Towards an Etiology of Adjunct Islands[1]

Kyle Johnson
University of Massachusetts at Amherst

In one approach to classifying island phenomena, there is a group that answers to the following description.

(1) ADJUNCT ISLAND CONDITION
If an XP is in an adjunct position, nothing may move out of it.

In the influential approach to this condition in Huang (1982), "adjunct" position is defined in terms that reference primarily argument structure and the phrase-marker geometry it is reflected in. This definition grouped together subject phrases and modifying phrases and contrasted them with phrases in "complement" position. The subsequent bounding theories in Lasnik and Saito (1984), Lasnik and Saito (1992) and Chomsky (1986) build on this basic idea, but attempt to spread it to a wide variety of island effects, including those characterized by early versions of Chomsky's Subjacency condition. Central to their approaches is the notion of "lexical governor," which is responsible for making the complement/non-complement cut — only phrases that are governed by a suitably lexical X^o are "complements," and the island conditions are defined, then, over all the others. This part of the system has fallen into disuse partly, I suspect, because characterizing the "lexical" versus "non-lexical" distinction never found itself grounded, and partly because it became unwieldy in the post-Pollock representation of phrase-markers with many functional heads.

This paper adopts the view that there is an island condition like that in (1), which groups together subjects and adjuncts, but I will not attempt to define these phrases on the basis of a "lexical governor." Instead, let us adopt a characterization of "adjunct" that is wholly geometric:

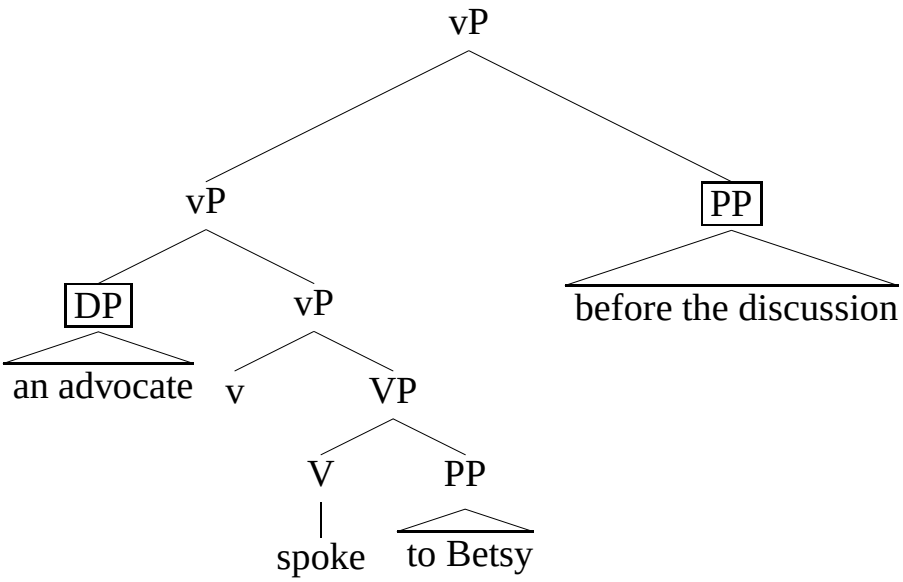
(2) An adjunct is a phrase whose sister is also a phrase and whose mother is not its projection.

[1]Many thanks to the participants of the conference, and to Satoshi Tomioka, Lisa Selkirk, Jason Merchant, Chris Kennedy, Danny Fox, Ayumi Ueyama, Hajime Hoji and to audiences at CUNY, University of Arizona at Tucson, University of Delaware, Harvard University, and the University of Texas at Austin for many helpful comments.

Nordlyd 31.1:187–215, © the author 2003
Proceedings of the 19th Scandinavian Conference of Linguistics, vol. 31.1,
Edited by Anne Dahl, Kristine Bentzen, and Peter Svenonius

This will put together "subject" phrases and modifier phrases under the standard assumption that these are both necessarily sisters to phrases and not heads. Thus it will single out the boxed phrases in (3) and make them islands.

