

Indefinites and Frozen Scope in Japanese: Restriction on QR and Choice Functions

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1. Introduction: frozen scope in IO-DO

It has been claimed that, in English, the direct object (DO) cannot take scope over the indirect object (IO) in IO-DO order, whereas in DO-IO order, either object can take scope over the other (Aoun and Li 1993, Larson 1990, Bruening 2001). Thus, in (1a), in IO-DO order, the scope is ‘frozen’ in that only the surface scope reading is available, whereas, in (1b), in DO-IO order, there is no scope-freezing effect.¹ The scope-freezing effect in IO-DO order also holds in Japanese, as shown in (2) (Kuno 1973, Hoji 1985, among others).

- (1) a. The teacher assigned one student every problem.
Scope-freezing: $\sqrt{\text{IO}>\text{DO}}$, $*\text{DO}>\text{IO}$
- b. The teacher assigned one problem to every student.
No scope-freezing: $\sqrt{\text{IO}>\text{DO}}$, $\sqrt{\text{DO}>\text{IO}}$ (Larson 1990)
- (2) a. John-ga [sannin-no onna]-ni [futari-no otoko]-o syookaisita.
John-NOM [three-GEN woman]-DAT [two-GEN man]-ACC introduced
‘(lit.) John introduced to three women two men.’
Scope-freezing: $\sqrt{\text{IO}>\text{DO}}$, $*\text{DO}>\text{IO}$
- b. John-ga [futari-no otoko]-o [sannin-no onna]-ni syookaisita.
John-NOM [two-GEN man]-ACC [three-GEN woman]-DAT introduced
‘John introduced two men to three women.’

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1. The scope-freezing effect seems to hold most robustly when the IO in IO-DO behaves as an indefinite.

No scope-freezing: $\sqrt{IO>DO}$, $\sqrt{DO>IO^2}$ (Hoji 1985)

Bruening (2001) accounts for the scope-freezing effect in English by claiming that Quantifier Raising (QR) obeys superiority. However, frozen scope in Japanese is observed with pseudo-scope relations achieved by choice function interpretation (Reinhart 1997), which crucially does not involve movement. In particular, I show that frozen scope obtains even if a scope island is involved, where QR should not apply. Thus, Bruening's analysis cannot explain the whole array of scope-freezing effects in Japanese. Instead, I claim that frozen scope is due to the specificity of the indefinite IO in IO-DO. This specificity is semantically encoded as a choice function interpretation (Kratzer 1998).

The structure of the paper is as follows: in section 2, I summarize Bruening's (2001) syntactic approach. In section 3, I present novel data which show that frozen scope in Japanese is observed even if QR is inoperative. In section 4, I introduce a choice function approach to the interpretation of indefinites (Reinhart 1997). In section 5, I compare 'specificity' of the indefinite IO in IO-DO in Japanese and of *a certain NP* in English. In section 6, based on Kratzer's (1998) claim that *a certain NP* introduces a variable over choice functions, I account for frozen scope in Japanese based on choice function approach. Section 7 is the conclusion.

2. Syntactic approach to frozen scope in English (Bruening 2001)

In English, Bruening (2001) shows that, although the DO in IO-DO cannot take scope over the IO, it can take scope over the subject, as in (3):

(3) A (different) teacher gave me every book. $\sqrt{DO>S}$ (Bruening's (28))

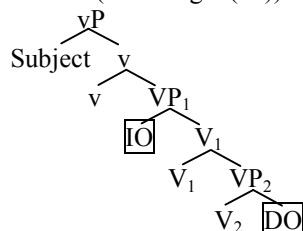
Thus, we must allow both the IO and the DO to undergo QR, and at the same time prohibit the DO from taking scope over the IO.³ Bruening claims that both objects in IO-DO undergo QR attracted by a P-feature on *v* (Chomsky 1999), but the DO cannot QR higher than the IO does due to

2. Crucially, the inverse reading IO>DO in (2b) is a distributive reading (distinct from the reading DO>IO), not a cumulative reading. In particular, the sentence in (2b) is true when there are three women and six men (two men for each woman) involved. In English, on the other hand, in sentences with two numeral quantifiers, the inverse distributive readings are generally unavailable (see, for example, Beghelli and Stowell 1997). Thanks to Benjamin Bruening (p.c.) for pointing out the English facts.

