Intension, free choiceness and the role of 'mo' in Japanese[1]

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1. Introduction

It is widely accepted that the notions of intensional quantification and variation play a central role in the recent literature on Free Choice Items (FCI) (Kadmon and Landman, 1993; Dayal, 1995, 1998; Horn, 1989, 2000; Giannakidou, 2001; Jayez and Tovena, 2005 among others). Researchers has reached agree on the modal view of FCI, that individuals which satisfy sentence are picked in different possible worlds. However, if FCI can be taken to contribute a universal quantifier in some cases and an existential indefinite in others, how do we decide what it means and is there something that derives their quantificational status in FCIs? The purpose of this paper is to show that the fact that FCIs are treated formally as function from world-time pairs to individuals. Crucial evidence for this analysis involves Japanese 'N-mo' phrases, including common and proper nouns as host N. As theoretical background, we adopt Janssen (1984).

2. The Japanese Indeterminate Quantification

In Japanese, an indeterminate quantifier consists of two parts: (i) an indeterminate pronominal expression and (ii) a focus-induced particle 'mo' or 'ka'. Generally 'mo' and 'ka' are assumed to carry a quantificational force. Analyses of particle 'mo' have focused on the fact that 'mo' contributes not only universal quantification in the universal series in (1a), but also existential quantification in the NPI series in (1b)[2].

(1) A (partial) list of indeterminate pronouns

	dare (person)	dore(thing)	doko(place)
a.	da're-mo (everyone)	do're-mo (everything)	do'ko-mo (everywhere)
b.	dare-mo (anyone NPI)	dore-mo (anything NPI)	doko-mo (anywhere NPI)
c.	dare-de-mo (anyone FC)	dore-de-mo (anything FC)	doko-de-mo (anywhere FC)

Shimoyama (2001, 2006) adopts Hamblin's (1973) semantics of questions for the indeterminate pronouns, such that they denote a set of alternatives. Unlike previous authors, she proposes that 'mo' in

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[2] 'Wh-de-mo' is defined for FCI but I omit consideration of such cases, as they are not crucial for the present discussion.

indeterminate-'mo' phrases always contributes universal quantification, so that the indeterminate-'mo' NPIs are quantifiers of type <<τ,t>,<<τ,t>,t>>, where τ is a variable standing for any category as in (2). This entails the 'mo'-phrase denotation is as shown in (3).

(2) MO=λPλQ ∀x [P(x)→Q(x)]、 where $x \in D_e$, and P, $Q \in D_{<e,t>}$
(3) [[X]mo] = λQ∀x [[X] (x) →Q(x)], of type <<e,t>,t>

According to Shimoyama, a common syntactic assumption that NPIs undergo movement to Spec of NegP, i.e. outside the syntactic scope of negation, is suitable for deriving the interpretation. For instance, (4a) asserts (5a) and (4b) asserts (5b).

(4) a. Dare-mo ko-nakat-ta.
anyone-MO come-NEG-PAST
(No one came.)
b. Da're-mo ko-nakat-ta.
Everyone-MO come-NEG-PAST
(Everyone did not come.)
(5) a. ¬ ∃x [person(x) ∧ came(x)]
b. ∀x [person(x) → ¬ came(x)]

In (5), the narrow scope existential analysis and the wide scope universal analysis are indistinguishable: (4a) and (4b) are identical. Thus, in both cases, *dare-mo* denotes the set of people in the given context. When presented with a more detailed picture of how indeterminate-'mo' NPIs are interpreted, however, *dare-mo* in (4a) can be interpreted to be the focus-induced alternatives that will be a sum of variables assigned distinct values in different worlds/situations as in (6). This seems to be very similar with the i(dentity)-alternatives in the sense of Giannakidou (2001:705):

(6) i-alternatives
A world w_1 is an i-alternative wrt α iff there exists some w_2 such that
$[\![\alpha]\!]^{w1} \neq [\![\alpha]\!]^{w2}$.

