of form and interpretation.

- **Universals and indefinites, classically**

*every* NP  $\lambda Q \forall x [NPx \rightarrow Qx]$

*some* NP  $\lambda Q \exists x [NPx \wedge Qx]$

Are those indeed two incommensurable operators?

- **Evidence is accumulating, piece by piece... dust hasn't settled yet**

Algebraic semantics: Universals can be built from indefinites by  $\cap$  (meet, intersection)

Distributive universals factored into a specific indefinite and a Dist head

Universals as recursively exhausted indefinites; bonus: NPI readings of indefinites

More compositionality: additive particle MO in distributive conjunctions and universals

MO as a recursive exhaustifier

*Every* as *ever* + *y*: syntax, universal free choice, subtrigging

Boolean Semantics / Inquisitive Semantics (Keenan & Faltz 1985, Ciardelli & Roelofsen 2014)

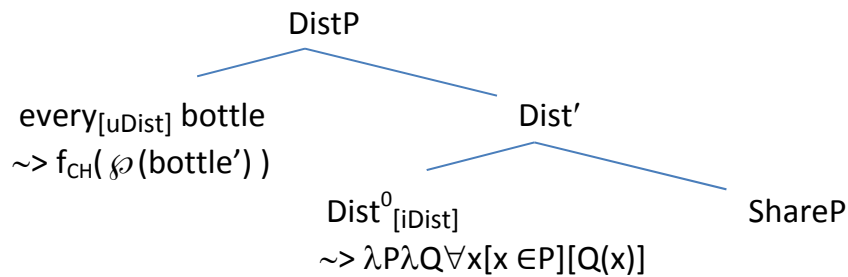
**[[everyone]] and [[someone]] built from the  
Montagovian individuals (GQs) by  $\cap$  and  $\cup$**

$\alpha \cup \beta \cup \gamma$   
...  
 $\alpha \quad \beta \quad \gamma$   
...  
 $\alpha \cap \beta \cap \gamma$

**[[everyone]] built from  
[[who]]=[[someone]] by  $\cap$**

$[[\text{someone}]] = \lambda P_{\langle e, \langle \langle s, t \rangle, t \rangle \rangle} \cdot \underbrace{\{ \{ w: P_w(x) \}: x \in D_e \}}_{\downarrow}$   
 $= \lambda P. \wp \{ w: P_w(a) \} \cup \wp \{ w: P_w(b) \} \cup \wp \{ w: P_w(c) \}$   
 $= \lambda P. \{ \wp \{ w: P_w(a) \}, \wp \{ w: P_w(b) \}, \wp \{ w: P_w(c) \} \}$   
 $[[\text{everyone}]] = \lambda P_{\langle e, \langle \langle s, t \rangle, t \rangle \rangle} \cdot \underbrace{\cap \{ \{ w: P_w(x) \}: x \in D_e \}}_{\downarrow}$   
 $= \lambda P. \wp \{ w: P_w(a) \} \cap \wp \{ w: P_w(b) \} \cap \wp \{ w: P_w(c) \}$

**every is not  $\forall$  itself** (Beghelli & Stowell 1997; Szabolcsi 1997, 2010)



where  $f$  is a contextually salient choice function that picks a particular subset of *bottle'*



Some bottles are empty.  
Every bottle is empty.

- Mei-(yi)-ge xuesheng \*(**dou**) mai-le shu. Dist<sup>0</sup> pronounced as *dou*  
 every-one-cl student DOU buy-perf book  
 `Every student bought a book' (Lin 1998: 219)
- [RefP ... [DistP ... [CountP ... [VP ... Hungarian, surface  
           *minden* NP                      \**minden* NP  
           every                                  every  
           *több mint 6* NP                      *több mint 6* NP                      distributivity varies  
           more than 6                              more than 6                              with position  
           ONLY DISTRIBUTIVE                      +/- DISTRIBUTIVE

**Hebrew *kol*: a universal quantifier as an undercover existential** (Bar-Lev & Margulis 2013)

KOL [+ abstract restrictor] as an NPI	KOL as a distributive universal	KOL as a free choice item, FCI
lo nigram kol nezek NEG was.caused KOL damage `No damage was caused'	kol yeled higi'a KOL boy arrived `Every boy arrived'	X raSai le'exol kol ugiya X is.allowed to.eat KOL cookie `X is allowed to eat any cookie'

Singular, uninflected, non-definite KOL is an alternative-activating existential w/o scalar alternative

$a \vee b$                       ← assertion  
 $a$                                        $b$                       ← (sub)domain alts  
 $a \wedge b$                               ← scalar alt

KOL is obligatorily recursively exhaustified (à la Fox 2007, IE).