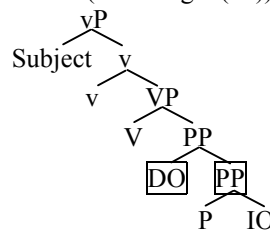
3. Bruening (2001) further presents data from antecedent-contained deletion to claim that both objects undergo QR, although the DO cannot raise above the IO.

Superiority. In a structure in (4a), the IO first undergoes QR, adjoining to the specifier of vP. Then the DO undergoes QR, “tucking in” beneath IO obeying Superiority (cf. Richards 1997). Thus, the DO never takes scope over the IO. In a structure for DO-IO in (4b), assuming that QR can pied-pipe the prepositional phrase, moving either the DO or the PP first will obey Superiority. Thus, there is no scope-freezing.

(4) a. IO-DO (Bruening’s (59))



b. DO-IO (Bruening’s (61))⁴



We could extend Bruening’s approach to Japanese, if we assume that Japanese has covert QR. Indeed, wide scope of the object over the subject is sometimes possible (Kitagawa 1990, Kuno et al. 1999, Hayashishita 2000), implying that the object might be able to undergo QR, as shown in (5):⁵

- (5) [Hutatuizyoo-no ginkoo]-ga [itutu-no kouriten]-o siensita.
 [two-or-more-GEN bank]-NOM [five-GEN retailshop]-ACC supported
 ‘Two or more banks supported five retail shops.’
 $\sqrt{O>S}$ (Hayashishita 2000)

4. Note that the structure given in (4b) is one of the several alternatives of a structure for DO-IO proposed by Bruening (2001).

5. Japanese is generally assumed to be a ‘rigid scope’ language: the scope is unambiguous when there is no syntactic movement (Kuno 1973, Hoji 1985). With a movement such as scrambling, the scope becomes ambiguous:

- (i) a. S-O: Dareka-ga daremo-o aisiteiru.
 someone-NOM everyone-ACC love
 ‘Someone loves everyone.’ $\sqrt{S>O}$, * $O>S$
 b. O-S (scrambled): Dareka-o daremo-ga aisiteiru.
 someone-ACC everyone-NOM love $\sqrt{S>O}$, $\sqrt{O>S}$

Even with the scope rigidity, it is possible to assume that Japanese has covert QR. Given a fundamental principle ‘Don’t do covertly what you can do overtly’ (Chierchia 1998), we can assume that scrambling, i.e., ‘overt’ QR, is preferred to ‘covert’ QR at LF. For this reason, it looks as if Japanese does not have covert QR. However, this is just a preference, and thus can be overridden under some circumstances, as shown in (5).

In the next section, I present data which indicate that the scope-freezing effect in Japanese can be obtained even when QR is inoperative. Crucially, Bruening's syntactic approach which hinges on the restriction on movement cannot account for such data.

3. Frozen scope revised: frozen scope outside islands

Before presenting additional data on frozen scope, let us briefly look at the nature of indefinites. It is well known that indefinite descriptions behave differently from genuine quantifiers in that the former can take logical wide scope escaping syntactic islands, as shown in (6a), whereas the latter cannot, as shown in (6b) (Fodor and Sag 1982, Abusch 1994, Reinhart 1997). The same claim holds for indefinites in Japanese, as shown in (7):⁶

- (6) a. If a woman comes to the party, John will be happy.
 $\sqrt{a \text{ woman} > \text{if}}$ (There is a woman such that John will be happy if she comes to the party.)
 $\sqrt{\text{if} > a \text{ woman}}$ (John will be happy if any woman comes to the party.)
- b. If each woman comes to the party, John will be happy. $*\text{each} > \text{if}$
- (7) [Futari-no josei]-ga paatii-ni kita-ra John-wa yorokobu-daroo.
 [two-GEN woman-NOM party-to come-if John-TOP be happy-will
 'If two women come to the party, John will be happy.'

6. Japanese does not have indefinite/definite articles which correspond to *a/the* in English. To define indefinites, Maribel Romero (p.c.) suggested a diagnosis based on a sluiced *wh*-phrase (Chung et al. 1995, Reinhart 1997). In English, indefinites, but not definites, can be an appropriate antecedent for a sluiced *wh*-phrase, as in (i). The diagnosis applies to Japanese, given that an NP with a demonstrative, which is definite, is not an appropriate antecedent for a sluiced *wh*-phrase, as in (ii).