The two i-alternatives are worlds w_1 and w_2 and agree on everything without a value assigned to α. Let us try to see how this idea interacts with the interpretation of (4a). Assuming a model containing three worlds W= {$world_1$, $world_2$, $world_3$} and three individuals D= {$person_1$, $person_2$, $person_3$}, (4a) could be true in the following state of affairs:

(7) a. w_1: $g(x) = person_1$
$[\![person(x) \wedge came(x)]\!]^{w1, g} = 1$
b. w_2: $g(x) = person_2$
$[\![person(x) \wedge came(x)]\!]^{w2, g} = 1$

c.w_3: g(x) = $person_3$
⟦person(x) ∧ came(x)⟧ $^{w3, g}$ = 1

Notice that in this model, the assignment function *g* assigns a different individual to *x* in each world and the available values are exhausted. However, (4a) contains negation and *dare-mo*-phrases undergo movement to Spec of NegP, where it takes the whole proposition as its argument. Therefore, (4a) can be analyzed as in (8).

(8) λw λx [person(x) (w) ∧¬ came(x) (w)]

In this reading, 'mo' contributes to induce the set of people whose interpretation/value would vary with the worlds/situations, rather than a set of people in one world/situation. Formulated in Giannakidou's (2001) terminology of the FC determiner: 'mo' is a type-shifter, which returns an intensionalized property as its output. However, what is an intensionalized property? How can one derive universal and existential FC readings?

3. The Japanese FCIs

The above observation shows that 'mo' contributes to induce the set of variables not only in one world but also in i-alternative worlds and prompts *wh-mo*-phrases to denote intensionalized property as a FCI. Before tackling the above-mentioned questions, the basic picture of Japanese FCI will be briefly examined.

3.1 Donna CN- mo

Let us start with Hamamoto's (2004) recent proposal on "donna CN-mo" *any CN/n'import quel CN* in comparison with "dono CN-mo" *every CN*. He adopts Giannakidou's (2001: 666) analysis for FCIs, such that FCIs are intensional indefinites that can be interpreted in a sentence only if the sentence provides possible worlds/situations which can serve as identity alternatives inducing variation. In this vein, Hamamoto proposes that "donna CN-mo" *any CN* has an intensional interpretation, while "dono CN-mo" *every CN* has an extensional interpretation as found in sentences such as (9):

(9) a. Donna keeki-de mo tabe-te-ii.
any cake-COPULA MO eat-may-PRESENT
(You may eat any cake.)

b. Dono keeki-de mo tabe-te-ii.
which cake-COPULA MO eat-may-PRESENT
(You may eat every cake.)

(9a) is acceptable before arriving at a cafeteria. However, (9b) is unacceptable in the same situation. It can be acceptable only if there exist couple of cakes and with the speaker's recognition. This difference in distributional constraint indicates that in the sentence (9b), the sister phrase of 'mo' denotes the set of the

alternative individuals in the context, i.e. type <e,t>. Thus "dono CN-mo" *every CN* is of type <<e,t>,t>. On the other hand, (9a) differs from (9b) in that 'mo' composes with the sister phrase "donna CN". Hamamoto takes this "donna" to be an intrinsic modal element, in the sense of Dayal (1998). (10) is the analysis of "donna" in Hamamoto (2004: 330):

(10) // donna // = $\lambda P\, ARB_W\, \lambda_X\, [P(x)(w)]$

The *ARB* is an arbitrary operator, which is sensitive to the context. Based on this analysis, Hamamoto posits that the ambiguity between universal and existential reading of "donna CN-mo" *any CN* due to the option of binding situations by the arbitrary operator (*ARB*), but not due to the universal/existential quantification over possible worlds/situations. Since possible modal operator is an existential quantifier, (9a) could be analyzed as in (11).

