

Against the Existence of Pied-Piping: Evidence from Tlingit

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I argue that pied-piping, as traditionally understood, might not exist. I reanalyze classic examples from English and other well-studied languages in light of new data from Tlingit, an understudied and endangered language of Alaska. I argue that the initial appearance of pied-piping in Tlingit is misleading and actually reflects structures where no true pied-piping occurs. I then show that a similar analysis is possible for putative cases of pied-piping in other, well-known languages. Consequently, both the phenomenon of pied-piping and the grammatical mechanisms introduced to derive it might be eliminable from the theory of grammar.

Keywords: pied-piping, constraints on pied-piping, Tlingit, Q-particle

1 Introduction: Pied-Piping as an “Epicycle” in the Theory of Movement

The central claim of this article is that, in a certain sense, pied-piping may not exist. That is, although we might retain the terms *pied-piping* and *pied-piping structure* as purely descriptive labels, the class of structures they circumscribe have perhaps been misanalyzed and differ in no important ways from simple non-pied-piping structures.

This ‘eliminativist’ perspective on pied-piping follows from a particular syntactic analysis of *wh*-questions. Under this analysis, fronting of a *wh*-operator is, contrary to common perception, not triggered by any features of the *wh*-word itself. Rather, such fronting targets a distinct formal

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element—one I dub a *Q-particle*—whose projection (QP) contains the projection of the *wh*-word. Under this account, then, so-called pied-piping structures are simply instances of normal phrasal movement of the QP.

This analysis is independently motivated by the special syntax of *wh*-questions in Tlingit, a Na-Dene language spoken in Southeast Alaska. The *wh*-questions of Tlingit do not at first appear very different from those of more familiar *wh*-fronting languages. Nevertheless, when examined carefully, Tlingit *wh*-questions challenge certain common notions regarding *wh*-fronting and pied-piping. To get a sense of why this is so—and to further clarify the central theoretical claim—I will first review some background regarding the theory of *wh*-fronting and pied-piping.

Since at least the 1960s, a fundamental question in the theory of *wh*-questions has been “Why do *wh*-words have to front in the *wh*-questions of some languages?” Although there are many specific answers to this question, they all share the following form:

(1) *Structure common to theories of wh-fronting*

Hypothesis 1

Wh-words have a special property, X.

Hypothesis 2

The position that *wh*-words move to has a special property, Y.

Hypothesis 3

General principles entail that X must be located at positions bearing property Y.

That is, across many different frameworks, linguists generally agree that *wh*-words front in some languages because the *wh*-word has a special property that requires it to be located at the position that it fronts to.

Interestingly, although virtually every theory of *wh*-fronting possesses the classic structure under (1), such proposals are immediately faced with a rather fundamental challenge: how to analyze sentences where *more* than the *wh*-word undergoes fronting.

- (2) a. [Whose book] did you read?
 b. [To whom] did you speak?
 c. [How long a book] did he write?

Although it's not often explicitly said, sentences like these directly challenge the analytic structure in (1). After all, if it's a property of the *wh*-word that motivates the fronting, how did this property come to appear on the larger, fronted phrase, a phrase that doesn't otherwise inherit the properties of the *wh*-word? For example, contrasts like those in (3) show that a possessive DP doesn't inherit the number properties of a *wh*-possessor. How, then, does the DP inherit the “*wh*-property” that supposedly triggers the fronting in (2a)?

- (3) a. Who is / *are coming to your party?
 b. [Whose sisters] are / *is coming to your party?

There is, of course, a commonly accepted answer, one that allows the hypothesis in (1) to preserve the phenomenon in (2): the structures in (2) all exhibit something called “pied-piping.”

Although details of implementation vary across frameworks, generally speaking, the term *pied-piping* describes cases where an operation targeting the features of a particular lexical item applies to a phrase properly containing the maximal projection of that item. This definition is highlighted in (4).¹

- (4) *Pied-piping* occurs when an operation that targets the features of a lexical item L applies to a phrase properly containing L^{Max} .

We might, then, contrast the analytic term *pied-piping* with the more descriptive and theory-neutral label *pied-piping structure*, defined in (5).

- (5) A *pied-piping structure* is one where a phrase properly containing the maximal projection of a *wh*-word (or related operator) has undergone fronting typically associated with that operator.

Thus, to claim that pied-piping exists is to claim that it is possible for an operation targeting the features of L to apply to a phrase properly containing the projections of L.

Of course, what makes such cases possible—what mechanisms serve to derive pied-piping—is a separate, subsequent question, one that has received much attention (Ross 1967, Sells 1985, Webelhuth 1992, Kayne 1994, Ginzburg and Sag 2000, Grimshaw 2000, Watanabe 2006, Horvath 2007a, Heck 2008, 2009). Curiously, however, the more fundamental question of whether pied-piping actually exists has not yet received serious attention. This is largely due to the ubiquity of the explanatory structure in (1). After all, if the only analytic option is that the fronting in *wh*-questions targets a property of *wh*-words, then the sentences in (2) clearly show that pied-piping exists. Indeed, in some introductory discussions of pied-piping, pied-piping is presented as an observable phenomenon, a datum that must be explained, rather than as a technical solution to an empirical challenge faced by a particular kind of analysis.

The present article seeks to challenge this classic, consensus view. I will show that it is possible for a theory to abandon the hypotheses in (1) and that the resulting theory is able to capture certain noted properties of pied-piping structures.² I begin my argument in the next section, by introducing the special syntactic theory of *wh*-fronting promoted here. After introducing the technology, I turn to the *wh*-questions of Tlingit, arguing that they transparently motivate the defining assumptions of the system.

¹ Note that, following the definition in (4), I do not include under the rubric of ‘pied-piping’ all instances of phrasal movement. That is, I accept as uncontroversial the existence of a mechanism of feature projection, which places the features of a head onto the projections of that head. What is at issue is any mechanism that places the features of a head onto nodes *outside* the projections of that head. This is a significant distinction, because feature projection is arguably indispensable, while the latter sort of device is of little utility outside of deriving pied-piping structures.

² Heck (2008, 2009) highlights a number of ‘pied-piping universals’ that any theory of pied-piping should account for. One of these universals, the Edge Generalization, will be discussed in section 6. For reasons of space, I will not be able here to discuss the other universals Heck proposes, though I do discuss them extensively in Cable 2007, 2010.

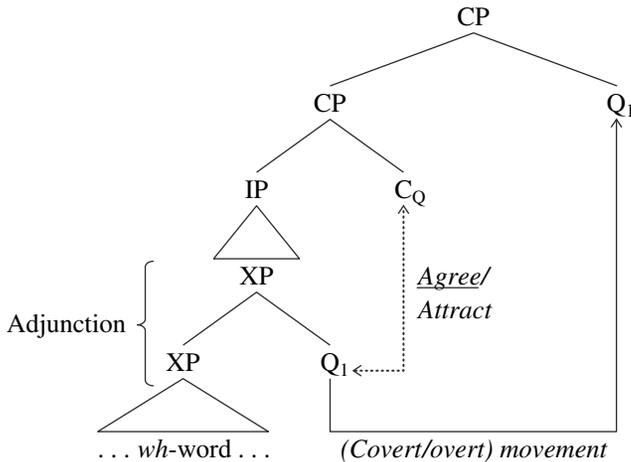
As a final introductory comment, I should note a potentially problematic feature of the discussion throughout this article. Although pied-piping structures can be found in a variety of \bar{A} -constructions, here I will restrict attention to pied-piping in *wh*-questions. For discussion regarding how this account may be extended to pied-piping across \bar{A} -constructions, see Cable 2007, 2010:chap. 6.

2 The Q-Based Analysis of *Wh*-Fronting

In this section, I introduce the theory of *wh*-fronting that will provide the foundation for my theory of pied-piping structures. It will help to begin with some recent proposals concerning *wh*-in-situ languages.

Some authors have argued that an operation of ‘‘Q-movement’’ is central to the formation of *wh*-questions in several *wh*-in-situ languages (Hagstrom 1998, Kishimoto 2005). Under this analysis, the formation of *wh*-questions in these languages proceeds as in (6).

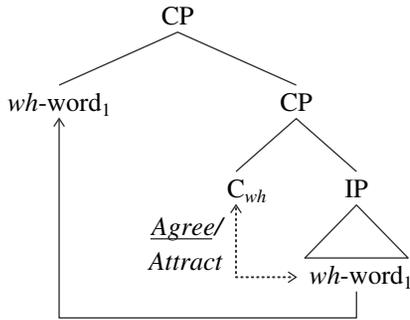
(6) *Q*-movement in *wh*-in-situ languages



The structure in (6) represents the following claims. A *wh*-word is obligatorily c-commanded by a Q(uestion)-particle, which adjoins to a phrase containing the *wh*-word. Most importantly, it is the Q-particle, *and not the wh-word itself*, that is probed by and enters into an Agree relation (Agrees) with the interrogative C of the *wh*-question. The interrogative C head bears an uninterpretable instance of the interpretable Q-feature borne by the Q-particle. The interrogative C therefore probes for an interpretable instance of Q. Upon probing the Q-particle, the interrogative C Agrees with it, and this Agree relation then triggers movement of the Q-particle into the CP. In some languages (e.g., Sinhala), this movement of Q is usually covert; in others (e.g., Japanese), this movement is always overt.

The analysis in (6) seems to entail that *wh*-questions in these in-situ languages are structurally quite different from those in *wh*-fronting languages. After all, under the classic analysis in (1), *wh*-questions in *wh*-fronting languages are structured as in (7).

