Feature Percolation, Movement and Cross-Linguistic Variation in Pied-Piping

Jeong-Me Yoon
Myongji University
50-3 Namgajwa dong, Seodaymun gu
Seoul, Korea
JMYOON@wh.myongji.ac.kr

Abstract

This paper deals with cross-linguistic variation in WH-pied-piping. In this paper, I claim that pied-piping is the result of the intermediate stages of WH-movement (i.e., the indirect feature checking movement of Chomsky (1998)) to the Spec of XP and the subsequent percolation of the WH-feature to the XP and that cross-linguistic variation in pied-piping can be explained in terms of various universal and language-specific syntactic constraints and properties. Crucially, I claim that the overt/covert nature of indirect feature checking movement could vary independently from that of direct feature checking movement. This means that in principle, there can be four different types of languages in terms of WH-pied-piping. Specifically, I show that Basque and Imbabura Quechua are languages where both the direct and indirect WH-feature checking movement are overt while WH-in-situ languages like Sinhala and Korean are those where both the direct and indirect WH-feature checking movement are covert. As for the languages where the indirect WH-feature checking movement is covert while the direct WH-feature checking movement, is overt, I claim that English is such a language and show how various facts of pied-piping in English can be explained in a principled manner if we assume this. Finally, concerning the languages where the indirect WH-feature checking movement is overt while the direct WH-feature checking movement is covert, I speculate that a potential candidate for this type of language is Slave, where it was claimed that partial WH-movement is possible without an overt scope marker.

1. Introduction: Cross-Linguistic Variation in Pied-Piping

WH-pied-piping shows a great deal of variation among languages.[1] For example, pied-piping in languages like English is quite constrained, having a last resort feel (Radford 1997).

(1) a. Which film did you see?
    b. *Which did you see [t film]?
(2) a. *[That John married whom] do you think?
    b. Whom do you think that John married t?
(3) a.*[Afraid of whom] are you?
    b. Who are you afraid of t?

In contrast, there are languages where pied-piping is much freer. Basque and Imbabura Quecua are two well-known examples of this case. In these languages, a large chunk of phrases such as tensed clauses can be pied-piped and furthermore, pied-piping can be optional, as we see below.

Basque

---

[1] The discussion on pied-piping in this paper will be restricted to pied-piping by WH-phrases, although it was claimed that certain scope facts in Italian and French involve pied-piping by Neg phrases (Longobardi 1992; Moritz & Valois 1994).

(4) a. [Nor etorri   d-ela]   esan   du   Mirenek   uste   du-ela   Jonek?
       Who come   aux-that said   has   Mary   think   aux-that John
       'That who has come has Mary said (that) John thinks?'

    b. Nor   esan   du   Mirenek   uste   du-ela   Jonek   etorri   d-ela?
       Who   said   aux   Mary   think   aux-that John   come   aux-that
       'Who has Mary said John thinks will come?'   (Ortiz de Urbina 1993:204)

Imbabura Quechua
(5) a. [ima-ta   Juan   randi-shka]-ta-taj   pro   ya-ngui?
       what-ACC Juan   buy-NML-ACC-Q   (you) think-2
       'What do you think that Juan bought?'

    b. ima-ta-taj   ya-ngui   Juan   randi-shka-ta?
       what-ACC -Q   think-2   Juan   buy-NML-ACC
       'What do you think that Juan bought?'   (Cole 1982:21)

Both Basque and Imbabura Quechua are overt WH-movement languages and sentence (4a) and (5a) clearly show that clauses can be pied-piped in these languages. In addition, the grammaticality of (4b) and (5b) shows that pied-piping can be optional in these languages, i.e., it is possible either to move the WH-phrase alone ((b)) or to pied-pipe the whole clause containing the WH-phrase ((a)) in Basque and Imbabura Quechua. As we have already seen in (2), this kind of optional clausal pied-piping is not possible in English.