It shows its true colors in decreasing, DE contexts, where exhaustification has no effect.

Exhaustification without negating a scalar alternative yields a universal, or an FCI in a modal context.                      => see pp. 5-6

### What do quantifier particles do? (Szabolcsi 2015), recap from 2-18

The MO family (Japanese, Malayalam, ...)

- |    |                           |                           |                        |
|----|---------------------------|---------------------------|------------------------|
| a. | A- <b>mo</b>              | A- <b>um</b>              | A too / even A (VP)    |
| b. | A- <b>mo</b> B- <b>mo</b> | A- <b>um</b> B- <b>um</b> | A as well as B (VP)    |
| c. | dare- <b>mo</b>           | aar- <b>um</b>            | everyone / anyone (VP) |

- Each particle acts on its own and always does the same thing. (a) is representative.
- MO requires another proposition parallel to its host to hold in the immediate context. The requirement is a postsupposition: checking slightly delayed.
- In (b), each MO's requirement is satisfied by the host of the other.
- [[dare]]=[aar]=[who]/[[someone]] has a  $\cup$  semantics by default, as per Alternative/Inquisitive Semantics.
- In (c), requirement imposed by MO forces  $\cap$  for universals.
- Cross-linguistically, questions and indefinites sometimes have no particle [*Wer mag was?*, *zheli que-le shenme(?)*], but universals have MO or some other marker.

### Morphosyntactic Atoms of Propositional Logic (Mitrović 2014)

Pulls together and analyzes Indo-European and Japanese diachronic and synchronic data. Builds on Szabolcsi 2015, but adds implicatures, following Chierchia 2013.

Main innovation (from our perspective):

The MO particle (his  $\mu$ ) is a recursive exhaustifier  $\exists^2$ , i.e. an anti-exhaustifier. 'A too' comes about as 'A and not only A'.

Pending details, this will explain how wh+MO expressions can act as polarity items in the presence of DE operators, as free choice items in the presence of modals, and as universals in the absence of these, as attested in Mitrović's languages, Hebrew, and Hungarian.

Those are all interpretations that propositions containing a wh-indefinite (disjunction) can receive when recursively exhaustified (dep. on what domain/scalar alternatives are used).

### Morphological composition of universals in Malayalam and English (after Jayaseelan 2011)

oor-oo	kuTTi-(y)um	<u>ever</u> uch a parrosshe	'every/any parish'	14/15th
one one	child-CONJ	<u>ever</u> ilka nede	'every/any need'	OED
'each child' (Malayalam)		<u>eu</u> eryche a soule	'every/any soul'	

### Modality and possession in NPs (Postma & Rooryck 1996)

<u>every vs. *each</u>	<i>his every thought</i>	<i>'whatever thought he may have ever had'</i>	
<u>"open-endedness"</u>	<i>She watched his every step/move.</i>		} (Szabolcsi 1994)
	<i>his every girlfriend / *aunt</i>		
	<i>the every whim of Mrs. Thatcher (BrE)</i>		
<u>light verbs</u>	<i>They had every reason to...</i>		
<u>limited modifiers</u>	<i>They made every (financial/imaginable/*laudable) effort to...</i>		

English *ever-y* < OE *aefer* *ylc*  
 ever wh-pron cf. what-ever

(29) [IP John<sub>i</sub> 's [NumP [A<sup>0</sup> ever] -y ] [CP [move] Ø<sub>C0</sub> [IP PRO<sub>i</sub> t<sub>ever</sub> Ø<sub>make</sub> t<sub>move</sub> ]]]

"Raised *ever* is licensed by infinitival modality and receives a universal interpretation on a par with [*Anyone can see that*]. The universal quantification then licenses the NPI *ever* within the embedded clause ... responsible for the open-ended interpretation."