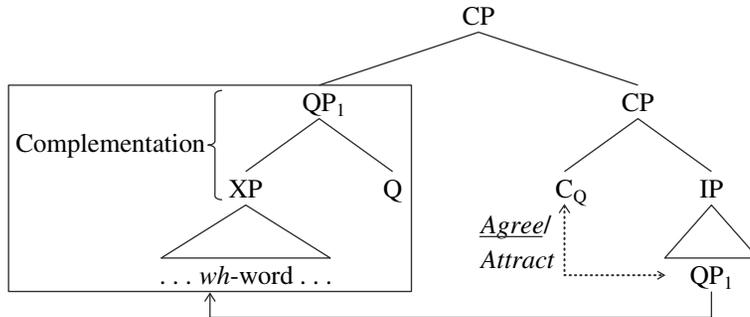
(7) Wh-movement in wh-fronting languages



That is, under one view, the interrogative C head probes and Agrees with a *wh*-feature of the *wh*-word itself. Since the *wh*-word is the goal, the *wh*-word is then subsequently moved into the projection of the interrogative C. Thus, it would appear that the *wh*-in-situ languages analyzable by (6) differ from *wh*-fronting languages in two respects: (a) the presence of a Q-particle, and (b) the nature of the feature probed by C.

However, I will argue that—contrary to the picture presented in (7)—the *wh*-fronting languages differ from those in (6) in only *one* respect: the relationship between the Q-particle and its sister. That is, I propose that in *wh*-fronting languages, the left-peripheral position of the *wh*-word has the structural basis shown in (8).

(8) Wh-fronting as a secondary effect of Q-movement



The structure in (8) represents the following claims. As in the *wh*-in-situ languages, the *wh*-word is obligatorily *c*-commanded by a Q-particle. However, in a *wh*-fronting language, this Q-particle does not *adjoin* to a phrase containing the *wh*-word; rather, it takes that phrase as its *complement*.³

³ It should be noted that the Q-particle in (8) is not part of the functional projection of the *wh*-word, as its sister could contain a lexical head selecting for the *wh*-word. Thus, (8) is not simply the claim that the *wh*-feature of a *wh*-word heads its own projection. Similarly, the proposal in (8) must be distinguished from the competing proposals in Watanabe 1992, which—though similar in outline—differ substantially in their treatment of *wh*-fronting languages. See Cable 2007, 2010 for more details, including the ways in which (8) avoids certain incorrect predictions of Watanabe 1992.

Consequently, the Q-particle projects the category of the phrase minimally dominating Q and Q's sister. Thus, when the C head probes for an interpretable instance of Q, the first node it encounters bearing this feature is the QP projected by the Q-particle. As a result, the C Agrees with the QP and attracts *the entire QP* into the CP projection. Finally, because the *wh*-word is contained within the QP, the *wh*-word is fronted into the left periphery along with everything else inside the QP.⁴

I propose, then, that even in *wh*-fronting languages there is no direct syntactic relationship between interrogative C and the *wh*-word. The fronted position of the *wh*-word is a mere epiphenomenon, a by-product of the real syntactic relationship between interrogative C and the c-commanding Q-particle. We will see that this analysis potentially holds valuable consequences for our understanding of pied-piping structures. First, however, I will present evidence that (8) does represent a grammatical possibility licensed by Universal Grammar. I will argue that the *wh*-questions of Tlingit *require* the analysis in (8) and cannot be accommodated within the traditional framework of (1)/(7).

3 Tlingit *Wh*-Questions Require the Q-Based Analysis

Sentence (9a) illustrates the general structure of Tlingit's *wh*-questions.⁵

- (9) a. Waa sá sh tudinookw i éesh?
 how Q feels your father
 ‘How is your father feeling?’
 (Dauenhauer and Dauenhauer 2000:138)
- b. *General form of a Tlingit wh-question*
 [_{CP} . . . [[. . . *wh*-word . . .] Q] . . . main-predicate . . .]

Schema (9b) encapsulates two central properties of Tlingit *wh*-operators: (a) they must precede the main predicate; and (b) they are followed by the question particle *sá*, which is adjacent to either the *wh*-word or a phrase containing it.

To motivate the analysis in (8) for Tlingit *wh*-questions, we must at the very least establish that (a) Tlingit is a *wh*-fronting language, and (b) the particle *sá* is a Q-particle in the sense of Hagstrom 1998 and Kishimoto 2005.

3.1 Tlingit Is a *Wh*-Fronting Language

Let us first consider whether Tlingit is a *wh*-fronting language. Because the language has highly flexible word order (Leer 1991:chap. 2), this matter cannot be easily determined by casual inspection of its *wh*-questions. Nevertheless, certain facts indicate that *wh*-words are left-peripheral in

⁴ Note that nothing in the account requires that the movement of the QP be overt. Consequently, this analysis would hold that there exist *wh*-in-situ languages possessing the structure in (8), but where the movement of the QP is covert. In Cable 2007, 2010, I argue that Sinhala represents such a case (though Hagstrom (1998) and Kishimoto (2005) argue that the structure of Sinhala *wh*-questions is as in (6)).

⁵ I will provide only the roughest of glosses for individual Tlingit words, which can be morphologically quite complex. This simplification is the most radical with verbs, as I indicate only their ‘lexical’ content and none of their rich inflectional information.

wh-questions. For reasons of space, these facts are only outlined here and are illustrated with only a modicum of data. For a more thorough discussion of *wh*-fronting in Tlingit, see Cable 2007, 2008, 2010.

First, note that unlike other sentential material, the *wh*-word of a *wh*-question must precede the matrix predicate, and cannot follow it.

- (10) a. *Aadóoch* *sá* *kwgwatóow* *yá* *x'úx'*?
 who.ERG Q will.read this book
 'Who will read this book?'
 b. **Yá* *x'úx'* *akwkwatóow* *aadóoch* *sá*?
 this book will.read who.ERG Q
- (11) a. [*Daa* *sá*]₁ *haa* *kóo* *at* *latóowu* *haa* *yawsikaa* [*t*₁ *wutootoowú*?]
 what Q our teacher said.to.us we.read
 'What did our teacher tell us to read?'
 b. **Haa* *kóo* *at* *latóowu* *haa* *yawsikaa* [*daa* *sá* *wutootoowú*?]
 our teacher said.to.us what Q we.read

Importantly, the facts in (10)–(11) do not directly follow from the pragmatics of word order in Tlingit; *wh*-words can be postverbal when they function as indefinites.

- (12) *Yá* *x'úx'* *akwkwatóow* *aadóoch* *sá*.
 this book will.read who.ERG Q
 'People will read this book.'

In addition, as noted in Cable 2007, 2008, 2010, while it is acceptable for material to precede the *wh*-word in a *wh*-question (13), such material must be referential (14) and is often translated as left-dislocation (15).

- (13) *Wé* *i* *sée* *daakw* *aa* *sáwé*?
 that your daughter which of.them Q.FOC
 'Which one is your daughter?'
 (Dauenhauer and Dauenhauer 1990:298)
- (14) a. *Aa* *sáyá* *I* *daa* *sá* *uxá*?
 who Q.FOC nothing he.eats.it
 'Who ate nothing?'
 b. **L* *daa* *sá* *aa* *sáyá* *uxá*?
 nothing who Q.FOC he.eats.it
- (15) *Ax* *éesh* *daa* *sá* *aawaxaa*?
 my father what Q he.ate.it
 Translated as 'My father, though, what did he eat?'

It seems, then, that material preceding a *wh*-word in a *wh*-question must occupy a left-peripheral topic position (or even perhaps be dislocated), a fact that would itself indicate that the *wh*-word necessarily occupies a left-peripheral position in such sentences.

Finally, as also observed in Cable 2007, 2008, 2010, multiple *wh*-questions in Tlingit exhibit Superiority, a feature characteristic of movement structures.

- (16) a. Aa sá waa sá kuyawsikaa?
 who Q how Q they.said.to.someone
 ‘Who said what?’
 b. *Waa sá aa sá kuyawsikaa?
 how Q who Q they.said.to.someone

3.2 Tlingit Sá Is a Q-Particle

Recall that we take the structure in (8) to be a parametric variant of the structure in (6), proposed by Hagstrom (1998) and Kishimoto (2005) for Sinhala and Japanese. Thus, in order to defend the analysis in (8) for Tlingit, we should confirm that its particle *sá* is the same formal element as those that Hagstrom and Kishimoto identify as ‘‘Q’’ in their analyses. That is, we must show that Tlingit *sá* is the same formal entity as the Sinhala Q-particle *da* and the Japanese Q-particle *ka*. Various grammatical similarities among the three particles are documented in Cable 2007, 2008, 2010. The most important of these will be summarized here.

One of the most fundamental features of Tlingit *sá* is that a *wh*-question must contain it. If it is removed from any of the sentences above, the result is ill formed. For example:

- (17) Daa *(sá) aawaḡaa i éesh?
 what Q he.ate.it your father
 ‘What did your father eat?’

This is similar to the requirement in Sinhala that its *wh*-questions contain the particle *da* (18a) and the requirement in Japanese that *wh*-questions contain *ka* (18b).⁶

- (18) a. *Sinhala*
 Chitra monawa *(da) gatte?
 Chitra what Q bought
 ‘What did Chitra buy?’
 (Kishimoto 2005:3)
 b. *Japanese*
 John-ga nani-o kaimasita *(ka)?
 John-NOM what-ACC bought.polite Q
 ‘What did John buy?’
 (Hagstrom 1998:15)

Besides appearing in *wh*-questions, Tlingit *sá* appears attached to *wh*-words functioning as indefinites (12). This can also be observed for Japanese *ka* and Sinhala *da*.

⁶ In spoken Japanese, it is possible to drop *ka* in matrix *wh*-questions (Lasnik and Saito 1992, Yoshida and Yoshida 1996). However, there are certain stringent conditions governing this, and some accounts appeal to an unpronounced *ka* (Ko 2005). It is also worth noting in this context that *ka* is uniformly obligatory in subordinate questions.

- (19) a. *Sinhala*
 Mokak *(da) waetuna.
 what Q fall
 ‘Something fell.’
 (Hagstrom 1998:23)
- b. *Japanese*
 John-ga nani-*(ka)-o katta.
 John-NOM what-Q-ACC bought
 ‘John bought something.’
 (Hagstrom 1998:17)

Both Hagstrom and Kishimoto conclude from facts such as these that the Q-particles *da* and *ka* are not properly analyzed as interrogative C heads. On the basis of (12), a similar conclusion can be drawn for Tlingit *sá*. Rather, in all three languages, the particle in question is an obligatory “satellite” of the *wh*-word.

Moreover, we can see that these particles are also not submorphemes of the *wh*-words themselves, as they can be separated from the *wh*-word by phrasal material.

