

Large-scale Pied-piping in Sinhala and Japanese*

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1. Introduction

Pied-piping in *wh*-questions is a phenomenon where not simply a *wh*-expression but also other (adjacent) elements go through raising. English shows small-scale pied-piping as follows:

- (1) [PP In which city] do you live?

In (1), not only *which* but also *in* and *city* go through overt *wh*-movement.

There are languages which allow more large-scale overt pied-piping as in (2) and (3):

- (2) a.? [Zer_i t_i ikusi ondoren]_j joan ziren hemen-dik t_j?
what see after go AUX here-from
b. * Zer_i joan ziren hemen-dik [ikusi t_i ondoren]
what go AUX here-from see after
'What did they leave after seeing t?'

(Ortiz de Urbina 1989: 249-252)

- (3) a. [ima-ta randi-shka runa-ta]-taj_i riku-rka-ngui t_i
what-ACC buy-nominalizer man-ACC-WH see-PAST-2
b.*[ima-ta]-taj_i riku-rka-ngui [t_i randi-shaka runa-ta]
what-ACC-WH see-PAST-2 buy-nominalizer man-ACC
'(Lit.) you saw the man who bought what?' (Cole 1982: 24, adapted)

(2) is from Basque and (3) is from Imbabura Quechua. As examples *b* show, extraction of a *wh*-expression alone from islands such as adverbial and relative clauses are disallowed. However, if the whole islands are moved, the *wh*-

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questions become better greatly as in (2)*a* and (3)*a*.

Arregi (2003), on the basis of Basque data, claims that pied-piped clauses must be reconstructed; in other words, there is no semantic effect in large-scale pied-piping. Consider the following Basque example, first:

- (4) [CP Sein il banela Jonek] pentzaten dau Mirenek *t*_{CP} ?
 who killed had Jon thinks Miren
 ‘Who does Miren think Jon killed?’

As will be discussed later, Strawson (1952) claims that the restriction of a quantifier is presupposed. Since the entire embedded clause is raised, the clause will function as a restriction of the *wh*-operator in (4). Then it is expected there is a presupposition that Jon killed someone, but there is no such presupposition. This fact has led Arregi (2003) to the claim that clausal pied-piping has no semantic effect on the meaning of *wh*-questions.

In this paper I would like to show that large-scale pied-piping can have semantic effects on the basis of Sinhala and Japanese *wh*-questions, in which the matrix TP can go through pied-piping.

2. *Wh*-questions in Sinhala and Japanese

This section introduces Sinhala and Japanese *wh*-questions. First, consider a Sinhala *wh*-question, (5):

- (5) Chitra monəwa-də gatt-e? [Sinhala (henceforth, S)]
 what-WH bought-E
 ‘What did Chitra buy?’ (Kishimoto 2005: 3, adapted)

In Sinhala, a particle *də* is attached to a *wh*-expression. Although it is sometimes called a Q-particle, I will call it a WH operator in this paper. In addition, *e* appears after a verb and marks the scope of a *wh*-question, so it is a question marker, which will be represented either *E* or *Q* in the examples. Thus, as the following pair illustrate, if a question is an indirect question, *e* appears in the embedded verb, while if it is a matrix question, it does so in the matrix verb:

- (6) a. Ranjit [kau -də aaw-e kiyəla] dannəwa. [S]
 who-WH came-E that know
 ‘Ranjit knows who came.’
 b. Ranjit [kau-də aawa kiyəla] dann-e. [S]
 who-WH came that know-E
 ‘Who does Ranjit know ___ came?’ (Kishimoto 1997:6, adapted)

In the case of Japanese, there is no counterpart of *də*, but *ka* is a question marker (represented as *Q* in the examples) marking the scope of a question as

follows:

- (7) Ken-ga nani-o kaimasita [ka]? [Japanese (henceforth, J)]
 -Nom what-Acc bought Q
 ‘What did Ken buy?’
- (8) a. Ken-wa [dare-ga kita [ka] sitteimasu. [J]
 -Top who-Nom came Q know
 ‘Ken knows who came.’
 b. Ken-wa [dare-ga kita to] omoimasu [ka]. [J]
 -Top who-Nom came C think Q
 ‘Who does Ken think came?’

As in (8), *ka* in the embedded clause indicates an indirect question whereas *ka* in the matrix clause indicates a direct question in Japanese.