Contrast with *every car* and *every move of John's*: no relative clause; *ever-y* still in Num

(34) [NumP [[*ever*] -y] [AP t<sub>ever</sub> [NP car]]]

(45) [CP [TP [[*ever*] -y] [AP t<sub>ever</sub> [NP move]]]] of [AGRP John's ]]

English *every* corresponds to adjectivally-inflected *elk-* and *ieder-* in Dutch [see Leu 2009]

<b>every</b>	<i>elk-e / ieder-e</i> jongen	(D <sup>0</sup> +A <sup>0</sup> ) infl.	* as bare DPs	NPI-licensors
<b>each</b>	<i>elk / ieder</i> van de jongens	(D <sup>0</sup> ) uninfl.	✓ as bare DPs	not NPI-licensors

### Universal free choice

with an overt modal in scope: *Any fool can add two and two.*

in episodic, via subtriggering: *John talked to any fool \*(who was / may have been there).*

Plausibly, Postma & Rooryck's (29) for *John's every move* [...] spells out silent subtriggering.

- \**John's every aunt* runs afoul of Dayal's Fluctuation Constraint, similarly to
- \**Yesterday John talked to any fool* (episodic, no modal, no subtriggering)
- \**John read any of these books that were on the table* (Partitive Restriction)

=> see pp. 7-8 (Chierchia 2013: Ch 6)

- **Appendix for Bar-Lev & Margulis 2013**

Exhaustification à la Fox 2007, with Innocent Exclusion.

KOL's alternatives cannot be "pruned" (=selectively ignored).

KOL ("some") introduces subdomain alternatives, but lacks a scalar alternative ("every"), thereby it has a chance to get a universal reading ("every" is not negated).

**Beware that different authors define alternatives and exhaustification differently.**

(a)  $\text{EXH}(\text{Alt}(p))(p)(w) \Leftrightarrow p$  is true in  $w$ , and every excludable alternative of  $p$  is false in  $w$ .

(b)  $\text{Excludable}(p, \text{Alt}(p)) = \bigcap \{ \text{Alt}(p)' \subseteq \text{Alt}(p) : \text{Alt}(p)' \text{ is a maximal set in } \text{Alt}(p) \text{ such that } \{p\} \cup \{\neg q : q \in \text{Alt}(p)'\} \text{ is consistent} \}$

- Recursively strengthened existential is a universal:  $\text{EXH EXH}(avb) = a \wedge b$ .

EXH EXH kol boy arrived

avb

Alt(avb) = {avb, a, b}

Note:  $a \wedge b$  is not an alternative.

EXH Alt(avb) [avb] = avb

B/c neither a, nor b is excludable. Why? {avb,  $\neg a$ } and {avb,  $\neg b$ } are both consistent sets and maximal as such. But  $a, b \notin \{avb, a\} \cap \{avb, b\}$ .

If  $a \wedge b$  were in  $\text{Alt}(avb)$ , it would be excludable;  $\text{EXH}(avb)$  would be  $(avb \wedge \neg(a \wedge b))$ .

**Alt<sub>EXH</sub>Alt(avb) [avb] =**

{ EXH Alt(avb) [avb], EXH Alt(avb) [a], EXH Alt(avb) [b] } =  
{ avb,  $a \wedge \neg b$ ,  $b \wedge \neg a$  }

EXH **Alt<sub>(EXH\_Alt(avb))</sub> [avb]** [ EXH Alt(avb) [avb] ] =

EXH {avb,  $a \wedge \neg b$ ,  $b \wedge \neg a$ } [ avb ] =

Now  $a \wedge \neg b$  and  $b \wedge \neg c$  are negated; the negations are consistent with avb.

$avb \wedge \neg(a \wedge \neg b) \wedge \neg(b \wedge \neg a) =$

$avb \wedge (a \rightarrow b) \wedge (b \rightarrow a) =$

$avb \wedge (a \leftrightarrow b) =$

$a \wedge b$

- Recursively strengthened modal existential is free choice: EXH EXH  $\diamond(avb) = \diamond a \wedge \diamond b$

Cf.  $\diamond(avb) \wedge (\diamond a \leftrightarrow \diamond b) =$   
 $\diamond a \wedge \diamond b$

If  $\diamond(a \wedge b)$  had been in  $\text{Alt}(\diamond(avb))$ , it would have been excludable and negated.

If FCI-KOL has an additional  $\diamond(a \wedge b)$  reading, that is pragmatic, or comes from  $\diamond \text{EXH EXH } (avb)$ .

- Recursive strengthening doesn't affect  $\exists$  in a DE environment: EXH EXH  $\neg(avb) = \neg(avb)$

$\neg(avb)$

$\text{Alt}(\neg(avb)) = \{\neg(avb), \neg a, \neg b\}$

EXH  $\text{Alt}(\neg(avb)) = \neg(avb)$

$\neg(avb)$  entails  $\neg a$  and  $\neg b$ , they aren't negatable.

