

The Busy Lives of Quantifier Particles

<http://www.esslli2014.info/program/week-one>

Preliminary slides, July 19

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Monday

The MO and the KA families.
Do the particles have a stable semantics
across their varied environments?
Meet and Join.

Main reading

Szabolcsi, Whang, & Zu (2014), Quantifier words
and their multifunctional(?) parts

http://www.ling.sinica.edu.tw/files/publication/i2014_1_6501.pdf

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Are words compositional primitives?

• Compositionality

The meaning of a complex expression is a function of the meanings of its parts and how they are put together.

• What are the “parts”?

- Are **phonological words** necessarily parts, even minimal (primitive) parts, that a compositional grammar should take into account? If not, what parts are to be recognized?

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Lessons from Distributed Morphology and some versions of Minimalist Syntax

Distributed Morphology

(Halle & Marantz 1994; Harley 2012; Bobaljik 2012; many others)

- Hierarchical syntactic structure all the way down to roots; Late Insertion of vocabulary items.
- The phonological word has no special status in semantic interpretation.

Some versions of Minimalist syntax

(Julien 2002; Kayne 2005a,b, 2010; Koopman 2005; Koopman & Szabolcsi 2000; Sigurðsson 2004; Starke 2009; many others)

- Phonological words correspond to potentially large chunks of syntactic structure.
- Especially when remnant movement is allowed, many words do not even correspond to complex heads created by head movement in syntax.

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Moral

- Words are not distinguished building blocks in syntax or morphology.
- Then, we do not expect words to be distinguished building blocks for compositional semantics.
- Specifically, “words” are not compositional primitives. Complex meanings cannot be simply written into the lexical entries, without asking how the parts of the word contribute to them. Parts of a “word” may also reach out to interact with, or operate on, the rest of the sentence. (Szabolcsi 2010, 2012; Szabolcsi, Whang, & Zu 2014)

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Our topic

- In many languages, the same particles build quantifier words and serve as connectives, additive and scalar particles, question markers, existential verbs, etc.
- Are these particles “the same” across the varied environments? If so, what is their stable meaning?
- Or, are they lexicalized with various distinct meanings that merely bear a family resemblance?

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In many languages, **the same particles** that build quantifier words **serve as** connectives, additive and scalar particles, question markers, existential verbs, etc.

| | Japanese | Hungarian |
|--|----------|------------------------|
| <i>every(one), every, both, as well as, too, even, ...</i> | -mo | <i>mind is</i> |
| <i>some(one), some, or, whether, at least/about, there is, I wonder, ...</i> | -ka | <i>vala/vagy/vaj-e</i> |

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| | |
|-----|----------------------|
| -mo | mind is |
| -ka | vala/vagy/vaj- -e |

Are these particles “the same” across the varied environments?

If so, what is their stable meaning?

Allomorphy and suppletivism in particles are in the background, but not discussed today.

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A sampler from Hungarian

ki

who, “indeterminate pronoun”

| | | |
|--------------------------------------|---|--|
| <i>vala-ki</i> someone | X <i>vagy</i> Y X or Y | <i>vagy</i> száz about 100 |
| <i>val-ó</i> be ₃ -ing | <i>vagy-on</i> (> <i>van</i>) be ₃ indicative | <i>vaj-j-on</i> let be ₃ : I wonder |
| <i>mind-en-ki</i> everyone | <i>mind</i> X <i>mind</i> Y X as well as Y X <i>is</i> (és) Y <i>is</i> X as well as Y | Ti <i>mind</i> VP. you all VP X <i>is</i> X too |
| <i>se-n-ki</i> no one | <i>se</i> X <i>se</i> Y neither X nor Y | X <i>se</i> nor X NC items |

Japanese *ka* somewhat similar to *vala/vagy*

| | |
|--|---|
| <i>dare-ka</i> | ‘someone’ |
| gakusei-no <i>dare-ka</i> | ‘some student’ (=one of the ...) |
| hyaku-nin-to- <i>ka</i> -no gakusei | ‘some 100 students’ (=approximately) |
| Tetsuya- <i>ka</i> Akira(- <i>ka</i>) | ‘Tetsuya or Akira’ |
| <i>Dare-ga</i> odorimasu <i>ka</i> | ‘Who dances?’ |
| Akira-ga odorimasu <i>ka</i> | ‘Does Akira dance?’ |

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Japanese *mo* somewhat similar to *mind*

| | |
|-------------------------------------|---|
| <i>dare-mo</i> | ‘everyone _{HLL} /anyone _{LHH} ’ |
| <i>dono-hito-mo</i> | ‘every/any person’ |
| hyaku-nin- <i>mo</i> -no gakusei | ‘as many as 100 students’ |
| Tetsuya- <i>mo</i> Akira- <i>mo</i> | ‘Tetsuya as well as Akira’ |
| Tetsuya- <i>mo</i> | ‘too/even Tetsuya’ |

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How prevalent and robust are these clusters?

Haspelmath 1995:

The Japanese clusters are typologically rare.

Cable 2010:

Japanese KA represents massive homonymy.

Counter-arguments in Jayaseelan 2001—2008;

Slade 2011; Szabolcsi, Whang & Zu 2014.

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| | Mod. Sinh | Old Mal | Mod Mal | Tling | 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] |

Slade
2011

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

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Cross-linguistic distribution, syntactic feature account (Slade 2011)

ModColl Sinhala Tlingit Japanese

| CATEGORY | FEATURE(s) | CATEGORY | FEATURE(s) | CATEGORY | FEATURE(s) |
|------------|----------------|------------|--------------------------|-------------|--------------------------|
| C-INT | uQ[], iInt[+] | C-INT | uQ[], iInt[+] | C-INT | uQ[], ulnt[+] |
| wh-pronoun | | wh-pronoun | | wh-pronoun | iWh[+] |
| də | iQ[+] | sá | iQ[+] | ka | iQ[+] |
| hari | | gé | iQ[+], uJunc[], ulnt[] | no | iQ[+], ulnt[] |
| J | | khach'u | uJunc[], iInt[-] | ndai | iQ[+], ulnt[], uWh[] |
| | | J | ijunc[+], ulnt[] | kai/kadooka | iQ[+], ulnt[], uJunc[] |
| | | | | J | ijunc[+] |

E.g. uQ[] C-INT needs iQ[+] də/sá/ka.