- (i) a. John met a student, but I don't know which one.
 b. #John met the student, but I don't know which one.
- (ii) #John-wa [kono gakusei]-o mita rasii ga,
 John-NOM [this student]-ACC saw seem while
 watasi-wa dono-gakusei-ka sira-nai.
 I-TOP which-student-Q know-NEG

'It seems that John saw this student, but I don't know which student.'

Thus, if the NP is an appropriate antecedent for a sluiced *wh*-phrase, it must be indefinite rather than definite. In the following, what I call 'indefinites' in Japanese are NPs which are felicitously used in this diagnosis.

Furthermore, bare nouns in Japanese can be interpreted either as singular or plural (see Nakanishi and Tomioka in prep). To disambiguate singular/plural distinctions, I use numeral quantifiers as indefinites in Japanese. Note that, as shown in footnote 2 above, numeral quantifiers in English and Japanese behave differently.

√two women>if (There are two women such that John will be happy if they come to the party.)

I consider examples in Japanese where a ditransitive sentence with an indefinite IO and an indefinite DO is within an island, i.e. the *if*-clause, as shown in (8). Given the above property of indefinites, both the IO and the DO should be able to take scope outside the island freely. However, as shown in the table in (9), there is a restriction in IO-DO order.⁷

- (8) a. *If*[S IO DO V], ...
 [Yonin-no kyaku]-ni [nidai-no kuruma]-o miseta-ra,
 [four-GEN customer]-DAT [two-GEN car]-ACC show-if
 Taro-wa boonasu-o mora-eru.
 Taro-TOP bonus-ACC get-can
 ‘If (Taro) shows four customers two cars, Taro can get a bonus.’

- b. *If*[S DO IO V], ...
 [Nidai-no kuruma]-o [yonin-no kyaku]-ni miseta-ra,
 [two-GEN car]-ACC [four-GEN customer]-DAT show-if
 Taro-wa boonasu-o mora-eru.
 Taro-TOP bonus-ACC get-can
 ‘If (Taro) shows two cars to four customers, Taro can get a bonus.’

(9)

	(8a) <i>If</i> [S IO DO V]	(8b) <i>If</i> [S DO IO V]
a. <i>if</i> > IO > DO	√	√
b. <i>if</i> > DO > IO	* (<i>frozen scope</i>)	√
c. IO > <i>if</i> > DO	√	√
d. DO > <i>if</i> > IO	* (<i>frozen scope</i>)	√
e. IO, DO > <i>if</i>	√	√

Given that QR is clause-bound, the readings where quantifiers are insensitive to islands cannot be obtained by QR. Thus, a distributive operator cannot be inserted outside of islands (Ruys 1992). For this reason, the readings IO>DO>*if* and DO>IO>*if* cannot be distinguished: without a

7. ‘*If* [S IO DO V]’ lacks both distributive and non-distributive readings of DO>*if*>IO, as shown in (9d). The distributive reading (DO>*if*>Distributive-operator>IO) involves certain two cars and any eight customers (four customers for each car), and the non-distributive reading (DO>*if*>IO) involves certain two cars and any four customers. Since the distributive reading can be rejected by Bruening’s approach (see Nakanishi 2001), I focus on the non-distributive reading in this paper.

distributive operator, both readings must involve exactly four customers and exactly two cars. This reading is available in both (8a) and (8b), i.e., both objects together can take scope outside of the island in these sentences.

The following two readings are relevant here: first, the reading $IO > if > DO$ in (9c) where the IO takes logical wide scope outside of the *if*-clause and the DO does not, and, second, the reading $DO > if > IO$ in (9d) where the DO takes logical wide scope outside of the *if*-clause and the IO does not. These readings are paraphrased in (10):

- (10)a. $IO > if > DO$
 There are four customers, such that, if Taro shows them any two cars, he can get a bonus. (But I don't know which customers.)
- b. $DO > if > IO$
 There are two cars, such that, if Taro shows them to any four customers, he can get a bonus. (But I don't know which cars.)

Crucially, in IO-DO, only the former reading is available, whereas in DO-IO, both readings are available. Thus, scopal effects obtained when a syntactic island is intervening also show the scope-freezing effect: only $IO > DO$ reading is available in IO-DO. Given that the effect here does not involve movement, it cannot be due to Superiority, which applies only to syntactic movement, but to something more general.