Ditto if EXH is re-applied to this.

- **Interesting further questions re NPI *kol* and universal *kol***

What nouns? B-L&M say that kol yeled is not a good NPI. Further from Itamar Kastner, p.c.:

lo xaSti kol ka'as klapa-v

not I.felt KOL anger towards-him

'I didn't feel any anger towards him'

lo nidreSet kol afiya/biSul/tigun

not required KOL baking/cooking/frying

'No baking/cooking/frying is necessary'

? hexanti et ha-mana ha-zo bli kol sukar/kemax

I.prepared ACC the-dish the-this without KOL sugar/flour

'I made this dish without any sugar' [not crashingly bad; not my language, says IK]

? lamadti algebra linearit bli kol more/sefer/ezra

I.learned algebra linear without KOL teacher/book/help

'I learned linear algebra without any teacher/book/help' [any kind of]

What is the role of definiteness, plurality, and inflection? from B-L&M

KOL [+ definite (plural) restrictor] is unambiguously universal

X (lo) pagaS et kol ha-yeladim

X NEG met acc KOL the-children

'(It is not the case that) X met all the children'

Inflected KOL is unambiguously universal (I. Francez, p.c.)

(lo) kulam po

NEG KOL.3.m.pl here

'(Not) everyone is here'



- **Appendix for Universal free choice and subtrigging** (Chierchia 2013, Ch 6)  
[Chierchia's O is a relative of Fox's EXH]

$\exists$ -FC      You can bring anyone to the prom. ✓ But not more than one person.  
*irgendein, un NP qualsiasi/qualunque*

$\forall$ -FC      The door is open, anyone can come in. # But not more than one person.  
*qualsiasi/qualunque NP*

Fluctuation constraint on free choice (from Dayal 2009, to be reconstructed in C's terms)

For [any NP VP] to be felicitous, it has to be the case that if [any NP VP] is true in  $w_{act}$ , then  
 $\neg \exists X[\forall w' \text{ Accessible}(w_{act}, w') \rightarrow \lambda x[\text{NP}(w')(x) \wedge \text{VP}(w')(x)]=X$ .

Recursive exhaustification of  $a \vee b$  yields a contradiction if scalar alternative  $a \wedge b$  is present.

High-scope modal  $\diamond(a \vee b)$  eliminates the contradiction  
and yields  $\exists$ -FC:  $\diamond a \wedge \diamond b \wedge \neg \diamond(a \wedge b)$ .

How to get  $\forall$ -FC? Not a plain universal, and *or* 'and' not productive, and needs modals.

[Note that the data Chierchia considers are not the same as Bar-Lev & Margulis's.]

Don't eliminate scalar alternative, instead, weaken scalarity via low-scope modal in either the scope or the restriction of FCI, and tweaking modal bases.

!!! If  $A \not\subseteq B$ , it is nonetheless possible that (i)  $A \subseteq B \cup E$  and that (ii)  $A \cap D \subseteq B$ .

(i) Enlarge the scope:

*Any student could speak* (p.316)

$\forall x \in D [\text{student}(x) \rightarrow \diamond_{FC} \text{ speak}(x)]$       assertion + FC-implicature  
 $\wedge \neg \forall x \in D [\text{student}(x) \rightarrow \diamond_{SC} \text{ speak}(x)]$       SC implicature

is a contradiction if the modal bases for two  $\diamond$ s, SC and FC, are the same.

It need not be a contradiction if the modal bases are different, and  $SC \subset FC$ .

'For every student there is a world in FC in which he speaks, although there are worlds in  $SC \subset FC$  in which not every student speaks'

(ii) Shrink the restriction, subtrigging:

*Yesterday John saw any student that happened to be around* (pp. 317-319)

$\forall x \in D [(\text{student}(x) \wedge \square_{FC} \text{ around}(x) \rightarrow \text{saw}(j,x))]$       assertion + FC-implicature  
 $\wedge \neg \forall x \in D [\text{student}(x) \wedge \square_{SC} \text{ around}(x) \rightarrow \text{saw}(j,x)]$       SC implicature

is a contradiction if the modal bases for two  $\diamond$ s, SC and FC, are the same.

It need not be a contradiction if the modal bases are different, and  $SC \subset FC$ .

'For every student who is around in all worlds in FC, John saw him, although there are students who are around in all worlds in  $SC \subset FC$  whom John didn't see'

Based on Italian subjunctives, Chierchia assumes that the restriction has a  $\square$  modal.