(3)



(Assume that "vP" in this representation is the hidden verb phrase that supports an external theta-role bearer.) Each of the other phrases in (3) is either a sister to a head, or projects its mother node, and, as (4a) illustrates, these phrases are all transparent for movement. By contrast, the boxed DP and PP are islands, as the comparative badness of (4b) and (4c) indicates.

(4) a. Who did Betsy speak to an advocate for before the discussion?
b. *Who did an advocate for speak to Betsy before the discussion?
c. *Who did an advocate speak to Betsy before a discussion of?

The decision to express adjunct islands in this way has certain consequences. It divorces these cases from the Wh-island phenomena, for instance, departing, in this respect, from the approach in Barriers. It leaves open the possibility, however, that instances of "derived islands," like those in (5), might fall under the adjunct island cases.

(5) a. Who did you say Mary bought [a picture of *t*]?
b. *Who did you say [which picture of *t*] Mary bought?
c. Who did Mary buy [a picture of *t*]?
d. *Who was [a picture of *t*] bought by Mary?

In the bad examples in (5), an object which is normally transparent for movement (as indicated by the good examples in (5)) has moved and thereby become an island for extraction. In such cases, then, the islands are derived adjuncts and, we might imagine, fall under the Adjunct Island Condition. In fact, we will see evidence below that suggests that these cases should not be collapsed into the Adjunct Island Condition. There are some small corners of the movement phenomena of English in which derived adjunct islands and underived adjunct islands seem to behave differently. Ross noted in his dissertation, for instance, that in a narrow range of cases involving wh-movement of PPs, whether a subject is derived or not seems to matter:

(6) a. ?Of whom was [a picture *t*] bought?
b. *Of whom did [a picture *t*] bother Betsy?

The improvement in (6a)a plausibly derives from the fact that in its underlying position, the object is a sister to *bought*. For this reason, and those that are to follow, I will assume that the Adjunct Island Condition produces islands by virtue only of the underlying position of phrases, and that it is therefore unrelated to the derived island phenomena illustrated in (5).[2]

Here then is the island whose etiology we seek.

(7) ADJUNCT CONDITION
When a phrase's underlying position in a phrase marker is such that it is a sister to another phrase but doesn't project, it is an island for extraction.

There have been previous attempts at deriving the Adjunct Condition. Stepanov (2000), for instance, suggests that adjunct phrases are necessarily introduced into syntactic structures after all other processes are complete. This would make it impossible for adjuncts to feed wh-movement; and thereby derives their islandhood. Such an approach would require, I believe, that the islandhood of adjunct modifiers and the islandhood of subjects have different sources, as it would be difficult to use the ideas Stepanov offers to guarantee that subjects are introduced after all movement operations have been completed. Many constructions seem to require that subjects themselves undergo movement, for example. But even

[2]See also Wexler and Culicover (1981, Chapter 5), Müller and Sternefeld (1993) and Takano (2000) for characterizations of this island that divorces it from the adjunct condition.

for adjunct modifiers, this approach faces several difficult hurdles. It would require, I believe, that when an adjunct appears in a position normally reserved for moved items, as in (8), it be inserted there without moving.

(8) How many times did you go to the store yesterday?

But this wrongly predicts that reconstruction effects should not materialize in such cases. For example, the pronoun in (9) can be bound by the subject, suggesting that it is being interpreted in the position it has moved from.

(9) How many days after his$_1$ election will almost every president$_1$ start receiving graft money?

This sort of phenomenon, then, suggests that adjuncts are introduced in a way that can feed movement operations. There is reason to look for an alternative to Stepanov's account.

