

# KA particles cross-linguistically

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1

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>

2

## Today: KA

- Japanese ka occurs (at least) in indefinites, approximate numerals, exemplifications, disjunctions, wh-questions, and polar questions.
- Is this a case of homonymy? A cross-linguistic rarity?
- (Old) Malayalam oo and Sinhala da/hari have a similarly wide distribution.
- Generic label to be used: KA.
- What unites the environments of KA?
- Other languages have KA particles, but they are often absent from some of the signature environments.
- In what environments is KA mandatory?
- Why is KA cross-linguistically optional elsewhere? <sup>3</sup>

3

## Japanese *ka*

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

[toka data discussed with M. Kobuchi] <sup>4</sup>

4

	Mod. Sinh	Old Mal	Mod Mal	Tlin	Jap
y/n-ques.	da	-oo	-oo	ge	ka, no, kai, kadooka
wh-ques.	da	-oo	-	sa	ka, no, ndai
wh-indef.	da (aff.), hari (aff.), vat(neg.)	-oo	-oo	sa	ka
decl. disj.	hari (aff.), vat (neg.)	-oo	-oo	khach'u	ka
interr. disj.	da	-oo	-oo	ge... gwaa	[ka]

Slade 2011

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

5

## Hungarian *vala-/vagy/vaj-* and *-e*

*vala*-ki, *vala*-mi, etc. someone, something  
*vala*-melyik/*vala*-mi kutya some dog  
 [*vala*-mi száz] kutya [some 100] dogs  
 [*vagy* száz] kutya [or 100] = about/at least 100 d.  
 (*vagy*) Kati *vagy* Mari (either) Kate or Mary  
*vagy*ok, *vagy*, *vagy*on(>van) BE, indicative 1-2-3sg pres  
*való*, *vala* BE, participle, indicative past  
*vaj*-j-on BE, 3sg subjctv. 'I wonder'  
 esik-*e* Is it...? / whether it is raining  
 -- etymol. unrel. polar q prt  
 Ki alszik? Who is asleep? -- no particle

## What unites the environments of KA?

A time-honored and beautiful insight  
(Haspelmath, Jayaseelan, a.o.)

If  $U = \{j, m, b\}$ ,

Someone dances =

John dances, **or** Mary dances, **or** Bill dances

Existential quantification and disjunction are both special cases of least upper bound, i.e. join (union, ... , least common multiple).

7

## How do questions fit in?

Hamblin, Karttunen:

- *whether John dances*

$\{ p: p = \{w: \text{John dances in } w\} \text{ or } p = \{w: \text{John doesn't dance in } w\} \}$

- *who dances*

$\{ p: p = \{w: K \text{ dances in } w\} \text{ or } p = \{w: M \text{ dances in } w\} \text{ or } p = \{w: J \text{ dances in } w\} \}$  viz.,

$\{ p: \text{Ex.human}(x). p = \{w: x \text{ dances in } w\} \}$

8

## The signature contexts of KA, according to Alternative Semantics

(Kratzer-Shimoyama, Alonso-Ovalle, Simons, Aloni, etc.)

- *whether Joe dances*

$\{ p: p = \{w: \text{dance}_w(j)\} \vee p = \{w: \text{not-dance}_w(j)\} \}$   
same as  $\{ \{w: \text{dance}_w(j)\}, \{w: \text{not-dance}_w(j)\} \}$

- *who dances*

$\{ p: \exists x. p = \{w: \text{dance}_w(x)\} \}$  same as  
 $\{ \{w: \text{dance}_w(k)\}, \{w: \text{dance}_w(m)\}, \{w: \text{dance}_w(j)\} \}$

- *Kate dances, or Mary dances, or Joe dances*

$\{ \{w: \text{dance}_w(k)\}, \{w: \text{dance}_w(m)\}, \{w: \text{dance}_w(j)\} \}$

- *Someone dances*

$\{ \{w: \text{dance}_w(k)\}, \{w: \text{dance}_w(m)\}, \{w: \text{dance}_w(j)\} \}$