- (20) a. *Sinhala*
 Chitra [kaa-ge amma] da daekke?
 Chitra who-GEN mother Q saw
 ‘Whose mother did Chitra see?’
 (Kishimoto 2005:13)
- b. *Japanese*
 Taro-ga [dono hito]-ka-o hoomon sita-rasii.
 Taro-NOM which man-Q-ACC visit did-seem
 ‘Taro seems to have visited some man.’
- c. *Tlingit*
 [Aadóo yaagú] sá ysiteen?
 who boat Q you.saw.it
 ‘Whose boat did you see?’

Nevertheless, the placement of Tlingit *sá*, Sinhala *da*, and Japanese *ka* is subject to a condition that the particle *c*-command the *wh*-word (Yatsushiro 2001, Kishimoto 2005).⁷

- (21) a. [Aadóo jeet] sá wé sakwnéin aawatee?
 who hand.to Q that bread he.brought.it
 ‘Who did he give the bread to?’

⁷ In summary, (a) every Q must *c*-command a *wh*-word, and (b) every *wh*-word must be commanded by a Q. In Cable 2007, 2008, 2010, I argue that this codependency between Q and *wh* follows from their semantics. In brief, a *wh*-word not *c*-commanded by Q will lead to an uninterpretable structure, while a Q not *c*-commanding a *wh*-word will lead to a violation of Full Interpretation (Chomsky 1995). For more details, see the works cited above.

- b. *[Aadóo jeet] wé sakwnéin sá aawatee?
 who hand.to that bread Q he.brought.it

One final parallel between Tlingit *sá* and Sinhala *da* concerns their behavior with respect to adjunct islands. As described by Hagstrom (1998) and Kishimoto (2005), the *wh*-operator of a Sinhala *wh*-question may be contained inside an adjunct island if and only if *da* is merged outside the island. In the case of relative clause islands, *da* must be merged to the right of the head of the relative clause. The following data illustrate:⁸

- (22) a. Oyaa [[Chitra *kaa*-ta dunna_{CP}] pota_{NP}] *da* kieuwe?
 you Chitra who-DAT give book Q read
 ‘Who did you read the book that Chitra gave?’
 b. *Oyaa [[Chitra *kaa*-ta *da* dunna_{CP}] pota_{NP}] kieuwe?
 you Chitra who-DAT Q give book read
 (Kishimoto 2005:29)

The same condition can be observed in Tlingit. The *wh*-operator of a Tlingit *wh*-question may be contained inside a relative clause island if and only if *sá* is merged outside the island. When this occurs, the entire island seems to be ‘‘pied-piped’’ into the left periphery of the interrogative clause.

- (23) a. [[*Wáa* kwligeyi_{CP}] *xáat*_{NP}] *sá* i tuwáa sigóo?
 how it.is.big.REL fish Q your spirit.at it.is.happy
 ‘How big a fish do you want?’ (Lit. ‘A fish that is how big do you want?’)
 b. *[[*Waa* *sá* kwligeyi_{CP}] *xáat*_{NP}] i tuwáa sigóo?
 how Q it.is.big.REL fish your spirit.at it.is.happy

In addition to these three shared properties, two other features that seem to unite Tlingit *sá* with Sinhala *da* are discussed in Cable 2007, 2008, 2010. It is also important to note that the syntactic and semantic theory of Q-particles put forth by Hagstrom (1998) and extended in Cable 2007, 2010 captures this observed constellation of properties, though only under the assumption that Tlingit *sá*, Sinhala *da*, and Japanese *ka* are all the same formal entity: a Q-particle. Thus, one may reasonably hold that Tlingit *sá* is a Q-particle in the sense of Hagstrom 1998 and Kishimoto 2005.

3.3 Tlingit Wh-Fronting Is a By-Product of Q-Movement

Thus far, I have given evidence that (a) *wh*-words in Tlingit *wh*-questions must occupy left-peripheral positions, and (b) they are obligatorily c-commanded by Q-particles. Finally, I will

⁸ Because the Japanese particle *ka* obligatorily appears at the end of the interrogative clause, it is difficult to see whether the same is also true of this particle. However, Hagstrom (1998:40) argues that the emphasis marker *ittai* in Japanese provides indirect evidence that it is.

review the evidence that the fronted position of Tlingit *wh*-words results from a movement operation targeting the features of the Q-particle alone. To establish this, I must defend the twin claims that (a) the movement operation in question targets features of the Q-particle, but that (b) it does not target any features of the *wh*-word.⁹

First, let us consider the claim that (a) the movement seen in Tlingit *wh*-questions targets (at least) the features of Q. Tlingit *wh*-questions are ill formed if only the *wh*-word is fronted. For example, (24a) becomes ill formed if *sá* is left below, as in (24b).

- (24) a. [[*Goodéi* *sá*]₁ [has oowajée [t₁ wugoot_x] i shagóonich]]?
 where.to Q they.think he.went your parents.ERG
 ‘Where do your parents think he went?’
 b. *[[*Goodéi*]₁ [has oowajée [t₁ *sá* wugoot_x] i shagóonich]]?
 where.to they.think Q he.went your parents.ERG

Now, one might wonder whether the ill-formedness of (24b) is not due simply to a requirement that *sá* not be stranded. Such a condition, however, would be too weak and would not alone rule out the ill-formed (25a). In (25a), the Q-particle *sá* is not stranded since its complement is the unmoved subordinate CP, a possibility that is independently witnessed in (CP-pied-piping) sentences like (25b).

- (25) a. *[[*Goodéi*]₁ [has oowajée [t₁ wugoot_x *sá*] i shagóonich]]?
 where.to they.think he.went Q your parents.ERG
 b. [[*Goodéi* wugoot_x *sá*]₁ [has oowajée t₁ i shagóonich]]?
 where.to he.went Q they.think your parents.ERG
 ‘Where do your parents think he went?’

We may conclude, then, that the obligatory left-peripheral position of the Q-particle in a Tlingit *wh*-question is due to a special condition, placed specifically on the Q-particle itself. That is, Tlingit *wh*-questions involve (at least) an operation of Q-movement.

But do they also involve a movement operation targeting the *wh*-word? In Cable 2007, 2008, 2010, I present several arguments that they do not. For our purposes here, however, the most crucial of these concern ‘island pied-piping’ sentences like (23a). Consider again the contrast between sentences (23a) and (23b), repeated in (26).

- (26) a. [[*Wáa* kwligeyi _{CP} *xáat* _{NP}] *sá* i tuwáa sigóo?
 how it.is.big.REL fish Q you.want
 ‘How big a fish do you want?’ (Lit. ‘A fish that is how big do you want?’)
 b. *[[*Waa* *sá* kwligeyi _{CP} *xáat* _{NP}] i tuwáa sigóo?
 how Q it.is.big.REL fish you.want

⁹ As noted by a reviewer, there is another feature of the analysis in (8) that could receive further empirical support: the claim that Q in Tlingit takes its sister as complement, rather than adjoining to it as in (6). Further evidence for this claim is provided in Cable 2007, 2010. In brief, there exists in Tlingit a constraint against placing Q between a functional head F and the complement of F. In Cable 2007, 2010, I argue that this pattern is most easily understood if it is assumed that Q takes its sister as complement; it is not as easily explained if Q is a mere adjunct to its sister.

The Q-based analysis in (8) predicts the contrast between (26a) and (26b), under the assumption that probing relations cannot cross into adjunct islands.¹⁰ The impossibility of (26b) is a straightforward result of the fact that the Q-particle is inside a relative clause island and so is inaccessible to probing by the matrix C. When the Q-particle is located outside the island, as in (26a), it is accessible to the matrix C, and the sentence is well formed. The fact that the *wh*-word in (26a) remains inside the island has no bearing on the well-formedness of the sentence, given that the matrix C does not probe for any of its features.

Now consider whether the facts in (26) could be made compatible with an analysis whereby the interrogative C does probe for features of the *wh*-word. Given the well-formedness of (26a), one must conclude that somehow the relative clause island does not upset probing of the *wh*-word by C. But then what accounts for the ill-formedness of (26b)? Since the Q-particle *sá* is directly adjacent to the *wh*-word, it should be as visible for probing by C as the *wh*-word. Therefore, the impossibility of (26b) must follow from something other than the fact that the Q-particle in this sentence is located inside a relative clause island. What this could be, however, remains unclear.

Therefore, from the contrast in (26), we must conclude that the interrogative C of the *wh*-question does not probe for any features of the *wh*-word itself.¹¹ Consequently, the movement in a Tlingit *wh*-question is not triggered by features of the *wh*-word, only by features of the Q-particle, a conclusion that is tantamount to accepting the analysis in (8).¹²

¹⁰ I reserve judgment as to why probing into an adjunct island is impossible. One idea I will mention again later is that the adjuncts in question constitute phases, and so probing into them is blocked by the Phase Impenetrability Condition.

¹¹ Indeed, it is the parallel contrasts in (22) that lead Hagstrom (1998) and Kishimoto (2005) to propose the analysis in (6) for Sinhala *wh*-questions, the core feature of which is the absence of a probe/Agree relation between C and the *wh*-word itself.

¹² A reviewer notes that one prediction of (8) for Tlingit is that there should be no limits on the “distance” between the Q and its associated *wh*-word. Thus, it should be possible for a *doubly* embedded *wh*-word to pied-pipe both the subordinate clauses within which it is contained. The possibility of pied-piping multiple subordinate clauses has not yet been tested, but it is indeed a prediction of the proposed account.

The same reviewer notes that the data in (24)–(26) seem explicable under an account similar to (7), but where the Tlingit particle *sá* realizes a *percolated wh*-feature. Space precludes discussion of this important issue, which I treat in greater depth in Cable 2007, 2010:chap. 4. However, two points can be made briefly. The first is that the possibility of (26a) entails that any such account must permit feature percolation across relative clause islands, something generally held to be impossible (Heck 2008).

The second, more important point is that such an analysis would fail to explain the pattern described in footnote 9, which is illustrated in (i).