(11) a. Donna keeki-de mo tabe-te-ii.
(You may eat any cake.)
b. [MAY [eat (you, ANY cake)]]
c. $\exists$ w, x [ARB (w) $\wedge$ cake (x, w)] $\rightarrow$ eat (you, x, w)]

The arbitrary operator *ARB* may restrict possible worlds/situations that correspond to the current possibilities, thus avoiding the modal overflow. However, as pointed in the literature, this kind of operator allows rescuing the anomalous sentences like (12).

(12) **Donna hito- mo* yuusyoku-o tabe-nakat-ta.
any person- MO dinner-ACC eat-NEG-PAST
(Any person did not eat the dinner.)

The second problem is the obligation modals. For instance, "donna CN-mo" *any CN* can appear even in episodic sentence including determinant expression like "senshyuu" *last week*, which is not at all modalized, as in (13).

(13) Sensyuu, Byooki-no-toki, Mary-wa donna tabemono-de mo tabe-ta.
last week sichness-GEN-time Mary-TOP any food-COPULA MO eat-PAST
(When Mary was sick last week, she ate any food.)

If "donna" is an inherent modal element, it might be filtered out in the extensional veridical episodic context like (13). The compatibility with (13) is incompatible with the idea that "donna CN-mo" *any CN* is bound by arbitrary operator (cf. Hamamoto) or nonveridical operator (cf. Giannakidou). Moreover, it is not clear how Hamamoto's approach accounts for the mecanisme that FCIs can have universal and existential readings. Hence, the discussion suggests that we cannot take "donna" to be a modal operator, rather it composes indeterminate pronoun with CN and prompts it to be interpreted as property denoting expression

in association with ‘mo’. This conclusion, however, does not constitute an account of what is ‘free choiceness’ and how/why one can derive universal and existential FC readings.

3.2 Euphemistic ‘mo’-phrase

At this point, let us note the fact that particle ‘mo’ can also be licensed when it occurs with a common noun (CN), proper-noun in subject-topic position, as shown in (14).

(14) a. Haru-mo takenawa-ni nari-masi-ta.
spring-MO peak-DAT become-PAST
(The spring has reached its peak.)
b. {Taroo/Musuko}-mo seizin-si-ta.
Taroo/son-MO grow up-DO-PAST
({Taroo/My son} grew up.)
c. Kotosi-mo ositumat-te-ki-ta.
this year-MO get close to the end-PAST
(We are getting close to the end of the year.)
d. Kimi-mo mekkiri fuke-ta-na.
you-MO a lot age-PAST-DISCOURSE PARTICLE
(You have aged a lot.)
e. Utage-mo takenawa-ni nari-masi-ta.
banquet-MO peak-DAT become-PAST
(The banquet has reached its peak.))

One may call of ‘mo’ involved in (14) “yawarage no ‘mo’, *euphemistic ‘mo’*, after Numata(1986). Generally, ‘mo’ phrases composed with CN and proper-noun introduce a focus-induced alternative, as in (14’a, b).

(14’) a. John-mo ki-ta
John-also come-PAST
(John came too. → Mary and Bill came.)
b. Mary-wa ringo-mo tabe-ta.
Mary-TOP apple-also eat-PAST
(Mary ate an apple too. → Mary ate an orange.)

The Ex. (14’a) has the hidden presupposition such that ‘Mary and Bill came’ and ‘John ate an orange and a pear). However, the euphemistic ‘mo’ phrase does not introduce an alternative set: for instance, (14a) does not imply an alternative as like “the summer has reached its peak”. As far as I know, there is no clear explanation for the semantic property of the euphemistic ‘mo’ in the literature. According to Numata (1986), it is assumed that the euphemistic ‘mo’ triggers an allusion to an alternative set like “cherry blossom is blooming”, “it became warm” etc.; as a result, this type of ‘mo’ can attenuate indirectly the meaning of

sentences or express authors' feeling/emotion toward the current event or situation described by the sentence.

Despite this inability to define the semantic status of euphemistic 'mo', this type of 'mo' associates with a stable licensing environment: it is infelicitous in generic sentences as in (15), assuming that 'mo' is euphemistic one.

