

# Intervention tracks scope-rigidity in Japanese

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Certain quantificational elements (“interveners”) have long been known to disrupt the interpretation of *wh*-in-situ (Hoji 1985 and many others), but the correct description of the set of interveners and the nature of intervention effects have been the subject of continued debate. We present a new generalization concerning the nature of intervener-hood in Japanese: A quantifier acts as an intervener if and only if it is scope-rigid. We follow the view that intervention effects reflect a particular LF configuration (Beck 2006 a.o.), but in contrast to previous approaches, we propose that any DP can lead to intervention if it is interpreted in a derived position above a *wh*-phrase at LF. Quantifiers which appear to be non-interveners are able to avoid this configuration. Intervention is limited to quantifiers interpreted in a derived position via movement, which supports the theory of intervention effects developed in Kotek 2017 as reflecting a logical incompatibility between the Predicate Abstraction rule and the computation of Rooth-Hamblin alternatives.

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# 1 Introduction

Over the past 30 years, a large and growing literature has described *intervention effects* in Japanese *wh*-questions. Descriptively, this refers to the inability of certain quantificational elements to precede an in-situ *wh*-phrase, in a c-commanding position at surface structure; see e.g. Hoji 1985, Hagstrom 1998, Kim 2002, Beck 2006, Tomioka 2007. For example, Hoji 1985 observes that a *wh-mo* universal quantifier cannot precede a *wh* object in canonical in-situ position, as in (1). Throughout the paper, interrogative *wh*-phrases are in italics and quantifiers of interest (potential interveners) are in bold.<sup>1</sup>

- (1) **Intervention with universal *wh-mo*:** (Hoji 1985:270)

?? **Da're-mo-ga** *nani-o* kai-mashi-ta-ka?  
who-MO-NOM what-ACC buy-POLITE-PAST-Q  
Intended: 'What did everyone buy?'

Hoji (1985) notes that the intended question can be expressed grammatically by scrambling the *wh*-phrase over the quantifier:

- (2) **Intervention is avoided by scrambling the intervener:**

✓ *Nani-o* **da're-mo-ga** \_\_\_\_\_ kai-mashi-ta-ka?  
what-ACC who-MO-NOM buy-POLITE-PAST-Q  
'What did everyone buy?'

However, not all quantifiers cause this ungrammaticality, as shown in (1). For example, as noted by Tomioka (2007:1574), the universal quantifier *subete-no-NP* 'all NP' in the same configuration as in (1) does not lead to ungrammaticality:

- (3) **Universal *subete* 'all' does not cause such intervention:**

✓ [**Subete-no** hito]-ga *nani-o* kai-mashi-ta-ka?  
all-GEN person-NOM what-ACC buy-POLITE-PAST-Q  
'What did everyone buy?'

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<sup>1</sup>The following abbreviations are used in glosses: ACC = accusative, GEN = genitive, NOM = nominative, TOP = topic, CL = classifier, NEG = negation, Q = question particle. Translations and glosses for examples from Japanese texts are contributed by the first author. The transliteration of some Japanese examples has been changed for consistency.

Therefore a central challenge is to identify the inventory of interveners, “which seem to be a random collection of various expressions” (Tomioka 2007:1570), and explain this classification of quantifiers into interveners and non-interveners. Previous work on intervention effects in Japanese has described interveners as items that compete syntactically with *wh*-phrases as targets of (covert) movement (Yanagida 1996, Hagstrom 1998), as focus-sensitive items which lead to uninterpretability of the in-situ *wh* (Kim 2002, Beck 2006), or anti-topic items which cause an information-structural mismatch in the *wh*-question (Tomioka 2007).

In this paper, we offer a new generalization for intervener-hood in Japanese (4):

(4) **Generalization: Intervener-hood correlates with scope-taking**

Scope-rigid DP quantifiers above an in-situ *wh*-phrase cause intervention. DP quantifiers that allow scope ambiguities—i.e., those that can reconstruct below the *wh*-phrase or scope out of the question—do not.

For example, even though the two universal quantifiers in (1) and (3) have the same denotation as a universal quantifier, they differ in their scope-rigidity. This is demonstrated with sentential negation in (5) below. We will argue that this is the key difference which explains their differing statuses as (non)interveners in (1) vs (3) above.

(5) ***Wh-mo* universal quantifier is scope-rigid; *subete* is not:<sup>2</sup>**

- |                         |  |  |
|-------------------------|--|--|
| a. [Dono mondai]-o-mo   | toka-nak-atta.                             |  |
|                         | which problem-ACC-MO solve-NEG-PAST        |  |
|                         | ‘ <i>pro</i> did not solve every problem.’ | $\checkmark \forall > \neg, * \neg > \forall$          |
| b. [Subete-no mondai]-o | toka-nak-atta.                             |  |
|                         | all-GEN problem-ACC solve-NEG-PAST         | (Mogi 2000:59)   |
|                         | ‘ <i>pro</i> did not solve every problem.’ | $\checkmark \forall > \neg, \checkmark \neg > \forall$ |

The generalization in (4) supports the view that intervention effects are determined at LF. Specifically, *wh*-phrases in Japanese questions are interpreted in-situ at LF, and the presence of an intervener between the *wh*-phrase and its interpreting complementizer leads to ungrammaticality (6). Non-intervening quantifiers such as the universal

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<sup>2</sup>There are two, superficially similar *wh-mo* forms in Japanese: the universal quantifier series and the NPI/n-word series. However, only the universal *wh-mo* construction can cooccur with case markers (Aoyagi and Ishii 1994a, a.o.), making it clear that the *wh-mo* here in (5a) is a universal.

quantifier *subete* in (3) can reconstruct into a position below the *wh*-phrase, avoiding this configuration at LF.

(6) \* LF: [CP C ... **intervener** [ ... *wh* ... ]]

The idea that intervention effects are due to the ungrammaticality of this LF configuration in (6) is a main claim of the work on intervention effects by Kim (2002), Beck (2006), Pesetsky (2000), and Kotek (2014). However, the fact that scope-rigidity is a *sufficient* condition for intervener-hood leads to the striking conclusion that *any* DP quantifier in Japanese in the LF configuration in (6) will trigger intervention. This is unpredicted by most previous accounts for intervention effects, including all of the works cited above. A notable exception is Kotek 2017, which proposes that intervention effects reflect a logical incompatibility between the interpretation of movement and the computation of Rooth-Hamblin alternatives, predicting *any* quantifier in a derived position to trigger intervention. Our discussion here, then, offers new empirical support for the Kotek 2017 approach to intervention effects, which previously has been motivated solely based on the study of English data.