Uriagereka (1999) devises an account that targets more narrowly those cases in which a subject is an island. Building on ideas in Kayne (1994), he suggests that when two phrases are sisters, the first one is spelled-out as an X^o. In this way subjects derive their islandhood from whatever it is that makes X^{o}s islands. This approach too faces certain difficulties. For example, it will not easily allow the lower VP in (3) to escape becoming an island. If this VP is subject to the spell-out process that Uriagereka proposes, by virtue of being to the left of the phrase it is sister to, then it will be turned into an island. If, by contrast, it is in this position because it has moved from some underlying right branch position (a solution to the ordering of VPs and their modifiers that Kayne often exploits), then they will become islands by virtue of their derived position (along the lines that the phrases in (5) do). We have cause to seek an alternative to Uriagereka (1999) too, then.

Of course, I will not promise that the proposal I make in the sections that follow does not similarly face problems; but they will be different, and I hope more surmountable, ones.

1. A tree building algorithm

Since the Adjunct Condition is framed purely in terms of phrase-marker geometry, I suggest that we look to the mechanisms that produce phrase-markers for its source. Let's take as our starting point the procedure

for building phrase-markers that Chomsky (1995) offers. This algorithm builds trees up from the bottom, starting with a list of terminal items he calls a Numeration. Items are removed from the Numeration in pairs and "merged" into a binary branching phrase, which is then returned to the Numeration. This step repeats until there is only one element in the Numeration, an element that contains all of the terminals that started out as individual elements. An informal definition of this procedure is in (10); and the "run" in (11) illustrates how it would create the phrase "I flew to Tromsø this week."

(10) a. The NUMERATION (N) begins with the set of terminal items that will build the phrase marker.
b. MERGE removes two members, α, β, from N, forms: [$_\gamma\{\alpha,\beta\}$] and enters [$_\gamma\{\alpha,\beta\}$] into N, where γ is the projection of either α or β.
"[$_\gamma\alpha$]" signifies that γ is the immediate mother of α.
"$\{\alpha,\beta\}$" signifies that α and β are sisters.[3]
c. Repeat Merge until N has just one member: submit that element to PF and LF.

(11) 1. N = {I, v, flew, to, Tromsø, this, week }
2. N = {I, v, flew, [$_\gamma${to, Tromsø}], this, week }
3. N = {I, v, flew, [$_\gamma${to, Tromsø}], [$_\gamma${this, week}] }
4. N = {I, v, [{flew, [$_\gamma${to, Tromsø}]}], [$_\gamma${this, week}] }
5. N = {I, v, [$_\gamma$[$_\gamma${flew, [$_\gamma${to, Tromsø}]}], [$_\gamma${this, week}]}] }
6. N = {I, [$_\gamma${v, [$_\gamma$[$_\gamma${flew, [$_\gamma${to, Tromsø}]}], [$_\gamma${this, week}]}]}] }
7. N = { [$_\gamma${I, [$_\gamma${v,[{[$_\gamma${flew,[$_\gamma${to, Tromsø}]}], [{this, week}]}]}]}] }
= an unlinearized "I flew to Tromsø this week."

Two important features of this procedure are that it allows for only binary branching trees and it does not specify how sisters are linearized. Chomsky suggests that the linear order of sisters be determined in the syntax to phonology interface, and this idea will play a central role in what follows.

This procedure has very little controls on it, and as a consequence may build from any given set of terminals wildly many unattested trees. We may assume that many of these will be prevented because of their inability to be semantically interpreted: there must be some semantic procedure for each pair of sisters that allows their denotations to be combined.

[3]I offer these definitions in place of Chomsky's because I have not found a consistent way of defining the sets which Chomsky's definitions would require.