(15)a. Musuko-{*mo/wa} itosi-i.
son-{*MO?TOP} be precious-PRESENT
(Son is precious)
b. Haru-{*mo/wa} yoake-ga yo-i.
spring-{*MO/TOP} dawn-NOM good-PRESENT
(The spring is best in dawn.)

Furthermore, it is neither permitted in episodic sentences including determinant expressions like "kinoo" *yesterday*, as in (16a), nor in epistemic modal context, as in (16b).

(16) a. *Kinoo, haru-mo takenawa-ni nari-masi-ta.
yesterday spring-MO fast and furious-DAT become-PAST
(Yesterday, the spring grew fast and furious.)
b.*Haru-mo takenawa-ni nare-ru.
spring-MO fast and furious-DAT can become-PRESENT
(The spring can grow fast and furious.)

If 'mo' always contributes universal quantification, it must be recognized that NPs with euphemistic 'mo' in (14) can be universal. Given these facts, however, one cannot reasonably hope to assimilate all cases of 'mo' to the universal. Rather, it seems that *haru* (spring) and *musuko* (my son) in (14) are considered along the time lines. In other terms, the denotation of host NP may vary with the world/situation-time shifts; the different world/situation-time pair may contain different spring's or son's aspects.

Let us see now how this idea works with i(dentity)-alternatives. Assuming a model containing three worlds W = {world$_1$, world$_2$, world$_3$} and three predicate P= {come, grow, deepen}, (14a) could be true in (17b) among the following state of affairs:

(17) Haru-mo takenawa-ni nari-masi-ta.
spring-MO peak-DAT become-PAST
(The spring has reached its peak.)

a. w_1: g(x) = spring$_1$
$[\![\text{spring}(x) \wedge \text{come}(x)]\!]^{w1, g} = 1$
b.w_2: g(x) = spring$_2$
$[\![\text{spring}(x) \wedge \text{grow}(x)]\!]^{w2,g} = 1$

c.w_3: g(x) = $spring_3$

$[\![$spring (x) $\wedge$ deepen (x)$]\!]^{w3, g} = 1$

Notice that in this model, the assignment function *g* assigns a different aspect of spring to *x* in each time point and the available values, i.e. spring aspects, are exhausted. In other term, euphemistic 'mo' contributes to induce the set of spring aspects whose value would vary with the time points. Therefore, all the members of the denotation of *haru* (spring)-(euphemistic)*mo* are not on a par, but no (specific) individual is highlighted before being syntactically connected with a predicate. These facts are consistent with the idea (Giannakidou, 2001) that FC 'mo' is a type-shifter, which returns an intensionalized property as its output. Moreover, this is consistent with the Non-Individuation constraint (Jayez and Tovena, 2005:40) that a FCI is licensed in a sentence S if S (i) is not referential or (ii) communicates something that cannot be reduced to referential information.

In the next section, we consider the issue of ambiguity and show that there is no need to appeal to universal or arbitrary operators.

4. The Proposal

Based upon the discussion/facts about euphemistic 'mo', the proposal I want to make here is that FC 'mo' is a type-shifter of type <<τ>,<s, τ> >, where τ is a variable standing for any category as in (18) and the FC 'mo' phrases can be a function from world/situation-time pair to individuals. This entails that the euphemistic 'mo'-phrase denotation is as shown in (19).

(18) MO=λPλQ $\forall$x [P(x)→Q(x)]、where x ∈ $D_{<s,e>}$, and P, Q ∈ $D_{<<s,e>,t>}$

(19) [[X]mo] = λQ$\forall$x [[X] (x) →Q(x)], of type <s, <<s,e>,t>>,t>

In this vein, *haru* (spring)-*mo* in (14a) says something about the spring considered in the course of the time. On this intended reading, *haru* (spring)-*mo* cannot be analyzed as that there is a unique individual to which the predicate applies. Rather, it expresses a property of "spring, i.e. Individual Concept of type <s,e> and *haru* (spring)-*mo* is predicate on this Individual Concept[3] of type <<s,e>,t>. Hence, it is attractive to analyse FC-mo phrase as determining a certain Individual Concept. (14a) is translated in (20).

