Japanese wh-doublets and metalinguistic variables*

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This paper looks at the distribution and the semantics of Japanese wh-doublets, such as “nani-nani” (what-what) and “dare-dare” (who-who). It is shown that these items can only appear in closed quotations in the sense of Recanati 2000, 2001, and that semantically, they behave like indefinites that range over referring expressions. In order to describe this semantics in a modeltheoretic way, a mechanism that allows quantification over expressions (or ‘metalinguistic quantification’) is in need. We will propose a fragment that allows predication as well as quantification over expressions, which nicely captures the metalinguistic nature of natural language.

1. Introduction

This paper looks at the distribution and the semantics of wh-doublets in the Tokyo dialect of Japanese, which are listed in (1).  

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1 Other dialects seem to have another usage of wh-doublets perhaps in addition to the one reported here. A dialectal study of wh-doublets awaits another occasion.

In this paper, I will adopt the following abbreviation convention: NOM = nominative, ACC = accusative, TOP = topic, C = complementizer, Q = question particle, TT = thematic topic, CT = contrastive topic, HON = honorific, ANTIHON = anti-honorific, PRT = declarative particle, POL = polite form, FOC = focus particle.
We will make a distributional generalization of these items in section 2. Section 3 looks at their semantic behavior and section 4 formalizes it in a modeltheoretic way. In particular, it is argued that the semantics of wh-doublets involves ‘metalinguistic quantification’ in a sense to be made clear below. Section 5 ties the loose ends and addresses further research questions. Section 6 is the conclusion.

2. Distribution

Wh-doublets show a very peculiar distribution. Most notably, they can never appear in ordinary matrix contexts as shown in (2), but seem to be able to show up in certain embedded contexts as in (3).

(2) * Bill-ga **nani-nani**-o katta.  
Bill-NOM what-what-ACC bought

(3) John-wa itsumo [Bill-ga **nani-nani**-o motteiru to] itteiru.  
‘John always says “Bill has such-and-such”’.

In light of this limited distribution of wh-doublets, this paper defends the following generalization.

(4) Wh-doublets are only licensed in closed quotations.

Before verifying this claim, a terminological explanation is in order. In particular, I will introduce a crucial dichotomy of quotations motivated on independent considerations, which wh-doublets are shown to empirically support.

2.1. Closed vs. open quotation

Abbott 2003 and Recanati 2000, 2001 argue that there are two types of quotations, namely the ones they call ‘closed quotation’ and ‘open quotation’, and that this distinction is linguistically significant (see also Geurts and Maier 2005, Partee 1973, Potts 2004, Stainton 1999 etc.). These two sorts of quotation can be characterized briefly as follows.

(5) a. Closed Quotation:  
A closed quotation is used as a singular term that refers to the expression enclosed by the quotation marks. The entire sentence
expresses that the quoted expression has such-and-such property or is used in such-and-such way.

b. Open Quotation:
The quoted material in an open quotation is used syntactically and semantically in an ordinary way, though it carries a certain connotation.

(6) and (7) below are some examples of closed and open quotations found in the literature.

(6) Closed quotations
a. John keeps crying and saying ‘Nobody likes me’. (Recanati 2001:649)
b. You should never say ‘never’. (Christensen 1967: 363)
c. “Cicero” has 6 letters. (Abbott 2003: 1)
d. “Incipient” is an adjective. (Abbott 2003: 1)

(7) Open quotations
a. Quine says that quotation ‘… has a certain anomalous feature’. (Davidson 1979: 28)
b. Alice said that life is ‘difficult to understand’. (Cappelen and Lepore 1997: 433)

Notice that the quotations in (6) all syntactically behave like noun phrases, despite the fact that the syntactic categories of the quoted words are not necessarily noun phrases: ‘Nobody likes me’ in (6a) is a sentence, ‘never’ in (6b) is an adverb, ‘incipient’ in (6d) is an adjective. This indifference to categorical status is one of the hallmarks of closed quotations as stated in (5a) above. On the contrary, in open quotations, the quoted materials do not lose their categorical status: the quoted VP ‘… has a certain anomalous feature’ in (7a) functions as a VP and the quoted AP ‘difficult to understand’ in (7b) functions as an AP.