- (i) a. Tléil *aadóo* teen *sá* *xwagoot*.
 not who with Q I.went
 ‘I didn’t go with anyone.’
 b. *Tléil *aadóo* *sá* teen *xwagoot*.
 not who Q with I.went

In Cable 2007, 2008, 2010, I argue that Tlingit *wh*-indefinites do not undergo covert or overt movement. Thus, the ungrammaticality of (ib) cannot be explained merely by an inability to extract *aadóo* *sá* ‘someone’ from the complement of P. Rather, the best account of such facts is that there is simply a constraint, dubbed the QP Intervention Condition (QPIC), which prevents QP from intervening between a functional head F and a phrase F selects for.

While space precludes a full discussion of the QPIC, it should be clear that facts like (ia–b) are not easily captured by an account where *sá* is merely a manifestation of a “percolated” *wh*-feature. Such an account must explain why the percolation in (ia) is obligatory, a task complicated by the evidence that Tlingit *wh*-indefinites do not covertly move.

4 Eliminating Pied-Piping: The Q-Based Theory of Pied-Piping Structures

In the preceding sections, I introduced the proposed Q-based theory of *wh*-fronting and presented arguments that Tlingit *wh*-questions establish its typological possibility. In this section, I begin to lay out the theory of pied-piping structures that follows from this account, starting with the pied-piping structures of Tlingit.

4.1 The Pied-Piping Structures of Tlingit: Not Really Pied-Piping

First, let us observe that Tlingit very clearly possesses pied-piping structures, as defined in (5). We have already seen several examples of Tlingit pied-piping structures; a number are collected below for consideration.

- (27) a. [_{PP} *Aadóo teen*] *sá* yeegoot?
 who with Q you.went
 ‘Who did you go with?’
 b. [_{DP} *Aadóo yaagú*] *sá* ysiteen?
 who boat Q you.saw
 ‘Whose boat did you see?’
 c. [_{DP} *X’oon keitl*] *sá* ysiteen?
 how.many dog Q you.saw
 ‘How many dogs did you see?’
 d. [_{DP}[_{CP} *Wáa kwligeyi*] *xáat*] *sá* i tuwáa sigóo?
 how it.is.big.REL fish Q you.want
 ‘How big a fish do you want?’ (Lit. ‘A fish that is how big do you want?’)

As in the English sentences (2a–c), sentences like (27a–d) exhibit the following crucial property: the phrase fronted in the *wh*-question properly contains the maximal projection of the *wh*-word. Thus, these structures qualify as pied-piping structures as defined under (5), and their similarity to the English structures in (2) is rather apparent.

However, let us also recall here that in a Tlingit *wh*-question, the particle *sá* always occurs to the right of the fronted phrase, as shown in (28).

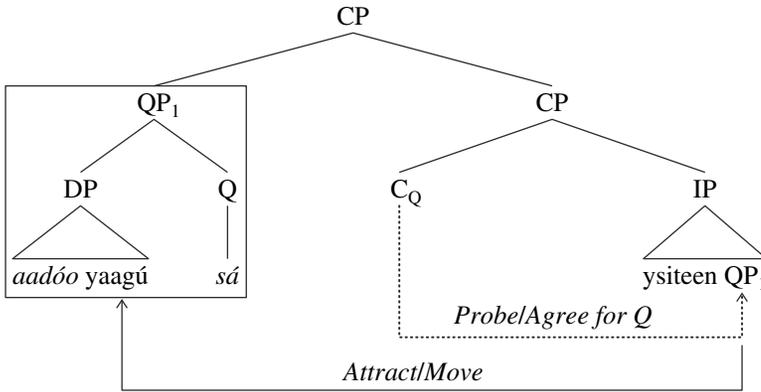
- (28) a. *_{[PP} *Aadóo* *sá* teen] yeegoot?
 who Q with you.went
 b. *_{[DP} *Aadóo* *sá* yaagú] ysiteen?
 who Q boat you.saw
 c. *_{[DP} *X’oon* *sá* keitl] ysiteen?
 how.many Q dog you.saw
 d. *_{[DP}[_{CP} *Waa* *sá* kwligeyi] *xáat*] i tuwáa sigóo?
 how Q it.is.big.REL fish you.want

Thus, the fronted phrase of a Tlingit *wh*-question never properly contains the QP.

Now, according to the analysis in (8), it is the features of the Q—and not the *wh*-word—that trigger movement in Tlingit *wh*-questions. Under the proposed analysis, then, the pied-piping

structures in (27) are all straightforward cases of simple phrasal movement. As illustrated in (29) for (27b), in each structure, movement simply targets the maximal projection of the head whose features motivate the movement (namely, Q).

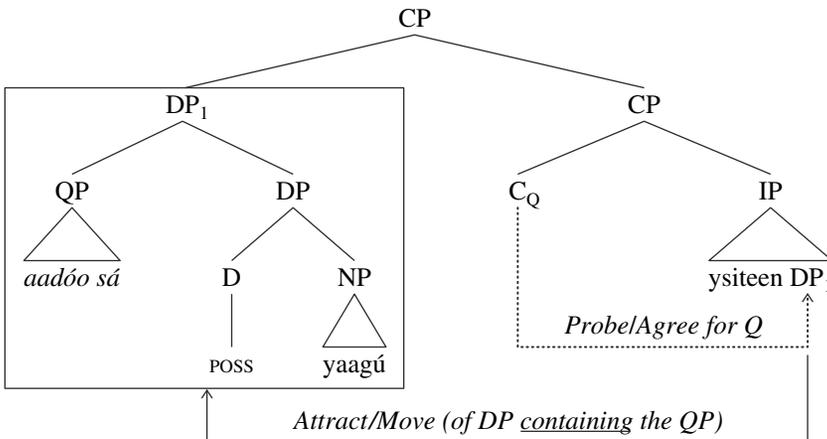
(29) *Derivation of the Tlingit pied-piping structure in (27b)*



Thus, none of the structures in (27) are cases where the moved phrase properly contains the projection of the head triggering the movement. Consequently, none of the Tlingit pied-piping structures in (27) are instances of true pied-piping, as defined in (4).

Furthermore, given the generalization illustrated in (28), there aren't any true cases of pied-piping in Tlingit. Following the definition in (4), true pied-piping in Tlingit *wh*-questions would have the appearance of the structures in (28), where the projections of the particle *sá* (the target of movement) would be properly contained within the fronted phrase. To clarify the point, such hypothetical structures are illustrated in (30).

(30) *A hypothetical true pied-piping structure in Tlingit*



Thus, under the Q-based account in (8), the pied-piping structures of Tlingit are not actually cases of pied-piping, and what *would* be actual cases of pied-piping in the language are ill formed.

For this reason, the concept of pied-piping as defined in (4) can be eliminated from the proposed theory of Tlingit grammar. By adopting the analysis in (8), we need not deviate from the null hypothesis that if an operation (in Tlingit) targets the features of a lexical item, then it applies only to the maximal projection of that item.¹³

4.2 *Pied-Piping Structures beyond Tlingit: A Preliminary Discussion*

We have just seen that, while the analysis of Tlingit *wh*-questions need not employ the concept of pied-piping in (4), the language nevertheless clearly possesses pied-piping structures as defined in (5), structures that are in their surface form intuitively similar to English pied-piping structures like (2). This, of course, raises the question of whether the Q-based account could not be extended to English and other *wh*-fronting languages. After all, given the striking surface similarity in their *wh*-questions and pied-piping structures, it would at first glance seem implausible that English and Tlingit could truly be as different from one another as the analyses in (7) and (8) would suggest. Furthermore, if the Q-based analysis were extended to all *wh*-fronting languages, we might in principle be able to fully dispense with the concept of pied-piping in (4). Pied-piping structures in English, for example, might receive a Q-based analysis like this:

- (31) a. Whose father's cousin did you meet at the party?
 b. [_{QP}[[[Whose] father's] cousin] Q] did you meet at the party?

Under this analysis, a pied-piping structure in English is derived exactly like the pied-piping structures of Tlingit. In such sentences, the (null) Q-particle takes as sister a phrase properly containing the *wh*-word, which entails that the fronted phrase of the *wh*-question properly contains the *wh*-word. Thus, one need not view sentences like (2) as cases where movement targets more than the phrase whose features trigger it. Under such a Q-based theory, then, one need never accept that pied-piping truly exists in English.¹⁴ If this same basic result can be maintained for

¹³ One might wonder, however, what principles actually account for the ill-formedness of the structures in (28). One obvious answer is that the impossibility of pied-piping in Tlingit, combined with the analysis in (8), predicts their ill-formedness. Interestingly, though, as long as we assume the analysis in (8), the impossibility of the structures in (28) could be explained even in a model that permitted pied-piping (via feature percolation). Note that (28d) would be ruled out by (a) the presence of Q inside the relative clause, and (b) the inability to percolate a feature beyond a relative clause island (see footnote 12). Similarly, the QPIC proposed in Cable 2007, 2008, 2010 would independently rule out (28a–c) (see footnote 12). This raises the empirical possibility, then, of an analysis whereby (a) Tlingit *wh*-questions receive the analysis in (8), but (b) independent factors conspire to prevent a Q-particle in Tlingit from pied-piping a larger phrase.

In response, however, we should again note that there is simply no evidence for the possibility in Tlingit of pied-piping as defined in (4). Thus, the motivation for a model of the kind described above would have to come from evidence that pied-piping (via feature percolation) is a possibility in *other wh*-fronting languages. The remainder of this article, though, questions the evidence that pied-piping as defined in (4) is ever a real phenomenon of human language. (I thank an anonymous reviewer for raising this point.)

¹⁴ On the other hand, it is indisputable that English pied-piping structures occur in constructions other than *wh*-fronting. For example, sentences like the following seem to exhibit pied-piping in focus movement (i) and relativization (ii):

- (i) I've read John's book, but [DAVE's book] I haven't read.
 (ii) I've met the man [whose book] you read.

One might worry, then, whether the Q-based account isn't too parochial, failing to derive the possibility of pied-piping structures in \bar{A} -constructions beyond *wh*-fronting.

all *wh*-fronting languages, then one need never admit the existence of pied-piping in human language.