The latter help, but don't need, C-INT. (Not quite true...)

Hari neither helps, nor needs C-INT.

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KA-families and MO-families are prevalent and robust.

Questions:

- Do the roles of each particle form a natural class?
If yes, what is the **unifying syntax/semantics**?
- Are the particles **aided by additional elements**, overt or covert, in fulfilling their varied roles?
If yes, what are those elements?

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A promising perspective: MO is meet, KA is join

Everyone dances iff
 Kate dances, **and** Mary dances, **and** Joe dances
Someone dances iff
 Kate dances, **or** Mary dances, **or** Joe dances

- Universal quantification and conjunction are special cases of lattice-theoretic **meet** (glb).
- Existential quantification and disjunction are special cases of lattice-theoretic **join** (lub).

(Gil; Haspelmath; Jayaseelan; Szabolcsi 2010: Ch 12)

Meet and join

[A, ≥] is a partially ordered set iff ≥ is a reflexive, transitive, anti-symmetrical relation on the set A.

- For any subset X of A, b ∈ A is a lower bound for X iff for every x ∈ X, x ≥ b.
The greatest of these, if there is one, is the **glb** (infimum) of X.
- For any subset X of A, c ∈ A is an upper bound for X iff for every x ∈ X, c ≥ x.
The least of these, if there is one, is the **lub** (supremum) of X.

Let a two-element subset of A be {d,e}.

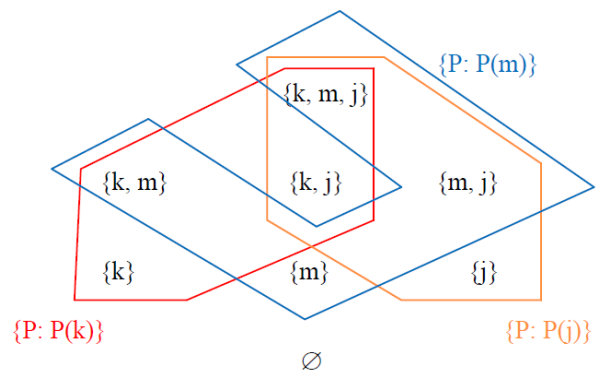
The **glb** (infimum) of {d,e} is the **meet** of d and e, written as **d ∧ e**.
 The **lub** (supremum) of {d,e} is the **join** of d and e, written as **d ∨ e**.

Conjunction of propositions (p ∧ q) and intersection of sets (P ∩ Q) are special cases of **meet**.

Disjunction (p ∨ q) and union (P ∪ Q) are special cases of **join**.

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[[Kate]] = {P: P(k)}, etc.



Universals and existentials

[[**everyone**]] is the intersection of the sets of properties of the individuals in the universe

$\{P: P(k)\} \cap \{P: P(m)\} \cap \{P: P(j)\}$ or, equivalently
 $\{P: P(k) \wedge P(m) \wedge P(j)\}$

[[**someone**]] is the union of the sets of properties of the individuals in the universe

$\{P: P(k)\} \cup \{P: P(m)\} \cup \{P: P(j)\}$ or, equivalently
 $\{P: P(k) \vee P(m) \vee P(j)\}$

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Aside

Algebraic semantics of scope taking

- Szabolcsi & Zwarts (1993) develop a theory of scope taking based on the explication of quantifiers and other operators in terms of Boolean operations.
- They exploit it to account for so-called weak island (intervention) effects, e.g.,

How did everyone behave?

ok everyone>how : pair-list

ok independent : uniformity presupposition

how>everyone : wants to compute the overlap of manners, and that's not possible (denotation domain of manners has at most join, but not meet or complement)

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Some difficulties, 1

How does KA as a question-marker fit in?

Questions denote the sets of their possible answers.

Does Kate dance? à la Hamblin/Karttunen

$\{p: p = \text{dance}(kate) \vee p = \text{not-dance}(kate)\}$

'the set of propositions that are identical to "Kate dances" or to "Kate doesn't dance"'

Who dances? à la Hamblin/Karttunen

$\{p: p = \text{dance}(k) \vee p = \text{dance}(m) \vee p = \text{dance}(j)\}$

'the set of propositions that are identical to "Kate dances," or to "Mary dances," or to "Joe dances"'

Disjunction is involved, but not as the main operation.

Some difficulties, 2

How does MO as also/even fit in?

Kate also dances

Even Kate dances

both entail "someone other than Kate dances, **and** Kate dances"

But "someone other than Kate dances" is thought to be a presupposition, so MO is not, or not just, intersection.

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Summary

- Words are not compositional primitives.
- KA-families and MO-families exist cross-linguistically, and call for a compositional analysis.
- Do they have a stable semantics?
- First stab: KA is \cup (join), and MO is \cap (meet).
- This unification encounters some difficulties, to which we'll return. In the mean time, celebrate!



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Tuesday

MO and KA are not binary operators,
hence cannot be Meet and Join.
They impose partial ordering
requirements on their contexts.

Main reading

Szabolcsi (2014), What do quantifier particles do?
Section ...

<http://ling.auf.net/lingbuzz/001857>

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Recap

- Words are not compositional primitives.
- KA-families and MO-families exist cross-linguistically, and call for a compositional analysis.
- Do the particles have a stable semantics?
- First stab: KA is join, MO is meet.
- This unification encounters some difficulties, to which we'll return later.