This paper is organized as follows. In section 2, we consider the intervener-hood and scope-rigidity of a wide range of quantificational expressions in Japanese, establishing (4) as a robust generalization. In section 3, we present some background regarding quantifier scope in Japanese, the interpretation of *wh*-questions, and the nature of intervention effects. In section 4, we then present our analysis which derives this generalization, based in large part on the analysis of Japanese DP quantifier scope in Shibata 2015a,b. We also present additional data corroborating predictions of this account for intervention in Japanese. This data further distinguishes between different theories of *wh*-intervention, with the results supporting the Kotek 2017 theory of intervention effects.

## 2 Intervener-hood and scope-rigidity

In this section, we survey a range of quantificational DPs in Japanese and show that their intervener-hood status in *wh*-questions correlates neatly with their scope-rigidity: scope-rigid quantifiers are interveners, and non-scope-rigid quantifiers are not interveners. After establishing this novel empirical generalization, we present some theoretical background on scope-taking in Japanese and the interpretation of *wh*-questions in section 3 and then

show how this generalization is straightforwardly derived under Kotek’s (2017) LF theory of intervention effects in section 4.

A recurrent theme in this section is that pairs of quantifiers which are denotationally equivalent but differ in their scope-taking abilities correspondingly differ in their descriptive status as interveners. As seen in the introduction, it has been noted since Hoji 1985 that *wh-mo* universal quantifiers are interveners for *wh*-questions, whereas other universal quantifiers such as *subete* do not trigger intervention (see e.g. Tomioka 2007). This correlates with the different scope-taking abilities of these quantifiers. Concretely, here we will primarily discuss scope-rigidity with respect to sentential negation. DPs that necessarily take wide scope with respect to negation are interveners, whereas those which are able to scope above or below sentential negation are not interveners. The use of negation for this diagnostic is addressed in footnote 13 below.

To our knowledge, only one previous author has noted this correlation, and only for one type of quantifier: this is the discussion of disjunction in the late Yoshiyuki Shibata’s dissertation. Shibata 2015a:96–102 discusses the behavior of two different disjunctors in Japanese: the very common *ka* and the more formal *naishi*. He reports that *ka*-disjunction is scope-rigid with respect to negation whereas *naishi*-disjunction is not (7). Shibata then notes that this correlates with their status as an intervener or non-intervener in *wh*-questions (8).

(7) ***Ka* disjunction is scope-rigid; *naishi* is not:**

- a. [Taro **ka** Jiro]-ga ko-**nak**-atta. (Shibata 2015a:23)  
 Taro or Jiro-NOM COME-NEG-PAST  
 ‘Taro or Jiro didn’t come.’  $\checkmark \vee > \neg, * \neg > \vee$
- b. [Taro **naishi** Jiro]-ga ko-**nak**-atta. (Shibata 2015a:96)  
 Taro or Jiro-NOM COME-NEG-PAST  
 ‘Taro or Jiro didn’t come.’  $\checkmark \vee > \neg, \checkmark \neg > \vee$

(8) ***Ka* is an intervener; *naishi* is not:**

- a. \* [Taro **ka** Jiro]-ga *nani*-o yon-da-no? (Hoji 1985:264; also Shibata 2015a:97)<sup>3</sup>  
 Taro or Jiro-NOM what-ACC read-PAST-Q
- b.  $\checkmark$  [Taro **naishi** Jiro]-ga *nani*-o yon-da-no? (Shibata 2015a:98)  
 Taro or Jiro-NOM what-ACC read-PAST-Q  
 ‘What did [Taro or Jiro] read?’

We note that many speakers, including the first author here, do not have clear judgments for *naishi* or feel that *naishi* simply patterns together with *ka* in (7–8). The judgments in (7–8) are those reported by Shibata. We have also met one speaker, Daisuke Bekki (p.c.), who allows the ‘ $\neg > \vee$ ’ reading of *ka* in (7), as well as the ‘ $\vee > \neg$ ’ reading, and for whom *ka* is not an intervener. Note that this behavior does not counterexample our claim. Although there is inter-speaker variation in the scope-taking behavior of these disjunctors, what is important is that, for each individual speaker, there is an internally-consistent correlation between scope-rigidity and intervener-hood.

Shibata 2015a:99–101 also goes on to show a parallel correlation between two disjunctions in Korean. He shows that *ani-myem* disjunction necessarily takes scope above negation and is an intervener, whereas (*i*)*na* disjunction allows for scope ambiguities with respect to negation and is not an intervener. However, in the interest of space, here we will concentrate on the facts in Japanese and leave the evaluation of the generalization in other languages for further work.

Next we consider focus particles, which have been extensively discussed as interveners, with Kim 2002 and Beck 2006 famously identifying focus-sensitivity as a defining feature of interveners. The examples below show that the focus particles *mo* ‘also’ and *sae* ‘even’ pattern together in taking obligatory wide scope with respect to sentential negation and in being interveners, thus following our generalization (4).<sup>4</sup> We will discuss the exclusive particle *dake* in detail later in the section.

(9) **Focus particles are scope-rigid:** (Shibata 2015b:235)

Taro-**mo/sae** ko-**nak**-atta.

Taro-also/even come-NEG-PAST

‘{Even} Taro {also} didn’t come.’

✓also/even >  $\neg$ , \* $\neg$  > also/even

(10) ***Mo* ‘also’ is an intervener:** (Hasegawa 1995:119; also Yanagida 1996:30)

\* Hanako-**mo** *nani*-o ka-tta-no?

Hanako-also what-ACC buy-PAST-Q

Intended: ‘What did [Hanako]<sub>F</sub> also buy?’ (in addition to other people)

<sup>3</sup>A minimally contrasting example is given here, but the observation goes back to Hoji 1985:264.

<sup>4</sup>Mogi 2000:59 also demonstrates the obligatory wide-scope of *mo* and *sae* with respect to negation.

(11) **Sae ‘even’ is an intervener:** (Yanagida 1996:30)

?\* John-wa Mary-ni-sae nani-o oku-tta-no?  
 John-TOP Mary-to-even what-ACC send-PAST-Q  
 Intended: ‘What did John send even to [Mary]<sub>F</sub>?’

