

## Ultimate Pied-Piping in Japanese and Sinhala\*

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### 1. Introduction

In this paper I will show that the whole sentences can be pied-piped in Japanese and Sinhala *wh*-questions if quantity questions such as ones containing *how many/much NP* are employed. To show this, I will provide a few pieces of evidence for pied-piping in Sinhala and Japanese. Then I will introduce peculiar data concerning *how many/much NP* questions in both languages and will answer why that is the case. I will also consider why other types of *wh*-expressions can resort to large-scale pied-piping in indirect questions.

#### 1.1. Do *wh*-expressions move in Japanese?

First consider the following examples:

- (1) [<sub>CP</sub>John-ga nani-o itta kara]  
-Nom what-Acc said because  
Mary-ga satta no?  
-Nom left Q  
'(Lit.) Mary left because John said what?'
- (2) Mary-wa [<sub>DP</sub>John-ga nani-o itta  
-Top -Nom what-Acc said  
jijitu-ni] ki-o kaketeiru no?  
fact-Dat attention-Acc pay Q  
'(Lit.) Mary is concerned with the fact that John said what?'

As (1) and (2) show, Japanese is an *wh-in-situ* language, and it allows *wh*-expressions to be

base-generated inside islands such as adverbial and relative clauses. This fact shows that Japanese *wh*-questions seem to be insensitive to the subjacency condition.

To account for this phenomenon, several types of proposal have been presented, and I will introduce a few of them. A first type is to claim that *wh*-expressions in *wh-in-situ* languages such as Japanese and Chinese do not move (cf. Tsai 1994 among others). A second type is to propose that somehow covert movement is not subject to the subjacency condition (Huang 1982). A third type is to argue that the whole islands are pied-piped (cf. Nishigauchi 1986, Morita 2002, 2009 among others). I will support the third type.

### 2. Primary data

In this section I will introduce important data of Sinhala and Japanese *wh*-questions to show that the two languages resort to large-scale pied-piping. Moreover, I will show that *how many/much NP* questions in both of the languages exhibit different characteristics from other types of *wh*-expressions.

#### 2.1. Sinhala

As the following data show, *wh*-questions in Sinhala have two interesting features. First, so called a Q-particle, *də*, is directly attached to a *wh*-expression. Second, the *wh*-expression with *də* exhibits agreement with a verb, so the verb ends with *e*.

- (3) Siri mokak-də keruw-e?  
what-Q did-E  
'What did Siri do?'

(Gair and Sumangala 1991: 93)

As the following examples show, *e* marks the scope of questions, which is similar to *ka* in Japanese.

- (4) a. Ranjit [kau-də aaw -e kiyəla] dannəwa.  
 who-Q came-E that know  
 ‘Ranjit knows who came.’  
 b. Ranjit [kau-də aawa kiyəla] dann-e.  
 who-Q came that know-E  
 ‘Who does Ranjit know \_\_\_ came?’  
 (Kishimoto 1997:6)

The next set of examples indicates that *wh*-expressions are allowed inside islands, but *də* cannot appear inside islands. Thus, the first feature introduced above is violated and *də* must be attached to the edge of islands as follows:

- (5) a. \*oyaa [<sub>NP</sub>kau-də liyəpu potə] kieuw-e?  
 you who-Q wrote book read-E  
 b. oyaa [<sub>NP</sub>kauru liyəpu potə]-də kieuw-e?  
 you who wrote book-Q read-E  
 ‘You read the book that who wrote?’

Suppose that *wh*-expressions move covertly in Sinhala and *də* is attached to what moves. Then (5)*b* shows that the entire island is pied-piped to avoid the violation of the subjacency condition.

Interestingly, quantity questions such as *how many/much NP* questions in Sinhala show a somewhat different phenomenon from other types of *wh*-expressions. Compare (6), (7) and (8):

- (6) a. \*kauru ee potə kieuwa də?  
 who that book read Q  
 b. kau-də ee potə kieuw-e?  
 who-Q that book read-E  
 ‘Who read that book?’  
 (a: Kishimoto 1997: 14, b: Hagstrom 1998: 22)
- (7) a. kiidenek enəwa də?  
 how.many come Q  
 b. kiidenek -də enn-e?  
 how.many-Q come-E  
 ‘How many (animate) are coming?’  
 (Kishimoto 1997: 8)
- (8) a. salli koccərə dunna də?  
 money how.much gave Q  
 b. salli koccərə-də dunn-e?  
 money how.much-Q gave-E

‘How much money did (you) give?’