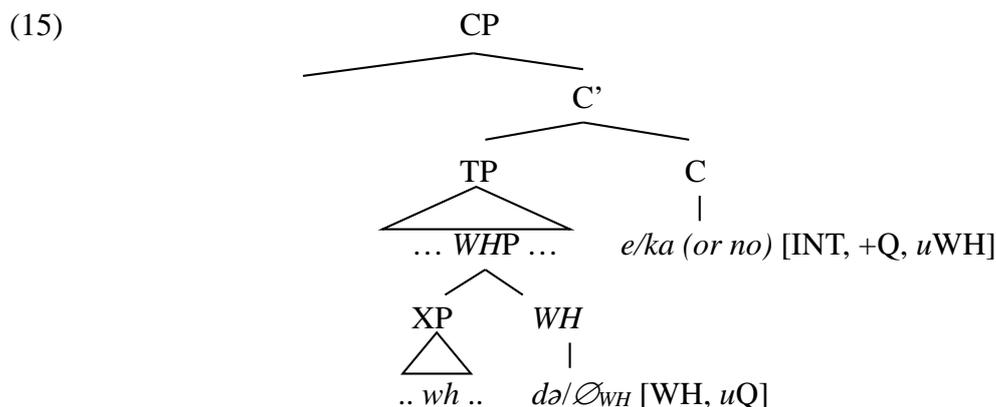
Both of the languages have one important common property: *Wh*-expressions in islands do not necessarily cause ungrammaticality as follows:

- (9) a. oyaa [NP kauru liyəpu potə]-[də] kieuw-[e]? [S]
 you who wrote book-WH read-E
 ‘(Lit.) You read [the book that who wrote]?’
 b. *Siri_i oyaa [NP t_i liyəpu potə] kieuwa. [S]
 ‘*Siri_i, you read [the book that t_i wrote].’
- (10) a. anata-wa [dare-ga kaita hon-o] yomimasita [ka]. [J]
 you -Top who-Nom wrote book-Acc read Q
 ‘(Lit.) You read the book that who wrote?’
 b. *John-ga_i anata-wa [t_i kaita hon-o] yomimasita. [J]
 ‘*John_i, you read [the book that t_i wrote].’

Both allow scrambling, but as examples *b* above show, scrambling across a relative clause is unacceptable because it is an island. Nevertheless, a *wh*-element can be employed inside a relative clause. Moreover, the Sinhala example exhibits that *də* is no longer directly attached to the *wh*-expression. Instead, it must attach to the edge of a relative clause. If *də* appears inside a relative clause, ungrammaticality follows as in (11):

- (11) *oyaa [NP kau-[də] liyəpu potə] kieuw-[e]? [S]
 you who-WH wrote book read-E
 ‘(Lit.) You read the book that who wrote?’

There is another interesting property in Sinhala. As mentioned above, *də* needs to be either immediately after a *wh*-expression or an island containing a *wh*-expression. Thus, it cannot be employed in the clause-final position serving



Following Cable's (2010) analysis of Tlingit and Tanaka (1999), I propose that *də* or \emptyset_{WH} is a head selecting XP as complement, which can be DP, PP, TP or CP. I will call such a phrase *WHP*. However, I also assume that a WH operator does not alter the syntactic category of an element which it selects, so it is a kind of extended projection. Thus, if matrix TP is selected by *də* or \emptyset_{WH} , *WHP* is raised, but it is equivalent to say that the entire TP is raised. I call movement of TP to C-spec in the same clause massive pied-piping and will present a piece of evidence in the next subsection.³ Finally, I suppose that *də* will go through head movement to C when it is employed clause-finally.⁴

Importantly, it is not a *wh*-expression but a WH operator such as *də* or \emptyset_{WH} which goes through Agree with C; hence, relevant syntactic features such as [WH] and [Q] are in the WH operator and C, not in a *wh*-expression and C, as in (15). Thus, if a WH operator is employed inside an island as in (16)*a* and (17)*a*, ungrammaticality surfaces:

- (16) a. *oyaa [DP kau-də] liyəpu potə] kieuw-e? [S]
 you who-Q wrote book read-E
 b. oyaa [DP kauru liyəpu potə]-də] kieuw-e? [S]
 you who wrote book-Q read-E
 '(Lit.) You read the book that who wrote?'