For the sake of exposition, I will further divide closed quotation into two subtypes: ‘quotations of utterances’ and ‘quotations of linguistic properties’. In the former case, quoted materials are predicated of by predicates such as ‘say’, ‘write’, ‘cry’, etc. and the whole sentence talks about the way they are used, as in (6a) and (6b), while in the latter case, certain properties of quoted expressions are at stake and predicates such as ‘has 6 letters’ and ‘is an adjective’ are used as in (6c) and (6d).

In the rest of this section, it will be shown that wh-doublets can appear in quotations of utterances and quotations of linguistic properties, but not in open quotations. Let us begin with quotations of linguistic properties in the next subsection.

2.2. Wh-doublets in quotations of linguistic properties

Quotations of linguistic properties are relatively easy to identify: if there is a predicate such as ‘is monosyllabic’ or ‘is an NP’ that is true of some property or properties of an expression, its argument (or one of its arguments) is a quotation of linguistic property.

The following examples demonstrate that wh-doublets are in fact licensed in
quotations of linguistic properties.

     “such-and-such-NOM want”-TOP adjectival.phrase-is
     ‘Such-and-such-ga hoshii” is an adjectival phrase.’

     “To break such-and-such”-top “what-what-acc break” C meaning-is
     ‘To break such-and-such” means “such-and-such-o kowasu”.’

Although not all quotations of linguistic properties in fact allow wh-doublets, their anomaly is explained by the semantics of wh-doublets on independent grounds. We will come back to this in section 5.1.

2.3. Wh-doublets in quotations of utterances

Now, let us look at quotations of utterances, which are relatively harder to identify in Japanese. This is because Japanese quoted speech and indirect speech are often string-identical. In particular, both are introduced by the complementizer to, unlike in English where quoted speech can never be accompanied by the complementizer that.2 This subsection provides several tests to disambiguate quoted speech from indirect speech and show that wh-doublets are in fact licensed in quotations of utterances.

The first test comes from Maynard’s 1984 claim that while embedded clauses introduced by to are ambiguous between quoted and indirect speech, those introduced by koto-o are unambiguously indirect speech. Our generalization in (4) predicts that wh-doublets can appear in a subset of to-clauses, but not at all in koto-o-clauses.3 This prediction is borne out, as the following examples demonstrate. Note that some predicates (e.g. itta ‘said’ in (9a)) only take to-clauses, while others (e.g. shitteiru ‘know’ in (9b)) only take koto-o-clauses. Still others (e.g. kiiteita ‘heard’ in (9e) and (9f)) take either of them.

     John- TOP [who-who-NOM tomorrow come C] everyone-to said
     ‘John said to everyone “So-and-so will come tomorrow”.’

       John- TOP [who-who-NOM tomorrow come fact]-ACC know
       ‘John knows that so-and-so will come tomorrow.’

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2 Rooryck 2001 notes in passing that some languages use the same complementizer (often the one derived from a verb of saying, though presumably not in the case of Japanese) for quoted and indirect speech.
3 While to is traditionally treated as a full-fledged complementizer, koto-o is morphologically comprised of a (functional) noun koto ‘fact/thing’ and the accusative marker -o. I abstract away from this issue here and regard koto-o as a kind of complementizer, although it is glossed as ‘fact-ACC’ in (9).
   John-TOP [who-who-NOM tomorrow come C] think  
   ‘John thinks “So-and-so will come tomorrow”.’

   ‘John believes that Bill bought such-and-such.’

e. John-wa itsumo Mary-kara [dare-dare-ga doko-doko-ni iru  
   John-TOP always Mary-from [who-who-NOM where-where-at be  
   to] kiiiteita. C] heard  
   ‘John always heard from Mary “so-and-so was in such-and-such  
   place”.’

f. * John-wa itsumo Mary-kara [dare-dare-ga doko-doko-ni iru  
   John-TOP always Mary-from [who-who-NOM where-where-at be  
   koto-o kiiiteita. fact]-ACC heard  
   ‘John always heard from Mary that so-and-so was in such-and-such  
   place.’

Although the data presented above supports our generalization in (4), the argumentation  
crucially hinges on the validity of Maynard’s claim, which is of course open to question.  
Furthermore, there is still a possibility that wh-doublets and the complementizer koto-o  
are incompatible on independent grounds. Thus, I will present some more tests below.