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Recap the data: Japanese *mo*

| | |
|-------------------------------------|---|
| dare- mo | `everyone _{HLL} /anyone _{LHH} ' |
| dono-hito- mo | `every/any person' |
| hyaku-nin- mo -no gakusei | `as many as 100 students' |
| Tetsuya- mo Akira- mo | `Tetsuya as well as Akira' |
| Tetsuya- mo | `too/even Tetsuya' |

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Recap the data: Japanese *ka*

| | |
|--|---|
| dare- ka | `someone' |
| gakusei-no dare- ka | `some student' (=one of the ...) |
| hyaku-nin-to- ka -no gakusei | `some 100 students' (=approximately) |
| Tetsuya- ka Akira(- ka) | `Tetsuya or Akira' |
| Dare-ga odorimasu ka | `Who dances?' |
| Akira-ga odorimasu ka | `Does Akira dance?' |

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The Problem, Part 1

| | | |
|---------------------------|------------------------------------|------------------------------|
| A- MO B- MO | John- MO Mary- MO | `John as well as Mary' |
| A- KA B- KA | John- KA Mary- KA | `John or Mary' |
| | John ran- KA not- KA | `whether or not John ran' |

If MO is \cap and KA is \cup ,
they should not occur **more than once** in
' $A \cap B$ ' and ' $A \cup B$ '.

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The Problem, Part 2

| | | |
|--------------|---------------------|--------------------|
| A- MO | John- MO | `John too' |
| A- KA | 100- KA | `approx. 100 m' |
| | John ran- KA | `whether John ran' |

Moreover, if MO is \cap and KA is \cup ,
they should not occur with a **single "junct"**
(that does not even contain a variable).

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A-MO/KA B-MO/KA

A-mo B-mo hashitta
 A is, B is elszaladt
 i A, i B ubezhal
 'A as well as B ran away'

J J
 H H
 R R

A-MO/KA

A-mo hashitta
 A is elszaladt
 i A ubezhal
 'A, too, ran away'

A-hari B-hari ... giyā
 'A or B ... went'
 A-də B-də ... giyē
 'Did A go, or did B?'

S H
 S D

Van vāgy 100 méter
 'It's some 100 m'
 Neem een Chomsky
 'Take e.g. Chomsky'

... prishla-li Eva ili net
 ... megjött-e Eva vāgy nem
 'whether or not Eve came'

R R
 H H

... prishla-li Eva
 ... megjött-e Eva
 'whether Eve came'

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Theoretical options

1st Option KA and MO are meaningful, but their mission in the compositional process is not directly related to \cup and \cap .

2nd Option KA and MO are meaningless syntactic elements that point to (possibly silent) meaningful \cup and \cap operators. Compare +/- interpretable features.

3rd Option KA and MO are meaningful elements that point to joins and meets in a semantic way. Compare presuppositions.

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1st option

KA is a choice-function variable that domesticates alternatives.

Hagstrom 1998; Yatsushiro 2002, 2009; Cable 2010; Slade 2011

- Inherits the problems of choice-functional analyses of indefinites,
- Offers no parallel insight for MO's role,
- Assumes that alternatives (in general, sets as opposed to individuals) are bad for you,
- Doesn't help with the Problem.

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2nd option

KA and MO are meaningless syntactic elements that point to (possibly silent) meaningful \cup and \cap operators. Compare +/- interpretable features.

- Carlson 1983, 2006 for all functional categories;
- Ladusaw 1992 for negative concord;
- Beghelli & Stowell 1997 for *every/each*;
- Kratzer 2005 for *ka, mo*, and more concord phenomena.

Could work. But I'm going to argue that the semantic route is also viable and interesting.

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3rd option

to be pursued

KA and MO are meaningful elements that point to joins and meets in a semantic way.

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MO is not \cap , and KA is not \cup



Proposal: **Re-assess the insight**

- MO and KA occur precisely in **contexts that are** the least upper bound / greatest lower bound of the contribution of the host of MO/KA and something else.



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An amendment: **postsuppositions**, 1

John-MO Mary-MO ran.

John too Mary too ran `J as well as M ran'

- Presupposition projection normally works left-to-right, so Mary's running can't satisfy the presupposition of John-MO.
- Brasoveanu 2013: Postsuppositions are delayed tests that are checked simultaneously, after at-issue content is established.
- Brasoveanu & Szabolcsi 2013: MO's requirement is a postsuppositional definedness condition.
- I assume the same for KA's requirement.

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An amendment: **postsuppositions**, 2

John-MO ran.

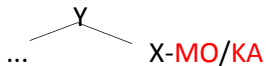
John too ran `J, too, ran'

- Brasoveanu-Szabolcsi 2013:
If at-issue updates in the sentence do not change the context in a way relevant to the postsupposition, the output and input contexts are identical in that respect. So a postsupposition expressing a definedness condition ends up being evaluated just like a presupposition: undefinedness results if the input context does not already satisfy it.

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Summary

- MO and KA attach to individual "juncts". Therefore, they cannot be meet and join operators.
- MO and KA impose partial ordering requirements on the immediately larger contexts:
- $[[Y]]$ must be the glb/lub of $[[X]]$ and something distinct from $[[X]]$:



- This will obtain if $[[Y]]$ is the meet/join of $[[X]]$ and something else.
- So there is a meet/join connection, even if MO/KA aren't meeters/joiners.

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Questions

- How to formulate MO/KA's requirements more precisely? What kind of propositions serve as the interpretations of the hosts?
- If MO/KA do not perform meet and join, who does?

We take up these questions in the next two lectures.

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Wednesday

Propositions in Alternative / Inquisitive Semantics. X -MO demands $[[X]] > [[Y]]$.
 X -KA demands $[[X]] < [[Y]]$.

Main readings

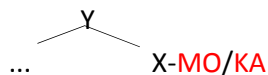
Szabolcsi (2014), What do quantifier particles do?
Section ...

