

On the Interpretations of the Discontinuous WH-*mo* Construction

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1. Introduction

This paper is concerned with the interpretive property of the discontinuous WH-*mo* construction in Japanese, as exemplified in (1):

- (1) [*dare-ga* *kaita* *ronbun*]-*mo* *saiyoo-sareta*
who-Nom wrote paper-MO accept-Pass-Past
'For every *x*, the paper that *x* wrote was accepted'

What is characteristic of this construction is that the indeterminate phrase *dare* ('who') is associated with the particle *mo*, which is separate from the indeterminate phrase, and yields a universal reading as shown in (1).

There have been two different approaches in the literature to the syntax/semantics of this construction. In one approach, which is called the "embedded restrictor view (henceforth, ERV)," ¹ the embedded indeterminate phrase is associated with the universal quantifier *mo* via some syntactic process and serves semantically as the restrictor of *mo* (Takahashi (2002)). The interpretation of sentence (2), for example, can be represented as (3):²

- (2) [[*dono-gakusei-ga* *teisyutusita*] *syukudai*]-*mo* *yuu-datta*
which student-Nom submitted homework assignment-MO A-was
'Every homework assignment that a student had handed in got an A'

- (3) $\forall x[\text{student}(x) \rightarrow \text{get an A}(\iota y[\text{homework assignment}(y) \ \& \ \text{submit}(y)(x)])]$
'For every student *x*, the homework assignment that *x* submitted got an A'

In the other approach, which is called the "direct restrictor view (henceforth, DRV)" and is taken by Shimoyama (2006), it is the head nominal of the relative clause, not the indeterminate phrase within the relative clause, that serves as the restrictor of the universal *mo*. On this view, the semantic interpretation of (2) is represented as (4), not as (3), as Shimoyama argues:

- (4) $\forall x[x \in \{ \iota y[\text{homework assignment}(y) \ \& \ \text{submit}(y)(z)]: \text{student}(z) \} \rightarrow \text{get an A}(x)]$

'Every homework assignment that a student submitted got an A'

This paper provides a careful examination of the interpretations of the discontinuous WH-*mo* construction, paying special attention to the definite/indefinite reading of the head nominal, and argues that the observed interpretations are better captured by the ERV.

2. Shimoyama's (2006) Direct Restrictor View Approach

Shimoyama's (2006) DRV is based on the observation of the example in (2), repeated below:

- (2) [[*dono-gakusei-ga teisyutusita*] *syukudai*]-*mo* *yuu-datta*
 which student-Nom submitted homework assignment-MO A-was
 'Every homework assignment that a student had handed in got an A'

Sentence (2) is true in a situation where each student submitted one and only one homework and for every student who submitted the homework, that homework was given the A grade. This is illustrated in the chart in (5):

(5) <i>Students</i>	Ichiro	Hideki	Kazuo	Daisuke	Hideo
<i>Submitted a homework?</i>	yes	yes	yes	yes	yes
<i>Did the homework get an A?</i>	yes	yes	yes	yes	yes

Since the universal quantifier *mo* quantifies over the set of homework assignments, as Shimoyama claims, the existence of a single homework that did not get an A, as in chart (6), will render sentence (2) false:

(6) <i>Students</i>	Ichiro	Hideki	Kazuo	Daisuke	Hideo
<i>Submitted a homework?</i>	yes	yes	yes	yes	yes
<i>Did the homework get an A?</i>	yes	yes	yes	yes	no

This is captured by the formula in (4), where the head nominal *syukudai* 'homework' serves as the restrictor of the universal quantifier *mo*: since *mo* ranges over the set of homework assignments, it has to be the case that ALL the homework assignments involved must be given the grade A.