Next we consider the so-called NPIs ‘only’ *shika* and *wh-mo*.<sup>5</sup> We follow Kataoka 2006 and Shimoyama 2011 in taking *shika* and *wh-mo* NPIs to be quantifiers which obligatorily take wide scope over a local negation. See these works for their evidence for these claims from the scope of these operators with respect to other quantifiers.<sup>6</sup> As predicted by our generalization, these items are also interveners for *wh*-in-situ:

(12) **Shika NPI ‘only’ is an intervener:** (Takahashi 1990:134; also Hasegawa 1995:118)

?\* John-shika nani-o tabe-nak-atta-no?  
 John-only<sub>NPI</sub> what-ACC eat-NEG-PAST-Q  
 Intended: ‘What did only John eat?’

(13) **Wh-mo NPI is an intervener:** (Aoyagi and Ishii 1994b:306)

?? Dare-mo nani-o tabe-nak-atta-no?  
 who-MO what-ACC eat-NEG-PAST-Q  
 Intended: ‘What did no one eat?’

Finally, we turn to indefinites and numerals. Examples (14–15) below show that *wh-ka* indefinites are scope-rigid and act as interveners:<sup>7</sup>

(14) **Indefinite *wh-ka* is scope-rigid:**<sup>8</sup>

Taro-ga nani-ka-o noma-nak-atta.  
 Taro-NOM what-KA-ACC drink-NEG-PAST

‘Taro did not drink something.’

$\sqrt{\exists} > \neg, * \neg > \exists$

<sup>5</sup>Note that *wh-mo* NPIs are distinct from *wh-mo* universal quantifiers discussed in the introduction (1). See footnote 2.

<sup>6</sup>See also Tanaka 1997 for syntactic evidence for the covert movement of *shika*.

<sup>7</sup>Recall that the scope-rigidity that we confirm and report here is simply with respect to sentential negation (footnote 13): *wh-ka* must take wide scope in (14). The scope of indefinite *wh-ka* may in fact be variable, as long as it is not lower than its surface position; see Yatsushiro 2009.

<sup>8</sup>Earlier examples showing the rigid wide-scope of *wh-ka* indefinites with respect to sentential negation can be found in Mogi 2000:59 and Shibata 2015a:72.



(15) **Indefinite *wh-ka* is an intervener:** (Hoji 1985:269)

\* **Dare-ka-ga** *nani-o nomi-mashi-ta-ka?*  
 who-KA-NOM what-ACC drink-POLITE-PAST-Q  
 Intended: ‘What did someone drink?’

This contrasts with the behavior of the indefinite *suu-* ‘some number,’ which can take scope under negation and does not act as an intervener:

(16) **Indefinite *suu-* is not scope-rigid:**

[**Suu-nin-no** *gakusei-ga ko-nak-atta.*  
 some-CL-GEN student-NOM come-NEG-PAST

‘Some number of students didn’t come.’

$\checkmark \exists > \neg, \checkmark \neg > \exists$

(17) **Indefinite *suu-* is not an intervener:**

$\checkmark$  [**Suu-nin-no** *gakusei-ga dono-hon-o yon-da-no?*  
 some-CL-GEN student-NOM which-book-ACC read-PAST-Q

‘Which book(s) did some number of students read?’

Modified numerals are also not scope-rigid and are not interveners:

(18) **Modified numerals are not scope-rigid:** (Shibata 2015a:66, Shibata 2015b:234)

[**Go-nin-ijyoo-no** *gakusei-ga ko-nak-atta*  
 5-CL-OR.MORE-GEN student-NOM come-NEG-PAST

‘Five or more students didn’t come.’

$\checkmark (\geq 5) > \neg, \checkmark \neg > (\geq 5)$

(19) **Modified numerals are not interveners:**

$\checkmark$  [**Go-nin-ijyoo-no** *gakusei-ga dono-hon-o yon-da-no?*  
 five-CL-OR.MORE-GEN student-NOM which-book-ACC read-PAST-Q

‘Which book(s) did five or more students read?’

Thus far we have considered a range of quantificational expressions in Japanese, compiling judgments largely from existing literature, and noting the correlation between scope-rigidity and intervener-hood. Novel supporting data comes from the interaction of postpositions and the exclusive particle *dake* which we gloss as ‘only.’ *Dake* can occur outside or inside a postposition, resulting in the surface form DP-P-*dake* or DP-*dake*-P. This correlates with a difference in scope rigidity: ‘only’ in -P-*dake* is scope-rigid, necessarily taking scope above sentential operators such as modals and negation, whereas ‘only’

in *-dake-P* can take scope above or below sentential operators (Morita 1971, Futagi 2004, Hayashishita 2005). This is illustrated with sentential negation in (20):<sup>9</sup>

(20) **-P-dake is scope-rigid; -dake-P is not:**

- a. Taro-wa Hanako-to-**dake** hanasa-**nak**-atta.  
 Taro-TOP Hanako-with-only talk-NEG-PAST  
 literally 'Taro didn't talk [only [with [Hanako]<sub>F</sub>]].'      ✓only > ¬, \*¬ > only
- b. Taro-wa Hanako-**dake**-to hanasa-**nak**-atta.  
 Taro-TOP Hanako-only-with talk-NEG-PAST  
 literally 'Taro didn't talk [with [only [Hanako]<sub>F</sub>]].'      ✓only > ¬, ✓¬ > only

This difference in scope-rigidity correlates with their status as interveners (21):

(21) **-P-dake is an intervener; -dake-P is not:**

- a. \* Taro-wa Hanako-to-**dake** nani-o tabe-ta-no?  
 Taro-TOP Hanako-with-only what-ACC eat-PAST-Q
- b. ✓ Taro-wa Hanako-**dake**-to nani-o tabe-ta-no?  
 Taro-TOP Hanako-only-with what-ACC eat-PAST-Q  
 'What did Taro eat with only Hanako?'

Again, as we have seen with pairs of universal quantifiers, disjunction, and indefinites above, intervention-hood tracks scope-rigidity within pairs of denotationally equivalent quantifiers.

The findings discussed in this section are summarized in the table below. Here, "scope-rigid" (○) indicates that the given quantifier takes obligatory wide scope with respect to sentential negation. Non-scope-rigid (×) quantifiers exhibit scope ambiguities with respect to sentential negation. Quantifiers may interrupt the interpretation of lower *wh*-in-situ, being "interveners" (○), or not (×).