In addition, there are languages such as Korean, Japanese, and Sinhala, which can be viewed and have been argued as involving 'covert' pied-piping (Choe 1987; Nichigauchi 1986, 1992; Kishimoto 1992; Yoon 1999, among others.). The claim that these languages have pied-piping which is on a par with that in overt pied-piping languages like Basque and Imbabura Quechua is based on the absence of certain island effects in these languages as in (6)-(7). It has been argued that the absence of island effects can be taken as showing that what is moved in these sentences is not the WH-phrase inside the island but the whole island containing the WH-phrase.

Sinhala
(6) oyaa   [Chitra   kaa-te   dunn ∂ pot ∂] d ∂ kieuwe?
    You   Chitra   who-DAT gave   book   Q   read-E
    'You read the book that Chitra gave to whom?'   (Kishimoto 1992)

Korean
(7) Ne-nun   [Yenghi-ka   mwues-ul machi-myen]   chwulpalha-l ke-ni?
    You-TOP Y-NOM   what-ACC finish-if   leave-FUT-C[+WH]
    '*What are you going to leave if Yenghi finishes (it)?'

The goal of this paper is to provide an analysis of pied-piping which can capture the observed cross-linguistic variation in pied-piping within the Minimalist Program.

2.   Proposal

I propose that the observed cross-linguistic variation in pied-piping can be explained if we assume the following analysis of pied-piping in the Minimalist Framework.

(i)   Operator features such as WH-features can percolate from the Spec to the mother node. Feature percolation, however, is not possible from the Complement position (Ortiz de Urbina 1993; Horvath 1997, etc.).

(ii)   Pied-piping is made possible by feature percolation. Given that feature percolation is possible from the Spec, this means that pied-piping will be possible when a WH-phrase is either base-generated in the Spec of XP or when it moves to the Spec. Once the WH-phrase is in the Spec of XP, it has an option of either moving out again, i.e., successively cyclically, to the higher Spec or percolating its WH-feature to the mother node. If feature percolation takes place, the

XP with the percolated WH-feature will undergo pied-piping WH-movement in the next cycle.[2]

(iii) The overt/covert nature of the intermediate stages of WH-movement (i.e., indirect feature checking movement of Chomsky (1998)) can vary independently from that of the final stage of WH-movement (i.e., direct feature checking movement).

(iv) Spell-out is cyclic (Chomsky 1998).

It has been already proposed by many researchers (Ortiz de Urbina 1993; Horvath 1997, etc.) that pied-piping involves percolation of the WH-feature from the Spec and thus any elements which take up the Spec of XP either by base-generation or movement can be pied-pipers. My proposal, however, differs from the previous analyses in that I am proposing that the overt/covert nature of the intermediate stages of WH-movement could vary independently from that of the final stage of WH-movement and that there can be cross-linguistic variation with regard to the nature of this indirect WH-feature checking movement as there is variation in the nature of the direct WH-feature checking movement. This means that in principle, there can be four different types of languages in terms of pied-piping: first, there can be languages where both the direct and indirect WH-feature checking movement are overt; second, there can be languages where both the direct and indirect WH-feature checking movement are covert; third, there can be languages where the direct WH-feature checking movement is overt while the indirect feature checking movement is covert; and finally, there can be languages where the direct WH-feature checking movement is covert while the indirect WH-feature checking movement is overt.

Of these four types of languages, what is novel and deserves discussion is the possibility of languages where the nature of the direct and indirect feature checking movement differs, i.e., the languages where the direct WH-feature checking movement is overt while the indirect WH-feature checking movement is covert and the languages where the direct feature WH-checking movement is covert, while the indirect WH-feature checking movement is overt. Specifically, the predictions for these two types of languages is that a constituent can be pied-piped overtly by a WH-element which is not in the Spec on the surface (first type) and that WH-elements can appear in non-scopal positions without any overt scope markers (second type). Of these two types, I will claim that English belongs to the first type and show that various facts of pied-piping in English could be explained if we assume this. As for the second type, I will suggest that a potential candidate is Slave, which was claimed to have partial WH-movement without any overt scope markers (Basilico 1998).