(Sumangala 1992: 248)

As has been mentioned, *də* must be attached to a *wh*-expression as in (6). However, as (7) and (8) show, *də* need not be adjacent to *how many/much NP*. Sumangala (1992) claims that examples *b* are more focused than examples *a*, and Hagstrom (1998) speculates that somehow *how many/much NP* questions are similar to *Yes/No questions*, the latter of which also places *də* at the end of a sentence. However, these accounts do not explain why only *how many/much NP* questions show such a behavior. In section 3, I will claim that it is possible to pied-pipe the whole sentence in the case of *how many/much NP* questions in Sinhala and Japanese, which I call ultimate pied-piping in this paper.

## 2.2. Japanese

Several pieces of evidence for pied-piping in Japanese *wh*-questions have been presented, and I will introduce two of them: *ittai(zentai)* ‘the hell/in the world’ and intervention effects.

### 2.2.1. *Ittai* (Pesetsky 1987)

Pesetsky (1987) notices that *ittai* normally can be placed before a *wh*-expression as in (9), but it is not allowed when a *wh*-expression is inside an island as in (10)*a*.

- (9) Mary-wa John-ni ittai(zentai)<sup>l</sup> nani-o  
 -Top -Dat the.hell what-Acc  
 ageta no?  
 gave Q ‘What the hell did Mary give to John?’
- (10) a. \*Mary-wa [<sub>DP</sub>John-ni ittai(zentai)]  
 -Top -Dat the.hell  
 nani -o ageta hito-ni] atta no?  
 what-Acc gave person-Dat saw Q  
 ‘(Lit.) Mary saw the person that gave what to John?’ (Pesetsky 1987, (43))  
 b. Mary-wa ittai(zentai) [<sub>DP</sub>John-ni nani-o  
 ageta hito-ni] atta no?

Instead, if *ittai(zentai)* is adjoined to the island as in (10)*b*, the sentence becomes grammatical. The inability of using *ittai(zentai)* inside islands is similar to *də* in Sinhala. Hence, this evidence can be regarded as the existence of pied-piping in Japanese *wh*-questions.<sup>2</sup>

### 2.2.2. Intervention effects (Hoji 1985, Hagstrom 1998, etc)

The next piece of evidence for pied-piping is that intervention effects are lifted when both interveners and *wh*-expressions are inside islands. Before going into details, let me first introduce intervention effects, which are characterized as follows:

(11) \*[C ... intervener ... *wh*] (the linear order is irrelevant)

Interveners include *A ka B* ‘A or B’, *WH-mo* (e.g. *dare-mo* ‘everyone’, ‘anyone’), *WH-ka* (e.g. *nani-ka* ‘something’) and *NP-sika* ‘only NP’. Relevant examples are the following:

(12) a. ?\*[John-ka Bill-ga] nani-o  
           -or    -Nom what-Acc  
           nomimasita ka?  
           drank    Q  
       b. nani-o<sub>i</sub> [John-ka Bill-ga] t<sub>i</sub>  
           nomimasita ka (Hoji 1985: 268)  
           ‘What did John or Bill drink?’  
       (cf. [John-matawa Bill-ga] nani-o  
           nomimasita ka?)

(13) a. ??[dare-mo-ga] nani-o kaimasita ka?  
           who-MO-Nom what-Acc bought Q  
       b. nani-o<sub>i</sub> [dare-mo-ga] t<sub>i</sub> kaimasita ka?  
           ‘What did everyone buy?’ (Hoji 1985: 270)  
       (cf. [minna-ga] nani-o kaimasita ka?)

(12)*a* and (13)*a* indicate that interveners such as *John-ka Bill* ‘John or Bill’ and *dare-mo* ‘everyone’ cannot precede *wh*-expressions, but when the *wh*-expressions are placed before the interveners due to scrambling, intervention effects are lifted and the sentences become grammatical as in (12)*b* and (13)*b*.

Intervention effects are considered to be one type of violation of the economy condition in that C needs to agree with the closest *wh*-expression to derive a *wh*-question; however, an intervener blocks the Agree (see Hagstrom (1998) and Morita 2009 for details).<sup>3</sup>

Moreover, Hagstrom (1998) shows that interveners do not intervene when they are inside islands:

(14) a. ?\*[John-ka Bill-ga] nani-o katta no?  
           -or    -Nom what-Acc bought Q  
           ‘What did John or Bill buy?’  
       b. Mary-wa [<sub>CP</sub>[John-ka Bill-ga] nani-o  
           -Top       -or    -Nom what-Acc  
           katta atode] dekaketa no?  
           bought after left    Q  
           ‘(Lit.) Mary left after John or Bill bought  
           what?’ (Hagstrom 1998: 54)

(15) a. ?? [dare-ka-ga] nani-o katta no?  
           who-KA-Nom what-Acc bought Q  
           ‘What did someone buy?’  
       b. Mary-wa [<sub>CP</sub>[dare-ka-ga] nani-o  
           -Top    who-KA-Nom what-Acc  
           katta atode] dekaketa no?  
           bought after left    Q  
           ‘(Lit.) Mary left after someone bought  
           what?’ (Hagstrom 1998: 55)

As shown in (14)*b* and (15)*b*, intervention effects are lifted when interveners and *wh*-expressions are within the same islands, which suggests that the entire islands are pied-piped.