10

## “Non-KA contexts”: singleton sets (of sets-of-worlds) in Alternative Semantics

- *Kate dances*

$\{ \{w: \text{dance}_w(k)\} \}$  i.e.  $\{ p: p = \{w: \text{dance}_w(k)\} \}$

- *Kate doesn't dance*

$\{ \{w: \neg \text{dance}_w(k)\} \}$

- *Everyone dances*

$\{ \{w: \text{dance}_w(k) \wedge \text{dance}_w(j) \wedge \text{dance}_w(m)\} \}$

- *Kate as well as Mary dance*

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

## Insight updated, using Alternative Semantics and Inquisitive Semantics

- An **inquisitive proposition** presents a set of multiple alternatives.  
KA occurs in inquisitive environments.
- A **non-inquisitive proposition** presents a singleton set of alternatives.
- **Conjunction and disjunction** re-emerge as Heyting-algebraic meet and join of propositions as non- $\emptyset$  downward closed sets of sets-of-worlds.
- We have a contemporary linguistic analysis, and still relate KA to join.

11

## Exactly how does KA relate to join?

- Does KA embody the join operator?

The join operator  $\cup$  forms the least upper bound of a two-element set. If KA performs join, we expect it to be a two-place operator.

- A problem: in some languages,

KA particles occur on each disjunct (without an “exclusive” meaning), and KA-particles occur in single-disjunct constructions (that do not even contain “variables”)

Not unusual: same for e.g. Jap. *mo* ‘every, as well as, too’ and Hung. *se* ‘neg. concord’

12

## X-KA Z-KA

- Mary John-ine-(y)oo Bill-ine-(y)oo cumbiccu.  
Mary John-acc-KA Bill-acc-KA kissed  
‘Mary kissed John or Bill’ (Malayalam)
  - Gunəpālə hari Chitra hari gaməṭə giyā.  
Gunapala KA Chitra KA to.village went  
‘Gunapala or Chitra went to the village’ (Sinhala)
- oo and -hari are mandatory  
these disjunctions need not be “exclusive”

13

## just X-KA

- Akira-ga odorimasu ka? (Jap.)  
Tancevaet li Akira ? (Rus.)  
Táncol-e Akira? (Hun.)  
‘Does Akira dance? whether Akira dances’
- hyaku-nin-toka vagy száz (Jap., Hun.)  
100- cl- toKA KA 100  
‘about/at least 100’
- Who came to the party?  
[J-toka M-toka K-toka]-ga party-ni kita. (cf. En. ↑)  
John-toka-ga party-ni kita. ‘For example, John’
- John will cook. Or, we go out.

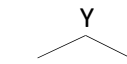
14

## Proposal to re-assess the join insight

- KA occurs in **contexts that are the join of the** contribution of the host of KA and something else.  
But **KA is not a join,  $\cup$  operator** itself.
- KA achieves the join effect by imposing a requirement on the entailment relation between its “host (proposition)”  $[[X]]$  and an “immediate context (proposition)”  $[[Y]]$ .
- **Each KA acts on its own.** The unary version exhibits the particle’s pure behavior.
- **Mutual satisfaction:** In X-KA Z-KA, each particle’s requirement is satisfied by its buddy’s host.

15

Each occurrence of KA imposes the same requirement.



KA’s requirement:  $[[X]] \subset [[Y]]$

- KA’s host proposition  $[[X]]$  unidirectionally entails an immediate context proposition  $[[Y]]$ .
- Trivially satisfied if  $[[Y]]$  is the join,  $\cup$  of  $[[X]]$  and some  $[[Z]]$ ,  $[[Z]] \not\subset [[X]]$ .

$[[X]]$  corresponds to KA’s actual sentential host, or is a sentence within which the subsentential host takes wide scope.

$[[X]]$  and  $[[Y]]$  address the same Question Under Disc.<sup>16</sup>

“ $\subset$ ” is one-way entailment/containment wrto inquisitive and informative content

KA’s reqmnt is satisfied in  $[[Y]]$  if KA attaches to X:

$[[X]]$	$[[Y]]$
$[[\text{Joe walks}]]$	$\subset [[\text{Joe or Bill walks}]]$
$[[\text{Joe walks}]]$	$\subset [[\text{whether Joe walks}]]$
$[[a \in \text{HUM walks}]]$	$\subset [[\text{someone walks}]]$
$[[a \in \text{HUM walks}]]$	$\subset [[\text{who walks}]]$
$[[\text{Joe has 10 dogs}]]$	$\subset [[\text{J has 10 or “near 10” ds}]]$

For some  $[[Z]] \not\subset [[X]]$ ,  $[[Y]] = [[X]] \cup [[Z]]$ .