Note that this kind of mixed movement, in particular, overt-pied-piping by the WH-element which is not in the Spec overtly is possible given the "Cyclic Spell-Out model" of Chomsky (1998). According to the Cyclic Spell-Out model, Spell-Out applies cyclically in the course of the derivation and there is no distinct LF component within narrow syntax. This means that overt and covert movement are interspersed and thus it is possible for a covert movement to precede an overt movement in the subsequent cycle. This will be crucial in my account of pied-piping in English, as will be seen shortly.

3. Explaining Cross-Linguistic Variation

3.1. Overt Clausal Pied-Piping in Basque & Imbabura Quechua

Both the direct and indirect WH-feature checking movement are overt in these languages. As we see in (8) and (9) below, the WH-phrase overtly moves to the beginning, i.e., the Spec, of the pied-piped CP and the whole CP in turn overtly moves to the Spec of +WH-C.

Basque

(8) [Nor etorri d-ela] esan du   Mirenek uste du-ela   Jonek?
    Who come aux-that said has   Mary   think aux-that   John

---

[2] As an alternative to feature percolation, we might assume that pied-piping is the result of Spec-Head agreement, as proposed by Moritz & Valois(1994). Although this appears to have the same effect as feature percolation from the Spec, I didn't adopt it for the following reason. Given that pied-piping can be optional in languages like Basque and Imbabura Quechua, we have to take Spec-Head agreement to be optional. Optional agreement, however, does not seem to be desirable conceptually, considering that agreement is a relational concept.

'That who has come has Mary Mary said (that) John thinks?'

Imbabura Quechua

(9) [ima-ta   Juan   randi-shka]-ta-taj   pro   ya-ngui?
    what-ACC Juan buy-NML-ACC-Q   (you) think-2
    'What do you think that Juan bought?'

That the WH-phrase must move overtly to the Spec of the pied-piped constituent is evidenced by the contrast in the following pair of sentences in Imbabura Quechua.

(10) a. [ima-ta$_i$ Juan   t$_i$ randi-shka]-ta-taj$_j$ pro   ya-ngui   t$_j$.
        what-ACC   Juan   buy-NML-ACC-Q   (you) think-2
        'What do you think that Juan bought?'
    b.*[Juan ima-ta   randi-shka]-ta-taj$_j$ pro   ya-ngui   t$_i$.
        Juan what-ACC buy-NML-ACC-Q   (you) think-2
        'What do you think that Juan bought?'

In both (10a) and (10b), the embedded CP has undergone pied-piping WH-movement to the beginning of the matrix clause, but sentence (10b), where the WH *ima-ta* is not fronted, is ungrammatical unlike (10a), where it is fronted. The same is also true in Basque according to Ortiz de Urbina (1993).

Specifically, in my analysis clausal pied-piping in these languages is explained in the following way: On its way to the Spec of +WH-C, the WH-phrase will pass through the Spec of intermediate CPs due to Subjacency. Once it reaches the Spec of the intermediate CP, it has two options. It can either move out again to the higher Spec or it can percolate its WH-feature to the mother node. If it percolates its WH-feature to the mother node, i.e., CP, we get (8) and (9): once the WH-feature is percolated up to the CP, the WH-phrase in the Spec of the intermediate CP will cease to be a WH-phrase and the CP with the percolated WH-feature will act as a WH-phrase. Consequently, in the next cycle, what will be attracted by the +WH-C is the whole CP with the percolated WH-feature, not the WH-phrase in the Spec of CP. On the other hand, if no feature percolation takes place, the WH-phrase will move out again to the next higher Spec, and we get the usual no pied-piping version such as the following sentences corresponding to sentence (8) and (9).[3]

(11)   Nor   esan   du   Mirenek   uste   du-ela   Jonek   etorri   d-ela?
        Who   said   aux   Mary   think   aux-that John   come   aux-that
        'Who has Mary said John thinks will come?'
(12)   Ima-ta-taj   ya-ngui   Juan   randi-shka-ta?
        what-ACC -Q   think-2   Juan   buy-NML-ACC
        'What do you think that Juan bought?'

