Japanese alternative questions and a unified in-situ semantics for *ka*

1. Introduction: It is cross-linguistically common for a single particle to serves as (a part of) a *wh*-indeterminate and a disjunction marker (Jayaseelan 2001; Slade 2011; Szabolcsi 2015). Among such multi-functional particles, one of the most well-studied one is the Japanese particle *ka* (Kuroda 1965; Hagstrom 1998; Shimoyama 2006, i.a.). However, as we will argue below, none of the current compositional semantic analysis of *ka* (Hagstrom 1998; Shimoyama 2006; cf. Slade 2011) can successfully capture the fact that its function is **conditioned by its syntactic position**, both in its *wh*-indeterminate use and its disjunction use, **in a parallel fashion**. This paper proposes a unified semantics for *ka* in *wh*-indeterminates and disjunction that can properly capture this parallel effect.

2. Data: A *wh*-phrase and *ka* participate both in an existential construction and in a *wh*-question. When *ka* directly attaches to the *wh*-phrase as in (1a), the *wh-ka* complex forms an indefinite. When *ka* is in the clause-final position as in (1b), the sentence becomes a *wh*-question (the embedding verb *oshiete* 'tell me' is added in (1b) since the clause-final *ka* is most natural in embedded contexts).

(1) a. Dare-**ka**-ga kita.
who-KA-NOM came.
'Someone came.' **(∃-statement)**

b. [Dare-ga kita-**ka**] (oshiete)
who-NOM came-KA tell
'(Tell me) who came?' **(Wh-Question)**

Another empirical domain in which *ka* appears is disjunction. Example (2) shows that *ka* can attach to each disjunct in a disjunction (optionally to the second disjunct). Also, an additional coordinator (in this case *matawa*) can be inserted between the two disjuncts marked by *ka*.

(2) [Hanako-**ka** (matawa) Jiro-**ka**]-ga kita.
Hanako-KA or Jiro-KA-NOM came.
'Hanako or Jiro came.' **(Disjunctive statement)**

So much is a well-known empirical paradigm. Our empirical contribution in this paper is to point out that the syntactic position of *ka* in a disjunction determines its interpretation in the same way as it does in *wh-ka*-constructions. That is, when the *ka*-phrases are syntactically **smaller than a CP**, the structure derives a **disjunctive statement** while, if they form **CPs**, the structure derives an **alternative question** (AltQ). This generalization is stated in below.

(3)

the *ka*-phrase is...	**smaller than a CP**	**CP**
wh...ka	existential statement	*wh*-question
α-ka β-ka	disjunctive statement	alternative question

Syntactically, *ka*-disjunctions can coordinate DPs, TPs and CPs (Kishimoto 2013; Miyama 2015). The fact that a *ka*-disjunction coordinating DPs is interpreted as a disjunctive statement is seen in (2) above, where the *ka*-phrases are DPs and the whole sentence is interpreted as a disjunctive statement, not as an AltQ 'Is it Hanako or Jiro that came?'. Adding a clause-final *ka* to (2) as in (4) does not lead to an AltQ interpretation, either. Rather, it only receives the interpretation as a *Yes/No Question* (YNQ) embedding a disjunctive statement (Uegaki 2014). Similarly, dropping the *ka*s attaching to the disjuncts in (4), as in (5), does not alter the interpretation from (4):

(4) [[Hanako-**ka** (matawa) Jiro-**ka**]-ga kita-**ka**] (oshiete).
Hanako-KA or Jiro-KA-NOM came-KA tell.
*'Tell me which is true: Hanako came or Jiro came.' **(*AltQ)**
'Tell me whether or not Hanako came or Jiro came.' **(✓YNQ)**

(5) [[Hanako matawa Jiro]-ga kita-**ka**] (oshiete).

The same generalization obtains for TP *ka*-disjunctions (see Kishimoto 2013 for data). In contrast, a *ka*-disjunction with CP disjuncts is interpreted as an AltQ:

(6) [[Hanako-ga kita-mitai-**ka**]$_{CP}$ [Jiro-ga kita-mitai-**ka**]$_{CP}$] (oshiete).
Hanako-NOM came-MOOD-KA Jiro-NOM came-MOOD-KA tell

'Tell me which is true: It seems that Hanako came or it seems that Jiro came?' **(✓AltQ)**
'Tell me that/whether it seems Hanako came or it seems Jiro came.' **(*YNQ)**

3. Proposal: Our proposal employs two-dimensional alternative semantics (Rooth 1985) for in-situ *wh*-questions (Beck 2006). The gist is as follows: *ka* introduces **a set of alternatives** in its ordinary-semantic value, but only specific operators (which I call INQUISITIVE OPERATORS), such as interrogative-CP-embedding predicates, semantically combine with such a set. As a result, a semantic composition of a *ka*-phrase and a non-inquisitive predicate requires that the set denoted by the former be 'flattened' into an **existential meaning**. This flattening is implemented with a type-shifter ⇓. Thus, when *ka*-phrases are smaller than CPs, they are 'trapped' inside a non-inquisitive predicate and receive an existential meaning. Lexical items have o(rdinary) and alt(ernative-semantic) values. The former is combined with Functional Application (FA) while the latter is combined with Point-wise Functional Application. ($\{\sigma\}$ is the type for sets of σ-type objects.)