The ability to eliminate pied-piping from the theory of grammar would be advantageous in several respects. For one thing, it would simply reduce the number of phenomena linguistic theory must explain. More importantly, though, pied-piping as defined in (4) represents a marked departure from the core tenets of the standard theory of movement. In the simplest and best-understood cases, phrasal movement triggered by a feature *F* applies only to the phrases projected by a lexical item bearing *F*. Indeed, as noted in section 1, the classic picture of *wh*-fronting in (1) is unable to account for pied-piping structures like (2) without the addition of a special theory of pied-piping (with attendant special mechanisms like feature percolation).¹⁵ However, if pied-piping were simply discounted, one would never need to deviate from the simplest (null) hypothesis: movement of a phrase *XP* can only be triggered by features of the head *X*.

Furthermore, under the classic picture in (1), the pied-piping structures in (2) represent a deviation from the expected grammatical pattern. That is, on its own, (1) would predict that structures like (2) should not exist, as it can only account for such structures via the addition of a special theory of pied-piping. This is in stark contrast to the *Q*-based analysis in (8). Under that analysis, pied-piping structures merely represent cases where the sister of *Q* is not the *wh*-word itself, but a phrase containing the *wh*-word. Importantly, the possibility of such configurations requires no special assumptions or additions to the basic theory. Indeed, it would require special assumptions to rule out pied-piping structures from the *Q*-based theory.¹⁶

In summary, extending the *Q*-based analysis to all *wh*-fronting languages—and thereby doing away with the concept of pied-piping in (4)—would seem to yield a simpler overall theory of

This issue is taken up in Cable 2007, 2010:chap. 6. There, I note that the *Q*-based theory can only account for facts such as (i)–(ii) if it is assumed that the extractions in question are *all* some variant of the *Q*-movement seen in *wh*-questions. That is, besides the *Q* found in *wh*-questions, there also exist separate, featurally distinct instances of the category *Q* in focus movement constructions, relative clauses, and so on.

I discuss this proposal in further detail in Cable 2007, 2010:chap. 6, noting that it receives some independent support from work by Horvath (2000, 2007b) and Sternefeld (2001). Horvath argues at length that so-called focus movement does not truly target the focus feature of the focused phrase; rather, it targets the features of a (null) focus particle located just above the fronted phrase. Similarly, Sternefeld (2001) develops a syntax and semantics for relative clauses whereby the movement in such clauses targets, not the so-called relative operator, but a (null) particle located just above the fronted phrase. For more details, including the relationship between the account proposed here and those of Horvath and Sternefeld, see the works cited above.

I should also note here that Sternefeld 2001, which was unknown to me when I wrote Cable 2007, independently develops the *Q*-based account in (8), as well as a version of the semantics developed for (8) in Cable 2007, 2010.

¹⁵ See Heck 2008, 2009 for arguments that feature percolation—as the concept is used in analyses of pied-piping—cannot be reduced to any more basic syntactic operations like Agree, Move, or Merge. Thus, any theory of pied-piping appealing to feature percolation necessarily introduces an additional operation into the theory of grammar, one that is of little utility outside of deriving pied-piping structures.

¹⁶ A reviewer notes that one possible advantage of the idea that pied-piping is a deviation from canonical *wh*-movement is that it predicts pied-piping to be a last-resort phenomenon, a claim defended at length by Heck (2008). Space precludes discussion of this important issue, but I have argued elsewhere (Cable 2007, 2010:chap. 5) that the evidence regarding the (non)optionality of pied-piping is equivocal.

I would also hasten to add that, given the sheer ubiquity of pied-piping structures across languages, an account in terms of special mechanisms such as feature percolation seems inappropriate. Consequently, the existence of pied-piping structures entails either that (a) *wh*-movement of a phrase does not require that the phrase itself bear the *wh*-feature, or that (b) the target/trigger of movement in a *wh*-question is not a feature borne by the *wh*-word itself. Heck (2008, 2009) explores a theory assuming (a), while in this article I explore the possibility of (b).

phrasal movement. However, one cannot be certain of this without seeing concretely how a Q-based account of, say, English would be structured. Therefore, in the remainder of this article, I aim to show in detail how this is to be done.

5 Q/Wh-Agreement and the Constraints on Pied-Piping

5.1 The Problem of Limited Pied-Piping

To begin, let us observe a potentially serious problem for applying the Q-based account to English. Recall that under this account, pied-piping structures are simply ones in which the Q-particle takes as its sister a phrase properly containing the projections of the *wh*-word. Moreover, recall that this theory of pied-piping structures is based on the surface form of Tlingit pied-piping structures, where the Q-particle *sá* is never directly adjacent to the *wh*-word, but appears at the right edge of the larger, fronted phrase.

- (32) [PP *Aadóo* teen] *sá* yeegoot?
 who with Q you.went
 ‘Who did you go with?’

Thus, the Q-based theory would view all pied-piping structures as homologous to the Tlingit phenomenon in (32). However, when we compare the pied-piping structures of languages like English with their putative correlates in Tlingit, we find some striking differences. Generally speaking, the differences lie in the “size” of what can be pied-piped. Tlingit permits the *wh*-word in a pied-piping structure to be dominated by structures that English and other well-studied languages never allow.

We have already encountered one example of this disparity. Recall that the *wh*-word of a Tlingit *wh*-question can be contained *inside an adjunct island* within the fronted phrase (see (23a), repeated here as (33a)). I will refer to such structures as *pied-piping past adjunct islands*.

- (33) a. [[*Wáa* kwligeyi_{CP}] *xáat*_{NP}] *sá* i tuwáa sigóo?
 how it.is.big.REL fish Q your spirit.at it.is.happy
 Lit. ‘A fish that is how big do you want?’
 b. [[*Daat* yís] át] *sá*kwshéiwégé?
 what for thing Q.DUBITATIVE
 Lit. ‘A thing for what is this?’
 (Nyman and Leer 1993:120)
 c. [[*Goodáx*] *k’anáaxán* tlein] *sáyá* du kát satéen?
 where.from fence big Q.FOC its surface.to it.rests(?)
 Lit. ‘A big fence from where rests on it?’
 (Nyman and Leer 1993:150)
 d. [[*Goodáx*] *káa*] *sáyá* yéi yatee?
 where.from man Q.FOC he.is
 Lit. ‘A man from where was he?’
 (Dauenhauer and Dauenhauer 1987:168)

Crucially, while Tlingit allows pied-piping past adjunct islands, the best-studied *wh*-fronting languages do not. As shown in (34), English sentences with the same structure as (33a–d) are ill formed.

- (34) a. *_{[DP A fish [_{CP} that is *how* big]]} do you want?
 b. *_{[DP A book [_{CP} that *who* wrote]]} did you buy?

Furthermore, as documented by Heck (2008), such structures are similarly ill formed in all the most familiar *wh*-fronting languages.

But this is not all that distinguishes the pied-piping structures of Tlingit. To facilitate the discussion here, let us adopt the following, more general terminology:

- (35) A *wh*-question exhibits *pied-piping past X* if the *wh*-word is dominated by an instance of X within the fronted phrase of the *wh*-question.

With this terminology in place, let us note that several authors have offered the generalization that English and other well-studied languages do not permit pied-piping past lexical categories (Cowper 1987, Webelhuth 1992, Grimshaw 2000).¹⁷ That is, in the most commonly studied *wh*-fronting languages, no *wh*-operator can be dominated by a lexical category within the fronted phrase of the *wh*-question. The ill-formed English structures in (36) illustrate.¹⁸

- (36) a. I wonder [_{[DP *whose* [_{NP} pictures]]} John bought]?
 b. *I wonder [_[NP pictures of *whom*] John bought]?¹⁹
 c. *I wonder [_[AP proud of *whom*] John was]?
 d. *I wonder [_[VP eaten *what*] John has]?

Although pied-piping past lexical categories is ill formed in many languages, it does not appear to be problematic in Tlingit. Indeed, under the plausible assumption that Tlingit relative clauses

¹⁷ Properly speaking, it is only Grimshaw (2000) who explicitly states this generalization. Webelhuth (1992) states that there is no pied-piping past θ -assigners, while Cowper (1987) states that there is no pied-piping past categories that can be lexically specified as [+wh]. However, in the context of these authors' respective theories, the latter two generalizations are equivalent to there being no pied-piping past N, V, or A.

¹⁸ One might legitimately doubt whether this is the correct generalization to draw from the handful of data in (36). I return to this issue in section 6.

¹⁹ Interestingly, the ill-formedness of subordinate questions like (36b) weakens if they are used instead as matrix questions (i) or appositive relative clauses (ii).

(i) Pictures of whom has John bought?

(ii) My father, pictures of whom John has bought, is very famous.

This phenomenon is carefully explored by Heck (2008) and discussed in Cable 2007, 2010. For present purposes, however, I will follow Heck (2009) in putting aside such cases of ‘‘massive pied-piping.’’ That is, I will adopt the position that the pied-piping in (36b) is indeed ill formed and that there is something special about matrix environments that (marginally) improves their acceptability (Heck 2008).

are adjuncts to NP, such pied-piping is widely exemplified by sentences like those in (33), where the *wh*-operator is buried within a relative clause.²⁰

We find, then, that the Q-based theory of pied-piping faces a difficult challenge. Although it proposes that all pied-piping structures be reduced to the Tlingit phenomenon in (32), those Tlingit structures exhibit properties contrary to the most well-studied cases of pied-piping. Consequently, the Tlingit structures in (32) are not *perfectly* homologous to the pied-piping structures of (e.g.) English. Now, one could conclude that the two structures are not homologous at all and that the Q-based theory of pied-piping is just wrong for languages like English. However, I will argue that such a reaction would be too extreme. Rather, we will see that a slight addition to the Q-based theory will allow it to capture the observed differences between English and Tlingit pied-piping.

To again facilitate the discussion here, I will use the term *limited pied-piping*, defined as follows, to describe the pied-piping structures of languages like English:

- (37) A *limited pied-piping structure* is a pied-piping structure where pied-piping past adjunct islands and pied-piping past lexical categories is not permitted.

Similarly, I will use the term *limited pied-piping language* to refer to languages where all pied-piping structures are instances of limited pied-piping.