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<sup>9</sup>To our knowledge, the earliest example making this point can be found in Morita 1971:23, with the scope of *-de-dake* 'DP-with-only' vs *-dake-de* 'DP-only-with' with respect to a negated modal.

(22) **Summary of Japanese data:**

		scope-rigid	intervener	
universal	<i>wh-mo</i>	○ (5a)	○ (1)	
	<i>subete</i>	× (5b)	× (3)	
disjunction	<i>ka</i>	○ (7a)	○ (8a)	
	<i>naishi</i>	× (7b)	× (8b)	
also	<i>-mo</i>	○ (9)	○ (10)	
even	<i>-sae</i>	○ (9)	○ (11)	
NPI ‘only’	<i>-shika</i>	○	○ (12)	see Kataoka 2006
NPI ‘any’	<i>wh-mo</i>	○	○ (13)	see Shimoyama 2011
indefinite	<i>wh-ka</i>	○ (14)	○ (15)	
	<i>suu-CL</i>	× (16)	× (17)	
modified numerals		× (18)	× (19)	
only	<i>-P-dake</i>	○ (20a)	○ (21a)	
	<i>-dake-P</i>	× (20b)	× (21b)	

As the table in (22) makes clear, the data presented in this section motivates the generalization in (4), repeated here:

(4) **Generalization: Intervener-hood correlates with scope-taking**

Scope-rigid DP quantifiers above an in-situ *wh*-phrase cause intervention. DP quantifiers that allow scope ambiguities—i.e., those that can reconstruct below the *wh*-phrase or scope out of the question—do not.

In particular, many pairs of synonymous operators—*wh-mo* vs *subete* universals, *ka*-disjunction vs *naishi*-disjunction, *wh-ka* vs *suu-CL* indefinites, and *-P-dake* vs *-dake-P* ‘only’—show that different quantifiers with the same semantics may trigger intervention or not, and this correlates with their scope-rigidity with respect to sentential negation. The existence of such pairs is problematic for prominent accounts of intervention, including the influential Beck 2006 proposal where interveners are focus-sensitive items and the information-structural theory of Tomioka 2007. More generally, any theory that proposes

a rigid set of interveners and bases the nature of intervention on the semantics of the interveners will face similar difficulties explaining the data we have shown here.

Instead, we propose that intervention tracks scope-rigidity. In the rest of the paper, we develop an analysis for scope-taking and intervention effects which derives this link. Intervention effects reflect a particular configuration at LF, which scope-rigid quantifiers may be unable to avoid.

But before that, we conclude with two caveats. First, we are aware of individual differences in the scope-taking behavior of different quantifiers as well as the strength of intervention effects. As the discussion regarding the *naishi* disjunction below (8) makes clear, what we predict is a *correlation* between scope-rigidity and intervener-hood within individual grammars. Second, here we will not present an account for why particular quantifiers are scope-rigid while others are not. Our analysis in section 4 will simply assume that certain quantifiers are scope-rigid or not—for example, due to the (un)availability of reconstruction—and derive the correlation observed.<sup>10</sup>

### 3 Theoretical background

In this section we spell out the background assumptions and theories that our analysis relies on. We concentrate on three components: Shibata’s (2015a, 2015b) approach to Japanese clause structure and quantifier scope, the Alternative Semantics approach to *wh*-questions (Hamblin 1973, Rooth 1985), and Kotek’s (2017) theory of intervention effects. Once in place, we will show in section 4 how these ingredients combine to explain the data patterns introduced above.

#### 3.1 Shibata 2015a,b on quantifier scope in Japanese

One notable feature of quantifier scope-taking in Japanese is the similarity of subject and object quantifiers in their scope-taking with respect to sentential operators such as negation. For example, consider the examples in (23). The disjunction in subject position (23a) and object position (23b) both obligatorily scope over sentential negation.

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<sup>10</sup>For some examples of analyses for the scope-rigidity of particular operators, see e.g. Shibata 2015a on focus particles *mo* and *sae* and Yatsushiro 2009 on *wh-mo*.

(23) **Both subject and object disjunction takes scope over negation:**

(Shibata 2015b:231–235)

- a. [Taroo **ka** Jiro]-ga ko-**nak**-atta.  
Taro or Jiro-NOM COME-NEG-PAST  
'Taro or Jiro didn't come.'  $\checkmark \forall > \neg, * \neg > \forall$
- b. Taroo-wa [pan **ka** kome]-o kawa-**nak**-atta.  
Taro-TOP bread or rice-ACC buy-NEG-PAST  
literally 'Taro didn't buy bread or rice.'  $\checkmark \forall > \neg, * \neg > \forall$

This sharply contrasts with the behavior of quantifiers in many other languages, which exhibit an asymmetry between subject position and object position. For example, in English, subject quantifiers often take scope over negation, while object quantifiers take scope below negation:<sup>11</sup>

(24) **Asymmetry between subject and object quantifiers in English:**

- a. **Every** boy **didn't** read the book.  $\checkmark \forall > \neg, ? \neg > \forall$
- b. Evan **didn't** read **every** book.  $* \forall > \neg, \checkmark \neg > \forall$

Much previous literature has described such facts as a puzzle regarding the scope of negation in Japanese. See e.g. Kuno 1980, Takubo 1985, Kataoka 2006, Kishimoto 2007, 2008. These authors have proposed that negation can take scope at various clausal positions in Japanese, or that pragmatic constraints affect the possible interpretations of negation and the phrase structure of the Japanese verb phrase. See Shibata 2015b section 1.1 for a review of these previous approaches.

In contrast, Shibata (2015a,b) proposes that the structural position of negation in Japanese is fixed, but that objects necessarily move out of the scope of negation, making both the subject and object disjunctions take scope over negation in (23) above. Under Shibata's approach, negation is an optional head introduced in the clausal spine between *v* and T, projecting a NegP projection. This in fact parallels previous proposals for sentential negation in many other languages; see e.g. Pollock 1989, Laka 1990, Chomsky 1991, Zanuttini 1991, Haegeman 1995.

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<sup>11</sup>Inverse scope of the subject quantifier is possible in (24a) but dispreferred. Various factors affect the exact scope-taking of quantifiers in English, which fall outside the scope of the current paper. The important point here is simply the contrast between the scope of the quantifier in subject and object positions in English.