17

Caveat: Not all “Q-particles” are KA-particles

- Inquisitive propositions are joins of alternatives. KA is relevant to the creation of the join. But not all inquisitive propositions are questions.
- Questions are inquisitive and non-informative.
- “Q-particles” ensure (sometimes vacuously) that the inquisitive proposition is non-informative.
- “Q-particles” may also shrink the possibility space.
- Lin Shih-Yueh (2014) for an inquisitive semantics for Mandarin ǒu, ne and ma (cf. Cheng 1991).

18

## Main distributional facts to explain

Among the environments where KA **may** occur,

- approx. numerals **need** some marker, e.g. KA;
- disjunctions **need** KA: *John Mary* # `John or Mary' (Payne 1985, Winter 1995);
- but polar questions, wh-questions, and indefinites **without** KA are well-attested.

*Is it raining?* ↑ *Esik?* ↑

**Where** is John? *Hol van Jani?*

*Jan heeft wat gedaan.*

*Ich habe wo gelesen, dass der Sommer schön wird.*

(Postma 1994, Gärtner 2009)

19

## Proposal in a nutshell

KA does not produce a join meaning, only requires it via  $[[X]] \subset [[Y]]$ . KA is needed when the  $[[X]] \subset [[Y]]$  relation would not arise otherwise.

	Without KA	KA needed for $[[X]] \subset [[Y]]$ ?
<i>10</i>	`10'	yes
<i>Joe Bill</i>	`Joe and Bill'	yes (see A)
<i>indet sleeps</i>	$\{p: \exists x.p=\{w: x sl_w\}\}$	no (see B)
<i>Joe sleeps</i> ↑	$?\varphi = \varphi \vee \neg \varphi$	no (see App.)

20

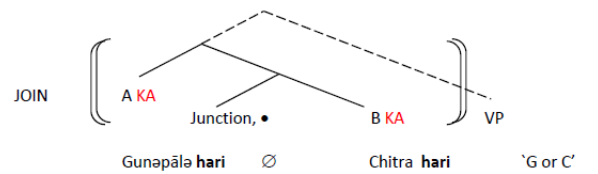
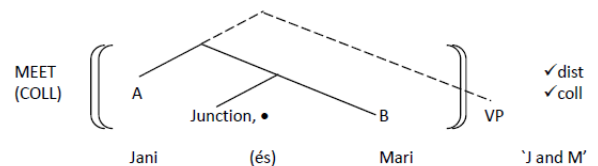
When a join interpretation would arise without KA's ministrations, and KA is still there,

- (i) KA may be purely optional, or
- (ii) that join interpretation may be computed differently in KA's presence than in its absence, or
- (iii) the KA particle may spell out a combination of the plain  $[[X]] \subset [[Y]]$  requirement with additional constraints (Farkas 2002, a.o.).

21

## (A) Silent MEET vs. JOIN apply to pairs

- JP (den Dikken 2006), with J a pair-former (Winter 1995)
- Semantic action performed by silent MEET and JOIN



22

By default, MEET applies to pairs

Kati, Mari elszaladt. Hungarian,  
 `Kate and Mary ran away' etc.

# `Kate or Mary ran away'

A man walks in the park. He whistles. universally

`A man<sub>i</sub> walks and he<sub>i/j</sub> whistles'

# `A man<sub>i</sub> walks or he<sub>i/j</sub> whistles'

KA bleeds the default and triggers JOIN.