In order for the Q-based theory to be applied to limited pied-piping languages, some account must be offered for why they do not permit pied-piping past adjunct islands or lexical categories. In the remainder of this section, I put forth such an account.

5.2 Background: Q/Wh-Agreement in Kratzer and Shimoyama 2002

The leading idea behind the proposed account of limited pied-piping is that *wh*-words in some languages must Agree with the *c*-commanding Q-particle. Interestingly, this notion of Q/Wh-Agreement is independently proposed by Kratzer and Shimoyama (2002:sec. 9).

In brief, Kratzer and Shimoyama propose that in some—but *not all*—languages, *wh*-operators bear an uninterpretable instance of the Q-feature. In these languages, then, the *wh*-word and the *c*-commanding Q-particle must Agree; failure to do so would leave the uninterpretable Q-

²⁰ It is difficult to find more direct evidence that Tlingit permits pied-piping past lexical categories. It is impossible to construct direct correlates to the English sentences in (36b–d). First, Tlingit has only a very small number of (putative) “adjectives,” none of which appear with complements. Furthermore, complements of N in Tlingit do not appear to ever remain as sisters of N; rather, they always move into a higher specifier position (Cable 2007). Finally, Tlingit has no process of VP-fronting.

As a reviewer notes, it would be most interesting to find evidence from other languages (e.g., Sinhala) that structures like (36c–d) are in principle possible. At present, it seems that the data from Tlingit are consistent with a generalization that the language permits pied-piping only of DP, PP, and CP, a generalization that also seems applicable to languages like English and does not obviously follow from the Q-based account.

feature on the *wh*-word, leading to a crash at LF.²¹ However, in those languages where *wh*-operators do not bear uninterpretable instances of the Q-feature, the Agree relation need not hold between the Q-particle and any *wh*-operators.

Kratzer and Shimoyama's ultimate interest in these morphosyntactic hypotheses is their ability to account for certain differences between German (hypothesized to have Q/*Wh*-Agreement) and Japanese (hypothesized not to). Interestingly, though, these same general hypotheses can be combined with the Q-based theory in (8) to provide an analysis of the limited pied-piping languages.

Before this analysis can be presented, however, we must flesh out the morphosyntactic hypotheses sketched above. Because Kratzer and Shimoyama's implementation of these hypotheses employs a syntactic theory different from that assumed here, we must develop a new implementation. Such formal implementation will require us to be more explicit regarding the exact nature of feature valuation under Agree. Throughout the rest of this article, I will adopt the theory of feature valuation developed by Pesetsky and Torrego (2007). The characteristic property of this system is that valuation and interpretability are independent of one another. Consequently, there are four states that a given feature may be in: (a) valued and interpretable, (b) valued and uninterpretable, (c) unvalued and interpretable, and (d) unvalued and uninterpretable. The following diagram (where $F = \textit{feature}$) illustrates this idea, as well as the notation I will use:

(38)	Interpretable (iF)	Uninterpretable (uF)
Valued (F[+/-])	iF[+/-]	uF[+/-]
Unvalued (F[])	iF[]	uF[]

Within this system, there are two principles that drive syntactic valuation. The first is the requirement that every feature must possess a value by LF. Given this principle, any unvalued feature $F[]$ must probe for a valued instance of itself, $F[+/-]$, at which point the usual mechanics of long-distance Agree apply (Chomsky 2000). The second is the requirement that by LF, all uninterpretable features uF must be matched to some interpretable instance iF . For further details regarding this theory of feature valuation, see Pesetsky and Torrego 2007.

With these ideas in place, let us incorporate the morphosyntactic hypotheses of Kratzer and Shimoyama (2002) into our broader system. First, we assume that the *wh*-words of some languages (e.g., German, English) bear an uninterpretable, valued Q-feature, while the *wh*-words of other languages (e.g., Japanese, Tlingit) do not bear any instance of the Q-feature.

- (39) a. German *wh*-word: $\text{was}_{uQ[+]}$
 b. Japanese *wh*-word: *dare*

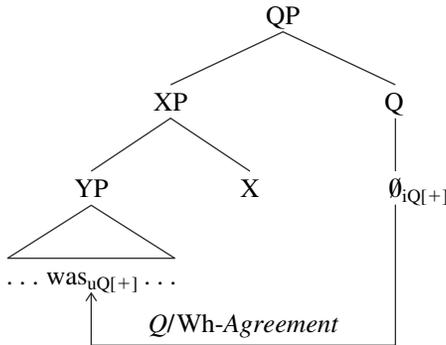
²¹ It should be noted, however, that Kratzer and Shimoyama (2002) view this c-commanding Q-element (which Agrees with the *wh*-word) as the interrogative C.

In languages where *wh*-words bear $uQ[+]$, by LF this uninterpretable Q-feature must be checked against some interpretable instance iQ . Given that the only head assumed to carry iQ is the Q-particle itself, the Q-particle in languages like German and English must Agree with the *wh*-word. In order for this Agree relation to be established, however, we must assume that the Q-particles of such languages initially bear *unvalued* instances of the Q-feature.²² That is, in languages where the *wh*-words bear $uQ[+]$, the Q-particle must in turn bear $iQ[-]$. Of course, in languages where *wh*-words do not bear $uQ[+]$, we can assume that the Q-particle simply bears an interpretable, valued instance of the Q-feature.

- (40) a. German Q: $\emptyset_{iQ[-]}$
- b. Japanese Q: $ka_{iQ[+]}$

Assuming the initial valuations in (39) and (40), we predict the necessity of *Q/Wh*-Agreement in languages like German and English, and the absence of *Q/Wh*-Agreement from languages like Japanese and Tlingit. First, in languages where the Q-particle is lexically assigned $iQ[-]$, the lack of a value for iQ entails that the particle probe for a valued instance of the feature. Following Chomsky’s (2000) algorithm for probing, the first element bearing $Q[+]$ that the Q-particle probes is the *wh*-word that it *c*-commands. Therefore, the Q-particle will Agree with that *wh*-word, as shown in (41).

(41) *Q-particle Agreeing with wh-word in German*



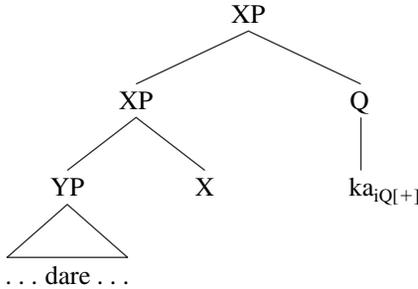
This *Q/Wh*-Agreement has the following results: (a) the unvalued instance of the Q-feature on the Q-particle receives a value, and (b) the uninterpretable instance of the Q-feature on the *wh*-

²² It may at first blush seem suspicious for a Q-particle to initially bear an unvalued Q-feature. However, my proposals regarding Q are rather parallel to the proposals regarding Tense in Pesetsky and Torrego 2007, where the Tense node of the clause initially bears unvalued Tense and receives its Tense value only by Agreeing with the uninterpretable (but valued) Tense feature of the verb.

word is matched to an interpretable instance. Consequently, both of the Agree-driving principles of Pesetsky and Torrego (2007) are satisfied, and the structure is well formed.

In languages where the Q-particle is lexically assigned $iQ[+]$, however, the presence of a value for iQ entails that the Q-particle will *not* act as a probe. Furthermore, since the *wh*-words of such languages are assumed not to bear any instance of the Q-feature, nothing will require them to Agree with the Q-particle. Consequently, in such languages, there is no Q/*Wh*-Agreement. This situation is depicted in (42).

(42) *No Q/Wh-Agreement in Japanese*



Given this implementation of Kratzer and Shimoyama's (2002) theory of Q/*Wh*-Agreement, we can now develop a Q-based analysis of the limited pied-piping languages.

5.3 The Theory of Limited Pied-Piping Languages

Recall the question we are trying to answer: “What is responsible for the more constrained variety of pied-piping in languages like English, where pied-piping structures are subject to constraints that do not hold in languages like Tlingit?” Since the constraints governing limited pied-piping concern the locality of the *wh*-word to the root of the pied-piped phrase, we should naturally seek to derive these constraints from independent locality principles of the grammar. Let us, then, consider the following proposal:

(43) *The nature of limited pied-piping*

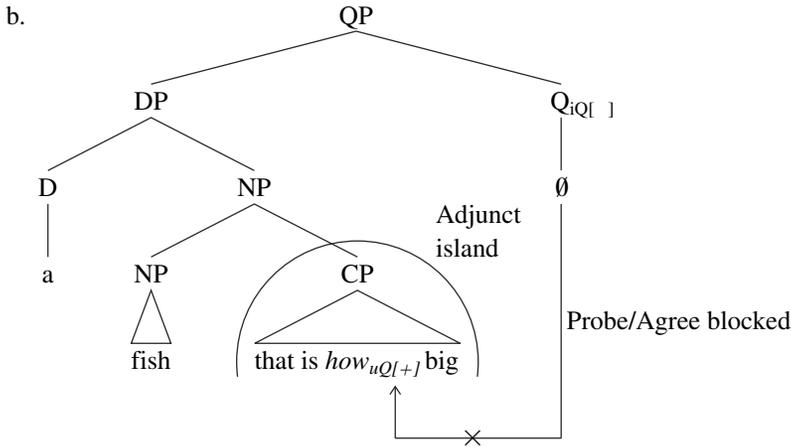
If the Q-particle must Agree with the *wh*-word it c-commands, then a *wh*-word cannot be dominated in the sister of Q by adjunct islands or lexical categories. Thus, limited pied-piping languages are those where Q/*Wh*-Agreement must occur.

That is, I propose that the constraints governing pied-piping in languages like English follow from a single requirement that the Q-particle and the *wh*-word Agree.

Let us first consider the condition against pied-piping past adjunct islands. Recall the assumption from section 3.3 that probing and Agree cannot take place across such islands. Therefore, if we assume that limited pied-piping languages require Q/*Wh*-Agreement, we correctly predict that such languages will not permit pied-piping past adjunct islands. As illustrated in (44), the domination of the *wh*-word by such an island within the sister of Q prevents the Q-particle from Agreeing with the *wh*-word.