4. Choice function approach

In the previous section, we see that the logical scope of indefinites, unlike other quantifiers, are insensitive to islands. This property of indefinites cannot be accounted for by QR, which is clause-bound. To allow indefinites to take logical scope outside islands without movement, a choice function approach is proposed (Reinhart 1997, Winter 1997, Kratzer 1998, Chierchia 1999, Matthewson 1999). A choice function is 'a (often very) partial function from sets of individuals that picks a unique individual from any non-empty set in its domain' (Kratzer 1998:167).

Opinions vary on how to treat choice function variables. Reinhart (1997) and Winter (1997) claim that choice function variables may freely be bound with widest, intermediate or narrow scope, whereas Matthewson (1999), modifying Kratzer (1998), claims that choice function variables are always existentially closed at the highest level (i.e., with widest scope).⁸

8. Kratzer (1998) claims that choice function variables remain free. However, this claim might cause the undesirable undergeneration of intermediate readings (cf. Chierchia 1999, Romero 2000).

Matthewson's approach, but not Reinhart's (1997) and Winter's (1997), can account for the fact that intermediate reading is available easily when a bound variable is present (see (15) below). Since Japanese shows the same effect ((22) below), I consider that choice function variables are existentially closed at the top, following Matthewson.⁹ For example, in (11) and (12), the choice function variable introduced by the indefinite *two women* is existentially closed at the highest level, as shown in (13). Crucially, the indefinite can take scope over the island without movement.

(11) If two women come to the party, John will be happy. $\sqrt{\text{two}} > \text{if}$

(12) [Futari-no josei]-ga paatii-ni kita-ra John-wa yorokobu-daroo.
 [two-GEN woman-NOM party-to come-if John-TOP be happy-will
 'If two women come to the party, John will be happy.' $\sqrt{\text{two}} > \text{if}$

(13) $\exists f [\text{CH}(f) \wedge [\text{come}(f(\text{two women})) \rightarrow \text{happy}(\text{John})]]$
 'There is some choice function f , such that John will be happy if two women, which f picks out from the set of women, come to the party.'

As claimed above, this analysis predicts that the intermediate reading is easily obtained when bound variables are present. In (14), the intermediate reading is very difficult or impossible to obtain, whereas it is fine in (15):

(14) Every professor rewarded every student who read *a book I had recommended*. *intermediate (every professor > a book > every student)

(15) [Every professor]_i rewarded every student who read *a book he_i had recommended*. $\sqrt{\text{intermediate}}$
 $\exists f [\text{CH}(f) \wedge \forall x [\text{professor}(x) \rightarrow \forall z [(\text{student}(z) \wedge \text{read}(z, f(\text{book that } x \text{ recommended})) \rightarrow \text{reward}(x, z)]]]]$
 'There is some choice function f , such that, for every professor x and for every student z who reads a book chosen by f from the set of books that x recommended, x rewarded z .'

In (14), the choice function simply picks out one book from the set of books I had recommended. In (15), the choice function may pick up a different

9. Chierchia (1999) chooses Matthewson's restricted \exists -closure approach over Reinhart/Winter's based on weak crossover data. However, he further claims that intermediate existential closure must be allowed in downward entailing contexts. See footnote 16 below.

book from each set of books recommended by a professor, yielding thus the effect that books may vary with each professor.

Kratzer (1998) further accounts for the intermediate reading obtained without a bound pronoun using implicit arguments, i.e., a hidden index.¹⁰ As shown in (16), the skolemized choice function f_x selects a different choice function for each individual x .

- (16) Each husband had forgotten a certain date -- his wife's birthday.
 $\exists f[\text{CH}(f) \wedge \forall x[\text{husband}(x) \rightarrow \text{had forgotten}(x, f_x(\text{date}))]]$
 'There is some skolemized choice function f , such that, for every husband x , x had forgotten the date that f_x picks out from the set of dates.'

5. 'Specificity' of a certain NP and the indefinite IO in IO-DO

In this section, I claim that the indefinite IO in IO-DO in Japanese is 'specific' in a similar way as English *a certain NP*, and that this specificity semantically translates as a choice function interpretation (cf. Kratzer 1998).