Many other trees will be blocked by language-particular category-based constraints. In English, for instance, adjective phrases do not combine with prepositional phrases.[4]

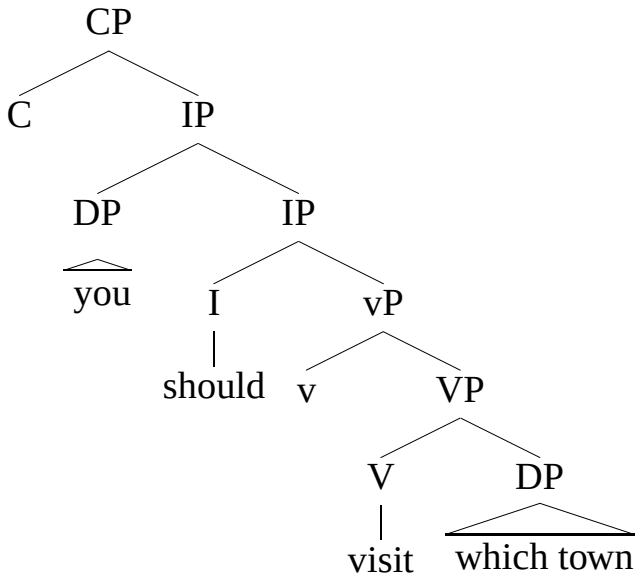
Finally, we must guarantee that subjects and modifiers are sisters to phrases, not X^os, giving only complements the ability to combine with X^os. It is this assumption that underlies the description I have given to the Adjunct Condition. For our purposes, we may adopt the condition in (12) for this need.

(12) If an X^o merges with a YP, then YP must be its argument.

This will require that"subjects" never be the arguments of an X^o, ensuring that they become subject to the Adjunct Condtion.

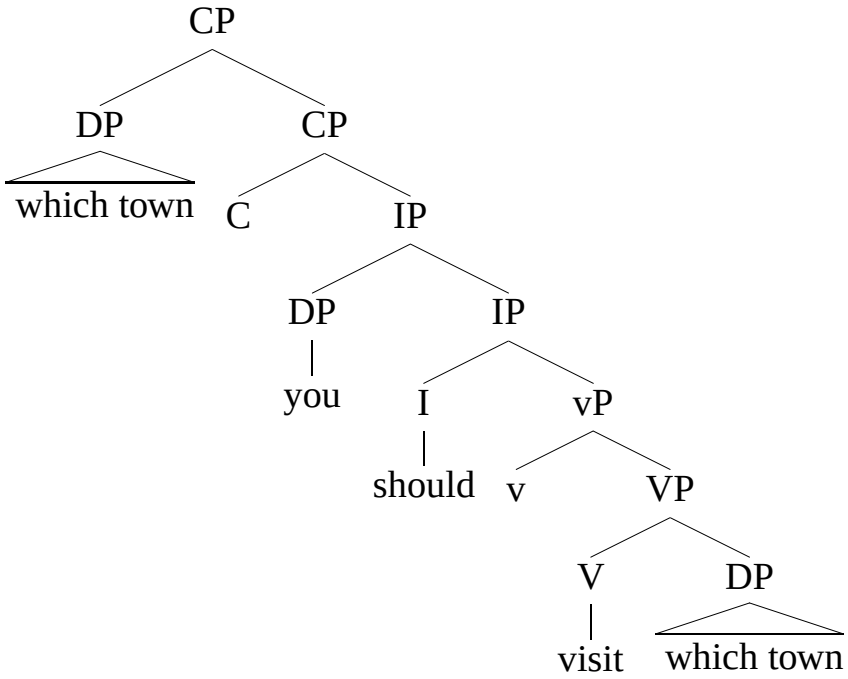
One of the goals of Chomsky (1995) is to let the tree-building procedure and the movement operation interleave. Indeed, he proposes that the Merge part of the tree building algorithm is also responsible for (part of) the syntax of movement operations. For instance, it is Merge which is (partly) responsible for building the representation in (13b) from the underlying one in (13a).

(13) a.



[4]The line dividing these two sorts of constraints is not always clear, of course.

b.