Quer (1998), who was among the first to discuss how in Romance there is a strong preference for the use of the subjunctive in the modifier of a universal FCI, as the following minimal pair illustrates:

- (32) a. Ieri Gianni ha parlato con qualunque studente volesse/voleva/ ??ha voluto parlargli  
 Yesterday Gianni spoke with any student that want-SUBJ/  
 want-IMP/want-PERF speak-to-him
- b. Ieri Gianni ha parlato con ogni studente che volesse/voleva/  
 ha voluto parlargli  
 Yesterday Gianni spoke with every student that want-SUBJ/  
 want-IMP/want-PERF speak-to-him

Partitive restriction (Dayal): By indexically fixing the set of books, the set cannot fluctuate:  
 ?? John read any of these books that were on his desk.  
 (?) John read any of the books that were on his desk.

- In summary,

Wide-scope constraint (WSC)

[any NP MODAL ... ] preferred to [MODAL any NP ...], unless scalarly uneconomical.  
 Alternatives in a rich scale collapse when FCI scopes over modal.

Modal containment (MC)

$SC \subset FC$  modal base for scalar impl (subj)  $\subset$  modal base for free choice impl (obj)

O MODAL FCI<sub>[scalar, Dom]</sub> ...  $\Rightarrow$   $\exists$ -FCI when rich, >2-member scale

O FCI<sub>[scalar, Dom]</sub> MODAL ...  $\Rightarrow$   $\forall$ -FCI when 2-member scale

MC predicts  $\checkmark$  FC-any with  $\diamond$  in its scope  
 O [any student] [ $\diamond$  YP]

Any student can speak.

$\checkmark$  FC-any with  $\square$  in its restriction  
 O [any student  $\square$  XP] [YP]

He talked to any student who was here.  
 “subtriggering”

Primitive Functional Elements  
3-31-16, Szabolcsi

**Hybrid negative concord, universals vs. existentials,  
and the syntax and semantics of particles, combined**

**Part I**

p.1 comes from the 2-11 handout and was discussed then (here for recap).  
pp. 2-3 come from the 2-11 handout, but will be first discussed today.  
p.4 is new, and sets the stage for 4-7.

**Negative concord items as indefinites ( $\exists$ ) within the immediate scope of negation (Zeijlstra)**

not NC <u>Dutch (SAE)</u>	non-strict NC (negative spread)		strict NC <u>Czech (Russian)</u>
	<u>Italian</u>	<u>French</u>	
niet $\neg$	non [iNeg] $\neg$	pas $\neg$	ne [uNeg]
niemand $\neg\exists$	nessuno [uNeg]( $\exists$ )	rien [uNeg]( $\exists$ )	nikdo [uNeg]( $\exists$ )
	Op [iNeg] $\neg$	Op [iNeg] $\neg$	Op [iNeg] $\neg$
		ne npi	

[I'll write N for Neg]

- (1) Gianni non [iN]  $\neg$  ha telefonato
- (2) Gianni non [iN]  $\neg$  ha telefonato a nessuno [uN]
- (3) Op [iN]  $\neg$  nessuno [uN] ha telefonato
- (4) Op [iN]  $\neg$  nessuno [uN] ha telefonato a nessuno [uN]
- (5) Chi ha telefonato? -- Op [iN]  $\neg$  Nessuno [uN] (vs. \*Alcuno=npi)
- (6) # Molto non ha mangiato Gianni (unless  $\wedge$ ) # `Gianni didn't eat much'
- (7) # Nessuno molto ha mangiato # `Nobody ate much'
- (8) Op [iN]  $\neg$  Ivan ne [uN] pozvonil
- (9) Op [iN]  $\neg$  Ivan nikomu [uN] ne [uN] pozvonil
- (10) Op [iN]  $\neg$  nikto [uN] ne[uN] pozvonil
- (11) Op [iN]  $\neg$  nikto [uN] nikomu [uN] ne[uN] pozvonil
- (12) Kto pozvonil? -- Op [iN]  $\neg$  Nikto[uN]
- (13) Op [iN]  $\neg$  mne {dve shljapy/mnogo} ne [uN] nuzhny/o `I don't need two hats/much'
- (14) Op [iN]  $\neg$  nikomu [uN] {dve shljapy/mnogo} ne[uN] nuzhny/o `Nobody needs...'

Why is sentential negation ne obligatory in strict NC? Z and P don't have a good answer.

Zeijlstra: The issue is independent and probably morphological.