5.1. a certain NP in English (Kratzer 1998)

Kratzer (1998) claims that "*a certain NPs* are always specific, and that specific indefinites are interpreted with the help of choice functions" (1998:168). In general, *a certain NP* takes wide scope (Hintikka 1986, Enç 1991). Indeed, it prefers the widest scope reading over conjunction, as shown in (18), although *a/an NP* does not have such a preference, as shown in (17). However, a bound variable can create the impression of narrow scope, as shown in (19), which is correctly predicted by the choice function analysis (cf. (15) above):

- (17) Mary visited a store, and Susan did, too.
 $\sqrt{\text{same}}: \exists x [\text{STORE}(x) \wedge \text{VISIT}(m, x) \wedge \text{VISIT}(s, x)]$
 $\sqrt{\text{different}}: \exists x [\text{STORE}(x) \wedge \text{VISIT}(m, x)] \wedge \exists y [\text{STORE}(y) \wedge \text{VISIT}(s, y)]$
- (18) *a certain NP* without bound variable
 Mary visited *a certain store*, and Susan did, too.
 $\sqrt{\text{same}}: \exists f [\text{CH}(f) \wedge \text{VISIT}(m, f(\text{store})) \wedge \text{VISIT}(s, f(\text{store}))]$

10. Kratzer (1998) and Chierchia (1999) claim that the intermediate reading can be favored by a variety of factors, such as a particular intonational contour, having *each* and no other element to distribute over, an appropriate context, etc. These cues evoke a hidden index, which accounts for intermediate scope effects.

??different: $\exists f [\text{CH}(f) \wedge \text{VISIT}(m, f_m(\text{store})) \wedge \text{VISIT}(s, f_s(\text{store}))]$ ¹¹

(19) *a certain NP* with bound variable

Mary visited *a certain store* in her neighborhood, and Susan did, too.

$\exists f [\text{CH}(f) \wedge \text{VISIT}(m, f(\text{store in } m\text{'s neighborhood})) \wedge \text{VISIT}(s, f(\text{store in } s\text{'s neighborhood}))]$

√same (when *m* and *s* live in the same neighborhood)

√different

5.2. The indefinite IO in IO-DO in Japanese

The IO in IO-DO in Japanese seems to behave in the same way as *a certain NP* in English in coordinate constructions. As shown in (20a), the IO in IO-DO prefers a wide scope interpretation over conjunction, although the IO in DO-IO and the DO in both orders do not have such a preference, as shown in (20b) and (21), respectively.¹²

(20) a. While S_1 -IO-DO₃-V, it seems that S_2 -∅-DO₃-V

Taro-ga [Penn-no gakusei]-ni John-o syookaisita-to
Taro-NOM [Penn-GEN student]-DAT John-ACC introduced-COMP
kiita kedo Jiro-mo ∅ John-o syookaisita-rasii.
heard while Jiro-too John-ACC introduced-seem

‘(lit.) While (I) have heard that Taro introduced to a Penn student John, it seems that Jiro introduced (to a Penn student) John, too.’

√same, ??different

b. While S_1 -DO₃-IO-V, it seems that S_2 -DO₃-∅-V

Taro-ga John-o [Penn-no gakusei]-ni syookaisita-to
Taro-NOM John-ACC [Penn-GEN student]-DAT introduced-COMP
kiita kedo Jiro-mo ∅ John-o syookaisita-rasii.
heard while Jiro-too John-ACC introduced-seem

‘While (I) have heard that Taro introduced John to a Penn student, it seems that Jiro introduced John (to a Penn student), too.’

√same, √different

(21) a. While S_1 -IO₃-DO-V, it seems that S_2 -IO₃-∅-V

11. In (18), the “different” reading by a skolemized choice function is theoretically possible (see (16)). However, it is not easily obtained lacking enough context to evoke it. Compare this example with (19), where a context involving a bound variable pronoun helps to obtain a skolemized reading.

12. Tanya Reinhart (p.c.) pointed out that the same contrast seems to hold for Hebrew.

Taro-ga John-ni [**gengogaku-no hon**]-o miseta-to
 Taro-NOM John-DAT [linguistics-GEN book]-DAT showed-COMP
 kiita kedo Jiro-mo John-ni \emptyset miseta-rasii.
 heard while Jiro-too John-DAT showed-seem

‘While (I) have heard that Taro showed John a book on linguistics, it seems that Jiro showed John (a book on linguistics), too.’