### 2.2.3. Quantity questions in Japanese

As in Sinhala, *how many/much NP* questions are exceptional in Japanese too. Examine the following examples:

(16) [Ken-ka Mary-ga] nansatu-no  
           -or    -Nom how.many-Gen  
           hon -o yomimasita ka?  
           book-Acc read    Q  
           ‘How many books did Ken or Mary read?’

(17) [dare-mo-ga] nansatu-no hon-o  
 who-MO-Nom how.many-Gen book-Acc  
 yomimasita ka?  
 read Q  
 ‘How many books did everyone read?’

(18) (?) [dare-ka-ga] nansatu-no  
 who-KA-Nom how.many-Gen  
 hon-o yomimasita ka?  
 book-Acc read Q  
 ‘How many books did someone read?’

The examples above show that *how many/much* NPs do not trigger intervention effects despite the preceding interveners.

It is easy to account for this fact about quantity questions if one assumes that they allow the entire sentences to be pied-piped. There are pieces of evidence for the ultimate pied-piping. Consider the following sentences:

(19) a. ?\* [Ken-ka Mary-ga] ittai(zentai)  
 -or -Nom the.hell  
 nansatu -no hon-o yomimasita ka?  
 how.many-Gen book-Acc read Q  
 b. ittai(zentai) [Ken-ka Mary-ga]  
 nansatu-no hon-o yomimasita ka?  
 ‘How many books in the world did Ken or Mary read?’

(20) a. ?? [dare-mo-ga] ittai(zentai)  
 who-MO-Nom the.hell  
 nansatu -no hon-o yomimasita ka?  
 how.many-Gen book-Acc read Q  
 b. ittai(zentai) [dare-mo-ga] nansatu-no  
 hon-o yomimasita ka?  
 ‘How many books in the world did everyone read?’

(21) a. ?\* [dare-ka-ga] ittai(zentai)  
 who-KA-Nom the.hell  
 nansatu -no hon-o yomimasita ka?  
 how.many-Gen book-Acc read Q  
 b. ittai(zentai) [dare-ka-ga] nansatu-no  
 hon-o yomimasita ka?  
 ‘How many books in the world did someone read?’

In examples *a* above, *ittai(zentai)* is placed immediately before a *how many* NP to prevent ultimate pied-piping. As expected, they exhibit intervention effects because the *wh*-expression alone must go through *wh*-movement in that case. If *ittai(zentai)* appears at the beginning of the sentences as in examples *b*, the entire sentences can be pied-piped; hence, no intervention effect is observed.

### 3. Proposal

In this section I would like to present a semantic/pragmatic account for the reason why only *how many/much* expressions can resort to ultimate pied-piping. Before doing this, I will introduce the meaning of *wh*-questions, and show that ultimate pied-piping is pragmatically inappropriate for other types of *wh*-expressions.

#### 3.1. The meaning of *wh*-questions

Following Hamblin (1973), I will assume that the meaning of a *wh*-question is a set of propositions. Consider the following *wh*-question:

(22) Which movie did Bill watch?

The meaning of (22) is the following:

(23) {Bill watched Harry Potter, Bill watched Star Wars, Bill watched LOTR, ...}

The truth value of each proposition in (23) is still unvalued, so that the listener chooses only (and all) true propositions out of the set, which counts as an answer to the question.

To derive (23), *which movie* is fronted and functions as an operator as in (24):

(24)  $\lambda p \exists x [\text{movie}(x) \ \& \ p = \wedge \text{Bill watched } x]$

‘movie(x)’ is called a restriction, and it is presupposed according to Strawson (1952) and Lahiri (2002). As a result, when one utters (22), it is presupposed that there are some movies in the context.

### 3.2. The reason for the lack of ultimate pied-piping in ordinary *wh*-expressions

Suppose ultimate pied-piping is applied to (22) and Chomsky's (1995) copy theory is assumed. Then the following semantic representation will be available:

(25)  $\lambda p \exists x [\text{Bill watched movie}(x) \ \& \ p = \wedge \text{Bill watched } x]$

Since the whole question is pied-piped, the restriction becomes more specific. Nevertheless, (25) generates a set of propositions as in (23). However, there is one important difference between (24) and (25). That is, (25) provides a set of true propositions because each proposition consists of 'Bill watched *x*, which he watched', the non-restrictive relative part of which is derived from the presupposed restriction. Moreover, this semantic representation does not function as an information-seeking question because the answer is already provided by the questioner and the listener cannot make any contribution. Accordingly, ultimate pied-piping is pragmatically inappropriate in ordinary *wh*-questions.