3.2.   Pied-Piping in English

Various facts of pied-piping in English can be explained by the proposed analysis of pied-piping if English is a language where the indirect WH-feature checking movement is covert while the direct WH-feature checking movement is overt.

First of all, given that feature percolation is possible from the Spec, pied-piping as in sentences

---

[3] As for the problem of Economy involved in optional pied-piping observed in these languages, note that both the pied-piping and non-pied-piping versions observe the Economy condition if we take it as a local condition and compute Economy at a given point in the derivation (Collins 1997). As we have seen, pied-piping or no pied-piping is determined depending on whether the WH-phrase moves out again or percolates its WH-feature to the mother node when it is in the Spec of XP. Given that feature percolation is a legitimate process of syntax and economy is computed locally at a given point in the derivation, we cannot say that the derivation in (11-12) without feature percolation is more economical than that in (8-9) with feature percolation. Both (8-9) and (11-12) are derived without violating Economy at each point in the derivation. Specifically, when the WH-phrase is in the Spec of the embedded CP, it is equally economical whether it moves out again to the higher Spec or it percolates its WH-feature up to the CP, and from that point on, the structures of (8-9) and (11-12) diverge and we cannot compare two different structures in terms of Economy.

like (13) below is readily explained.

(13) a. [Whose book] did you buy?
    b. [How smart] is he?
    d. [How soon] can you finish it?

We can reasonably assume that the WH-elements in these sentences are base-generated in the Spec of DP, AP and AdvP, respectively, and given this, it is readily explained why the whole phrases containing them can be pied-piped: given that feature percolation is possible from the Spec, the WH-feature of the WH-element in the Spec will be percolated to the mother node, resulting in the pied-piping movement.

Secondly, this proposal provides an immediate explanation for the pied-piping of PPs as in (14).

(14) [To whom] did you talk?

Given that the indirect WH-feature checking movement is covert in English, the prediction is that an XP can be pied-piped even when the WH-phrase is not in its Spec overtly as long as it could move into the Spec covertly. In (14), we can say that the WH-complement of P moves 'covertly' to the Spec of PP and percolates its WH-feature to the PP.[4] As a result of this 'covert' movement and feature percolation, the PP *to whom* undergoes 'overt' pied-piping WH-movement to the Spec of CP.[5] In contrast, when no feature percolation takes place, we get the following sentence without pied-piping.

(15) Whom did you talk to?

Assuming that the indirect WH-feature checking movement in English is covert also explains the sharp contrast between sentences like (16a) and (16b) below.

(16) a. (?)[Pictures of whose mother] are on the table?
    b.*[Whose mother pictures of] are on the table?

Although sentences like (16a), where a DP is pied-piped by a non-phrase-initial WH-element, sounds old-fashioned and literary, many native speakers report that they are not completely ungrammatical like (16b), where the WH-phrase is in the Spec of the pied-piped DP on the surface.[6] This contrast is

---

[4] This kind of covert movement was also proposed by Kayne (1993).

[5] A strong piece of evidence that PP pied-piping also involves movement of the WH-element to the Spec of PP comes from Tzotzil discussed in Aissen (1996). In Tzotzil, in order for a WH-complement of P to pied-pipe the whole PP, it must, first, move to the beginning of the PP, which Assien analyzes to be the Spec of P. The contrast in the following pair of sentences in Tzotzil shows this point.

(i) a. [**Buch'u** ta s-na]   ch-a-bat?
    Who   P A3-house ICP-B2-go
    'To whose house are you going?
    b. *[Ta s-na   **buch'u**]   ch-a-bat?
     P A3-house who   ICP-B2-go
    'To whose house are you going?

See Aissen (1996) for more detailed discussion on this.

[6] Certain instances of DP pied-piping by WH-complements are judged to be fully grammatical by some speakers. For example, sentences like (i) below are judged to be fully grammatical in Radford(1997).