(25) **The Hierarchy of Projections for Japanese clauses (Shibata 2015b:230):**  
 $T > (\text{Neg}) > v$

Although Shibata proposes that all DPs move out of the scope of negation in Japanese, this does not mean that quantifiers cannot take scope under negation. Whereas disjunctions as in (23) above necessarily take scope in their surface position and therefore above negation, certain other quantifiers allow for reconstruction into their predicate-internal base position and thus within the scope of negation. Modified numerals are one such case:

(26) **Scope ambiguities with modified numerals in subject and object positions:**  
 (Shibata 2015b:234–239)

- a. [**Go-nin-ijyoo-no** gakusei]-ga ko-**nak**-atta  
 5-CL-OR.MORE-GEN student-NOM COME-NEG-PAST  
 ‘Five or more students didn’t come.’  $\checkmark(\geq 5) > \neg, \checkmark\neg > (\geq 5)$
- b. Taro-wa [**go-nin-ijyoo-no** gakusei]-o sikara-**nak**-atta.  
 Taro-TOP 5-CL-OR.MORE-GEN student-ACC SCOLD-NEG-PAST  
 ‘Taro didn’t scold five or more students.’  $\checkmark(\geq 5) > \neg, \checkmark\neg > (\geq 5)$

What is important for Shibata is that, even in cases of scope ambiguities as in (26), the scope possibilities for subjects parallel the possibilities for objects. For Shibata, this parallelism stems from the fact that both subjects and objects originate within the scope of negation and then move out. The idea that Japanese subjects start in a predicate-internal position and then necessarily move out (the VP-internal subject hypothesis) is not a new idea; see e.g. Fukui 1986, Kitagawa 1986, Takezawa 1987, Kuroda 1988. Shibata’s insight is to extend this same behavior to objects.

Shibata’s conception of DP quantifier scope-taking in Japanese is schematized in (27) below. All DP arguments move out of  $vP$  and  $\text{NegP}$  if present (27a).<sup>12</sup> The interpretation of such quantifiers in their surface position leads to wide scope over negation (27b). For some quantifiers, this is the only possibility, as reconstruction is not possible. For other quantifiers, the quantifier can reconstruct into its predicate-internal base position as in (27c), taking scope below negation.

<sup>12</sup>Shibata proposes that this movement of objects is related to the realization of morphological case. See Shibata 2015b section 4 for his analysis and discussion. The specific motivation for this movement is not relevant for our purposes here.



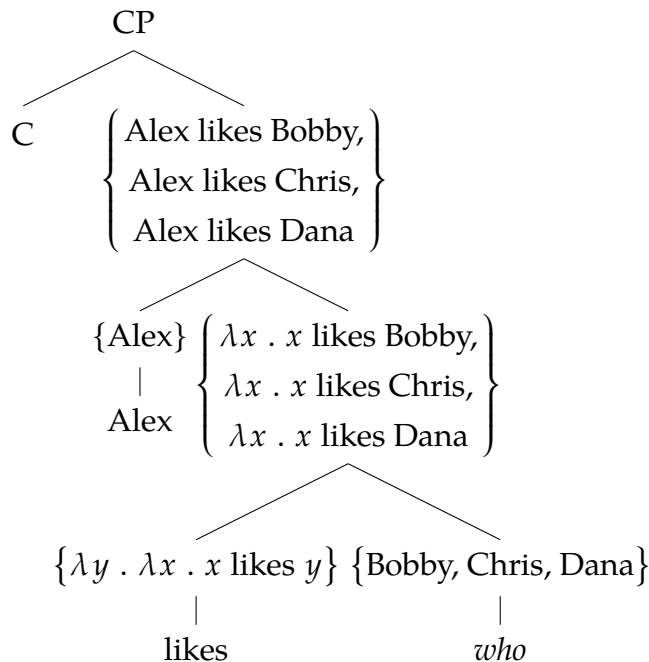
The alternative value of *wh*-phrases can be thought of as corresponding to possible short answers to a question containing these phrases. We follow the assumption that *wh*-phrases do not have a defined ordinary semantic value (Ramchand 1997, Beck 2006). For example, the semantic denotations of *what* and *who* from Beck 2006 are given below:

- (28) **Semantics of *who*:**  
 ordinary semantics:  $\llbracket who \rrbracket$  undefined  
 focus-semantics:  $\llbracket who \rrbracket^f = \{x_{\langle s,e \rangle} : x \in \text{human}\}$   
 “the set of human individuals”

- (29) **Semantics of *what*:**  
 ordinary semantics:  $\llbracket what \rrbracket$  undefined  
 focus-semantics:  $\llbracket what \rrbracket^f = \{x_{\langle s,e \rangle} : x \notin \text{human}\}$   
 “the set of nonhuman individuals”

We illustrate how a question meaning is derived based on these assumptions using the LF representation for the *wh*-in-situ pseudo-English question “Alex likes *who*?” in (30). Alternative values are given for each node.<sup>14</sup>

- (30) **A toy LF for question interpretation through Rooth-Hamblin alternatives:**



<sup>14</sup>The semantic denotations here must be interpreted intensionally. World variables are not illustrated here to simplify the presentation.

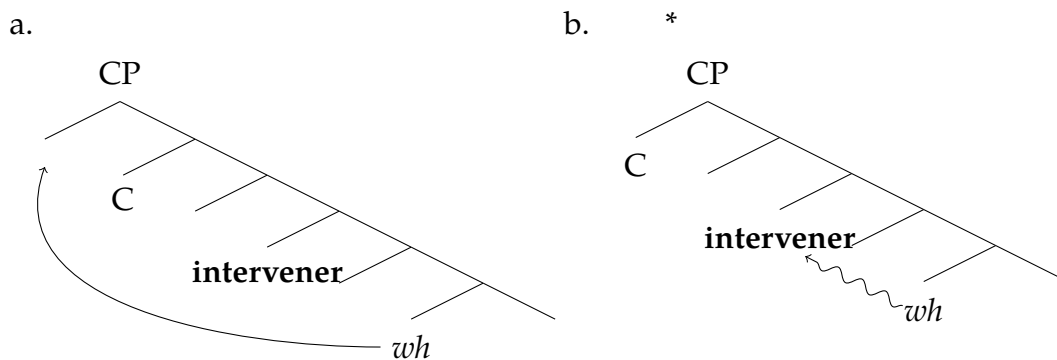


In (30), the *wh*-phrase *who* has a focus-semantic value corresponding to relevant individuals in its domain—here, Bobby, Chris, and Dana. These *alternatives* compose pointwise at each nonterminal node, so that the focus-semantic value of the complement of interrogative C denotes a set of propositions corresponding to possible (weak) answers to the question (Hamblin 1973, Karttunen 1977). Interrogative C then takes this focus-semantic value and returns it as the ordinary meaning of the question (Shimoyama 2001, Beck 2006, Kotek 2014, to appear). In this way, the focus-semantic value provided by the in-situ *wh*-phrase is interpreted by the interrogative C, yielding the appropriate question semantics without establishing a syntactically local relationship between the *wh*-phrase and C.<sup>15</sup>