(The representation in (13b) assumes that movement leaves silent copies, in part to account for phenomena like that illustrated by (9).) Merge brings together *which town* and the root CP of (13a) to form the CP in (13b).

Interestingly, however, this application of Merge has an asymmetry in it that is not part of Chomsky's use of Merge in forming phrase-markers. In particular, it is always the term that hasn't moved which projects. That is why this situation is commonly described as the wh-phrase merging, or adjoining, **to** the CP.

I suggest that we build this asymmetry into the tree-building algorithm as well. Indeed, I believe there is a way of doing this that explains why the Adjunct Condition distinguishes subjects and modifying adjuncts from complements.

2. A new tree building algorithm

I will modify the procedure in (10) so that it does not pick out items of the Numeration pairwise, but rather picks out one item from the Numeration and Merges others to that initial item.

(14) a. N begins with the set of terminal items that will build the sentence.
b. SELECT removes one item from N, let us call this "the host."
c. MERGE (α, β) forms [$_\gamma\{\alpha,\beta\}$], where γ dominates the host and is determined by the Projection Rules.

d. RENUMERATE places [$_\gamma\{\alpha,\beta\}$] into N.
e. Terminate when N has one member.

There are in (14) two other departures from Chomsky's procedure. One is that the category status of the phrases formed by Merge is determined along the way, by whatever the Projection Rules turn out to be. It is not essential for what follows that this be determined as the tree is produced, though it will be essential that every phrase have a category label at the end of the procedure. The other departure concerns how the construction of phrases relates to the Numeration. Because Chomsky's procedure Merges items symmetrically, there is no reason to frame it as he does, as a process that removes and restores items to the Numeration. The procedure could have been equivalently expressed as an operation that forms one set from another by joining two members of the original set into a single element of the resulting set. But being in or out of the Numeration is precisely how the procedure in (14) expresses the asymmetry. Moreover, expressing the asymmetry in this way allows for the possibility that phrases can be built up without being restored to the Numeration after every application of Merge. (14) exploits this possibility, and it plays a central role in what follows.

The rules that determine how phrases project will also play a role. We needn't delve into how these rules are precisely formulated; it will be enough to record two generalizations about their consequences.

(15) THE PROJECTION RULES
In [$_\gamma\{\alpha,\beta\}$],
a. If just one of α and β is a phrase, then make γ a projection of the non-phrase.
b. If both α and β are phrases, then make γ a projection of the phrase that dominates the host.

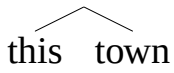
I will take these to be uncontroversial statements about normal practice in syntax: that when a head and a phrase combine, it is the head that projects; and that when one phrase adjoins to another, it is the other that projects. These rules do not fix how projection works in cases where one head adjoins to another. I will assume that something guarantees the correct outcome in these cases, and simply record in the derivations that follow what should occur. It's the rules in (15) that will do the work in what follows.

Making these changes to the procedure for building phrase markers — changes, incidentally, that leave untouched Chomsky's reasons for proposing an algorithm of this sort — treats the construction of adjuncts and non-adjuncts differently, and so takes us a step closer to our goal of explaining the Adjunct Condition. To see this, consider how the procedure could build the phrase: "flew to this town." Imagine that we begin with the Numeration indicated in (16), and go through the steps indicated in (17).