(i) [Pictures of whose mother] did you think were on the mantelpiece? (Radford 1997:280)

In contrast to this, Radford judges sentences like (ii) below, where the object DP is pied-piped, to be ungrammatical.

readily explained in my analysis. (16b) is ungrammatical since the indirect WH-feature checking movement is covert in English. (16a), in contrast, is grammatical since in (16a), we can say that the WH-phrase has moved, covertly, to the Spec of DP and percolated its WH-feature to the DP. As a result of this covert movement and feature percolation, the whole DP with the percolated WH-feature has undergone overt pied-piping movement to the Spec of CP. Although it remains to be explained why sentences like (16a) are somewhat marginal grammatically, sounding old-fashioned and literary, the sharp contrast between (16a) and (16b) is explained if we assume that the indirect WH-feature checking movement is covert in English.

Third, the impossibility of pied-piping tensed CPs in English as in (17) below can be explained in the following way.

(17) a. *[What (that) John bought t] do you think ?
     b. [*That John bought what] do you think?

The ungrammaticality of (17a) is readily explained since the intermediate WH-movement is covert in English.[7] As for (17b), I propose that it can be ruled out in terms of the Doubly Filled Comp Filter. Given that feature percolation is possible only from the Spec, in order for the embedded CP to be pied-piped, the WH-phrase *what* must move, covertly, to the Spec of the embedded CP. The resulting structure, however, violates the DFC filter. It was already noted that languages which allow clausal pied-piping such as Imbabura Quechua and Basque do not show DFC effects (Ortiz de Urbina 1993). The only additional assumption we need to make to rule out the structure like (17b) in the present analysis is that the covert phrasal material in the Spec of CP also counts for the DFC filter. Note also that it is not possible to save (17b) by omitting either the Comp as in (18a) or the WH-phrase as in (18b).

(18) a. *[what   e   John bought ti] do you think?
     b. *[e   that   John bought t] do you think?

Structure (18a) will be ruled out by the ECP since a null complementizer must be identified by the verb selecting it (Stowell 1981) and structure (18b) will be ruled out by the Recoverability Condition.

Fourth, the impossibility of pied-piping VPs and certain APs can be explained if we assume that [+V]-categories, i.e., VPs (or *v*Ps) and APs, inherently, cannot carry WH-features.[8] [9]

(19) a. *[Marry whom] did he?
     b. *[Afraid of whom] are you?

For example, in (19a), in order for the VP to be pied-piped, first, the WH-phrase in the object position of VP must move to the Spec of VP (or *v*P) and percolate its WH-feature up to the VP. However, if

---

(ii) *[Pictures of whose mother] did you see on the mantelpiece?

Based on this contrast, he argues that pied-piping is a last resort measure made possible only when it is forced by the need to ensure convergence: pied-piping the DP in (i) is grammatical since moving the WH-word alone will violate the Subject island constraint. The same does not hold in (ii) since moving the WH-word out of the object DP is possible. However, there can be some questions about viewing (i) as fully grammatical on a par with (13)-(14) and (ii) to be completely ungrammatical. Although many native speakers do find some differences between (i) and (ii), the distinction is subtle and even those who consider sentences like (i) as acceptable report that they sound old-fashioned and literary.

[7] The fact that partial WH-movement is absolutely impossible in English might be taken as evidence for the covert nature of the indirect feature checking movement in English.

[8] A similar proposal was made by Bresnan (1976) and Tanaka (1999). The observation that WH-words corresponding to VPs do not exist or are very rare could provide a piece of evidence supporting the idea that VPs cannot carry WH-features.

[9] Alternatively, we might attribute the impossibility of pied-piping VPs and APs to the 'A'-nature of their Spec positions. Given that pied-piping is the result of the intermediate stages of WH-movement, an A'-movement, the prediction is that XPs with A-Specs cannot be pied-piped

VPs, by nature, cannot carry WH-features, the VP in (19a) will not be able to inherit the WH-feature and consequently will not be able to undergo pied-piping WH-movement. The same explanation can be extended to (19b), where an AP is pied-piped.