An advantage of the DRV, as Shimoyama argues, is that this approach allows one to assume a very simple process in which the sentence meaning is compositionally calculated since it does not have to rely on any syntactic (or semantic) mechanism (whether it is the covert movement of the indeterminate phrase to *mo* (Nishigauchi (1986, 1990)) or the overt movement of *mo* from inside the indeterminate phrase to its surface position (Takahashi

(2002)) that is designed to associate the universal *mo* and the indeterminate phrase (*dono-gakusei* in (2)) within the relative clause.³

3. Interpretations of the WH-*mo* Construction

Let us now consider the following example that is pointed out but is left unexplained in Shimoyama (2006):

- (7) [[nan-yoobi-ni toogoron-o totteiru] gakusei]-mo hito-ri-wa paatii-ni kiteita
 what-day of week-on syntax-Acc are taking student-MO one-CI-WA party-to had come
 ‘For every day *x* of the week, at least one of the students who are taking syntax on *x* was at the party’.

As Shimoyama observes, sentence (7) is true in the following situation:

(8) <i>Days of the week</i>	Wednesday	Thursday	Friday
<i>The number of students in the syntax class</i>	10	9	8
<i>The number of students who came to the party</i>	2	1	3

As the existence of the floating quantifier *hito-ri-wa* suggests, the existence of at least one student per syntax class who came to the party makes the sentence true. The point to note is that sentence (7) does not seem to involve universal quantification of *mo* over the head nominal (the set of students), since the sentence is true despite the existence of students who did not come to the party. Moreover, consider the following scenario:

(9) <i>Days of the week</i>	Wednesday	Thursday	Friday
<i>The number of students in the syntax class</i>	10	9	8
<i>The number of students who came to the party</i>	0	1	3

Sentence (7) sounds false under this scenario, where there is one day whose syntax class has no students who came to the party. A crucial difference between these two situations is that ALL the three days have students present at the party in scenario (8), but not in scenario (9).

It is not clear how Shimoyama’s (2006) account can be extended to this case since it lets *mo* universally quantify over the set of students: sentence (7) is true even if there are students of the syntax class who did not come to the party. Rather, this interpretive fact can be taken to support the ERV of the WH-*mo* construction since this fact can be easily captured by saying that the universal quantifier ranges over the set of days, the embedded nominal, not on the set of students, the head nominal: the existence of a single day that contains students who were absent from the party renders the sentence false .

Moreover, consider the following example, which does not involve a floated quantifier:

- (10) a. [dono-sensei-ga osieta gakusei-mo] daigakuin-ni susunda
 which-teacher-Nom taught student-MO graduate-school moved-on
 'For every professor, a student who (s)he taught went to a graduate school'
- b. [dare-ga sono-DJ-ni okutta rikuesuto-mo] saiyou-sareta
 who-Nom the-disk-jockey-to sent request-MO accepted
 'For everyone, a request that (s)he sent to the disk jockey was accepted'

Sentence (10a), for example, sounds true under the following scenario:

(11) <i>Professors</i>	Prof. A	Prof. B	Prof. C
<i>The number of students he (she) taught</i>	7	8	6
<i>The number of students who went to a graduate school</i>	2	3	4

The point is that only 9 students, out of the 21 students involved in this scenario, went to a graduate school. The existence of many students who did not go to a graduate school does not render sentence (10a) false. Moreover, the existence of a single professor whose set of students does not contain any who went to a graduate school, as in (12), renders the sentence false.

(12) <i>Professors</i>	Prof. A	Prof. B	Prof. C
<i>The number of students he (she) taught</i>	7	8	6
<i>The number of students who went to a graduate school</i>	2	3	0

Under the DRV, it would not be clear how it could account for the difference of the truth value between the scenarios in (11) and (12). The above fact supports the ERV since it indicates that the universal quantificational force of *mo* is on the indeterminate phrase embedded in the relative clause, but not on the head nominal.

4. Interpretive Ambiguity of Japanese Nominals

4.1 (In)definiteness and Singularity/Plurality

The preceding section has pointed out that it must be the embedded indeterminate phrase that serves as the restrictor of *mo*. Then why does it appear to be the case that *mo* universally quantifies over the head nominal in (2)? I would like to point out that this comes from (the lack of) the ambiguity with respect to the definite/indefinite interpretation of Japanese nominals and that external factors can select the preferred reading.