Our second test comes from honorifics. In Japanese, the predicate of a sentence  
takes the honorific form when the subject is socially superior to the utterer. This reference  
to the utterer can be used to disambiguate quotations from indirect speech: in the case of  
quotation, the attitude is not the actual utterer’s, but the quoted speaker’s.

Here is a situation.  
Imagine Lisa is Homer’s daughter and Lenny is his friend. While Lisa and Homer are family and hence she does not use honorifics to her father, she  
does use them in speaking to Lenny, who is her father’s friend and by assumption socially  
superior to her. In contrast, Homer and Lenny do not use honorifics to each other since  
they are close friends, nor to Lisa, who is socially inferior to both of them. In this context,  
if the subject of the predicate of utterance is Lenny and the actual utterer of the sentence  
is Homer, wh-doublets can appear only when Homer quotes Lisa’s utterance containing  
honorifics, and not when Homer’s utterance involves indirect speech which does not  
reflect Lisa’s use of honorifics. Consider the following example.

4 Note that despite the fact that shinjiteiru ‘believe’ selects a to-clause, (9d) is ungrammatical. This is  
perhaps due to the fact that believing is not a linguistic act and hence shinjiteiru never takes a quotation but  
only a proposition as its argument. Compare this with the case of omotteiru ‘think’ in (9c). I thank Irene  
Heim for pointing this contrast to me.

5 This example is inspired by one of Potts and Kawahara’s 2004.
said
‘Homer: Lisa said “Lenny came to such-and-such place”.’

said
‘Homer: Lisa said “Lenny came to such-and-such place”.’

In the situation given above, (10a) is appropriate because the honorific marking appears on the embedded verb *irashatta* ‘came (honorific)’ and that reflects Lisa’s attitude toward Lenny. On the other hand, if this predicate is not in the honorific form, but in the ordinary or anti-honorific form as in (10b), the sentence is infelicitous. Again, this must be because the embedded predicate reflects Lisa’s but not Homer’s attitude toward Lenny. This state of affairs is precisely what our generalization in (4) predicts, namely that the presence of a wh-doublet in the embedded clause forces it to be a quotation.

Thirdly, quoted questions and indirect questions are distinguished on the surface in Japanese: while the former is accompanied by the complementizer *to* in addition to the question particle *ka*, the latter appears without *to*. The following examples demonstrate that wh-doublets are licensed in quoted questions which appear with *to* but not in indirect questions which lack *to*.

John-TOP [yesterday who-who-NOM came Q C] asked
‘John asked “Who came yesterday?” ’

John-TOP [yesterday who-who-NOM came Q] asked
‘John asked who came yesterday.’

Fourthly, it has been widely acknowledged that quotation, but not indirect speech, can be introduced by non-embedding verbs such as ‘sigh’. Hence such embedded clauses are guaranteed to be quotations and as expected, wh-doublets can appear there, as the following example illustrates.

(12) [John-wa watashi-dewa naku, dare-dare-o aishiteiru to], [John-TOP me-CT not, who-who-ACC love C],
Hanako-wa tameikiotaita.
Hanako-TOP sighed
‘Hanako sighed, “John loves so-and-so, not me”.’

Note that for this test, we cannot obtain negative evidence, since we cannot force an indirect speech interpretation. Yet, the fact that (12) is compatible with (4) still supports
Lastly, there are many phenomena across languages whose appearance is limited to matrix contexts, or *root phenomena*. Unsurprisingly, there is one exception to this generalization, namely closed quotation, which functions as independent speech in relevant respects. Our generalization in (4) predicts that wh-doubets are compatible with clause-mate root phenomena in embedded contexts.

\[(13)\]

(a) John-wa [Bill-wa sonogo *doko-doko*-e itta to] itta.
   John-TOP [Bill-TOP after.that where-where-to went C] said
   ‘John said “Bill(TT/CT) went to such-and-such place after that”’

(b) Bill-wa Mary-ni [dare-dare-wa kuru no to] kiita.
    Bill-TOP Mary-to [who-who-TOP come Q C] asked
    ‘Bill asked Mary, “Will so-and-so come?”’

(c) Bill-wa [dare-dare-ga hon-o katta ne/sa/yo to] itta.
    ‘Bill said “So-and-so bought a book”.

(d) Bill-wa [dare-dare-ga hon-o kaimashita to] itta.
    Bill-TOP [so-and-so-NOM book-ACC bought.POL C] said
    ‘Bill said “So-and-so bought a book”.