### 3.3 Kotek 2017 on intervention effects

This approach to interrogative semantics affords us an understanding of intervention effects. Kim 2002, Beck 2006, and Beck and Kim 2006 argue that the Rooth-Hamblin alternatives computation strategy of interpreting *wh*-phrases is sensitive to intervention effects. On the other hand, derivations in which a *wh*-phrase has undergone (overt or covert) movement are immune from intervention effects. This is schematized in (31):<sup>16</sup>

(31) **Focus alternatives, but not movement, are sensitive to intervention effects:**



Building on this idea, Kotek (2017) proposes that intervention effects are due to a logical problem that occurs when any quantifier takes scope between a *wh*-phrase and C at LF.

<sup>15</sup>In this paper we will not be presenting computations of Rooth-Hamblin alternatives beyond the toy example in (30). We refer the reader to Hamblin 1973, Rooth 1985, 1992 and subsequent work on the technical details of Rooth-Hamblin (focus) alternatives computation.

<sup>16</sup>Here and throughout, straight arrows indicate movement and curly arrows indicate areas in which Rooth-Hamblin alternatives are computed. These arrows are used here as a notational convenience only.

Previous authors such as Shan (2004) and Novel and Romero (2009) have observed that, whenever  $\lambda$ -abstraction must take place between an in-situ *wh*-phrase and interrogative C, the resulting LF is undefined.<sup>17</sup> While these previous authors have proposed revisions to the grammar in order to sidestep this technical problem, Kotek (2017) proposes that this technical problem is in fact the source of so-called intervention effects in *wh*-questions:

- (32) **Intervention is the result of scope-taking across focus (Kotek 2017):**  
 Movement into a scope position above *wh*-in-situ at LF leads to ungrammaticality.
- (33) **Kotek’s intervention schema:**  
 \* LF: C ...  $\lambda$  ... *wh*  
 ↖~~~~~

Kotek then proposes that whether or not a quantifier acts as an intervener depends on whether or not it can *move out of the way* at LF to avoid the configuration in (33). In what follows, we show that this approach to intervenerhood and intervention effects can explain the data that we observed above, and explains a range of additional data.

## 4 Proposal

### 4.1 Explaining the correlation

With these background assumptions about the syntax and semantics of Japanese questions in place, we are now able to explain the intervention effect pattern we observe above. Recall that the data in section 2 motivates the generalization in (4), repeated here:

- (4) **Generalization: Intervener-hood correlates with scope-taking**  
 Scope-rigid DP quantifiers above an in-situ *wh*-phrase cause intervention. DP quantifiers that allow scope ambiguities—i.e., those that can reconstruct below the *wh*-phrase or scope out of the question—do not.

Now, consider a surface structure as in (34) below. Following Shibata 2015a,b (§3.1 above) we assume that all DPs must vacate *vP* in the course of the derivation. As a result,

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<sup>17</sup>We refer the reader to Kotek 2017 for an explanation of the logical incompatibility between Predicate Abstraction as in Heim and Kratzer 1998 and Rooth-Hamblin alternatives.

(34) contains a DP quantifier which could lead to an intervention configuration.<sup>18</sup>

(34) **Potential intervener (DP) moves above *wh*:**

[<sub>CP</sub> C ... DP ... *wh* ... [<sub>vP</sub> ... *t* ... V ] ]

↑

If the quantifier is scope-rigid, it has no choice but to lead to the LF configuration in (35). This is a Kotek intervention configuration (33): the calculation of Rooth-Hamblin alternatives must cross an instance of Predicate Abstraction ( $\lambda x$ , in bold), which cannot be defined, causing an intervention effect.

(35) **LF interpretation in surface position lead to intervention (cf 33):**

\* LF: [<sub>CP</sub> C ... DP  $\lambda x$  ... *wh* ... [<sub>vP</sub> ...  $x$  ... V ] ]

~~~~~

But if a quantifier is not scope-rigid—i.e. it can reconstruct at LF—the LF in (36) will also be available. This structure avoids the intervention configuration at LF, despite surface appearances, and is hence predicted to be grammatical.

(36) **Reconstruction avoids the intervention configuration:**

✓ LF: [<sub>CP</sub> C ... *wh* ... [<sub>vP</sub> ... DP ... V ] ]

~~~~~

(36) is the LF structure we assume for non-intervening quantifiers in section 2, which as we saw were precisely those quantifiers which can reconstruct into their predicate-internal position. In section 4.2 below, we offer additional evidence for this reconstruction of quantifiers which are descriptively non-interveners.

Alternatively, scrambling the *wh*-word above the potential intervener also avoids intervention (37) without requiring the DP to reconstruct. The *wh*-phrase is moved to a higher position, and hence its interpretation via Rooth-Hamblin alternatives computation does not cross the Predicate Abstraction step associated with movement of the potential intervener. This is our explanation for data such as (1–2), repeated here in (38).