23

## (B) Indefinites and wh-questions

**indefinite pronoun**

nani/-thing

**indefinite+KA**

nani-ka/some-thing

**[indefinite ...]+KA**

[nani/what ...]-ka/∅

**indefinite+MO**

nani-mo/every-thing

Inspired by Keenan & Faltz 1985:

$[[\text{indet}]]$  = set of individuals-as-generalized-quantifiers

$[[\text{indet-KA}]]$  = the join of those individuals

$[[\text{indet-MO}]]$  = the meet of those individuals

24

## Alternative Semantics

- Indeterminate pronouns as  $\{x: x \in H\}$  plus general pointwise function application à la Hamblin give  $[[\text{indet move}]] = \{\{w: \text{move}_w x\} : x \in H\}$ , that is,  $\{\{w: \text{move}_w m\}, \{w: \text{move}_w k\}, \{w: \text{move}_w j\}\}$ .
- This is equivalent to  $\{\{w: \text{move}_w m\}\} \cup \{\{w: \text{move}_w k\}\} \cup \{\{w: \text{move}_w j\}\}$ , which is what  $[\text{indet} + \text{KA} \dots]$  and  $[\text{indet} \dots] + \text{KA}$  want. “[T]he semantic contribution of the question particle *ka* may now be seen as a rather trivial one” (Shimoyama 2006: 154)
- There is a problem with  $\cap$  though (cf. MO).

25

## Inquisitive Semantics

Ciardelli & Roelofsen 2014

- Propositions as non- $\emptyset$  downward closed ( $\downarrow$ ) sets of sets-of-worlds, where  $S^\downarrow := \{p \mid p \subseteq q \text{ for some } q \in S\}$ .
- $[[\text{indet}]] = \lambda P_{\langle e, \langle \langle s, t \rangle, t \rangle \rangle} \cup x \in \text{Thing}_e P(x)$   
 $[[\text{indet move}]]_{\langle \langle \langle s, t \rangle, t \rangle \rangle} = \cup x \in \text{Thing}_e \text{move}(x) = \{\{w: x \text{ move in } w\} : x \in \text{Thing}_e\}^\downarrow$ .
- Equivalent to what  $[\text{indet} + \text{KA} \dots]$  and  $[\text{indet} \dots] - \text{KA}$  want:  $\{\{w: \text{move}_w m\}\}^\downarrow \cup \{\{w: \text{move}_w k\}\}^\downarrow \cup \{\{w: \text{move}_w j\}\}^\downarrow$ .
- Happily,  $[[\text{indet} + \text{MO move}]] = \{\{w: \text{move}_w m\}\}^\downarrow \cap \{\{w: \text{move}_w k\}\}^\downarrow \cap \{\{w: \text{move}_w j\}\}^\downarrow$ .

## Inquisitive Semantics

my experiment with factoring  $\cup$  out

- Propositions as non- $\emptyset$  downward closed sets of sets-of-worlds. I write  $\wp(p)$  for  $\{\{p\}\}^\downarrow$ , the powerset of  $p$ .
- $[[\text{indet}]] = \lambda P. \{\wp\{w: P_w x\} : x \in \text{Thing}_e\}$   
 $[[\text{indet move}]]_{\langle \langle \langle s, t \rangle, t \rangle \rangle} = \{\wp\{w: \text{move}_w x\} : x \in \text{Thing}_e\}$
- Assume default  $\cup$  to produce what KA wants:  
 $\wp\{w: P_w m\} \cup \wp\{w: P_w x\} \cup \wp\{w: P_w x\} = \{\{w: \text{move}_w m\}\}^\downarrow \cup \{\{w: \text{move}_w k\}\}^\downarrow \cup \{\{w: \text{move}_w j\}\}^\downarrow$ .
- $\wp\{w: P_w m\} \cap \wp\{w: P_w x\} \cap \wp\{w: P_w x\} = \{\{w: \text{move}_w m\}\}^\downarrow \cap \{\{w: \text{move}_w k\}\}^\downarrow \cap \{\{w: \text{move}_w j\}\}^\downarrow$ .