An obvious counterexample for this explanation, of course, is a sentence such as (20) below.

(20) [How smart] is he?

If what is pied-piped in (20) is an AP and if APs cannot carry WH-features, the grammaticality of (20), in contrast to (19b), is not explained. As an answer to this problem, I propose that what is pied-piped in (20) is not an AP but some functional projection above the AP. It has been noted that certain classes of modifiers such as *very, this,* and *so* can occupy the pre-adjectival, Specifier-like positions and that they act like Determiners of NPs. Given that Determiners are reanalyzed as the Spec with the null D Head (or as the Head itself) of a separate functional projection DP, it is not unreasonable to analyze APs with these D-like elements as some kind of functional projection above AP, which I will call Deg(ree)P. Given this, we can say that what is pied-piped in (20) is a DegP with *how* occupying its Spec, not an AP. Assuming that DegPs, unlike APs, can carry WH-features, the grammaticality of (20) in contrast to the ungrammaticality of (19b) is explained.

Coming back the ungrammaticality of (19b), it can be explained if we assume that DegP is an optional projection, which is present only when there is an overt Degree modifier such as *how* and *very.* This means that what is pied-piped in (19b) can only be an AP, not a DegP. Given the assumption that APs cannot carry WH-features, the ungrammaticality of (19b) thus is explained. The grammaticality of sentences like (21) below renders support to the analysis.

(21) [How afraid of the police] is John?

In contrast to (19b), the presence of *how* in (21) shows that what is pied-piped in (21) is a DegP, not an AP.

Another piece of evidence for the proposed explanation comes from the fact that unlike APs, VPs can never be pied-piped. It is because VPs can never project optional DegPs, as can be seen from the incompatibility of VPs with degree modifiers like *very, so,* or *how,* as we see in (22) below.

(22) a. *John very laughed.
    b. *John so laughed.

Given that [+V]-categories cannot carry WH-features and that unlike APs, VPs can never project optional DegPs, it is explained why VPs can never be pied-piped.

3.3 Covert Pied-Piping in WH-in-Situ Languages like Sinhala & Korean

WH-in-situ languages like Korean, Japanese and Sinhala could be taken as languages where both the direct and indirect WH-feature checking movement are covert. Although pied-piping is not visible on the surface due to the covert nature of movement involved in it, there is evidence for covert pied-piping in these languages, i.e., the absence of certain island effects in these languages. That these languages do not show Complex NP and Adjunct island effects is well-known and it has been proposed that it can be explained if what is moved is the the whole island containing the WH-phrase, not the WH-phrase inside the island (Choe 1987; Nichigauchi 1986, 1992; Kishimoto 1992; Yoon 1999, etc.).

That covert pied-piping is involved in cases where we observe the apparent island violations in these languages is most clearly seen in Sinhala.[10] In Sinhala, WH-expressions, which correspond to a single WH-word like *what, who* in English, are made up of two words, as we see in (23).

(23) Siri **mokak d** ∂ keruwe?
    Siri what Q did-E

---

[10] All the Sinhala examples in this paper come from Kishimoto (1992).

'What did Siri do?

What is crucial in our discussion on the existence of covert pied-piping is that in order for an element in syntactic islands like complex NPs and adjunct clauses to be questioned in Sinhala, the second part of the WH-word, i.e., $d\,\partial$, must appear at the edge of the island, not next to the first part of WH-word inside the island. The contrast in the following pairs of sentences shows this.

(24) a. oyaa [**kauru** liy ∂ pu pot ∂] **d** ∂ kieuwe?
      You who wrote book Q read-E
      '*Who did you read the book that (he) wrote?'

    b. *oyaa [**kau** **d** ∂ liy ∂ pu pot ∂] kieuwe?
      You who Q wrote book read-E
      '*Who did you read the book that (he) wrote?'