(e) Bill-wa [nani-nani-o kau, John-ga to] itta.
    Bill-TOP [what-what-ACC buy, John-NOM C] said
    ‘Bill said “John buys such-and-such”.

(13a) contains a topic phrase in the embedded clause. Japanese topic phrases are marked by -**wa** and they can be interpreted either as a *thematic topic* or *contrastive topic* (Kuno 1973, Miyagawa 1987), the latter of which is often associated with a high tone on the marked portion or on the marker -**wa**, or possibly on both. Of interest here is the former interpretation: as is well known, thematic topics appear only in root contexts. What (13a) shows is that wh-doublets and thematic topics can co-occur. Similarly, (13b) uses the question marker *no* as a diagnostic. Japanese has two question markers, namely *ka* and *no*, but the latter can only appear in root contexts. Note that as mentioned above, quoted questions appear with the complementizer *to* as well. Again, wh-doublets and *no* in embedded clauses are compatible. Likewise (13c) shows that wh-doublets and declarative particles *ne, sa*, and *yo*, which only appear in matrix contexts, can appear together. Polite forms of predicates are another instance of root phenomena and (13d) shows that they are compatible with wh-doublets in clause-mate embedded contexts. Lastly, (13e) exploits rightward scrambling, whose distribution is again confined to root contexts, and shows that in embedded clauses, it is compatible with wh-doublets. Note that we cannot gain negative evidence with these tests either, but nonetheless the data given in (13) are all expected from our distributional generalization in (4) and hence support it.

To sum up the discussion so far, in this and the last subsections, we have seen that wh-doublets can appear in closed quotations (quotations of linguistic properties and
quotations of utterances respectively). Before closing this section, let us see if open quotations in fact disallow wh-doublets as (4) predicts.

2.4. Wh-doublets in Open Quotation

As our generalization in (4) states, wh-doublets are not licensed in open quotations, as the following examples demonstrate.

(14) a. * Quine-niyoruto, iNyoo-wa “nani-nani-no Quine-according.to quotation-TOP “what-what-GEN seeshitsu-o motteiru”. property-ACC have ‘According to Quine, quotation “have such-and-such property”.’

b. * Kono mondai-wa “nani-nani-no mondai”-no ichiree-da. this problem-TOP “what-what-GEN problem”-GEN example-is ‘This problem is an instance of “such-and-such problem”.’

c. * Kare-koso tenkeetekina “doko-doko-kara kita hito”-da. he-FOC typical “where-where-from came person”-is ‘He is a typical “person from such-and-such place”.’

We thus conclude that our generalization in (4) that wh-doublets are only licensed in closed quotations is correct. Now, in the next section, we will look at their semantic behavior.

3. The semantic duality of wh-doublets

In the last section we have observed a peculiar distribution of wh-doublets, namely that they only appear in closed quotations. Now, we will look at their peculiar semantics. Above all, despite the fact that wh-doublets appear in closed quotations, they semantically behave as if they are not quoted. Rather, it seems that expressions obtained from substituting wh-doublets by some other expressions are talked about in sentences containing them. For example, the following sentence is most naturally interpreted as a report of John’s utterance of, say, “Bill-ga Mary-o aishiteiru” or “Bill-ga Sue-o aishiteiru”, but not a report of John’s saying “Bill-ga dare-dare-o aishiteiru”, which is, as we have seen, an ungrammatical sentence.


Then, instead of what do wh-doublets appear? The following examples

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6 Actually wh-doublets can be quoted and talked about as well, just as this paper occasionally demonstrates in the body of text. Thus, a sentence containing wh-doublets is inherently ambiguous. We will come back to this point in footnote 13.
demonstrate that wh-doublets can only appear in place of referring expressions. Thus, among the following utterances of John’s, the ones in (16) but not the ones in (17) can be felicitously reported by (15) above.

(16)  
\[ \text{a. John: } \text{Bill-ga } \text{Mary-o } \text{aishiteiru.} \]  
\[ \text{Bill-NOM Mary-ACC love} \]  
‘John: Bill loves Mary.’

\[ \text{b. John: } \text{Bill-ga } \text{sono onna-o } \text{aishiteiru.} \]  
\[ \text{Bill-NOM that woman-ACC love} \]  
‘John: Bill loves that woman.’