### 3.3. The reason for ultimate pied-piping of quantity questions

Before I provide the answer for why *how many/much NP* questions are different from other types of *wh*-expressions, I would like to discuss the meaning of *how many/much NP* questions, starting with a case where only a *how many NP* is raised. Consider the following question:

(26) How many books did Bill read?

For the sake of exposition, I will assume the following two semantic representations for (26):

(27)  $\lambda p \exists n [\text{number}(n) \ \& \ p = \wedge \exists^n x [\text{Bill read book}(x)]]$

(28)  $\lambda p \exists n \exists^n x [\text{number}(n) \ \& \ \text{book}(x) \ \& \ p = \wedge \text{Bill read } x]$

' $\exists^n x$ ' means that there are *n* instances of *x*. (27)

provides the following set of propositions:

(29) {Bill read one book, Bill read two books, Bill read three books, ... }

On the other hand, (28) generates the following set:

(30) {Bill read Harry Potter, Bill read Narnia, Bill read LOTR, ... }

(30) is possible because books generally have their own titles. As is the case with (23), the truth value of each proposition is still unvalued, so that the listener chooses all true propositions. However, this is not all in the case of (30). S/he must count the number of all the true propositions and utter the number as an answer.

Next suppose ultimate pied-piping is applied to (26). Then the following semantic representation will be available:

(31)  $\lambda p \exists n \exists^n x [\text{number}(n) \ \& \ \text{Ken or Mary read book}(x) \ \& \ p = \wedge \text{Ken or Mary read book}(x)]$

As is the case with (25), the restriction of (31) is presupposed, so that the set of propositions are all true. Nonetheless, this semantic representation is not an inappropriate question because the listener still has a job of counting the true propositions. Therefore, s/he can make a contribution by providing new information, so the sentence can be asked.<sup>4</sup>

### 3.4. Another environment where ultimate pied-piping may be applied

Actually, there is another environment where the restriction and the scope are identical: indirect questions. This is so because the listener is not required to answer. The following examples support this claim:

(32) a. Ranjit [kau- $\boxed{d\check{a}}$  aaw- $\boxed{e}$  kiyəla] dannəwa.  
           who-Q came-E that know  
       b. Ranjit [kauru aawa  $\boxed{d\check{a}}$  kiyəla] dannəwa.  
           who came Q that know  
           'Ranjit knows who came.'  
       (Kishimoto 1997: 6-7)

(33) Mary-wa [[John-ka Bill-ga] nani-o  
 -Top -or -Nom what-Acc  
 nonda ka] sitteiru. (cf. (12))  
 read Q know  
 ‘Mary knows what John or Bill drank.’

In (32), *da* can be separated from the *wh*-expression and employed as a question particle, which suggests that the entire embedded clause has gone through covert *wh*-movement. Similarly, no intervention effect is observed in (33) because the whole indirect question is pied-piped. Both of the examples permit ultimate pied-piping despite the fact that they are not quantity questions, because the listeners are not required to answer.

#### 4. Summary

In this paper, the following findings have been made. First, ultimate pied-piping is possible with *how many/much NP* questions in Japanese and Sinhala, and possibly many other languages, which supports the movement theory of covert *wh*-questions. Second, ultimate pied-piping is also possible in indirect questions, which partly answers why intervention effects are unobserved in embedded context. Thus, the present account, if correct, supports that intervention effects are syntactic (as well) (contra Tomioka 2007). Finally, large-scale pied-piping contributes to interpretations; specifically, the content of restriction becomes more specific (contra Arregi 2003). This fact independently supports Chomsky’s (1995) copy theory.

#### NOTES

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<sup>1</sup> Pesetsky’s (1987) examples do not have *zentai* after *ittai*, but I added *zentai* because it seems to make the grammatical contrast clearer.

<sup>2</sup> It is also possible to consider that *ittai(zentai)* is an independent operator which goes through Agree with interrogative C. In that case, the data does not serve as evidence for pied-piping. I would like to thank Hideki Kishimoto (p.c.) for pointing out this possibility.

<sup>3</sup> Intervention effects are also observed in Sinhala:

- (i) a. ?\*kauru-t mokak-da kiwi-e?  
 who-T what-Q said-E  
 b. mokak-da<sub>i</sub> kauru-t *t<sub>i</sub>* kiwi-e?  
 what-Q who-T said-E  
 ‘What did everyone say?’

(Hagstrom 1998: 59)

Like Japanese, universal quantifiers are interveners in Sinhala, so it cannot be placed before a *wh*-expression as in (ia). But scrambling lifts the effect as in (ib).

<sup>4</sup> The situation where the ultimate pied-piping arises is easily imagined. For example, suppose we want to know the number of guests in a party and the list of the guests’ names is available. Then we simply can count the names in order to answer how many guests are in the party.

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