Ciardelli, Groenendijk, & Roelofsen (2012),
<https://sites.google.com/site/inquisitivesemantics/courses/nassli-2012>

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Recap

- MO and KA attach to individual “juncts”. Therefore, they cannot be meet and join operators.
- MO and KA impose partial ordering requirements on the immediately larger contexts: $[[Y]]$ must be the lub/glb of $[[X]]$ and something distinct from $[[X]]$:



- This will obtain if $[[Y]]$ is the meet/join of $[[X]]$ and something else.

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First question

- How to formulate MO/KA’s requirements more precisely? What kind of propositions serve as the interpretations of the hosts?

Notation below, for brevity:

$\wedge\text{dance}(k) = \{w: \text{dance}(w)(k)\}$

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Alternative Semantics for the signature environments of KA

- *whether* *Joe dances*
 $\{p: p = \wedge\text{dance}(j) \vee p = \wedge\text{not-dance}(j)\}$
same as $\{\wedge\text{dance}(j), \wedge\text{not-dance}(j)\}$
- *who* *dances*
 $\{p: \exists x. p = \wedge\text{dance}(x)\}$
same as $\{\wedge\text{dance}(k), \wedge\text{dance}(m), \wedge\text{dance}(j)\}$
- *Kate dances, or Mary dances, or Joe dances*
 $\{\wedge\text{dance}(k), \wedge\text{dance}(m), \wedge\text{dance}(j)\}$
- *Someone* *dances*
 $\{\wedge\text{dance}(k), \wedge\text{dance}(m), \wedge\text{dance}(j)\}$

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Alternative Semantics for atomic propositions, negations, and the signature environments of MO

- *Kate dances*
 $\{\wedge\text{dance}(k)\}$ i.e. $\{p: p = \wedge\text{dance}(k)\}$
- *Kate doesn't dance*
 $\{\wedge\neg\text{dance}(k)\}$
- *Everyone dances*
 $\{\wedge(\text{dance}(k) \wedge \text{dance}(j) \wedge \text{dance}(m))\}$
- *Kate as well as Mary dance*
 $\{\wedge(\text{dance}(k) \wedge \text{dance}(m))\}$

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View updated, using Alternative Semantics and Inquisitive Semantics

- A **non-inquisitive proposition** presents a singleton set of alternatives.
- An **inquisitive proposition** presents a set of multiple alternatives.
- **Conjunction and disjunction** re-emerge as Heyting-algebraic meet and join of such new propositions.
- We'll have contemporary linguistic analyses and still relate MO to meet, and KA to join.



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Pocket Inquisitive toolkit (after Roelofsen 2012)

A **proposition** is a non-empty downward closed set of possibilities. A **possibility** is a set of worlds.

$[\phi] = [[\text{John runs}]] = \text{POW}\{w: \text{run}_w(j)\}$

The informative content of ϕ , $\text{info}(\phi) = U[\phi]$

Meet: $A \cap B$. **Join:** $A \cup B$. **Psd-cmp:** $A^* = \{\beta: \text{disjoint}(\beta, UA)\}$.

$A \cap A^* = \perp$, but $A \cup A^*$ may not be T. Heyting-algebra.

ϕ is **informative** iff $\text{info}(\phi) \neq W$; excludes something in W .

ϕ is **inquisitive** iff $\text{info}(\phi) \notin [\phi]$; has >1 maximal possibility.

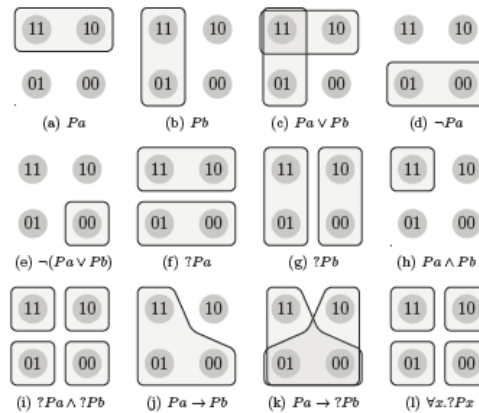
A maximal possibility is an **alternative** in the AltS sense.

Non-inquisitive closure: $[\!|\phi] = (([\phi])^*)^* = \text{POW}(\text{info}(\phi))$

Non-informative closure: $[\? \phi] = [\phi] \cup [\phi]^*$

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Ciardelli, Groenendijk & Roelofsen 2012



Only maximal possibilities (alternatives) are indicated. Downward closure is not indicated.

Figure 7: The propositions expressed by some simple sentences.

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How to define KA's requirement?

- $[[X]] < [[Y]]$ must ensure that the "alternatives" in KA's host X are "preserved" and "boosted".
- **Approve** $[[Y]] = [[X]] \text{ JOIN } [[Z]]$ and possibly also $[[Y]] = ((([[X]] \text{ JOIN } [[Z]])^*)^*)^*$, i.e. one-fell-swoop non-inquisitive join (as satisfiers of KA).
- **Exclude** shrinking, $[[Y]] = [[X]] \text{ MEET } [[Z]]$ and endogamy, $[[Y]] = ((([[X]])^*)^*)^*$ (as satisfiers of KA).

Basically, $[[X]] < [[Y]]$ is $[[X]] \subset [[Y]]$. But downward closure causes an endogamy problem. Either eliminate downward closure, or use a slightly different definition.

$[[X]] < [[Y]]$ iff every possibility in $[[X]]$ is a possibility in $[[Y]]$, and $[[Y]]$ contains a possibility excluded in $[[X]]$.
Or, equivalently,

$[[X]] < [[Y]]$ is one-way inquisitive and informative entailment:
 $[[X]] \subset [[Y]]$ plus $\text{info}(X) \subset \text{info}(Y)$.

If $Y = !X$, then their informative contents are by definition identical.

Moreover, $\text{info}(X) \subset \text{info}(Y)$ ensures that $[[X]] \subseteq [[Y]]$ is in fact $[[X]] \subset [[Y]]$.