(17)  
\[ \text{a. John: } \text{Bill-ga } \text{dareka-o } \text{aishiteiru.} \]  
\[ \text{Bill-NOM someone-ACC love} \]  
‘John: Bill loves someone.’

\[ \text{b. John: } \text{Bill-ga } \text{takusannoo onna-o } \text{aishiteiru.} \]  
\[ \text{Bill-NOM many woman-ACC love} \]  
‘John: Bill loves many women.’

\[ \text{c. John: } \text{Bill-ga } \text{minna-o } \text{aishiteiru.} \]  
\[ \text{Bill-NOM everyone-ACC love} \]  
‘John: Bill loves everyone.’

That wh-doublets appear instead of referring expressions suggests that they are a kind of definite expression. Interestingly, however, they have a property as an indefinite at the same time. Namely, they themselves show scope ambiguity with other scope bearing elements in the matrix clause. I call this the *semantic duality* of wh-doublets. The sentence in (18c) is a case in point.

(18)  
\[ \text{a. } \text{Sa} \text{nbuNnonino hito-dake-ga } \text{Bill-o } \text{aishiteiru.} \]  
\[ 2/3 \text{ person-only-NOM Bill-ACC love} \]  
‘Only two thirds of the people love Bill.’

\[ \text{b. } \text{Sa} \text{nbuNnonino hito-dake-ga } \text{dareka-o } \text{aishiteiru.} \]  
\[ 2/3 \text{ person-only-NOM someone-ACC love} \]  
‘Only two thirds of the people love someone.’

\[ \text{[2/3>someone, someone>2/3]} \]

\[ \text{c. } \text{Sa} \text{nbuNnonino hito-dake-ga } \text{[dare-dare-ga kuru to] itta.} \]  
\[ 2/3 \text{ person-only-NOM [who-who-NOM come C] said} \]  
‘Only two thirds of the people said “So-and-so will come”.’

\[ \text{[2/3>dare-dare, dare-dare>2/3]} \]

A referring expression like *Bill* in (18a) does not show scope ambiguity with the clausemate *sanbuNnonino hito-dake-ga* ‘only two thirds of the people’, but indefinites
such as *dareka* ‘someone’ does as in (18b).\(^7\) Wh-doublets are similar to *dareka* in this respect and they show the same kind of scope ambiguity as in (18c).

I take these two observations as suggesting that wh-doublets are semantically indefinites that range over referring expressions, and propose to capture this by treating their semantics as involving existential quantification over referring expressions.\(^8\) Schematically, this idea looks as follows. Here I use the English glosses for the sake of readability.

\[
(19) \quad [[\text{John said "Bill loves WHO-WHO"}]] = \\
\text{There is an expression } X \text{ referring to a person such that } \lceil \text{Bill loves } X \rceil \text{ was} \\
\text{uttered by John}
\]

However, to the best of my knowledge, there is not a model theory that allows this sort of metalinguistic quantification, or quantification over expressions that in turn denote a modeltheoretic object. In the next section, I will propose a new theory which allows precisely this by extending Heim and Kratzer’s 1998 system.

### 4. A model theory with a metalinguistic flavor

This section proposes a model theory of a fragment of Japanese which nicely accounts for the basic properties of closed quotations and the semantic duality of wh-doublets. I will basically extend Heim and Kratzer’s 1998 type-driven fragment here, though I believe a similar extension can (and should) be made in other frameworks too. Here the basic combinatory tools, namely Functional Application (FA) and Predicate Abstraction (PA) are implicitly assumed as given in Heim and Kratzer 1998.

#### 4.1 Basics

Firstly, I will introduce a new type \(u\), the type of expressions. For the sake of simplicity, intensions are ignored unless necessary.

\[
(20) \quad \text{Types} \\
\begin{align*}
\text{a. Primitive types: } & e, t, u, s \\
\text{b. If } & \sigma \text{ and } \tau \text{ are types, } <\sigma, \tau> \text{ is a type} \\
\text{c. Nothing else is a type}
\end{align*}
\]

\(^7\) It has been widely thought that Japanese is a rigid-scope language in which the scope relation is determined according to the word order. However, for this particular example, my informants including myself accept the inverted reading as well.