Japanese, unlike such languages as English that have markers of (in)definiteness, has no counterpart of the definite/indefinite article. Therefore, head nominals of Japanese relative clauses can be ambiguous between the definite and indefinite readings in (14). Consider (13) below:

(13) [sono-toori-ni aru ie-ga] uri-ni deteiru
that-street-on be house-Nom on-sale

- (14) a. The house (which is) on that street is on sale. (definite reading)
b. A house (which is) on that street is on sale. (indefinite reading)

As the English translations in (14) show, (13) is true either in the situation where there is just one house on the corner and that house is on sale (the definite reading, as in (14a)), or in the situation where one of the houses on the corner is on sale (the indefinite reading, as in (14b)).

Furthermore, since Japanese does not have an overt marker of singularity/plurality on nominals, as opposed to such languages as English that do have grammatical markers of singularity/plurality, Japanese nominals can be ambiguous between a singular and a plural reading as well. Thus (13) is also ambiguous between the singular and the plural interpretation. Coupled with the ambiguity with respect to (in)definiteness, sentence (13) is ambiguous in four different ways, as shown in (15):

- (15) a. The house (which is) on the corner is on sale. (definite, singular)
b. The houses (which are) on the corner are on sale. (definite, plural)
c. A house (which is) on the corner is on sale. (indefinite, singular)
d. Some houses (which are) on the corner are on sale. (indefinite, plural)

This four-way ambiguity of the head nominal seems to hold with the head nominal of the WH-*mo* construction as well. Consider (10a) again, which seems to be true in all of the following situations:

- (16) a. For each professor, there is only one student that he taught and that student went to a graduate school. (definite, singular)
b. For each professor, there are some students that he taught and those students all went to a graduate school. (definite, plural)
c. For each professor, there are some students that he taught and one of them went to a graduate school. (indefinite, singular)
d. For each professor, there are several students that he taught and some, but not all, of them went to a graduate school. (indefinite, plural)

It is the existence of reading (16d) that allows (10a) to be true under the scenario (11): only some of the students, out of the several that each professor taught, went to a graduate school. The other readings in (16a), (16b) and (16c) are true in the situations (17a), (17b) and (17c), respectively:

(17) a.	<i>Professors</i>	Prof. A	Prof. B	Prof. C
	<i>The number of students</i>	1	1	1
	<i>he (she) taught</i>			
	<i>The number of students</i>	1	1	1
	<i>who went to a graduate school</i>			
b.	<i>Professors</i>	Prof. A	Prof. B	Prof. C
	<i>The number of students</i>	2	3	4
	<i>he (she) taught</i>			
	<i>The number of students</i>	2	3	4
	<i>who went to a graduate school</i>			
c.	<i>Professors</i>	Prof. A	Prof. B	Prof. C
	<i>The number of students</i>	2	3	4
	<i>he (she) taught</i>			
	<i>The number of students</i>	1	1	1
	<i>who went to a graduate school</i>			

This interpretive fact of the WH-*mo* construction does not pose a problem at all for the ERV, since in all these interpretations it is true of every professor that his/her students, whether it is his/her entire group of students or a part of the group, went to a graduate school.

The DRV, which states that the universal quantifier *mo* is associated to the head nominal, does account for the interpretations in (17a) and (17b) since it is indeed true that in these interpretations ALL the students involved went to a graduate school. However, the DRV fails to account for the interpretations in (17c) and (17d), since it does not predict the existence of any students in the group who did not go to a graduate school.