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KA satisfied in $[[Y]]$

- *KA in inquisitive disjunction*
 $[[Y]] = [[\text{KA}(\text{Mary runs})]] \cup \text{KA}[[\text{Kate runs}]] = \text{POW}\{w: \text{run}_w(m)\} \cup \text{POW}\{w: \text{run}_w(k)\} = \{\emptyset, \{m \rightarrow k\}, \{mk\}, \{m \rightarrow k, mk\}, \{k \rightarrow m\}, \{k \rightarrow m, mk\}\}$
- *KA in disjunction subsequently de-inquisitivized*
 $[[Y]] = ((([[\text{KA}(\text{Mary runs})]] \cup \text{KA}[[\text{Kate runs}]]))^*)^* = \text{POW}\{w: \text{run}_w(m) \vee \text{run}_w(k)\} = \{\emptyset, \{m \rightarrow k\}, \{mk\}, \{m \rightarrow k, mk\}, \{k \rightarrow m\}, \{k \rightarrow m, mk\}, \{m \rightarrow k, k \rightarrow m\}, \{m \rightarrow k, k \rightarrow m, mk\}\}$

Both preserve all possibilities in $[[\text{Mary runs}]]$, and add a possibility excluded in $[[\text{Mary runs}]]$, e.g. $\{k \rightarrow m\} = \text{only Kate runs}$.

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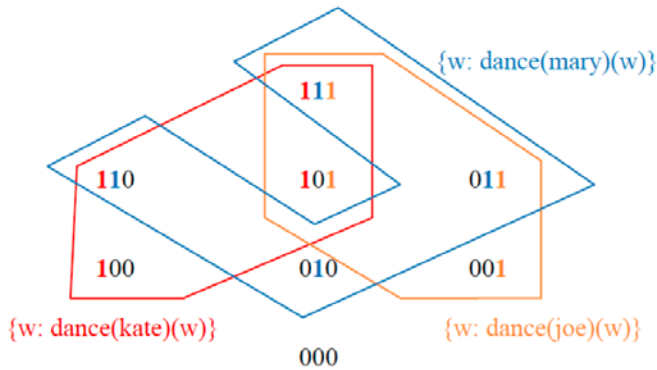
KA not satisfied in $[[Y]]$

- *KA in conjunction*
 $[[Y]] = [[\text{KA}(\text{Mary runs})]] \cap \text{KA}[[\text{Kate runs}]] = \text{POW}\{w: \text{run}_w(m) \wedge \text{run}_w(k)\} = \{\emptyset, \{mk\}\}$
MEET eliminates $\{m \rightarrow k\}$ from $[[\text{Mary runs}]]$. Shrinking.
- *KA right under non-inquisitive closure, cf. $[\!|\phi] = ((([\phi])^*)^*)^*$*
 $[[Y]] = ((([[\text{KA}(\text{Mary runs or Kate runs})]]))^*)^* = ((\text{POW}\{w: \text{run}_w(m)\} \cup \text{POW}\{w: \text{run}_w(k)\})^*)^* = \{\emptyset, \{m \rightarrow k\}, \{mk\}, \{m \rightarrow k, mk\}, \{k \rightarrow m\}, \{k \rightarrow m, mk\}, \{m \rightarrow k, k \rightarrow m\}, \{m \rightarrow k, k \rightarrow m, mk\}\}$

Non-inq. closure preserves the possibilities in $[[\text{Mary runs}]]$, but all new alternatives are joins of old ones. Endogamy.

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An issue with three max. possibilities



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Hurford's constraint in disjunctions

The generalization (Hurford 1974):

The disjunction A or B is unacceptable if A entails B, or the other way around.

- # *John lives in Paris or in France.*
- # *John lives in France or in Paris.*

Counterexample?

- OK *They invited John, or John and Mary.*

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Counterexample?

Chierchia, Fox & Spector (2012) on scalar implicatures and exhaustification

- *They invited EXH(John) or John and Mary.*

Assume that the sentence was originally intended to mean, "only John or both John and Mary". Then there is no entailment.

M-C. Meyer, *Grammatical uncertainty implicatures and Hurford's constraint* (SALT 2014) derives the constraint from Brevity.

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In conjunctions?

- # *John lives in Paris and in France.*
- # *John lives in France and in Paris.*

Counterexample?

- OK *We sell roses and flowers for Mother's Day.*

R. Levy, L. Bergen & N. Goodman, *'Roses and flowers': An informativeness implicature in probabilistic semantics* (SALT 2014) propose refined meanings with 'roses and other flowers'.

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Asymmetry?

Singh (2008)

- OK *They invited John, or John and Mary.*
- # *They invited John and Mary, or John.*
- OK *They invited John and Mary, or only John.*
- OK *We sell roses and flowers.*
- OK *We sell roses and other flowers.*

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KA, MO, and Hurford

The requirements $[[X]] < [[Y]]$ and $[[Y]] < [[X]]$ effectively incorporate Hurford's constraint.

This treatment is compatible with the exhaustification approach of Chierchia et al. and the refined meanings approach of Levy et al., since these postulate that apparent counterexamples are originally intended as "only Z" and "other Zs".

Linear asymmetries are not explained. See Brasoveanu & Szabolcsi 2013 for other unexplained linear effects.

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Thursday

If MO and KA do not perform Meet and Join,
who does?
Enter Junction, silent \cap and \cup , and defaults.

Main reading

Szabolcsi (2014), What do quantifier particles do?
Section...

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Recap

- The natural habitat of KA is Alternative / Inquisitive Semantics.
- MO happily tags along (meet semantics replicates classical results, with types adjusted).
- The requirements are formulated as inquisitive and informative entailment:
 $[[A]] \subset [[B]]$ plus $\text{info}(A) \subset \text{info}(B)$.
- Hurford's constraint is built into definitions.