- (17) a. *[CP kau-də] enə kotə] Ranji paadam kəramin hiti-e [S]
 who-WH came time study doing was-E
 b. [CP kauru enə kotə]-də] Ranji paadam kəramin hiti-e [S]
 who came time-WH study doing was-E
 '(Lit.) Ranjit was studying when who came?'

(Kishimoto 1992: 58, adapted)

³ As will be discussed later, massive pied-piping can happen in quantity *wh*-questions, where *də* can appear at the end of a clause instead of *e* in Sinhala.

⁴ When *e* is not present in C, that is, *də* is used at the end of a question, I assume that a covert question marker is generated in C and causes head movement of *də* to C, which does not affect covert pied-piping of TP if head movement carries only phonological features.

3.1. The intervention effect: Hagstrom (1998) and Morita (2009)

Before presenting a piece of evidence for massive pied-piping, let us discuss the intervention effect, which will be defined as follows:

- (18) The intervention effect
 *[C ... intervener ... *wh-d*/∅_{WH}]

(18) says that when an intervener, which will be underlined in the examples below, c-commands a WH operator, ungrammaticality follows. There are a few proposals to account for the effect, but I assume a syntactic account following Hagstrom (1998) and Morita (2009). In other words, the intervention effect observed in Japanese and Sinhala *wh*-questions is an instance of economy condition, or Minimal Link Condition (MLC) violation. More specifically, an intervener has [WH]. Thus, when C probes into its c-commanding domain for [WH], it will try to enter into Agree with the intervener, not the WH operator, resulting in Agree with the wrong goal and ungrammaticality.

On the basis of the assumption above, let us consider examples of the intervention effect in the two languages:

- (19) a. ?*John-ka Bill-ga nani-o-∅_{WH} nomimasita ka? [J]
 -or -Nom what-Acc-WH drank Q
 b. nani-o-∅_{WH} John-ka Bill-ga *ti* nomimasita ka [J]
 ‘What did John or Bill drink?’ (Hoji 1985: 268)
- (20) a. *{kaurude/kaurut} mokak-də kiwi-e? [S]
 someone/everyone what-WH said-E
 b. mokak-də {kaurude/kaurut} *ti* kiwi-e? (scrambled) [S]
 ‘What did {someone/everyone} say?’

In both languages, disjunction and existential quantifiers are interveners as shown in (19)*a* and (20)*a*. However, if the *wh*-expression is scrambled before the intervener, ungrammaticality is lifted as in (19)*b* and (20)*b*, which receives a natural account under the present syntactic account because the *wh*-expression is now closer to C after scrambling, and no violation of the MLC arises.

One interesting property in Japanese and Sinhala *wh*-questions is that the intervention effect is unobserved when both an intervener and a *wh*-expression are inside an island. Compare the following pairs:

unexpected because the quantity *wh*-expression is c-commanded by an intervener. However, as with Sinhala, if we suppose that a WH operator, which is covert in Japanese, can head TP, then the grammaticality is naturally explained.

3.2. Presupposition of *wh*-questions

So far the claim that Agree between C and a WH operator has been attested in Sinhala and Japanese, but whether covert pied-piping follows Agree or not is yet to be shown. One piece of evidence comes from Japanese *wh*-questions.

Compare the following dialogues, first:

- (25) Q: kinoo Ken-ga [DP nansatu-no hon-o]- \emptyset_{WH} yomimasita ka? [J]
 yesterday -Nom how.many-Gen book-Acc-WH read Q
 ‘How many books did Ken read?’
 A: issatu-no hon-mo yomimasendesita.
 one-Gen book-Mo read.not
 ‘Not a single book’

- (26) Q: [_{TP} kinoo Ken-ka Mary-ga nansatu-no hon-o yomimasita]- \emptyset_{WH} ka? [J]
 yesterday -or -Nom how.many-Gen book-Acc read-WH Q
 ‘How many books did Ken or Mary read?’
 A: #issatu-no hon-mo yomimasendesita.
 one-Gen book-Mo read.not
 ‘Not a single book’

(25) has no c-commanding intervener, so a covert WH operator is expected to head the quantity *wh*-expression, i.e. DP (or TP). In this case, it is possible to answer that Ken read no book. Therefore, the question does not presuppose that Ken read some books yesterday. However, when an intervener c-commands the quantity *wh*-expression, the WH operator has no choice but to head TP. Interestingly, in this case, one cannot answer the question by saying that Ken read no book. Thus, when the WH operator heads TP, the content of TP is presupposed: Ken read some books yesterday.