As for sentence (2), we find that it does not seem to have the same interpretive possibilities. The sentence sounds true in (18a) (, which Shimoyama (2006) pays attention to,) and (18b), but not in (18c) or (18d):

(18) a.	<i>Students</i>	Student A	Student B	Student C	Student D
	<i>The number of</i>				
	<i>assignments submitted</i>	1	1	1	1
	<i>The number of A's</i>	1	1	1	1

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b.	<i>Students</i>	Student A	Student B	Student C	Student D
	<i>The number of assignments submitted</i>	2	2	3	4
	<i>The number of A's</i>	2	2	3	4
c.	<i>Students</i>	Student A	Student B	Student C	Student D
	<i>The number of assignments submitted</i>	2	2	3	4
	<i>The number of A's</i>	1	1	1	1
d.	<i>Students</i>	Student A	Student B	Student C	Student D
	<i>The number of assignments submitted</i>	3	3	4	5
	<i>The number of A's</i>	2	2	2	3

The point is that sentence (2) is only true when the head nominal has a definite interpretation. This fact can indeed be accounted for by the DRV since in the only possible interpretations in (18a) and (18b) it is true that ALL the assignments got an A. But then why does (2) have only the definite interpretation of the head nominal?

4.2 Predicate Choice

I would like to point out in this section that the difference in the interpretive possibilities between (2) and (10) comes from the choice of predicates which the WH-*mo* is the subject of. Compare (2) and (10):

- (2) [[*dono-gakusei-ga teisyutusita*] *syukudai*]-*mo* *yuu-datta*
 which student-Nom submitted homework assignment-MO A-was
 'Every homework assignment that a student had handed in got an A'
- (10) a. [*dono-sensei-ga osieta gakusei-mo*] *daigakuin-ni susunda*
 which-teacher-Nom taught student-MO graduate-school moved-on
 'For every professor, a student who (s)he taught went to a graduate school'
- b. [*dare-ga sono-DJ-ni okutta rikuesuto-mo*] *saiyoo-sareta*
 who-Nom the-disk-jockey-to sent request-MO accepted
 'For everyone, a request that (s)he sent to the disk jockey was accepted'

We find that the predicate in (2) *yuu-datta* 'was an A' is what Carlson (1977) calls an individual-level predicate, a type of predicate that denotes a permanent property of the subject. On the other hand, the predicates involved in (10) are regarded as Carlson's stage-level predicates, predicates that denote a temporary, non-permanent state or event.

What is important in relation to the present discussion is that individual-level predicates do not readily allow an indefinite DP as its subject, as Milsark (1974, 1977) points out:

- (19) a. The man is tall.
 b. ??A man is tall.

This restriction seems to hold with Japanese as well. Compare (20a) and (20b):

- (20) a. [sono-toori-ni aru ie-ga] san-kaidate-de-arū (koto) (individual-level predicate)
 that-street-on be house-Nom three-storied-be (fact)
 'The house(s) on that street is (are) three-storied'
 b. [sono-toori-ni aru ie-ga] uri-ni-deteiru (koto) (stage-level predicate) (= (13))

In contrast to (13), repeated here as (20b), which has both the definite and the indefinite readings, (20a) seems to lack the indefinite reading. Thus (20a) has the interpretations in (21a) and (21b), but not (21c-d):

- (21) a. The house on the street is three-storied. (definite, singular)
 (There is one house on the street and the house is three-storied.)
 b. The houses on the street are three-storied (definite, plural)
 (There are some houses on the street and all the houses are three-storied.)
 c. A house on the street is three-storied. (indefinite, singular)
 (There are some houses on the street and one of them is three-storied.)
 d. Some houses on the street are three-storied. (indefinite, plural)
 (There are several houses on the street and some of them are three-storied.)

If we replace the predicates in (10) with individual-level predicates, we obtain only the definite readings:

- (22) a. [dono-sensei-ga osieta gakusei-mo] yuusyuu-da
 which-teacher-Nom taught student-MO smart-be
 'For every professor, the student(s) who (s)he taught is (are) smart'
 b. [dare-ga sono-DJ-ni okutta rikuesuto-mo] hurui-kyoku-da
 who-Nom the-disk-jockey-to sent request-MO old-song-be
 'For everyone, the request(s) that (s)he sent to the disk jockey is (are) an old song (old songs)'

(22a), for example, does not sound true in a situation where for each professor there are several students that he taught and one of them is smart, or where for each professor there are several students and some of them are smart.