√same, √different

b. While S_1 -DO-IO₃-V, it seems that S_2 - \emptyset -IO₃-V

Taro-ga [**gengogaku-no hon**]-o John-ni miseta-to
 Taro-NOM [linguistics-GEN book]-DAT John-DAT showed-COMP
 kiita kedo Jiro-mo \emptyset John-ni miseta-rasiiyo.
 heard while Jiro-too John-DAT showed-seem

‘While (I) have heard that Taro showed a book on linguistics to John, it seems that Jiro showed (a book on linguistics) to John, too.’

√same, √different

Based on their similarities, I claim that the indefinite IO in IO-DO should be interpreted as a choice function, just like *a certain NP* in English. Indeed, if the indefinite IO is a generalized quantifier, then both readings should be equally easy to obtain. If the IO is interpreted as a choice function, the “different” reading should be harder.¹³ Furthermore, with a bound variable, the “different” reading can be easily obtained, as shown in (22), which is predicted by the choice function analysis of the IO:

(22) While S_1 -IO-DO₃-V, it seems that S_2 - \emptyset -DO₃-V

Yamada sensei-ga [**zibun-no gakusei**]-ni John-o syookaisita-to
 Yamada prof.-NOM [self-GEN student]-DAT John-ACC introduced-COMP
 kiita kedo Kita sensei-mo \emptyset John-o syookaisita-rasii.
 heard while Kita prof.-too John-ACC introduced-seem

‘(lit.) While (I) have heard that Prof. Yamada_i introduced to a self_i’s student John, it seems that Prof. Kita_j introduced (to self_j’s student) John, too.’

√same, √different

In this section, I showed that the indefinite IO in IO-DO in Japanese seems to have a similar kind of specificity as *a certain NP* in English,

13. For speakers who permit the “different” reading in (20a), the specificity of the IO in IO-DO is not so strong, and thus a choice function variable might be \exists -closed under conjunction.

which is semantically encoded as a choice function interpretation.¹⁴ The IO in DO-IO and the DO in both orders, on the other hand, are interpreted as generalized quantifiers unless they scope out of islands.

6. Choice function approach to frozen scope in Japanese

In this section, I show that the proposal in the previous section can account for frozen scope data presented in (8) above (shown again in (23)). The representations of the logically possible readings $IO > if > DO$ and $DO > if > IO$ under choice function approach are given in (24):¹⁵

- (23) a. *If* [S IO DO V], ...
 [Yonin-no kyaku]-ni [nidai-no kuruma]-o miseta-ra,
 [four-GEN customer]-DAT [two-GEN car]-ACC show-if
 Taro-wa boonasu-o mora-eru.
 Taro-TOP bonus-ACC get-can
 ‘If (Taro) shows four customers two cars, Taro can get a bonus.’
- b. *If* [S DO IO V], ...
 [Nidai-no kuruma]-o [yonin-no kyaku]-ni miseta-ra,
 [two-GEN car]-ACC [four-GEN customer]-DAT show-if
 Taro-wa boonasu-o mora-eru.
 Taro-TOP bonus-ACC get-can
 ‘If (Taro) shows two cars to four customers, Taro can get a bonus.’
- (24) a. $IO > if > DO$
 $\exists f [CH(f) \wedge [[\exists y [CAR(y) \wedge |y|=2 \wedge SHOW(t, y, f(\text{four customers}))]] \rightarrow GET(t, b)]]$
 There is a group of four customers chosen by *f*, such that, if Taro shows them any two cars, he can get a bonus.
- b. $DO > if > IO$
 $\exists g [CH(g) \wedge [[\exists x [CUSTOMER(x) \wedge |x|=4 \wedge SHOW(t, g(\text{two cars}), x)]] \rightarrow GET(t, b)]]$
 There is a group of two cars chosen by *g*, such that, if Taro shows them to any four customers, he can get a bonus.

In IO-DO order, the indefinite IO is interpreted as a variable over choice functions. Thus, it should have a pseudo-wide scope over the *if*-

14. ‘Specificity’ of the IO in IO-DO may be determined by the scope interaction with the subject. See Nakanishi (2001) for this issue.

15. In (24), $|x|$ stands for the number of atoms in *x*.

clause. For this reason, the reading in (24b) is unavailable.¹⁶ In DO-IO order, on the other hand, there is no such constraint and both objects can be freely interpreted as a variable over choice functions. Thus, both readings in (24) are available.