\(^8\) Of course, treating indefinites as existentials is just one and perhaps the simplest approach to the semantics of indefinites. However, I believe that the basic idea spelled out here can be extended to any approach to indefinites available on the market (the choice function approach, the indefinites-as-variables approach à la DRT, etc.), although a concrete demonstration is deferred here.
(21) **Domains**

a. $D_i$ is the set of individuals

b. $D_t$ is the set of truth-values, i.e. $\{1,0\}$

c. $D_u$ is the set of expressions

d. $D_s$ is the set of possible worlds

e. $D_{<\sigma,\tau>}$ is the set of functions from $D_\sigma$ to $D_\tau$

I take $D_u$ as containing all sorts of imaginable expressions, including interpretable and uninterpretable/ungrammatical ones, ones with syntactic structures (or phrase markers) and ones without them (i.e. linear sequences of symbols/phonemes), ones belonging to foreign languages, and so on and so forth.

In this system, the interpretation function $[\[]$ is defined as a partial function from $D_u$ to the set of semantic representations. Note that it is always the case that expressions themselves are only of type $u$ and their interpretations are of some other type, which is an implicit convention in Heim and Kratzer, but has to be stated explicitly here.

Now, a new compositional rule that allows predication of type $u$ elements is introduced (cf. Potts 2005).

(22) **Metalinguistic Functional Application (MFA)**

If $\alpha$ has $\beta$ and $\gamma$ as its daughters and $[\beta]$ is of type $<\!\!u,\tau\!\!>$ for some type $\tau$, then $[\alpha] = [\beta](\gamma)$

Note that unlike in the ordinary FA, $\gamma$ is not interpreted in MFA. MFA comes into play in a type-driven way, i.e. when there is a predicate that predicates of an expression, such as ‘say’ or ‘is monosyllabic’. The verb ‘say’ is assumed to be ambiguous between the metalinguistic ‘say$q$’ that takes an expression as its first argument, and the familiar propositional ‘say$p$’ à la Hintikka 1969.

(23) a. $[\text{say}_q] = \lambda X \in D_u. \lambda y. \in D_e. y \text{ utters } X$

b. $[\text{say}_p]^w = \lambda p \in D_{<\!\!u,s,t\!\!>}. \lambda y. \in D_e. \forall w' \text{ compatible with what } y \text{ says in } w, [p](w') = 1$

(24) $[\text{is monosyllabic}] = \lambda X \in D_u. X \text{ is monosyllabic}$

Note that this theory treats the quotation marks as semantically vacuous, i.e. they merely serve to indicate that MFA applies at that place (contra Davidson 1979 and Potts 2004 among others). This is a rather welcome result given the fact that quotation marks are a mere notational device that does not appear in spoken languages.

4.2 Metalinguistic quantification and the semantics of wh-doublets

Now, let us turn to our main topic, the semantics of wh-doublets. In the present system, their semantics can be schematically represented as generalized quantifiers over

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9 Note that this rule never results in ‘undefined’ unlike the ordinary Functional Application.

type $u$ elements.11

\begin{equation}
[[\text{wh-wh}]] = \lambda P \in D_{<u,t>} \exists X : X \in D_v \& [[X]] \in D_e \& Q([[X]]) = 1 \& P(X) = 1
\end{equation}

$Q$ here is an inherent restriction of the wh-doublet. For example, in the case of *dare-dare* ‘who-who’, the interpretation of $X$ must refer to a person.

\begin{equation}
[[\text{dare-dare}]] = \lambda P \in D_{<u,t>} \exists X : X \in D_v \& [[X]] \in D_e \& \text{person}'([[X]]) = 1 \& P(X) = 1
\end{equation}

Furthermore, I assume that the function $P$ of type $<u,t>$ in the above representation is derived by Quantifier Raising of wh-doublets.

\begin{equation}
\text{wh-wh} <i,u> [_{\text{IP} \ldots \ldots t_{<i,u>}} \ldots \ldots ]
\end{equation}

This operation introduces a metalinguistic variable which is eventually quantified over by the existential operator built into the semantics of wh-doublets. In the present fragment, I use complex indices, represented as ordered pairs of an integer and a type (cf. Heim and Kratzer 1998). In (27), we have $<i,u>$, where $i$ is an arbitrary integer and $u$ is the expression type. The desired interpretation is achieved by the following compositional rule.

\begin{equation}
\text{Metalinguistic Predicate Abstraction (MPA)}
\text{If } \alpha \text{ has an index } <i,u> \text{ and } \beta \text{ as its daughters, then } [[\alpha]] = \lambda X \in D_v
\text{[[}\beta[X/t_{<i,u>}]\text{]]}
\end{equation}

Here, $\beta[X/t_{<i,u>}]$ denotes the expression obtained from $\beta$ by substituting every occurrence of $t_{<i,u>}$ in $\beta$ by $X$. I call this operation *Metalinguistic Substitution*.