## Appendix: KA in polar questions

Krifka (2001) distinguishes

- |                                |                      |
|--------------------------------|----------------------|
| • <b>polarity questions</b>    | <b>ok Yes./No.</b>   |
| Is he asleep?                  | Yes. / (Yes), he is. |
| Do you want [tea or coffee]?   | Yes. / (Yes), I do.  |
| • <b>alternative questions</b> | <b># Yes./No.</b>    |
| 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.        |

28

## ? $\phi$ vs. disjunction

- Only (a) Alszik?  $\uparrow$  is a Krifkaean polarity question.
- Polarity questions are a main clause phenomenon.
- Interpreted via the Inquisitive Semantic  $\underline{?}$  operator.
- $?\phi =_{\text{def}} \phi \vee \neg\phi = [[\phi]] \cup [[\phi]]^*$ . Delivers a join, but compositionally,  $\underline{?}\phi$  is not a disjunction. KA is not needed, because there is no pair and so no MEET to bleed.

- Alternative version of polar questions:  $[[\phi]] \cup [[\phi]]^*$
- e is a KA-particle (etymol. unrelated to vala/vagy).
- e requires  $[[X]] < [[Y]]$ .
- Alternative questions need -e or vagy to bleed MEET.

29

## Hungarian

- |  |                           |
|--|---------------------------|
| (a) Alszik? $\uparrow$                     | `Is he asleep?'           |
| (b) Alszik- <u>e</u> ? $\downarrow$        | `Is he asleep-KA?'        |
| (c) Alszik <u>vagy</u> nem?                | `Is he asleep or not?'    |
| (d) Alszik- <u>e</u> <u>vagy</u> nem?      | `Is he asleep-KA or not?' |
| Kíváncsi vagyok, hogy                      | `I am curious SUBORD'     |
| (a') * ... alszik.                         |                           |
| (b') ... alszik- <u>e</u> .                |                           |
| (c') ... alszik <u>vagy</u> nem.           |                           |
| (d') ... alszik- <u>e</u> <u>vagy</u> nem. |                           |

30

## Russian

- (a) On spit? ↑           `Is he asleep?’  
 (b) Spit-**li** on? ↑/(↓)   `Is he asleep-KA?’  
 (c) Spit on **ili** net?     `Is he asleep or not?’  
 (d) Spit-**li** on **ili** net?   `Is he asleep-KA or not?’

Interesno, ...           `I am curious...’

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

31

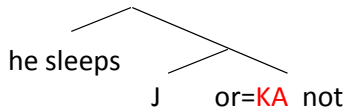
## KA in alternative questions, 1

- (b,b’), (c,c’), (d,d’) are disjunctions. They contain either **one KA** (-e or vagy / -li or ili) or **two KAs** (-e and vagy / -li and ili).
- In (b, b’) the only possible exclusive alternative is semantically recovered:  
 $[[ \text{he sleeps KA} ] ] \cup \wp \{w: \text{he does not sleep}_w\}$   
 Compare: *whether he is asleep*.  
 The content that serves to satisfy KA’s  $[[X]] \subset [[Y]]$  requirement is not syntactically represented.

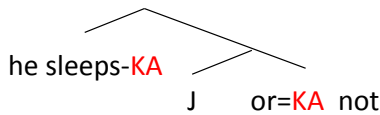
32

## KA in alternative questions, 2

- (c, c’) contain KA in just the second disjunct:



- (d, d’) contain KA in both disjuncts:



Compare: *whether he is asleep or not*

33

## Further research: Indefinite pronouns?

Are there systematic differences in the interpretations of indefinite pronouns that

- are identical to a bare indeterminate pronoun (German *was, wo*, etc.)
- have a KA-morpheme that serves in disjunctions and wh/polar questions (Japanese *ka*, Sinhala *də*),
- have a KA-morpheme that only serves in disjunctions (Sinhala *hari*, Hungarian *vala-, akár*),
- have a KA-morpheme that does not even serve in disjunctions (German *irgend*)? etc.

34

## Further research: Conditionals?

- Cremers 2014: logic behind the patterns

wenn →	ob ?	oder ∨	
als	of	of	(D, HG, Tu, ...)
if	if	or	(E, S, Ta, Sw, ...)
esli	li	ili	(R)

( ha            -e            vagy            (H, by AS)  
 ha `wh<sub>event/case</sub>`    *soha, valaha, néha, bárha, vajha*  
 vs. *mikor* `wh<sub>time</sub>`    *semmikor, valamikor, bármikor* )

- Starr 2014: *If*-clause is a polar question that highlights one of the alternatives.

35

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36