(37) **Scrambling *wh* above also avoids intervention:**

✓ LF: [<sub>CP</sub> C ... *wh*  $\lambda y$  ... DP  $\lambda x$  ... *y* ... [<sub>vP</sub> ...  $x$  ... V ] ]

~~~~~

<sup>18</sup>Movement of the *wh*-phrase to its surface position is not illustrated in (34) and subsequent schemas in this section. The interpreting complementizer is at the left edge of CP for illustration purposes only.

(38) **Intervention avoided by scrambling:** (=1–2)

- a. ?? **Da're-mo-ga** *nani-o* *kai-mashi-ta-ka?*  
 who-MO-NOM what-ACC buy-POLITE-PAST-Q  
 Intended: 'What did everyone buy?'
- b. ✓ *Nani-o* **da're-mo-ga** \_\_\_\_\_ *kai-mashi-ta-ka?*  
 what-ACC who-MO-NOM buy-POLITE-PAST-Q  
 'What did everyone buy?'

Finally, the possibility of scoping the quantifier out of the question itself (39) offers one additional means for avoiding intervention.<sup>19</sup> This configuration has been shown to exist in German and in English (see Beck 1996 and Pesetsky 2000, respectively), and we will show in section 4.3 below that it is possible in Japanese as well.

(39) **Scoping the quantifier out of the question also avoids intervention:**

✓ LF: ... DP  $\lambda x$  ... [CP C ... \_\_\_\_\_ ... *wh* ... [<sub>vP</sub> ... *x* ... V ] ]

In the remainder of this section we present three predictions of our account and show that they are indeed borne out by the data, supporting the approach to intervener-hood and intervention presented here. These findings are not predicted by existing accounts of intervention effects in Japanese.

## 4.2 Non-intervention through reconstruction

First, we concentrate on our characterization of *non-intervening* quantifiers. We claim that quantifiers which descriptively do not intervene can do so by reconstructing into a lower, *vP*-internal base position. Therefore in a potential intervention configuration, we predict that the potentially intervening quantifier must be *interpreted* in this reconstructed position inside *vP*.

We first test this forced reconstruction by considering the scope of the intervening quantifier with respect to sentential negation. Following Futagi 2004, we showed in (20–21) that the *only* particle *dake* inside a postposition (DP-*dake*-P) can take scope above or

<sup>19</sup>Note that in order to predict no intervention in cases of reconstruction (36) and of further movement (39), all intermediate landing sites of movement—between DP's base position and its final *scope* position at LF—must be ignored as far as the computation of intervention configurations is concerned. Instead, the  $\lambda$ -binder at the final LF position of the moved DP must directly bind its lower variable. See Kotek 2017 for discussion.

below sentential negation, and at the same time is descriptively a non-intervener. Now consider example (40) below. The quantificational PP ‘with only Hanako’ *Hanako-dake-to* is in a higher position than the *wh*-word in the surface structure. We therefore predict that it will be forced to reconstruct into its *v*P-internal base position to avoid the Kotek intervention configuration. Hence, it will necessarily be interpreted below negation at LF.

(40) **DP-*dake*-P must reconstruct below *wh*; *only* > ¬ reading is not possible:**

Taro-wa Hanako-**dake**-to *nani*-o tabe-**nai**-no?  
 Taro-TOP Hanako-only-with what-ACC eat-NEG-Q

- a. \* ‘What does Taro only not eat with Hanako<sub>F</sub>?’ only > ¬  
 Answer: Squid ink pasta (because he gets embarrassed)
- b. ✓ ‘What does Taro not eat with only Hanako<sub>F</sub>?’ ¬ > only  
 Answer: Dimsum (because it’s better with more people)

The two potential readings of (40) are illustrated by the potential expected answers and respective contexts: ‘What is *x* such that, just when he is with Hanako, Taro won’t eat *x*’ (wide scope for *only* over negation), vs ‘What is *x* such that Taro does not eat *x* with Hanako alone’ (narrow scope for *only*). While both readings are plausible in appropriate supporting contexts, and *-dake*-P can generally scope above or below negation, only (40b) is possible here. This is predicted by the reconstruction account of non-intervention, illustrated in (36) above.

A further prediction made by our account is that scrambling the *wh*-word above *Hanako-dake-to* will make both readings available. See the LF schema in (37). This prediction is borne out:

(41) **When *wh* scrambles above intervener, both scope readings become available:**

Taro-wa *nani*-o Hanako-**dake**-to \_\_\_\_\_ tabe-**nai**-no?  
 Taro-TOP what-ACC Hanako-only-with \_\_\_\_\_ eat-NEG-Q

- a. ✓ ‘What does Taro only not eat with Hanako<sub>F</sub>?’ only > ¬
- b. ✓ ‘What does Taro not eat with only Hanako<sub>F</sub>?’ ¬ > only

Next, consider the collective vs distributive event interpretation of subjects. We assume that distributive readings require the subject to move out of its base position (Diesing 1992). Example (42) provides a baseline, illustrating that in the absence of an intervener,

universally quantified subjects in Japanese allow for both collective and distributive interpretations. However, when these quantifiers c-command an in-situ *wh*-phrase, only a collective interpretation is possible, (43).

(42) **Baseline: collective and distributive readings with *zen'in*:**

[Gakusei **zen'in**]-ga LGB-o ka-tta.  
 student all-NOM LGB-ACC buy-PAST

- a. ✓ 'All the students together bought a copy of LGB.' collective
- b. ✓ 'All the students each bought a copy of LGB.' distributive

(43) ***Zen'in* must reconstruct below *wh*; only the collective reading survives:**

[Gakusei **zen'in**]-ga [*dono hon*]-o ka-tta-no?  
 student all-NOM which book-ACC buy-PAST-Q

- a. ✓ 'Which book(s) did the students all buy together?' collective
- b. \* 'Which book(s) did the students all individually buy?'  
 (and they each bought other books too) distributive

Here too, scrambling the *wh*-phrase above the quantifier allows for both the collective and distributive readings (44). The distributive reading is possible in (44) because scrambling the *wh*-phrase higher (37) makes it no longer necessary to reconstruct the quantifier (36) in order to interpret the *wh*-question.

(44) **When *wh* is scrambled above *zen'in*, both readings are again available:**

[*Dono hon*]-o [gakusei **zen'in**]-ga \_\_\_ ka-tta-no?  
 which book-ACC student all-NOM buy-PAST-Q

- a. ✓ 'Which book(s) did the students all buy together?' collective
- b. ✓ 'Which book(s) did the students all individually buy?' distributive

### 4.3 Non-intervention by scoping out

Next, we consider another way of avoiding intervention, discussed in prior literature for German in Beck 1996 and for English in Pesetsky 2000 and Kotek 2014: A quantifier can avoid causing an intervention effect if it is able to scope out of the question and quantify into it. See (39). This is possible with universal quantifiers, and leads to a predicted

wide-scope reading of the quantifier with respect to the *wh*-phrase—a pair-list reading (see e.g. Karttunen 1977, Comorovski 1989, 1996, É Kiss 1993, Krifka 2001).