The contrast above can be accounted for if Strawson (1952) is correct, who claims that the restriction of a quantifier is presupposed to be non-empty. Thus, if TP with a WH operator (which is a quantifier) is raised, it serves as the restriction and is expected to be presupposed. Japanese data points to the existence of (covert) pied-piping after Agree between C and the WH operator.

Nonetheless, Sinhala exhibits the opposite effect:

- (27) Q: [DP kiidenek]- $\boxed{d\bar{a}}$ potə kieuw- \boxed{e} ? [S]
 how.many-WH book read-E
 ‘How many people are there who read the book?’
 A: #kauruwat kieuwe nææ [S]
 anyone read not
 ‘No one read it. (Kishimoto 2005: 10, adapted)
- (28) Q: [TP kiidenek potə kieuw] $\boxed{d\bar{a}}$? [S]
 how.many book read Q
 ‘How many people read the book?’
 A: kauruwat kieuwe nææ [S]
 anyone read not
 ‘No one read it. (Kishimoto 2005: 9, adapted)

In (28), *də* heads TP, so its semantic content is presupposed to be non-empty; that is, someone read the book. However, the answer shows otherwise. I will come back to this point later.

4. The semantics of ‘how many/much (NP)’ questions

In this section I will discuss why massive pied-piping is limited to quantity *wh*-expressions. Let us discuss non-quantity *wh*-expressions, first. Consider (12), which is repeated below:

- (29) a. *kauru ee potə kieuwa $\boxed{d\bar{a}}$? [S]
 who that book read Q
 b. kau- $\boxed{d\bar{a}}$ ee potə kieuw- \boxed{e} ? [S]
 who-WH that book read-E
 ‘Who read that book?’
 (a: Kishimoto 1997: 14, b: Hagstrom 1998: 22, adapted)

Considering the fact that TP pied-piping is actually possible in quantity *wh*-expressions indicates that there is nothing wrong with (29)*b* syntactically, and I claim that it is due to a semantic reason.

The semantics of (29)*a* and *b* are the following:

- (30) a. $\lambda p[\exists x[\text{person}(x, w_1^5) \wedge x \neq \emptyset \wedge p = \lambda w[\text{read}(x, \text{that.book}, w) \wedge \text{person}(x, w)]]]$
 b. $\lambda p[\exists x[\text{read}(x, \text{that.book}, w_1) \wedge \text{person}(x, w_1) \wedge x \neq \emptyset \wedge p = \lambda w[\text{read}(x, \text{that.book}, w) \wedge \text{person}(x, w)]]]$

⁵ ‘*w*₁’ here and the rest of the representations stands for the actual world, the assumption of which is based on Strawson (1952), who claims that the restriction of an operator (or quantifier) is presupposed.

As argued before, raised elements function as the restriction of the WH operator, which is assumed to be an existential quantifier above. Thus, when *kau-də* is raised, the variable *x* in *x read that book* must range over people as in (30)*a*, which roughly means ‘Answer who read that book by choosing from the set of people.’ In contrast, when the entire TP is moved to C-spec, the variable *x* must satisfy the condition that *x read that book*. Thus, (30)*b* roughly means ‘Answer who read that book by choosing from the set of people who read the same book,’ which is a gibberish question because every proposition created in this representation is true, and hence, the question does not have any information-seeking function. This is why massive or matrix TP pied-piping is not allowed in non-quantity *wh*-expressions.

Next let us consider quantity *wh*-questions. (13) is repeated below:

- (31) a. kiidenek enəwa $\boxed{də}$? [S]
 how.many come Q
 b. kiidenek $\boxed{-də}$ enn- \boxed{e} ? [S]
 how.many-WH come-E
 ‘How many (people) are coming?’ (Kishimoto 1997: 8, adapted)

The semantics of (31)*a* and *b* are (32)*a* and *b* respectively:

- (32) a. $\lambda p \exists n [\exists X [\text{come}(X, w_1) \wedge \text{people}(X, w_1) \wedge n = |X| \wedge R(n) \wedge X \neq \emptyset]$
 $\wedge p = \lambda w \exists X [\text{come}(X, w) \wedge \text{people}(X, w) \wedge n = |X| \wedge R(n)]]$
 b. $\lambda p \exists n [\exists X [\text{people}(X, w_1) \wedge n = |X| \wedge R(n) \wedge X \neq \emptyset]$
 $\wedge p = \lambda w \exists X [\text{come}(X, w) \wedge \text{people}(X, w) \wedge n = |X| \wedge R(n)]]$