Thus the fact that the interpretations of (2) are limited to definite readings should not be taken as an empirical ground on which the DRV can stand. The lack of the indefinite readings for (2) can be independently accounted for by the potential ambiguity with respect to definiteness of Japanese nominals.

4.3 A Pragmatic Factor

Another example discussed by Shimoyama (2006) does indeed favor the definite interpretation of the head nominal, thus making it possible to account for it under the DRV as adequately as the ERV.

- (23) [dono gakusei-no okaasan-mo] odotta
 which-student-of mother-MO danced
 ‘Every mother of some student or other danced’ or ‘For every student, his/
 her mother danced’

This sounds true if and only if all the mothers involved did the dancing; the existence of a single mother of some student would render this sentence false. However, consider the following example:

- (24) [dono gakusei-no imooto-mo] odotta
 which-student-of sister-MO danced
 ‘Every sister of some student or other danced’ or ‘For every student, his/her
 sister danced’

We find this example to have more interpretive possibilities than (23). Consider the following scenarios:

(25) a.	<i>Students</i>	A	B	C	D
	<i>The number of sisters</i>	1	1	1	1
	<i>The number of sisters</i>	1	1	1	1
	<i>who danced</i>				
b.	<i>Students</i>	A	B	C	D
	<i>The number of sisters</i>	1	2	3	2
	<i>The number of sisters</i>	1	1	2	1
	<i>who danced</i>				

In addition to (25a), in which there is only one sister per student, each student in (25b) has one or more than one sister and the dancing was not necessarily done by all of the sisters involved. Sentence (24) is true in either of these situations. That is, it does not have to be

the case that all the sisters involved did the dancing. Moreover, sentence (24) is false if there is a student whose sister did not do the dancing.

(26)	<i>Students</i>	A	B	C	D
	<i>The number of sisters</i>	1	2	3	2
	<i>The number of sisters</i>	0	1	2	1
	<i>who danced</i>				

The existence of the indefinite reading in (25b) for sentence (24), and the fact that (24) is false in scenario (26) are indeed predicted by the ERV, which states that *mo* universally quantifies the embedded indeterminate phrase, but not the head nominal. But then the question arises as to what makes (23) unambiguous with respect to definiteness. It is easy to answer this question if we take into account the way things are in the real world we live in. That is, whereas it is quite easy to imagine a situation like the one in (27a), the situation in (27b), in which a person has more than one mother, is quite unlikely.

(27) a.	<i>Students</i>	A	B	C	D
	<i>The number of mothers</i>	1	1	1	1
	<i>The number of mothers</i>	1	1	1	1
	<i>who danced</i>				
b.	<i>Students</i>	A	B	C	D
	<i>The number of mothers</i>	1	2	3	2
	<i>The number of mothers</i>	1	1	2	1
	<i>who danced</i>				

The above consideration, as well as the discussion in Section 4.2, leads us to say that in principle the examples of WH-*mo* construction yield both definite and indefinite interpretations of the head nominal. Therefore it would be misleading to build an analysis based only on its definite interpretations.

5. Conclusion

This paper has examined the interpretations of the discontinuous WH-*mo* construction in Japanese and argued for the “embedded restrictor view,” as opposed to the “direct restrictor view” on the construction, claiming that the “embedded restrictor view” can account for the interpretive possibilities of the WH-*mo* construction in a straightforward manner. Whereas the “direct restrictor view” approach can only handle those cases where the head nominal of the construction has a definite reading, the “embedded restrictor view” can naturally deal with the construction with the indefinite reading of the head nominal, as

well as those cases with the definite reading of the head nominal.

Notes

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- 1 The terms “embedded restrictor view” and “direct restrictor view” are employed in Shimoyama (2006).
 - 2 The representation in (3) is due to Shimoyama (2006).
 - 3 Shimoyama (2006) proposes an interpretive mechanism of the construction that is based on Hamblin’s (1973) treatment of *wh*-phrases. See Shimoyama (2006) for details.

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