To get a grasp of this analysis, let us look at the interpretation of the example in (29) below step by step.

\begin{equation}
\text{John-wa “Bill-ga dare-dare-o aishiteiru” to itta.}
\text{John-TOP Bill-NOM who-who-ACC love” C said}
\text{‘John said “Bill loves so-and-so”.’}
\end{equation}

I assume that *dare-dare* moves and adjoins to the top IP node at LF, leaving behind a trace of type $u$.12 Suppose the index the trace bears is, say, $<6,u>$.

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11 As suggested to me by Christopher Tancredi (p.c.), if the class of referring expressions includes demonstratives and indexicals, which seems correct, the semantics in (25) has to refer to contexts of utterance somehow. One way to get the desired meaning is to relativize the interpretation function to Kaplanian contexts and existentially quantify over them in the semantics in (25), so that demonstratives and indexicals refer to an individual in *some* context and thus the variable $X$ ranges over them as well. I would like to abstract away from this point in this paper for the sake of simplicity.

12 As is the case with ordinary QR, the targeted node does not have to be IP, but can be any node with type $t$ (see Heim and Kratzer 1998 for a discussion). For the sake of simplicity, I use IP here.
(30) \[[\text{IP} \text{[dare-dare]} \langle 6, u\rangle \text{[IP} \text{John-wa} \text{[VP "Bill-ga} t_{<6,u>}-o \text{aishiteiru" to itta}}]]\]

Interpreting top-down, the ordinary FA decomposes the first node as follows:

(31) \[[\text{dare-dare}] (\langle 6, u\rangle \text{IP})]\]

Then by MPA, \(\langle 6, u\rangle \text{IP}\) turns to be the following function.

(32) \[[\langle 6, u\rangle \text{IP}] = \lambda X \in D_u. [[\text{IP} X_{t_{<6,u>}}]] = \lambda X \in D_u. [[\text{IP} \text{John-wa} \text{[VP "Bill-ga} X-o \text{aishiteiru" to itta}}]]\]

Here, we have a metalinguistic variable \(X\), which is to be bound by dare-dare ‘who-who’. The third line is obtained from the second by performing Metaliguistic Substitution. Now let us interpret the rest of IP. Assuming the complementizer to is semantically vacuous (i.e. an identity function over expressions) and that itta ‘said’ has the same denotation as ‘sayq’ given in (23a), the IP is interpreted as follows:

(33) \(\lambda X \in D_u. [[\text{IP} \text{John-wa} \text{[VP "Bill-ga} X-o \text{aishiteiru" to itta}}]]\]

Then, dare-dare ‘who-who’, taking this as its argument, yields:

(34) \(\exists X : X \in D_u & [[X]] \in D_e & \text{person} ([[X]]) = 1 & \text{John uttered} \text{[Bill-ga} X-o \text{aishiteiru}]\]

This is exactly what we want for the interpretation of (29).

5. Further notes on metalinguistic expressions

5.1. Infelicitous instances of wh-doublets in quotations of linguistic properties

As noted in section 2.2 above, there are apparently instances of quotations of linguistic properties that do not allow wh-doublets. For example (35) sounds infelicitous out of the blue.

(35) # “Nani-nani”-wa yo n moji-da.
    “what-what”-TOP four letter-is
    ‘Such-and-such’ has four letters.’

The anomaly of this example is explained by taking into consideration the fact that it is

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13 As noted in footnote 5, there is an interpretation of (29) where the wh-doublet is quoted, i.e. John was reported as having uttered Bill-ga dare-dare-o aishiteiru, an ungrammatical sentence. This reading is captured by assuming that QR of wh-doublets is optional.

14 Makoto Kanazawa (p.c.) reported to me that (35) sounds felicitous to him, but I disagree. I have no explanation of this variation across speakers.
taken as a generic statement about properties of expressions in its most prominent reading. That there is a generic reading of wh-doublets is not surprising, since they are a kind of indefinite and indefinites generally are able to receive a generic interpretation, whatever the mechanism responsible for it is. Obviously, in the generic reading, the sentence in (35) is false, since it is not that case that an expression usually has four letters. I argue that this is what makes the sentence infelicitous. In fact, when read episodically, (35) becomes felicitous.