Starting with (32)*b*, *kiidenek* ‘how many (people)’ alone is raised there. The quantity *wh*-expression contains two existential quantifiers: one for people, $\exists X$, and the other for the number of people, $\exists n$. As a result, it is presupposed that there are people and *n* represents its number (of people). Then it means “Choose an appropriate number *n* (which indicates the number of books) which makes ‘*n* number of *X* are coming’ true”.

In the case of (32)*a*, since the matrix TP serves as the restriction of the WH operator, *n* represents the number of people who are coming. Then its meaning would be “Choose an appropriate number *n* (which indicates the number of people who are coming) which makes ‘*n* number of *X* are coming’ true”. This representation is not a gibberish question because the restriction simply says that there is *n* which indicates the number of people who are coming, so it does not say what number *n* is (even though it indicates the number of who are coming). Accordingly, it does not automatically make every proposition created out of the nuclear scope true. Thus, it is a legitimate question.⁶

⁶ Such a situation is easily imagined. For example, suppose you have a list of people who have come to a party. Then you know who has come to the party. But in that situation you still can ask somebody how many have come to the party.

presupposition in (28), which is why TP is not presupposed in that case.

It is possible to confirm the claim above through Japanese examples. Compare the following pair:

- (36) a. Ken-wa [CP[TPJohn-ka Mary-ga doko-ni itta] ka] sitteimasu. [J]
 -Top -or -Nom where-to went Q know
 ‘Ken knows where John or Mary went.’
 b. Ken-wa [CP [TPJohn-ga doko-ni itta] ka] sitteimasu. [J]
 -Top -Nom where-to went Q know
 ‘Ken knows where John went.’

Although an intervener *c*-commands a *wh*-expression, the intervention effect is not detected in (36)*a*, which implies that massive pied-piping of TP is applied.⁷ As expected, (36)*a* implies that John or Mary went somewhere. However, if there is no intervener as in (36)*b*, the question does not need to presuppose that John went somewhere. That is, it is legitimate even if John went nowhere and Ken knows it.

Consider the clefted sentence of (36)*a* next:

- (37) Ken-ga *t*_{CP} sitteiru-no-wa [CP [TP John-ka Mary-ga doko-ni itta] ka] desu. [J]
 -Nom know-C-Top -or -Nom where-to went Q is
 ‘What Ken knows is where John or Mary went’

In (37), the massive pied-piping is expected due to the intervener; however, it is different from (36)*a* in that it does not presuppose that John or Mary went somewhere. That is to say, (37) holds even if John or Mary went nowhere, which is because the entire embedded clause is new information in the cleft construction, and this is exactly what takes place in Sinhala *wh*-questions.

Moreover, it is possible to make the same claim in Basque, which allows overt large-scale pied-piping, but does not produce Strawson’s presuppositional effects such as (4). In other words, the overtly moved phrase receives information focus canceling the presuppositional effect. Indeed, Arregi (2001) claims that a phrase in the position before the verb, where a pied-piped phrase moves, has information focus. Accordingly, it is not surprising that pied-piped phrases do not contribute to presupposition in Basque. This claim, if correct, supports the present argument that pied-piped phrases function as the restriction of a WH operator; hence, no reconstruction is initiated.

6. Conclusion

In this paper I have argued that *də* in Sinhala and \emptyset_{WH} in Japanese are a

⁷ Due to limited space, I have not discussed massive pied-piping in embedded questions, but they are possible. For example, Sinhala examples show that *də* can be used clause-finally even with non-quantity *wh*-expressions if it is an indirect question.

pied-piper, and the rest of the pied-piped phrase serves as the restriction of the operator. Specifically, clausal pied-piping affects the interpretation of *wh*-questions contra Arregi (2003). Moreover, massive pied-piping, i.e. pied-piping of (root) TP, is possible in Sinhala and Japanese *wh*-questions if the question is a quantity *wh*-question, which is due to a semantic reason. Finally, the reason for no presuppositional effect in large-scale pied-piping in Sinhala and Basque is that their *wh*-phrases are information-focused canceling Strawson's (1952) restriction presupposition.

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