Penka: Negative marker must be used as long as compatible with intended meaning.

**A second approach to strict NC: N-words are universals immediately above negation**

The common thread in Szabolcsi 1981:528-535, Surányi 2006 (Hungarian); Giannakidou 2000, 2006 (Modern Greek); and Shimoyama 2011 (Japanese):

N-words fall under the same generalizations concerning linear order and prosody that apply to other quantifiers in the given language. If the position and stress of N-words suggests that they are scoping right above sentential negation, they must be universals; they cannot be existentials within the scope of negation.

Example: Hungarian

Two descriptive generalizations (Szabolcsi 1997, 2010, Kiss 2002, Brody & Szabolcsi 2003, a.o.):

- (i) In the preverbal field, left-to-right order maps to c-command and to scopal order.
- (ii) A stressed operator scopes over a de-stressed one.

NC items precede or follow “sentential negation” nem; in both cases the NC item is stressed.

- (a) SENKI nem szólt.  
noone not spoke
- (b) Nem szólt SENKI.  
not spoke noone
- (c) SENKI nem szólt SEMMIT.  
noone not spoke nothing
- (d) SENKI SEMMIT nem szólt.                      (e) Nem szólt SENKI SEMMIT.  
noone nothing not spoke                      not spoke noone nothing
- (f) \* MINDENKI nem szólt.                      (g) \* Nem szólt MINDENKI.  
everyone not spoke                      (h) NEM szólt mindenki.

- Conclude: Senki, semmi are  $\forall > \neg$ . They fill the gap left by minden-, \*  $\forall > \neg$ .
- Four difficulties for all theories of “strict NC items as universals”

Bad: Fragments require Merchant-style ellipsis. -- While the obligatoriness of sentential negation is a puzzle for Zeijlstra, its absence from fragments is a puzzle for this theory.

Kit láttál? whom saw.2sg Senkit (sem). 'I saw no one'	Vagy MARI tudja, or Mari know.3sg 'Either M knows it, or no one'	vagy SENKI. or noone	Kit nem láttál? whom not saw.2sg Senkit (??sem). 'I saw no one'
--	--	-------------------------	--

Worse: Non-specific indefinite N-words, e.g. Itt nincs SEMMI 'There's nothing here'.  
(A possible universal analysis: Every kind is such that it has no realization here.)

Worst: Stressed minimizers preceding nem are clearly within the scope of negation

Egy	SZÓT	nem	szóltam.	SENKI	egy	SZÓT	nem	szólt.
one	word-acc	not	said.1sg	noone	one	word-acc	not	spoke
'I didn't say a word'				'No one said a word'				

Worrisome: "Must scope immediately above negation" an unusual requirement (legitimate?)

- Hungarian in fact has a hybrid system, argues Surányi 2006

	Strict NC items ( <u>s</u> -words)	e.g. <u>senki</u>	[happily co-occur in
<b>NEW</b>	Non-strict NC items ( <u>sem</u> -expressions)	e.g. <u>senki sem</u>	the same sentence]

"N-words in Hungarian can be semantically negative or non-negative, and both types are lexically ambiguous between a universally quantified and a non-quantificational interpretation."

In what follows, I take Surányi's insight and important new data as a point of departure, but do not adopt his analyses.

- (i) He postulates many ambiguities; I'm aiming for a system without ambiguities.
- (ii) On 3-10, we saw that many universals are undercover existentials. Starting from existentials (indefinites, disjunctions) jibes well with the Zeijlstra/Chierchia approach to negative concord. I'll pursue that strategy.

- Can the hybrid system be accommodated in a Zeijlstra-esque theory?

Main obstacle: Zeijlstra analyses non as  $[iN]_{\neg}$  and ne as  $[uN]$ . We need a single nem.

### Mimic Zeijlstra's analysis for Italian, and modify his analysis for Slavic

nem  $[iN]_{\neg}$  *There is no  $[uN]$  sentential negation in Hungarian.*

Op  $[iN]_{\neg}$

senki sem  $[uN](\exists)$  *Capable of supporting null negation (Op).*

senki  $[uN](\exists)$  *Not capable of supporting null negation (Op).*

Op  $[iN]_{\neg}$  senki\_sem  $[uN]$  szólt { semmit\_sem  $[uN]$  / semmit  $[uN]$  / egy szó }t }

When senki precedes nem, it sits in [Spec, NemP], possibly remnant-moved.

nem  $[iN]_{\neg}$  szólt { semmit\_sem  $[uN]$  / semmit  $[uN]$  / egy szó }t }

[NemP senki egy szó... [nem [szólt \_\_\_ ]]]

Nem is obligatory, because it negates senki and egy szó (Zeijlstra's problem eliminated).