(7) a. $[\![\alpha \text{ ka}]\!]^o = \begin{cases} \{[\![\alpha]\!]^o\} & \text{if } [\![\alpha]\!]^o \neq \varnothing \\ [\![\alpha]\!]^{alt} & \text{otherwise} \end{cases}$ b. $[\![\alpha \text{ ka}]\!]^{alt} = \{\lambda P. \bigvee_{x \in [\![\alpha]\!]^{alt}} P(x)\}$

(8) a. $[\![\text{dare}]\!]^o = \varnothing$ b. $[\![\text{dare}]\!]^{alt} = \{x \mid x \in \textbf{human}\}$

(9) a. $[\![\Downarrow]\!]^o = \lambda Q_{\{\sigma\}} \lambda P_{\langle \sigma,t \rangle}. \bigvee_{x \in Q} P(x)$ b. $[\![\Downarrow]\!]^{alt} = \{\lambda \alpha.\alpha\}$

(10) a. $[\![\text{kita}]\!]^o = \lambda x_e.\textbf{came}(x)$ b. $[\![\text{kita}]\!]^{alt} = \{\lambda x_e.\textbf{came}(x)\}$

(11) a. $[\![\text{oshier}]\!]^o = \lambda Q_{\{\langle s,t \rangle\}} \lambda x.\textbf{tell}(x, Q)$ b. $[\![\text{oshier}]\!]^{alt} = \{\lambda p_{\langle s,t \rangle} \lambda x.\textbf{tell}(x, Q)\}$

(12) a. $[\![\text{J/matawa}]\!]^o = \lambda \alpha \lambda \beta.\alpha \sqcup \beta$ b. $[\![\text{J/matawa}]\!]^{alt} = \{\lambda \alpha \lambda \beta.\alpha \sqcup \beta\}$

We assume that ⇓ is applied only when FA in the ordinary-semantic dimension is not possible. Given the definitions above, a *wh*-question can be derived from structures as in (1b) since the alt-value of *dare* is passed up until *ka* returns it as the o-value. On the other hand, (1a) is analyzed as involving ⇓ since the set denoted by *dare-ka* cannot be combined with *kita* (10a) with FA:

(13) a. $[\![\Downarrow \text{[dare-ka]}]\!]^o = \lambda P_{\langle et,t \rangle}. \bigvee_{x \in \textbf{human}} P(x)$ b. $[\![\Downarrow \text{[dare-ka]}]\!]^{alt} = \{\lambda P_{\langle et,t \rangle}. \bigvee_{x \in \textbf{human}} P(x)\}$

As a result, an existential statement is derived instead of a *wh*-question. Turning to *α-ka β-ka*, it involves the coordinator head J(unction) as in (14) (cf. den Dikken 2006), which is optionally realized as *matawa*. J denotes a generalized disjunction (12) and is compatible with sets. Since *ka* projects the singleton set of its sister when the sister possesses an o-value, we have the following:

(14) a. $[\![\text{[Hanako-ka [J [Jiro-ka]]]}]\!]^o = \{\textbf{h}, \textbf{j}\}$ b. $[\![\text{[H.-ka [J [J.-ka]]]}]\!]^{alt} = \{\lambda P_{et}.P(\textbf{h}) \vee P(\textbf{j})\}$

Again, in order for (14) to combine with a non-inquisitive predicate, it has to be type-shifted by ⇓:

(15) a. $[\![\Downarrow \text{[H.-ka [J [J.-ka]]]}]\!]^o = \lambda P_{et}.P(\textbf{h}) \vee P(\textbf{j})$ b. $[\![\Downarrow \text{[H.-ka [J [J.-ka]]]}]\!]^{alt} = \{\lambda P_{et}.P(\textbf{h}) \vee P(\textbf{j})\}$

This is what happens in the semantics of (2,4). In contrast, the alternatives introduced by the CP *ka*-disjunction in (6) are not trapped inside a non-inquisitive predicate. Hence, there is no type-shift by ⇓. Thus, it receives the following AltQ meaning in its o-value: $\{\textbf{saw}(\textbf{t}, \textbf{h}), \textbf{saw}(\textbf{t}, \textbf{j})\}$

4. Problems for previous accounts: Hagstrom's (1988) choice-function analysis of *ka* supplemented with Slade's (2011) analysis of disjunction cannot account for the pattern above. Such an analysis would treat *ka* in questions as overtly moving to Spec,CP, forming a Karttunen-style question denotation. This analysis would not explain why (5) disallows an AltQ reading which would result from an ATB overt movement of *ka* to Spec,CP. Shimoyama's (2006) in-situ analysis supplemented with Hamblin-semantic analysis of disjunction (e.g., Beck & Kim 2006) cannot deal with the pattern, either. Here is why: given that (6) allows an AltQ reading, the analysis would have to posit that *α-ka β-ka* introduces alternatives. But then, (4) would be predicted to allow an AltQ reading (given the null hypothesis that *α-ka β-ka* has uniform semantics in (4) and (6)) since the alternatives introduced by *Hanako-ka Jiro(-ka)* would pass up until the clause-final question-operator *ka* operates on them. Note that there is no intervener (Beck 2006) in (4) and (5).

References: Beck & Kim 2006. In *J Comp German Ling* 9 • Hagstrom 1998. MIT diss. • Kishimoto 2013. In *Sekai ni Muketa Nihongo Kenkyuu*, Kaitaku-sha. • Miyama 2015. In *Linguistic Research* 30. • Shimoyama 2006. In *NLS* 14 • Slade 2011. UIUC diss. • Uegaki 2014. In *SALT* 24.