Consider the German examples below in (45), which come from Dayal 2016:246. The “narrow scope” interpretation of the universal ‘every boy’ involves interpretation of the quantifier in its surface position above the lower *wh*-phrase *wann* ‘when,’ leading to an intervention effect in (45aii). This problem is avoided by scrambling the *wh*-phrase in (45bii), just as we discussed in (37–38) above. Example (45a) does however have a grammatical reading which involves scoping the universal quantifier out of the question, resulting in a multiple question interpretation (45ai). This is also independently possible in (45b): see (45bi).

(45) **Intervention above *wh*-in-situ, rescued by covert movement *every*:**

- a. *Wen* hat **jeder Junge** *wann* beobachtet?  
 who has every boy when observed
  - i. ✓ ‘For every boy, who did he observe when?’ wide scope
  - ii. \* ‘Who is such that every boy observed him when?’ narrow scope
- b. *Wen* hat *wann* **jeder Junge** beobachtet?  
 who has when every boy observed
  - i. ✓ ‘For every boy, who did he observe when?’ wide scope
  - ii. ✓ ‘Who is such that every boy observed him when?’ narrow scope

The relevant Japanese example is given in (46). The embedded question in (46) allows the collective interpretation but not a distributive interpretation, just as in (43) above. However, this sentence has another reading where *all students* takes wide scope out of the question. The resulting interpretation, then, expects that each student bought a (potentially different) book, and that this *list of pairs* is what the teacher would like to know. This reading is predicted given an LF structure as in (39).<sup>20</sup>

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<sup>20</sup>Matrix questions with universal quantifiers also permit pair-list interpretations, but this reading seems clearer at least in this example when embedded, as in (46).

(46) **An additional possible reading: A pair-list with *zen'in* quantifying-in**

Sensei-wa [CP [gakusei **zen'in**]-ga [*dono hon*]-o ka-tta-ka ] shiri-tai.  
teacher-TOP student all-NOM which book-ACC buy-PAST-Q know-want  
'The teacher wants to know...

- a. ✓ [which book(s) the students all bought together].' collective (43a)
- b. \* [which book(s) the students all individually bought].' distributive (43b)
- c. ✓ [for each student<sub>*i*</sub>, which book(s) they<sub>*i*</sub> bought].' pair-list

#### 4.4 Base-generated quantifiers are not interveners

Finally, we return again to the fact that the proposal above ties intervention to movement into a position between the in-situ *wh*-phrase and C. The data we have seen so far is compatible with the interpretation of *wh*-in-situ being interrupted by (a) *any* quantifiers or (b) quantifiers in *derived* positions, as we have in fact proposed. Here we offer an argument to tease these two potential explanations apart and provide support for explanation (b).

Our proposal predicts that quantifiers that are base-generated high—above *vP*—and can be interpreted in their base positions without any movement will not act as interveners.<sup>21</sup> In example (47), this is shown to be the case using the adjunct 'only on Tuesdays,' which unlike arguments, can be base-generated in a high position and does not require movement out of a low *vP* position (see section 3.1).

(47) **Temporal modifiers base-generated high do not cause intervention:**

- ✓ Taro-wa kayoubi-ni-**dake** nani-o tabe-ru-no?  
Taro-TOP Tuesday-on-only what-ACC eat-NONPAST-Q  
'What does Taro eat only on Tuesdays?'

Notice that example (47) appears to instantiate an intervention configuration: it contains an in-situ *wh*-phrase which is c-commanded by a scope-rigid quantifier *P-dake*. As we have shown in (20–21), in the case of DP arguments, this leads to an intervention effect. However, we observe that this adjunct does not cause a similar intervention effect.

The crucial difference between examples in which *-P-dake* leads to an intervention effect and the example here is that *-dake* in (47) is on a temporal modifier which is base-generated


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<sup>21</sup>We thank Paloma Jeretič (p.c.) for suggesting this prediction and to Yohei Oseki (p.c.) for initial discussion.



high and can be interpreted in-situ. Being interpreted without movement means that (47) can avoid the Kotek intervention schema, repeated here, despite its surface similarity to intervention examples in (20–21).

(33) **Kotek’s intervention schema:**

\* LF: C ...  $\lambda$  ... *wh*  


This supports hypothesis (b) above, that it is specifically quantificational material interpreted in a *derived* position that triggers intervention, over hypothesis (a), that simply any quantificational material triggers intervention. This is the crux of the Kotek 2017 account for intervention effects in *wh*-questions. It is unexplained by other accounts, including the influential Beck 2006 approach, which also interprets *wh*-questions through Rooth-Hamblin alternatives computation, but does not predict a correlation with movement and Predicate Abstraction.

## 5 Conclusion

Intervention effects have been the subject of a large and growing body of literature over the past 30 years. Previous work has offered various characterizations for a rigid set of interveners, together with a corresponding theory for the nature of intervention effects, be it as related to the semantics of focus (Kim 2002, Beck 2006, Beck and Kim 2006), quantification (Beck 1996), topichood (Grohmann 2006), prosody (Tomioka 2007), (anti-)additivity (Mayr 2014), or semantic type-mismatch (Li and Law 2016). The lesson from our work here is that all of these descriptions are necessarily misguided, by starting from the assumption that intervener-hood is an inherent property of some quantifiers but not others.

In this paper, we established a robust generalization regarding the nature of intervener-hood in Japanese: If a DP quantifier is scope-rigid—as diagnosed with respect to sentential negation—it will be an intervener. Scope-rigidity was shown to be the necessary and in fact sufficient property to predict intervener-hood in Japanese. This generalization has not been observed before, although it is hinted at by Shibata’s (2015a) brief discussion of different forms of disjunction in Japanese and Korean.

This generalization motivates the view that intervener-hood is crucially tied to the quantifier's possible scope positions at LF. In particular, we argued for Kotek's (2017) conclusion that interveners are those elements which must move into a scope position that separates an in-situ *wh*-phrase from the interrogative complementizer that must interpret it at LF, and which cannot move out of the way. A (potential) intervener can evade intervention by moving out of the way in one of two ways: (a) some quantifiers are able to reconstruct to a base-position below *wh*-in-situ, and (b) some quantifiers are able to scope above interrogative C and quantify into the question. In addition, as has been widely observed, *wh*-in-situ can evade intervention through scrambling above the intervener. We showed that the empirical generalization is immediately derived by this Kotek 2017 theory of intervention—previously motivated by the study of English *wh*-questions—when combined with the independently-motivated Shibata 2015a,b theory for quantifier scope-taking in Japanese.

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