Scope generalization is by and large preserved (preV senki, egy szó do not c-command NemP).

Fragment answers with s-words require more work, not to be undertaken here.

### Main tasks for 4-7

Build s-words and sem-expressions compositionally.

Explain why senki sem, but not senki, is capable of supporting null negation.

Develop these in a uniform system for Hungarian NPIs and various particle constructions.

- Preparation: some background considerations

**Etymologically**, sem (more colloquially, se) derives from is+nem = too+not. The negation part has not been semantically active for a long time. Se(m) is similar to the MG negative concord item ou+te = not+and, which contains the now defunct classical ou `not' (compare MG dhen `not'); see Giannakidou 2007 (Landscape of even).

Both sem and oute have scalar uses, esp. with még and kan (remember még--hai--noch?) but are not generally scalar. As paired particles they are never scalar, similarly to neither X nor Y.

I will treat se(m) as an **allomorph** of is `too' within the immediate scope of clause-mate negation. That will make is a positive polarity item, and se(m) a negative concord item.

You will recognize is `too' as one of the **MO particles** in Szabolcsi 2015. For simplicity, here I will treat is as asserting  $(p \wedge q)$ , where  $p$  is the host proposition (prejacent) and  $q$  a salient focus-alternative of  $p$ ,  $p \neq q$  (as in Ahn 2015).

However, following the insights of Bar-Lev & Margulis 2013, Mitrović 2014, I assume that is `too' is in fact an **alternative-activating disjunction**, which obtains its conjunctive flavor via recursive exhaustification in a non-decreasing environment. Roughly,

$$\begin{aligned} \text{EXH}(\text{EXH}(p)) &= \text{EXH}(p \text{ and only } p) = p \text{ and not only } p = p \text{ too} \\ \text{EXH}(\text{EXH}(p \text{ or } q)) &= p \text{ and } q \end{aligned}$$

Is retains its disjunctive interpretation in a decreasing environment (exhaustification vacuous). Note that the allomorph se(m) only surfaces right under clause-mate negation. So is can occur in the remaining decreasing environments and participate in forming negative polarity items similar to Progovac's Serbo-Croatian I-NPIs; and it definitely does.

for	Ha nem segít Kati <b>is</b> , végünk.	$\neg (\text{EXH}(\text{EXH}(p \vee q))) \rightarrow \text{doom} =$
	if not helps Kate too, we_are_doomed	$\neg(p \wedge q) \rightarrow \text{doom}$
	`(Mary is helping.) If Kate doesn't help too, we're doomed'	

fun	Ha nem segít Kati <b>se</b> , végünk.	$\text{EXH}(\text{EXH}(\neg(p \vee q))) \rightarrow \text{doom} =$
	if not helps Kate either, we_are_doomed	$(\neg p \wedge \neg q) \rightarrow \text{doom}$
	`(Mary isn't helping.) If Kate doesn't help either, we're doomed'	

Hybrid negative concord,  
 universals vs. existentials,  
 and the syntax and semantics of  
 particles, combined: Part II

slides + prose  
 4-7-16, Szabolcsi  
 as of 4-5

1

## What is the difference between particles mind and is?

(MO family, cf. 2-18)

- a. **minden**-ki      dare-**mo**      everyone (anyone)
- b. **mind** A **mind** B      } A-**mo** B-**mo**      A as well as B  
     A **is** (és) B **is**      }
- c. A **is**      A-**mo**      A too/even A

2

Phrase-internal, precede host  
 reiterated, or with indet. pronoun

- [Mind Kati mind (pedig) Mari]      protestál `protest'.
- [Akár Kati akár (pedig) Mari]      protestál-**hat**.
- [Vagy Kati vagy (pedig) Mari]      protestál.
- [Se Kati se (pedig) Mari]      **nem** protestál.

Also OK (neg) V [prt Kati prt (pedig) Mari]

- mindenki      everyone
- akárki      anyone, free choice [-HAT `may']
- valaki      someone
- senki      no one (strict NC)

3

is and se as clausal heads  
 follow host [=focus in their spec]

- (Kati protestál.) Mari is protestál.
- (Kati nem protestál.) Mari se protestál.
- Kati is protestál (és) Mari is protestál.
- Kati se protestál (és) Mari se protestál.
- Kati is \_\_\_\_\_ (és) Mari is protestál.
- Kati se \_\_\_\_\_ (és) Mari se protestál.