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Question

I have argued that MO doesn't perform Meet and KA doesn't perform Join. They only check that requisite ordering relations hold between their hosts and the immediate larger contexts.

Who performs Meet and Join, then?

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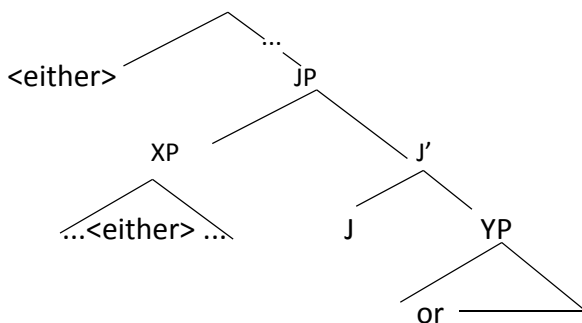
Winter's bullet and silent MEET

Winter 1995, 1998

- A and B = $A \bullet B = \langle A, B \rangle$ And merely forms pairs.
- Pairs grow pointwise (much like Hamblinian alternatives).
- At some point silent MEET applies, creating the illusion that and scopes there.
- And can also be silent (asyndetic conjunction).
- In contrast, OR is cross-linguistically almost never silent (no asyndetic disjunction).

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Den Dikken (2006), J for Junction



Similarly for both... and...

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Den Dikken' syntax accounts for

- 1 John ate either rice or beans.
- 2 John either ate rice or beans.
- 3 Either John ate rice or beans.

- 4 Either John ate rice or he ate beans.
- 5 John either ate rice or he ate beans.

- 6 John ate both rice and beans.
- 7 John both ate rice and beans.

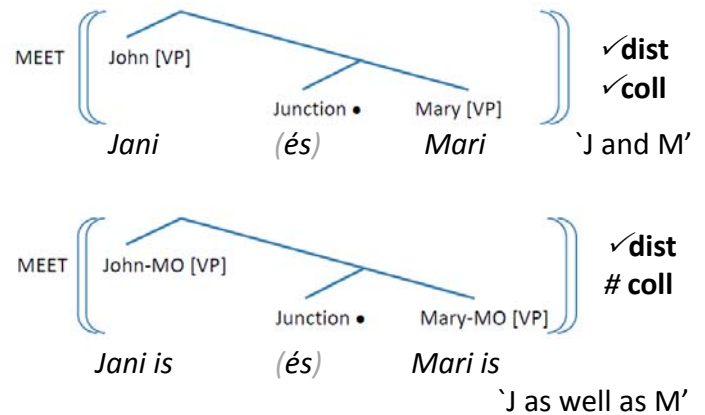
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Modify Winter

- Identify and or its silent counterpart, interpreted as Winter's •, as den Dikken's 2006 J(unction).
- Delimit the pointwise growth of pairs.
- Replace Winter's plain Boolean MEET with Dekker's 2012 order-sensitive MEET, which interprets the 2nd conjunct strictly in the context of the 1st (cf. anaphora).
- Order-sensitive MEET is the default silent operation on pairs, cf. text-level sequencing.
- Extend the analysis to or, with • and silent JOIN.

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Pairs with MEET, \cap



Hungarian *is* -- *és* -- *mind*

with Japanese glosses

Kati *és* Mari `Kati-*to* Mari (and, Junction)'

Kati *is* `Kati-*mo* (also/even)'

[Kati *és* Mari] *is* `[Kati-*to* Mari]-*mo* (also/even)'

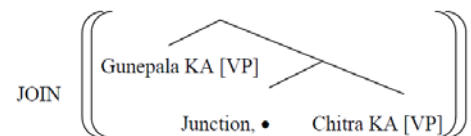
Kati *is* (*és*) Mari *is* `Kati-*mo* Mari-*mo* (both)'

mind Kati *mind* Mari `Kati-*mo* Mari-*mo* (both)'

mind-en-ki `dono-hito-*mo* (every)'

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Add silent JOIN, \cup



Gunepala-KA VP • Chitra-KA VP = $\langle\langle \wedge \text{vp}(g), \wedge \text{vp}(c) \rangle\rangle$

JOIN ($\langle\langle \wedge \text{vp}(g), \wedge \text{vp}(c) \rangle\rangle$) = $\{ \wedge \text{vp}(g), \wedge \text{vp}(c) \}$

- How do we know which of silent MEET and silent JOIN applies to the pair formed by J?

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MEET is the default operation on pairs.
 OR (=KA) is required to bleed default MEET

- The presence of KA forces JOIN by requiring that $[[X]]$ be preserved and boosted in $[[Y]]$.
- The presence of MO forces MEET by requiring that $[[X]]$ and a parallel $[[Z]]$ be included in $[[Y]]$ (and it gives rise to distributivity).
- Elsewhere MEET applies to pairs, by default (and collective shift may optionally follow).

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KA is mandated in disjunctions, but not in wh-questions or indefinites

- Disjunction without KA not attested
- Wh-questions without KA attested
- Indefinite pronouns without KA attested

G Wer mag *was*?
 `Who likes *something*?'
 `Who likes *what*?'

M John kan-guo *shei*
 `John saw *someone*'
 `Who did John see?'

- Conclude: JOIN is the default operation on sets of open propositions – cf. disembodied Existential Closure.

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JOIN is the default operation on open propositions. Then, MO is required in quantifiers to bleed default JOIN

- Segmentally unmarked universal quantifiers are not attested (to my knowledge).
John saw whom does not get to mean 'John saw everyone'.
- Once MO is present, the quantifier is irrevocably distributive (cf. every, each). All the-type DPs are plural definites, not universals, and are not formed with MO-particles.

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Bumford (2013), Incremental Quantification

$$\text{every} = \lambda PQ . \Delta \{ m \star_{\sim} Q \mid m \in {}^{\prime}P \}$$

P, Q are functions from indivs to stateful truth values.
 \star_{\sim} is a monadic "bind" combinator, returns a stateful function.