(44) *Inability to pied-pipe past adjunct islands in English*

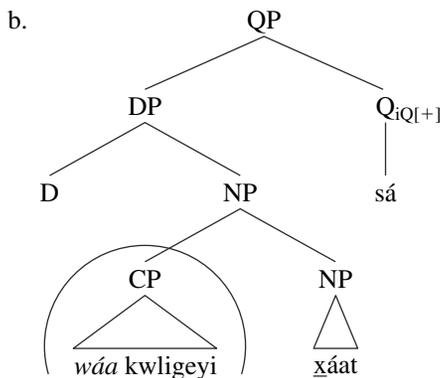
a. *_{[DP A fish _[CP that is how big]]] do you want?}



That is, in languages like German and English—where Q bears an interpretable but *unvalued* Q-feature ($iQ[-]$)—an adjunct island between the Q-particle and the *wh*-word prevents the Q-particle from receiving a value for its Q-feature by LF. As a result, such structures induce a crash at the LF interface. However, in languages where the Q-particle lexically bears a valued Q-feature ($iQ[+]$), such an island between the Q-particle and the *wh*-word does not affect the LF interpretability of the structure. This is illustrated in (45).

(45) *Ability to pied-pipe past adjunct islands in Tlingit*

a. _{[DP_[CP Wáa kwligeyi]] xáat] sá i tuwáa sigóo?}
 how it.is.big.REL fish Q your spirit.at it.is.glad
 ‘How big a fish do you want?’



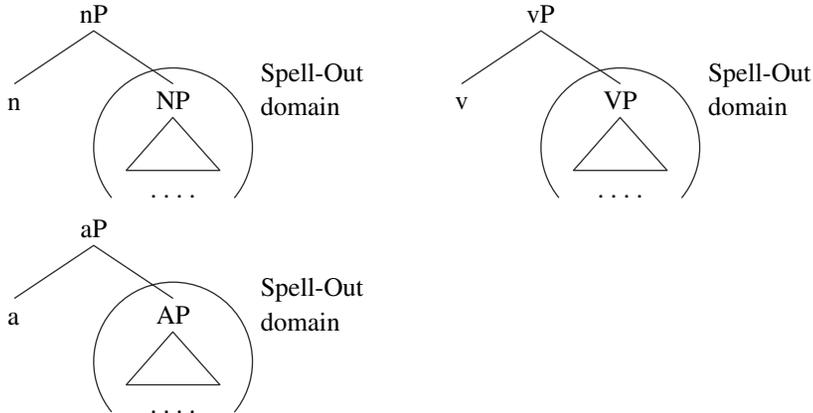
Thus, languages without *Q/Wh*-Agreement should permit pied-piping past such islands. We hypothesize then that Tlingit (like Japanese) does not require *Q/Wh*-Agreement.

Let us now consider the constraint against pied-piping past lexical categories in languages like English. Interestingly, this condition might follow from certain independent ideas concerning the structure of lexical projections. Let us adopt the hypothesis in (46), taken from recent work in Distributed Morphology.

(46) a. *The fine structure of lexical categories* (Embick and Marantz 2008)

Every lexical projection (VP, NP, AP) is complement to a phase head (little v, little n, little a).²³

b. *Diagram of the lexical projections*



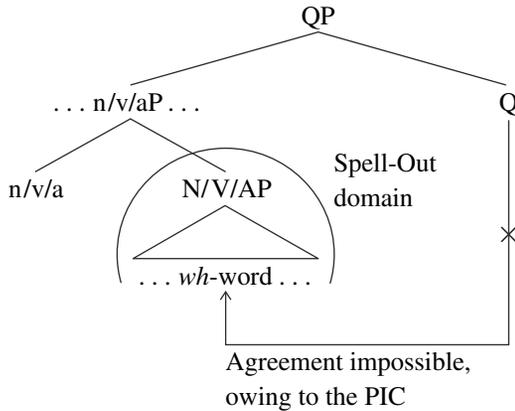
Under the assumption that each of the little categorial heads shares with little v the property of being a phase head (Chomsky 2000), it would follow that Q/*Wh*-Agreement cannot cross into lexical projections. As illustrated in (46b), any material inside a lexical projection would occupy a separate Spell-Out domain from material outside the lexical projection. However, under the original formulation of the Phase Impenetrability Condition (PIC), syntactic operations such as Agree cannot apply to heads in separate Spell-Out domains (Chomsky 2000).²⁴ Under these assumptions, then, no material inside a lexical projection can Agree with any head outside that lexical projection. Consequently, we predict that the Agree relation cannot hold between a Q-particle and a *wh*-word buried within a lexical projection. This is illustrated in (47).

²³ A somewhat similar notion—that every nonphase is complement to a phase head—is proposed in Boeckx 2009.

²⁴ Note, however, that there is much controversy over the exact nature, and therefore the statement, of the PIC. For instance, Bošković (2005) argues that the Agree relation *can* apply across different Spell-Out domains. Some evidence in support of this includes verbal agreement with nominative case-marked *objects* in Icelandic.

(i) Honum mundu sennilega hafa [_{VP} líkað þeir].
 him.DAT would.3PL probably have liked *them*.NOM
 'He would probably have liked them.'
 (Heck 2008:44)

(47) *Inability for Q/Wh-Agreement to cross a lexical projection*



Thus, in languages like English and German, where the Q-particle bears unvalued $iQ[-]$, it should be impossible for a lexical category to intervene between the Q-particle and the *wh*-word. Consequently, pied-piping past lexical categories should be ill formed in these languages. However, for languages like Tlingit and Japanese, where the Q-particle bears valued $iQ[+]$, no problem arises if the *wh*-word and the Q-particle are separated by a lexical projection, and so pied-piping past lexical categories should be possible there.

In summary, broader syntactic assumptions predict that pied-piping past adjunct islands and past lexical categories should be impossible in all and only the languages requiring Q/Wh-Agreement. It appears, then, that the striking differences between the pied-piping structures of English and Tlingit are not necessarily due to some fundamental disparity in their nature; instead, they are due to a rather superficial morphosyntactic contrast.

We find, then, that the Q-based theory of pied-piping structures offers a sensible perspective on the crosslinguistic variation observed in (33)–(36). But does it actually fare better than an account appealing to a theory of pied-piping, as defined in (4)? After all, in order to properly limit pied-piping in English, we have had to supplement the basic Q-based theory in (8) with the following additional assumptions: (a) there are languages where Q and the *wh*-word must Agree, (b) the Agree relation cannot cross into adjunct islands, (c) lexical projections have the structure in (46), and (d) the Agree relation cannot cross separate Spell-Out domains (the PIC).²⁵

In response to this criticism, it should first be noted that assumptions (a)–(d) have independent merit; they are not stipulations introduced *ex nihilo* here, but do enjoy some external currency and validity. Furthermore, it is worth noting that the proposed account promises a unified treatment of the seemingly *sui generis* locality conditions on pied-piping, by reducing them to the independently observable locality conditions on Agree.²⁶ Finally, I would submit that any theory admitting

²⁵ But note that (b) could be dropped as a separate hypothesis, if it were assumed that adjunct islands are islands precisely because they are phases (see footnote 10).

²⁶ However, see Heck 2008, 2009 for an account that does appeal to pied-piping as defined in (4), but also captures many locality conditions on pied-piping in terms of the locality of Agree.

the existence of pied-piping as defined in (4) will almost certainly be more complex than the Q-based account, inasmuch as it would still appeal to a special theory of pied-piping. Recall that under the classic picture of *wh*-fronting in (1)/(7), pied-piping structures are a deviation from the expected pattern, and the postulation of pied-piping represents a weakening of the theory of movement. Even if such a theory offered an elegant treatment of the constraints on English pied-piping, it would still treat pied-piping structures as a kind of aberration and would abandon the null hypothesis that movement applies only to projections headed by the features triggering it. By contrast, the Q-based account offers a system where pied-piping structures are fully consistent with this null hypothesis, where they are an organic, natural consequence of the general theory of \bar{A} -movement.

It is reasonable, then, to conclude on general grounds that the Q-based account—even paired with the additional assumptions (a)–(d)—offers serious competition to classic accounts of pied-piping with similar empirical coverage.

6 Pied-Piping, Lexical Categories, and “the Edge”

In this final section, I return to a crucial empirical assumption of the preceding discussion: English and many of the best-studied *wh*-fronting languages disallow pied-piping past lexical categories. Although I illustrated this claim with but a handful of English data in (36), its empirical coverage is much broader. Indeed, this generalization has (in essence) been discovered several times in the literature on pied-piping (Cowper 1987, Webelhuth 1992, Grimshaw 2000), as it accounts for an array of seemingly disparate facts. Therefore, to provide a fuller picture of the empirical coverage provided by the theory of *Q/Wh*-Agreement proposed here, I will review some of the phenomena falling under this broader generalization. Then I will offer some related remarks on the way in which the Q-based theory captures the observation that (in the best-studied languages) pied-pipers typically appear at the periphery of the pied-piped phrase (Heck 2008, 2009).

6.1 Further Evidence regarding Pied-Piping Past Lexical Projections

Perhaps the most striking property of pied-piping structures is how constrained they are. None of the best-studied languages permit a *wh*-word to pied-pipe any and all phrases containing it. Indeed, it might sometimes seem as if—but for a few well-known exceptions—pied-piping is generally *impossible*.

Happily, things are not as dire as they might at first appear. While there is yet no completely unified account of *all* the constraints and quirks governing pied-piping structures,²⁷ a number of phenomena have been found to follow from the generalization that (in the best-studied languages) pied-piping past lexical categories is impossible. For example, we have seen that this generalization captures the pattern in (36), repeated in (48).

²⁷ However, for some recent thorough treatments, see Heck 2008, 2009 and Horvath 2007a.

- (48) a. I wonder [[_{DP} *whose* [_{NP} pictures]] John bought]?
 b. *I wonder [[_{NP} pictures of *whom*] John bought]?
 c. *I wonder [[_{AP} proud of *whom*] John was]?
 d. *I wonder [[_{VP} eaten *what*] John has]?