4

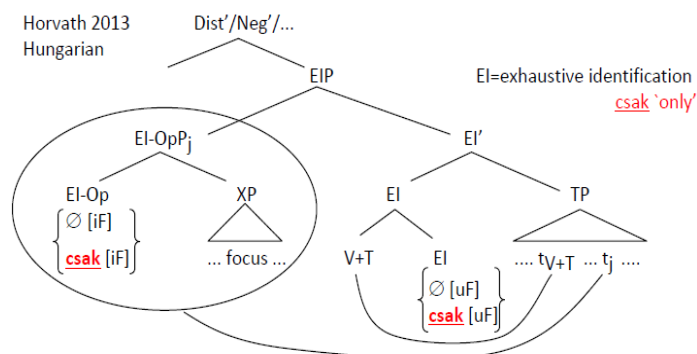
↑ No clausal head behavior

- \* Mind Kati protestál  
     ((és) mind Mari protestál).
- \* Akár Kati protestál-hat  
     ((és) akár Mari protestál-hat).
- # Vagy Kati protestál  
     (vagy Mari protestál).
- # Se Kati nem protestál  
     ((és) se Mari nem protestál).
- All \* (neg) V [prt Kati] ((és) neg verb [prt Mari])

-- Exx with # may have a structure that's OK.

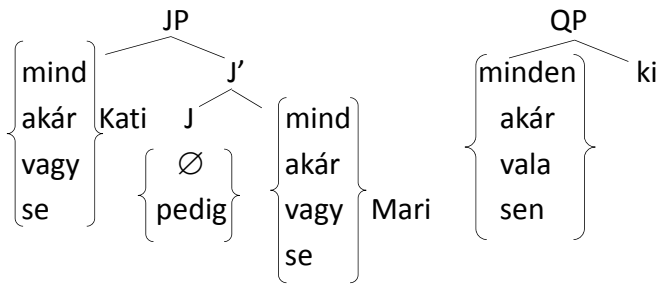
5

compare  
**Csak** KATI megy haza -- phrase-internal operator  
 KATI megy **csak** haza -- head on the clausal spine



6

## Phrase-internal particles



'the set of properties that every/any/some/no element of {Kati, Mari} / {x: human x} has'

7

## Clausal head particles

- operate on whole proposition
- associate with focus

[ ... [<sub>ISP/SEP</sub> KATI Is/Se [ ... [<sub>TP</sub> ... Kati ... ]]]]

ditto [ ... [<sub>SEP</sub> SENKI Se [ ... [<sub>TP</sub> ... senki ... ]]]]

- paired propositions are postsuppositional (delay)
- seemingly small coordinations (K is/se M is/se) involve ellipsis

8

## PPI—NPI—NCI classes

### PPIs

valaki  
vagy<sub>(∅)</sub> Kati vagy Mari  
Kati is ... (Mari is ...)

### NPIs (in non-NC environ.)

valaki is ... , akárki is ...  
egy szót is ...

### strict NCIs

senki  
se Kati se Mari

### non-strict NCIs

senki se ...  
Kati se ... (Mari se ...)  
egy szót se ...

9

## NC allomorphs of $\exists$ and $\forall$

existential: vala-, (vagy) \_ vagy \_

its allomorph when  
in immediate scope of

clause-mate negation: sen-, se \_ se \_

disjunction(?) +/-scalar: is (clausal head)

its allomorph when  
in immediate scope of

clause-mate negation: se (clausal head)

10

## Strict vs. non-strict NCIs

- Senki and se Kati se Mari always require nem (don't support null negation), because their relevant NC-feature (Chierchia...) is trapped within their QP/JP.
- Senki se and Kati se support null negation, because features of the clausal head Se are visible above/below it.
- Alternatively, the head Se plays the role of "null syntactic negation" in Hungarian. As before,  $\neg$  must operate on the proposition, but it is not a null syntactic element.

11

## Outlook

- Allomorphy?
- Phrase-internal and clausal particles in other languages?
- Are all particles expected to have both phrase-internal and clausal head versions?
- Disembodied (not: syntactic but null)  $\neg$ ? Compare disembodied (not: syntactic but null) join  $\cup$  and meet  $\cap$  in Szabolcsi 2015.

See <http://ling.auf.net/lingbuzz/003114> for a more fully developed version.

12