(25) a. [**kauru** en ∂ kot ∂] **d** ∂ Ranjit paadam k ∂ ramin hitie?
      Who came time Q Ranjit study doing was-E
      '*Who was Ranji studying when (he) came?'

    b. *[**kau d** ∂ en ∂ kot ∂] Ranjit paadam k ∂ ramin hitie?
      Who Q came time Ranjit study doing was-E
      '*Who was Ranji studying when (he) came?'

The preceding facts can be explained if we assume that d ∂ is the overt realization of WH-feature and that covert pied-piping is involved in the apparent island violation cases like (24a) and (25a).[11] What the preceding contrast shows is that when there is an apparent violation of island constraints, the WH-feature has percolated to the whole island and thus what has undergone covert WH-movement to the Spec of +WH-C is the whole island with the percolated WH-feature, not the simple WH-word inside the island. The overt d ∂ -marking at the edge of the island in (24a) and (25a) clearly shows this.

Of course, given that feature percolation is possible only from the Spec (and the Head), in order for this feature percolation and the subsequent pied-piping movement to be possible, the WH-phrase such as *kau d* ∂ must move 'covertly' to the Spec of the pied-piped phrase. Specifically, as for the Complex NP island violation cases such as (24a), I will assume, following Nichigauchi (1992) and Ortiz de Urbina (1993), that relative clauses take up the Spec(DP) position in languages like Sinhala, Japanese, Korean and Basque, which do not show Complex island effects. This means that in sentences like (24a), the WH-phrase moves to the Spec of the relative clause and from there the WH-feature percolates first to the relative clause and then to the NP dominating the relative clause.

In short, the preceding discussion shows that the apparent island violation cases such as (24a) and (25a) in Sinhala can be explained as not violating Subjacency if we assume that covert pied-piping is involved. In contrast, sentence (25b) and (25b) do violate Subjacency since no feature percolation takes place in this case, and thus what moves covertly to the Spec of +WH-C is the WH-phrase inside the island. Basically the same explanation can be extended to island violation cases in languages like Korean (See Yoon 1999.).

To summarize, the apparent absence of Complex NP and Adjunct island effects in languages like Sinhala and Korean show that there is covert pied-piping in these languages, more specifically, that both the direct and indirect WH-feature checking movement are covert in these languages.[12]

3.4. Pied-Piping in Languages Where Indirect WH-Feature Checking Movement Is Overt and Direct WH-Feature Checking Movement Is Covert

In principle, there can be languages where the indirect WH-feature checking movement is overt while the direct WH-feature checking movement is covert. The prediction for this type of pied-piping language is that WH-phrases can appear in non-scopal positions without any overt scope markers such

---

[11] See Yoon (1999) for more discussion on this.

[12] Specifically, if syntactic islands such as adjunct islands can be pied-piped in these languages, the predicion is that the WH-phrase will appear in the initial position of the island although the island itself stays in-situ.

as WH-expletives found in partial WH-movement languages like German or Hungarian (McDaniel 1989; Horvath 1997). Although I do not know whether there exist any languages which exclusively belong to this type, one potential candidate for this type of language is Slave, which was claimed to have partial WH-movement without an overt scope marker (Basilico 1998). Due to the limitation of this paper, I will not discuss this type of language in this paper and leave it for future study.

3.5. Summary: Four Types of Languages

Following is the summary of the four types of WH-pied-piping languages discussed in this paper.