This proposal can also account for the original frozen scope data:

- (25) John-ga [sannin-no zyosee]-ni [dono dansee]-mo syookaisita.
 John-NOM [three-GEN woman]-DAT [every man]-also introduced
 ‘(lit.) John introduced to three women every man’
- a. LF1 (surface scope): [_{IP} John [_{VP} three women [_{VP} every man introduced]]]
 $\exists f [CH(f) \wedge \forall x [MEN(x) \rightarrow INTRODUCE(j, x, f(\text{three women}))]]$
 i.e., IO>DO
 - b. LF2: [_{IP} John [_{VP} every man₁ [_{VP} three women t₁ introduced]]]
 $\exists f [CH(f) \wedge \forall x [MEN(x) \rightarrow INTRODUCE(j, x, f(\text{three women}))]]$
 i.e., IO>DO
 - c. LF3: * [_{IP} John [_{VP} every man₁ [_{VP} (f₁)-three women t₁ introduced]]] ←WCO
 $\exists f [CH(f) \wedge \forall x [MEN(x) \rightarrow INTRODUCE(j, x, f_x(\text{three women}))]]$
 i.e., *DO>IO

In IO-DO order in (25), the IO is interpreted as a choice function variable taking the widest scope, whereas the DO is interpreted as a generalized quantifier. The DO can undergo QR over the IO, but that does not give us the inverse scope reading, as shown in (25b). To obtain the inverse DO>IO reading, the IO would have to introduce a skolemized choice function f_x and the DO would have to undergo QR over f_x . However, this creates a weak crossover configuration, as shown in (25c) (cf. Chierchia 1999). In DO-IO order, on the other hand, both objects are generalized quantifiers, and thus either of them can undergo QR first, yielding scope ambiguity.

Note that I am not denying the existence of QR *per se*. As Reinhart (1997) claims, apart from the fact that indefinites can take scope over islands, there is no serious reason to abandon QR. Indeed, there are some phenomena such as antecedent-contained deletion which seem to require

16. As mentioned in footnote 9 above, Chierchia (1999) shows that, in downward entailing contexts such as the *if*-clause, intermediate existential closure is allowed. If we accept this view, we can account for the fact that ‘*If* [S IO DO V]’ has the reading *if*>IO>DO, although the indefinite IO is semantically encoded as a choice function interpretation: the IO can take narrower scope than the *if*-clause because the intermediate existential closure is allowed. Once the intermediate \exists -closure is permitted, the question arises why DO>*if*>IO is unavailable. Several possible accounts arise, that I leave for future research (cf. Nakanishi 2001).

QR (cf. Bruening 2001). Moreover, the scope-freezing effect without an intervening island (see (25)) can be accounted for equally well by Bruening's QR approach and the current choice function approach. However, I have shown that the effect is observed even when QR is inoperative, which cannot be accounted for by the QR approach. In such cases, the choice function approach is required.

7. Conclusion

In this paper, I presented novel data demonstrating that frozen scope holds even if QR is inoperative. Since Bruening's (2001) approach hinges on a constraint on QR, it cannot account for such data. Instead, I proposed a new approach appealing to the specificity of the indefinite IO in IO-DO. This property is semantically encoded as a choice function interpretation in a similar way as *a certain NP* in English.

Finally, I remark on two remaining issues. First, what about the cases where the IO in IO-DO is a definite NP or a quantificational NP other than an indefinite? I showed that the indefinite IO in IO-DO is a specific indefinite, which semantically translates as a choice function interpretation. I suggest that this specificity of IO in IO-DO is manifested as partitivity when the IO is a definite NP or a quantificational NP. Following Enç (1991), partitivity and the functional interpretation of *a certain NP* can be unified under some definition of specificity.

Second, why is the IO in IO-DO specific? For lack of space, I cannot discuss possible accounts (cf. Kaiser and Nakanishi 2001), but I point out that the current proposal on the specificity of the IO in IO-DO points toward the same direction as previous studies of pragmatics: the IO in IO-DO is 'nondominant' (i.e., generally definite) (Erteschik-Shir 1979), 'more topicworthy' (Thompson 1995), or 'the possessor of the DO' (Gropen, Pinker et al. 1989), whereas the IO in DO-IO does not necessarily satisfy these properties. Thus, it is not surprising to find that the IO in IO-DO has a different semantics from the IO in IO-DO and the DO in both orders.

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