(20) x, y ∈ var <s,e>

$\exists$x [$\forall$y [spring'(y) ↔ x = y] $\wedge$ takenawaninaru' (x)]

The function is quantified in and (14a) says something about the current value of the function, i.e. the current phase of spring.

On the other hand, in (14b) a particular individual *Taroo* is determined by means of a set of properties of him (individual *Taroo*). Therefore, *Taroo* + "mo" may be considered to denote a function resembling an

[3] According to Janssen(1984), an individual concept (IC) is by definition an element in $D_e^{I\times J}$; xo it is a technical term for a function with domain I×J and range D_e. (the set D_e is the set of individuals and the elements in I×J are called reference points.)

Individual Concept. It may yields for every index the different phase of *Taroo*. The function is quantified in, and (14b) says something about the current value of the function, i.e. the current aspect of *Taroo*. Hence, The translation of (14b) into intensional logic is given in (21).

(21) x, y ∈ var <s,e>
$\exists x [\forall y [Taroo'(y) \leftrightarrow x = y] \wedge seizingsuru'(x)]$

In both cases, it can be said that the NPs in restrictor denote function, while they are existentially quantified by predication and give the value as its denotation. Incorporating this way of analysis into indeterminate-'mo' FC, (22) is analyzed as (23).

(22) Donna gakusei-de-mo kono mondai-ga toke-ru. .
any student de-MO this problem-NOM solve-can-PRES
(Any student can solve this problem.)

(23) y ∈ var <s,e>
$\forall y[student'(y) \rightarrow tokeru'(y, this\ problem)]$

Since (22) says different students in the course of world and time, *donna gakusei-demo* "any student" is considered as a predicate on Individual Concepts. Therefore, *y* in (23) is considered a variable (over individual concepts) of type <<s,e>,t>; *y* is not invariant across all accessible worlds. The difference between existential readings in (14a) and universal reading in (22) is thus reduced to a predicate difference, i.e. stage vs. individual level predicates. Assuming a Heim (1982) style LF is suitable for deriving the interpretation; in the former case, i.e. (14a,b), the FC 'mo' phrase is quantified in existential closure, in the latter case, i.e. (19), the FC 'mo' phrase is mapped into restrictive clause in LF, receiving the universal reading. Therefore, on the individual reading, (14b) means "Taroo grew up also" and implies that there are others who grew up.

5. Conclusion

In essence, FCIs are in most cases treated as intensional indefinites, due to the limited distribution of FCIs in nonveridical and nonepisodic contexts. This distributional pattern develops a modal view of FCIs, where the individuals that satisfy the sentence are picked in different possible worlds. Despite this distributional pattern, FCIs are felicitous in some episodic/non-modal contexts. This motivates a move from the standard modal analysis to another view. For instance, Jayez and Tovena (2005) propose an informational constraint they call Non-Individuation. It says that the information conveyed by the sentence with FCI should not be reducible to a referential situation. The Non-Individuation does not exclude non-modal information. Nevertheless, as we saw above, in Japanese, there exist sentences with FCI that can be reducible to a referential situation when FC 'mo' associates with a common noun or proper-noun in subject-topic position. Given the empirical problems of the modal view and the virtue of the Non-Individuation, it can be suggested that a better approach might be to assume that FC 'mo' phrases can be a function from world-time pair to individuals, i.e. Individual Concept. Furthermore, if we assume that FC 'mo' phrases are

basically functions, then the quantificational variability of FC'mo' phrases can also be accounted for more naturally: the existential/universal interpretations of FC 'mo' phrases are determined depending on the predicate difference, i.e. stage vs. individual level predicates.

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