(36) Context: John saw a poster of the movie “Starwars Episode III”, but he could not remember it clearly. Now he is trying to recall it.
John: Taitoru-wa **dare-dare**-no gyakushuu” de,
title-TOP “Who-who-GEN Revenge” and,
(sono) **dare-dare**-wa yon moji-da.
(that) “what-what”-TOP four letter-is.
‘John: The title is “Revenge of the Such-and-such”, and (that) “such-and-such” has four letters.’

Thus, the apparent counter-example in (35) to the distributional generalization made in section 2 is not a problem given the semantics of wh-doublets.

5.2. *Nani-nani* ‘what-what’

Among wh-doublets, *nani-nani* ‘what-what’ exhibits a broader usage than the others in that it does not have an inherent restriction on the denotation of referring expressions it ranges over.

(37) Amerikajin-ga “John is **nani-nani**” to itteita.
American-NOM “John is what-what” C said
‘An American said “John is blah-blah-blah”.’

It seems that not only referring expressions denoting things, but any expression can come to the position of *nani-nani* ‘what-what’ in (37). For example, it can be not only a referring expression such as ‘the chairman’, but also an indefinite noun phrase ‘a man’ or a more complex phrase ‘looking for a cute girl’. This is not possible with the other wh-doublets. I propose the following denotation for *nani-nani*.

(38) \[[nani-nani] = \lambda P \in D_{<u,t>}. \exists X:X \in D_u & P(X)=1\]

Note that this semantics does not impose any constraint on the denotation of the metalinguistic variable $X$.

Furthermore, *nani-nani* functions as an indefinite ranging over verbs and adjectives when combined with the light verb *-suru* and the adjectival suffix *-shii* respectively.
   John-TOP “Bill-NOM what-what-did” C said
   ‘John said “Bill did such-and-such”.’

b. John-wa "Bill-wa **nani-nani-shii**" to itta.
   John-TOP “Bill-TOP what-what-ish” C said
   ‘John said “Bill is such-and-such-ish”.’

I propose to treat these as separate (though perhaps morphologically related/derived)
lexical items from *nani-nani* ‘what-what’. This is because *-suru* and *-shii* themselves do
not have to be contained in the referent insofar as it is a verb and an adjective
respectively (e.g. the verb *taberu* ‘eat’, the adjective *akai* ‘red’).

(40) a. \[ [nani-nani-suru] = \lambda P \in D_{<u,t>} \exists X:X \in D_u & \text{verb}(X)=1 & P(X)=1 \]

b. \[ [nani-nani-shii] = \lambda P \in D_{<u,t>} \exists X:X \in D_u & \text{adj}(X)=1 & P(X)=1 \]

5.3. More metalinguistic expressions

Besides wh-doublets, there are a number of expressions in Japanese that function
in a very similar way including *kore-kore* ‘this-this’, *dore-sore* ‘which-that’, and *kore-
kore-koiu-koto* ‘this-this-like.this.say-thing’.  

(41) John-wa “Bill-ga **kore-kore/ dore-sore/ kore-kore-koiu-koto-o**
   John-TOP “Bill-NOM this-this/ which-that/ this-this-like.this-thing-ACC
   did” to itta.
   'John said “Bill did such-and-such”.'

Apparently, they too only appear in closed quotations, but as suggested to me by Mamoru
Saito (p.c.), these expressions seem to differ from wh-doublets in that they tend to prefer
‘specific’ interpretations. A detailed investigation of these items is deferred to another
occasion, however.

6. Conclusion

This paper made a distributional generalization of Japanese wh-doublets stated in
(4), and observed that their semantics involves quantification over referring expressions.
However, such metalinguistic quantification has not been formulated in a modeltheoretic
way, and we have proposed an extension of Heim and Kratzer’s 1998 system that allows
predication and quantification over expressions. The theory presented here sheds a new
light on the metalinguistic nature of natural language, which has hitherto not been widely
discussed in modeltheoretic semantics.

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15 *Shita* is the past tense form of *suru*.
16 I thank Makoto Kanazawa for directing my attention to these items.
References