Now, one can certainly imagine other explanations for the impossibility of (48b–d). Indeed, facts such as these have led some to propose the stronger generalization that *no* complements of *any* head can serve as pied-pipers (Kayne 1994, Koopman 2000, Koopman and Szabolcsi 2000). However, this stronger generalization is challenged by the ubiquity of pied-piping by complements of P. That is, contrary to the stronger generalization, it is possible in all the best-studied languages for *wh*-words to pied-pipe a PP from the complement of P. For example, (48b–d) contrast with the well-formed (49).

- (49) [_{PP} In [*what* sense]] was he a doctor?

To allow for these rather common structures, proponents of the stronger generalization must introduce special assumptions whereby the *prima facie* complements of P are (at the relevant level of syntax) actually specifiers of P. By contrast, the weaker generalization against pied-piping past lexical categories actually predicts the ubiquity of PP-pied-piping. Because P may be regarded as a *functional* category (rather than a lexical one), the weaker generalization correctly predicts that *wh*-words may generally be dominated by PPs within the fronted phrase.

Thus, a ban on pied-piping past lexical categories correctly predicts that complements of lexical heads cannot pied-pipe. In addition, it predicts that *modifiers* of lexical projections cannot pied-pipe (Webelhuth 1992).

- (50) a. *[_{QP}[_{DP} The [_{NP} party *where*]] *Q*] will John enjoy?
 b. *[_{QP}[_{VP} Go *where*] *Q*] will you?
 c. *[_{QP}[_{DP} A [_{NP}[_{DEGP} *how* big] party]] *Q*] will you throw?

Again, since the *wh*-words in each of these structures are contained within a lexical projection inside the fronted phrase, the Q-based account predicts their ill-formedness.

A third prediction of the weaker generalization concerns pied-piping by possessors. A pervasive phenomenon across limited pied-piping languages is the inability of *postnominal* possessors to pied-pipe (Heck 2008:89–94). Sentence (48b) demonstrates this for English, and (51a–c) illustrate it for German.

- (51) a. die Bilder des Künstlers
 the paintings the.GEN artist.GEN
 ‘the artist’s paintings’
 (Heck 2008:91)
 b. Ich weiß [*wessen* Bilder] du kaufen würdest.
 I know whose paintings you buy would
 ‘I know whose paintings you would buy.’
 (Heck 2008:91)

- c. *Ich weiß [Bilder *wessen*] du kaufen würdest.
 I know paintings whose you buy would
 (Heck 2008:91)

As discussed by Heck (2008, 2009), similar data can also be observed in many Romance languages, as well as the Mayan language Tzotzil.²⁸ However, recall that in these head-initial languages, it is commonly held that postnominal possessors are *complements* of the possessed N. Consequently, if they were ever to pied-pipe the possessive phrase, they would be pied-piping past a lexical category. Therefore, a ban on pied-piping past lexical categories would correctly predict the impossibility of such structures.²⁹

The weaker generalization can also capture a related, though subtly different, phenomenon in Hungarian. Szabolcsi (1994) argues that possessors in Hungarian can occupy either of two positions inside the DP: one internal to the NP and one external to it. Importantly, however, both these positions are *prenominal*; Hungarian does not permit postnominal possessors. Nevertheless, the position a possessor occupies can in part be determined by its case: possessors internal to NP bear nominative, while those external to NP bear dative. Interestingly, only dative-marked possessors can pied-pipe.

- (52) a. [_{DP} *Ki*-nek a [_{NP} vendégét]] ismertétek?
 who-DAT the guest you.knew
 ‘Whose guest did you know?’
 b. *[_{DP}[_{NP} *Ki* vendégét]] ismertétek?
 who.NOM guest you.knew

Given the evidence that the nominative possessor in (52b) is NP-internal, the ill-formedness of (52b) would follow from the Q-based account. Furthermore, the proposed account provides a unified treatment of both (52) and (51), despite the fact that (52) superficially concerns the case of the pied-piper while (51) concerns its linear position.

A parallel argument can be made using certain intriguingly similar data from English. As reported by Horvath (2007a), Culicover (1999) observes the following contrast:

²⁸ As reported by Coon (2009), this pattern is also found in the Mayan language Chol. Moreover, Coon argues that a Q-based theory of pied-piping like the one developed here can capture certain complex features of possessor pied-piping in Chol. A related (though slightly different) account of the Chol facts is provided in Cable 2007, 2010:chap. 5.

²⁹ As noted by Heck (2008:243–244), there are some languages that permit pied-piping by postnominal possessors. Greek, illustrated in (i), is one such language.

- (i) Anarotieme [[_{DP} to vivlio *tinós*]₁ mu ipes pos dhiavases t₁].
 I.wonder the book whose you said that you.read
 ‘I wonder whose book you said you read.’
 (Heck 2008:244)

Following Heck (2008), I adopt the view that such languages allow Spec,DP to be rightward. Thus, in these structures, the postnominal possessor has not actually remained within the NP; rather, it has moved up into a (rightward) specifier of D.

- (53) a. *[*Who* solving the problem] were you thinking about?
 b. [*Whose* solving the problem] were you thinking about?

As in (52), the contrast between the sentences in (53) seems to lie in the case of the pied-piper. In the ill-formed (53a), the gerundive subject bears accusative case, while in the well-formed (53b), it bears genitive. As noted by Horvath (2007a), the proposed account of the Hungarian data in (52) could easily be extended to these English data. Let us assume that accusative-marked gerundive subjects in English occupy the NP-internal position of Hungarian nominative possessors. Furthermore, let us assume that genitive-marked gerundive subjects occupy the NP-external position of Hungarian dative possessors (i.e., Spec,DP). Under these plausible assumptions, the data in (53) follow from the condition against pied-piping past lexical categories.

We have seen, then, that an inability to pied-pipe past lexical categories predicts an interesting variety of pied-piping phenomena. We may reasonably conclude that a theory of limited pied-piping languages should predict such a constraint.

6.2 *The Relationship between Pied-Piping and ‘‘the Edge’’*

In the previous section, I argued against accounts that would rule out pied-piping from *any* complement position and thereby force pied-pipers to be specifiers. Since the apparent relationship between pied-piping and specifier position is a significant and recurring topic in the literature on pied-piping, I will sketch out the perspective offered by the Q-based account.

To begin with, note that the Q-based account employs exactly the same mechanisms to derive pied-piping by specifiers and pied-piping by complements of P. That is, the Q-based analysis of sentences like (54a) appeals to no notions beyond those used in the analysis of cases like (54b).

- (54) a. [*Whose* book] did you steal?
 b. [In [*what* sense]] is he a doctor?

Interestingly, such analytic uniformity does not hold for most other theories of pied-piping (Sells 1985, Cowper 1987, Kayne 1994, Grimshaw 2000, Koopman 2000, Koopman and Szabolcsi 2000). Under most other accounts, the analysis of structures like (54b) requires mechanisms not needed for the analysis of (54a). For example, Kayne (1994) and Koopman (2000) hold that only specifiers can truly pied-pipe. Consequently, structures like (54b) can only be analyzed via appeal to covert movement operations. On the other hand, Grimshaw (2000) proposes that complements of P can pied-pipe because PP is an extended projection of D and so can inherit D’s *wh*-feature. However, since her system assumes that a phrase can never be an extended projection of its specifier, it follows that some other mechanism (i.e., spec-head agreement) must be responsible for pied-piping structures like (54a).

While such distinct treatments of (54a) and (54b) might seem inelegant at first, they do hold one potential advantage over the uniform treatment of the Q-based account. Indeed, it is largely by design that these other accounts treat pied-piping by Comp,PP as a distinct phenomenon from pied-piping by specifiers. Such accounts generally seek to predict that, *except for* Comp,PP, all

pied-piping must take place from specifier position. Importantly, this prediction is in fact true, at least for the best-studied languages. As is clear from the crosslinguistic studies of Heck (2008) and Horvath (2007a), in these languages, it is the case that *only P* permits pied-piping from its complement; in all cases except pied-piping of PP, a pied-piper must be a specifier. Given this tendency, which Heck (2008, 2009) dubs the ‘‘Edge Generalization,’’ we must therefore question whether the uniform treatment of pied-piping proposed here is in fact accurate; does the Q-based account actually fail to capture an important property of pied-piping structures?

In fact, it does not. Rather, under the Q-based account there is a quite straightforward explanation for this pattern: P happens to be the only functional (nonlexical) category that takes interrogative words as complements. To see this more clearly, let us first consider the class of functional categories, which we might reasonably assume to consist of C, I, D, Deg, P.³⁰ Now, consider the class of *wh*-words, which we might reasonably assume to be represented by *who*, *what*, *which*, *where*, *why*, *how*. Placing these two sets side by side, we easily observe that the only member of the former that can take as complement a member of the latter is the category P. It follows, then, that if a *wh*-word ever occupies a complement position and is *not* complement to P, then it must be complement to some lexical head. Consequently, in the best-studied *wh*-fronting languages, such a *wh*-word will not be able to pied-pipe.

Thus, while the Q-based theory does predict that in the best-studied languages, pied-pipers will almost always be specifiers, it does not derive this tendency from a general ban on pied-piping from complement position. Rather, this tendency simply follows from the independent fact that P is the only functional (nonlexical) head to take *wh*-complements.

7 Conclusion

We have seen that the Q-based theory of pied-piping is able to capture certain variation and uniformity in pied-piping structures across languages. It might be concluded, then, that while the Q-based account denies the existence of (true) pied-piping, it nevertheless provides a versatile—though properly constrained—tool for the analysis of those structures that have traditionally been thought to exemplify the phenomenon. At the very least, this result calls into question a long-standing and widespread analytic tradition surrounding structures like those in (2). More interestingly, it casts doubt on the existence of a phenomenon that has hitherto been accepted as a very real and deeply problematic property of human language. Most importantly, we find that the overall theory of grammar can potentially be simplified. If we simply abandon the problematic assumptions in (1), we need not deviate from the null hypothesis that operations targeting the features of a lexical item apply only to the projections of that item.

³⁰ To my knowledge, all other purported functional heads (e.g., Foc, Agr, Num, Loc) are a result of ‘‘exploding’’ the five basic functional categories listed here.

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