Δ is iterated conjunction, lifted into the monad; dynamic, as per combinatory machinery.

Each generation inhabits a more Orwellian world.

$$\lambda s . \{ (\text{inhab } x \ g_1, s : g_1 : x) \mid \text{world } x \wedge \text{Orw } x > \max [\text{Orw } s_i \mid s_i \in s \wedge \text{world } s_i] \} \Delta \lambda s . \{ (\text{inhab } x \ g_2, s : g_2 : x) \mid \text{world } x \wedge \text{Orw } x > \max [\text{Orw } s_i \mid s_i \in s \wedge \text{world } s_i] \} \dots$$

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J(unction) in complex connectives, 1

- A is* **és** *B is* 'A as well as B' Hung.
A MO J B MO
- arma* **et** *virum* 'arms and [the] man'
arms J man
- arma(que)* \emptyset *virum-que* 'arms and [the] man'
arms(MO) J man-MO
- ad vim* **at-que** ~~MO~~ *ad arma* 'to force and to arms'
PP-MO \emptyset J-MO ~~MO~~ PP

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J(unction) in complex connectives, 2

- Petja* **i** *Vanja* 'Petya and Vanya'
P J V
- i Petja* \emptyset *i Vanja* 'Petya as well as Vanya'
MO P J MO V

Russian *i* spells out both as Junction and as MO.

- Tancevala-li* *Masha?* 'Did Masha dance?'
'danced-KA

Arsenijević (2011)

- Petja* **i-li** *li-Vanja* 'Petya or Vanya'
P-KA \emptyset J-KA KA-V

Russian *ili* 'or' is composed of J and KA (Mitrović 2013).

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What about vagy and or?

In A vagy B and A or B, vagy/or may be KA-particles belonging to the second disjunct, staying in place or moving up to a phonetically null Junction head, or they may trigger agreement with Junction, so that Junction ends up taking different shapes in conjunctions (és, and) and disjunctions (vagy, or). Calls for further morpho-syntactic research.

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Summary

- Both conjunctions and disjunctions are JPs, where the J(unction) head is a meaningless pair-former.
- Disembodied order-sensitive MEET is the default operation on pairs; KA particles are needed in disjunctions to bleed MEET by $[[X]] < [[Y]]$.
- Disembodied JOIN is the default operation on sets of alternatives computed from open propositions; MO particles are needed in quantifiers to bleed JOIN by $[[Y]] < [[X]]$.

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Friday

More on KA:
alternative questions,
approximate numerals, indefinites.
Free discussion.

Main reading

Szabolcsi (2014), What do quantifier particles do?
Section...

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Recap

- Both conjunctions and disjunctions are JPs, where the J(unction) head is a meaningless pair-former.
- Disembodied order-sensitive MEET is the default operation on pairs; KA particles are needed in disjunctions to bleed MEET by $[[X]]<[[Y]]$.
- Disembodied JOIN is the default operation on sets of alternatives computed from open propositions; MO particles are needed in quantifiers to bleed JOIN by $[[Y]]<[[X]]$.

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Questions re: constructions with KA

- Some polar (yes/no) questions contain a KA-particle, some do not.
Why?
- Unary MO is 'too/even'.
Examples of unary KA?

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Polar (yes/no) questions

Krifka 2001, arguing for structured meanings for questions, distinguishes

- | | |
|--------------------------------|----------------------|
| • polarity questions | ok Yes./No. |
| Is he asleep? | Yes. / (Yes), he is. |
| Do you want [tea or coffee]? | Yes. / (Yes), I do. |
| • alternative questions | #/?? Yes./No. |
| Is he asleep, or isn't he? | (Yes), he is. |
| Is he asleep, or is he awake? | He is asleep. |
| Do you want TEA, or COFFEE? | (I want) TEA. |

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Hungarian

- (a) Alszik? ↗ 'Is he asleep?'
 (b) Alszik-e? ↘ 'Is he asleep, or not?'
 (c) Alszik **vagy** nem? 'Is he asleep-KA?'
 (d) Alszik-**e vagy** nem? 'Is he asleep-KA or not?'

Kíváncsi vagyok, hogy 'I am curious SUBORD ...'

- (a') * ... alszik.
 (b') ... alszik-**e**.
 (c') ... alszik **vagy** nem.
 (d') ... alszik-**e vagy** nem.

same patterns
with *tea/kávé*

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Russian

- (a) On spit? ↗ 'Is he asleep?'
 (b) Spit-**li** on? 'Is he asleep, or not?'
 (c) Spit on **ili** net? 'Is he asleep-KA?'
 (d) Spit-**li** on **ili** net? 'Is he asleep-KA or not?'

Kíváncsi vagyok, hogy 'Interesno, ...'

- (a') * ... on spit / spit on.
 (b') ... spit-**li** on.
 (c') ... spit on **ili** net.
 (d') ... spit-**li** on **ili** net.

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? ϕ versus disjunction

- Only (a) Alszik? is a Krifkean polarity question.
- Polarity questions are a main clause phenomenon.
- Interpreted via the Inquisitive Semantic ? operator.
- $?\phi =_{\text{def}} \phi \vee \neg\phi$. Hence it delivers a disjunctive meaning, but $?\phi$ is not a disjunction. KA is not needed, because there is no Meet to bleed.
- -e is a KA-particle (etymol. unrelated to vala/vagy).
- -e requires $[[XP]] < [[YP]]$.
- Disjunctive questions need -e or vagy to bleed Meet.

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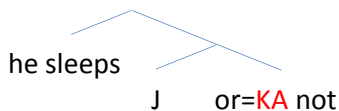
KA in alternative questions, 1

- (b,b'), (c,c'), (d,d') are disjunctions. They contain either **one KA** (-e or vagy / -li or ili) or **two** (-e and vagy / -li and ili)
- In (b, b') the only possible exclusive alternative is recovered:
[[danced KA]] JOIN [[did not dance]]_{recovered}
- As in John MO danced 'John, too, danced', the content that satisfies KA's $[[X]] < [[Y]]$ requirement is not syntactically represented.