(26)   Four Types of Languages

	Direct WH-Feature Checking movement	Indirect WH-Feature Checking Movement
Imbabura Quechua, Basque, etc.	Overt	Overt
Sinhala, Korean, Japanese, etc.	Covert	Covert
English, etc.	Overt	Covert
(Slave?)	Covert	Overt

4.   Conclusion

In this paper, I have claimed that pied-piping is the result of the intermediate stages of WH-movement to the Spec of XP and the subsequent WH-feature percolation to the XP. Concerning the cross-linguistic variation in pied-piping, I have proposed that the possibility of pied-piping an XP in a language is determined by the conspiracy of various universal and language-specific syntactic constraints and properties. Crucially, I have claimed that the overt/covert nature of the indirect feature checking movement could vary independently from that of the direct feature checking movement and that given this there can be four different types of pied-piping languages depending on the overt/covert nature of the direct and indirect WH-feature checking movement in a language. I have claimed that Basque and Imbabura Quechua are languages where both the direct and indirect WH-feature-checking movement are overt while languages like Sinhala and Korean are those where both are covert. As for the languages where the indirect WH-feature checking movement is covert while the direct WH-feature checking movement is overt, I have claimed that English is such a language and shown how various facts of pied-piping in English can be explained in a principled manner if this is the case. Finally, as for the languages where the indirect WH-feature checking movement is overt while the direct WH-feature checking movement is covert, I have suggested that a potential candidate for this type of language is Slave, where partial WH-movement is possible without an overt scope marker.

Acknowledgements

References

Aissen, J. 1996. Pied-Piping, Abstract Agreement, and Functional Projections in Tzotzil, In *Natural Language & Linguistic Theory* 14: 447-491.

Basilico, D. 1998. Wh-movement in Iraqi Arabic and Slave. In *The Linguistic Review* 15:301-339.

Bresnan, J. 1976. On the Form and Function of Transformations. In *Linguistic Inquiry* 7: 3-40.

Choe, J.-W. 1987. LF Movement and Pied-Piping. In *Linguistic Inquiry* 18.

Chomsky, N. 1995. *The Minimalist Program*. MIT Press.

Chomsky, N. 1998. Minimalist Inquiries: the Framework. Ms., MIT.

Cole, P. 1982. *Imbabura Quechua*. Lingua Descriptive Grammar.

Collins, C. 1997. Local Economy. MIT Press.

Horvath, J. 1997. The Status of 'Wh-Expletives' and the Partial Wh-movement Construction of Hungarian. In *Natural Language & Linguistic Theory* 15: 509-572.

Kayne, R. 1994. *The Antisymmetry of Syntax*. MIT Press.

Kishimoto, J. 1992. LF Pied-piping: Evidence from Sinhala. In *Gengo Kenkyu* 102: 46-87.

Longobardi, G. 1992. In Defense of the Correspondence Hypothesis: Island Effects and Parasitic Constructions in Logical Form. In *Studies in Linguistics & Philosophy: Logical Structure & Linguistic Structure*, ed. J. Huang & R. May. Kluwer Academic Publishers.

McDaniel, D. 1989. Partial and Multiple WH-Movement. In *Natural Language and Linguistic Theory* 7: 565-604.

Moritz, L. & D. Valois. 1994 . Pied-Piping and Specifier-Head Agreement. In *Linguistic Inquiry* 25:667-707.

Nishigauchi, T. 1986. *Quantification in the Theory of Grammar*. Ph.D dissertation, University of Massachusetts.

Nishigauchi, T. 1992. Construing *Wh*. In *Studies in Linguistics & Philosophy: Logical Structure & Linguistic Structure*, ed. J. Huang & R. May. Kluwer Academic Publishers.

Oritz de Urbina, J. 1993. Feature Percolation and Clausal Pied-Piping. In *Generative Studies in Basque Linguistics* 105.

Radford, A. 1997. *Syntactic Theory and the Structure of English*. Cambridge University Press.

Stowell, T. 1981. *Origins of Phrase Structure*. Ph.D dissertation, MIT.

Tanaka, H. 1999. LF WH-Islands and the Minimal Scope Principle. In *Natural Language & Linguistic Theory* 17-2:371-402.

Webelhuth, G. 1989. *Syntactic Saturation Phenomena in the Modern Germanic Languages*. Ph.D dissertation, Univ. of Massachusetts.

Yoon, J-M. 1999. Decomposing WH-Questions: WH-marking and WH-scoping Movement. In *Studies in Generative Grammar* 9-1, Seoul, Korea.