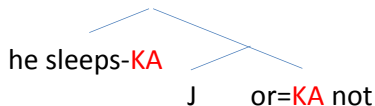
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KA in alternative questions, 2

- (c, c') contain KA on just the second disjunct:



- (d, d') contain KA on both disjuncts:



- Compare: *whether he is asleep or not*

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Unary KA, indefinites and wh-questions

hyaku-nin-to-ka-valami 100, vagy 100 'some 100 = a number in the vicinity of 100'

Neem een Chomsky. 'een Chomsky = Chomsky or someone like him'

Kxi eyze tapuax! 'eyze apple = an apple or some other fruit'

dare-ka odorimasu
dare-ga odorimasu-ka
Vala-ki táncol.

$\bigvee \{ \wedge \text{dance}(x) : x \in \text{person} \}$

Ki táncol?

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Summary, 1

- KA and MO style quantifier particles in their various roles have stable meanings, but they do not perform join or meet.
- The particles impose requirements on the purely semantic contents of their immediate contexts.
- When multiple particles occur, each carries the same requirement, and the hosts mutually satisfy the requirements of each other's particles.
- X-KA requires $[[X]] < [[Y]]$,
X-MO requires $[[Y]] < [[X]]$.

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Summary, 2

- The semantics can be naturally formalized in terms of Alternative / Inquisitive Semantics.
- The particles are aided (at least) by a pair-forming J, silent JOIN, silent order-sensitive MEET, non-informative closure and non-inquisitive closure.
- Whether the particles need to occur at all depends in part on what the default operation is (MEET or JOIN). KA bleeds default MEET on pairs. MO bleeds default JOIN on open propositions.
- For simplicity, I am pretending that all the particles are sentential adjuncts.

96

Alonso-Ovalle 2006. *Disjunction in Alternative Semantics*. PhD.

AnderBois 2012. Focus and uninformativity in (Yucatec Maya) questions. *Natural Language Semantics*.

Arsenijević 2011. Serbo-Croatian coordinative conjunctions at the syntax-semantics interface. *The Linguistic Review* 28.

Brasoveanu & Szabolcsi 2013. Presuppositional *too*, postsuppositional *too*. *Festschrift for Jeroen Groenendijk, Martin Stokhof, and Frank Veltman.* <http://www.ilc.uva.nl/Festschrift-JMF/>.

Bumford 2013. Incremental quantification. <http://www.ilc.uva.nl/AC/AC2013/Proceedings/>.

Cable 2010. *The Grammar of Q*. Oxford UP.

Carlson 2006. 'Mismatches' of form and interpretation. In van Geenhoven, ed. *Semantics in Acquisition*. de Gruyter, 19-36.

Ciardelli et al. 2012. Inquisitive Semantics, NASSLI lecture notes. <https://sites.google.com/site/inquisitivesemantics/courses/nassli-2012>.

97

Dekker 2012. *Dynamic Semantics*. Springer.

den Dikken 2006. *Either-float and the syntax of co-ordination*. *Natural Language and Linguistic Theory* 24.

Hamblin 1973. Questions in Montague English. *Foundations of Language* 10.

Haspelmith 1995. *Indefinite Pronouns*. Clarendon.

Jayaseelan 2001. Questions and question-word incorporating quantifiers in Malayalam. *Syntax* 4.

Jayaseelan 2011. Comparative morphology of quantifiers. *Lingua* 121.

Inquisitive Semantics <http://sites.google.com/site/inquisitivesemantics/>.

Karttunen 1977. The syntax and semantics of questions. *Linguistics and Philosophy* 1.

Kobuchi-Philip 2009. Japanese MO: universal, additive and NPI. *Journal of Cognitive Science* 10.

98

Kratzer & Shimoyama 2002. Indeterminate pronouns, the view from Japanese. <http://semanticsarchive.net/>.

Krifka 2001. For a structured meaning account of questions and answers. *Audiatur Vox Sapientia*. Berlin: Akademie Verlag.

Lin Shih-Yueh 2014. Inquisitive semantics for Mandarin Chinese question particles. Ms., New York University.

Mitrović 2012. Configurational change in Indo-European coordinate construction. <http://mitrovic.co/>.

Mitrović and Sauerland 2013. Decomposing coordination. Talk at NELS 44. <http://mitrovic.co/papers/MS2013-NELShandout.pdf>.

Roelofsen 2013. Algebraic foundations for the semantic treatment of inquisitive content. *Synthese* 190/1. DOI: 10.1007/s11229-013-0282-4.

Slade 2011. Formal and philological inquiries into the nature of interrogatives, indefinites, disjunction, and focus in Sinhala and other languages. PhD. <http://ling.auf.net/lingbuzz/001321>

99

Szabolcsi 2010. *Quantification*. Cambridge University Press.

Szabolcsi 2012. Compositionality without word boundaries: *(the) more* and *(the) most*. <http://elanguage.net/journals/salt/article/view/22.1>.

Szabolcsi 2013. What do quantifier particles do? *Linguistics and Philosophy*, pending revisions. <http://ling.auf.net/lingbuzz/001857>.

Szabolcsi, Whang, & Zu 2014. Quantifier words and their multi-functional(?) parts. *Language and Linguistics* 15. http://www.ling.sinica.edu.tw/files/publication/j2014_1_6501.pdf.

Szabolcsi & Zwarts 1993. Weak islands and an algebraic semantics for scope taking. *Natural Language Semantics* 1.

Yatsushiro 2009. The distribution of quantificational suffixes in Japanese. *Natural Language Semantics* 17.

Winter 1995. Syntcategoriomatic conjunction and structured meaning. <http://elanguage.net/journals/salt/article/view/5.387>.

100