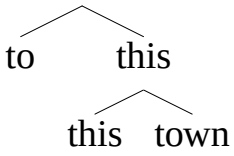
(16) N = {v, flew, to, this, town}

(17) a. **Select:**
town N = {v, flew, to, this}

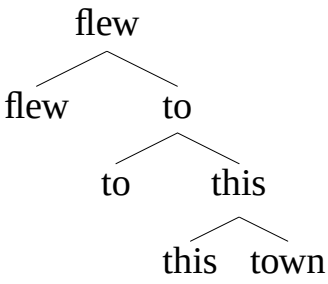
b. **Merge:**
this N = {v, flew, to}



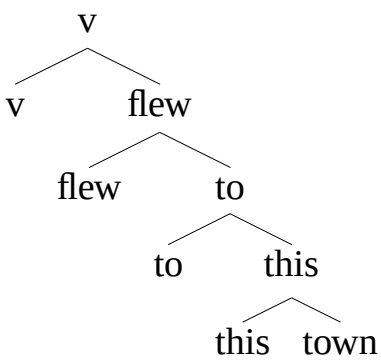
c. **Merge:**
to N = {v, flew}



d. **Merge:**
flew N = {v}



e. **Merge:**
v N = { }



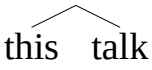
Note that Merge has applied iteratively, attaching things to the "host," *town*, and that with each application of Merge, except the first, the Projection rules have determined what the resulting phrase is. So, for instance, in step (17c) Merging *to* onto the determiner phrase *this town* results in a projection of *to*, that is, a prepositional phrase.[5] This is because in this case, an X^o is joining with a phrase, and the projection rules insist in that instance that it is the head that projects. And so it goes in all of the other instances of Merge in (17), and in each case the outcome is the expected, and grammatical, one. Further, note that in each instance of Merge, the condition in (12) is also obeyed — in each case a head is combining with a phrase that is its argument. This derivation, then, is permitted by the procedure.

Compare now how a similar phrase is constructed in which the PP is not an argument of the verb, but an adjunct instead, as in "flew after this talk." Although this can start with a Numeration that looks superficially like (16), it will not be able to precede in the same manner, iteratively adjoining terms to a host that is drawn from within the adjunct PP. There are two conceivable ways in which such a derivation could go, and each is blocked by a different constraint on the procedure. In one derivation, which mimics precisely (17), a violation of (12) will ensue at the point at which the verb is adjoined to the PP.

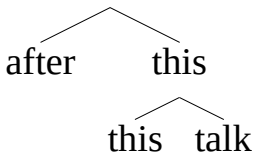
(18) N = {v, flew, after, this, talk}

(19) a. **Select:**
talk N = {v, flew, after, this}

b. **Merge:**
this N = {v, flew, after}

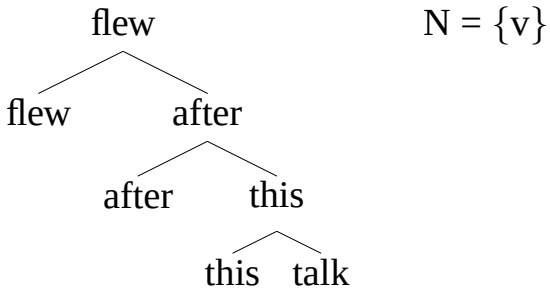


c. **Merge:**
after N = {v, flew}



[5]I have adopted here Chomsky's convention of labeling the phrase that Merge forms after the lexical item that is its head, rather than after the category that that item belongs to.

d. ***Merge:**



This derivation, in other words, violates the central assumption of this paper: that non-arguments cannot be sisters to heads.

The other derivation to consider is one in which the verb phrase to which the adjunct PP will be joined is built up first and then later Merged onto a host drawn from within the PP. This derivation is illustrated by (21), and it crashes because of the action of the projection rules.

(20) N = {v, flew, after, this, talk}

(21) a. **Select:**
v N = {flew, after, this, talk}

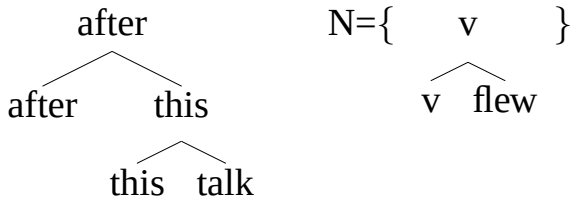
b. **Merge:**
v N = {after, this, talk}
v flew

c. **Renumerate:**
N = { v , after, this, talk}
v flew

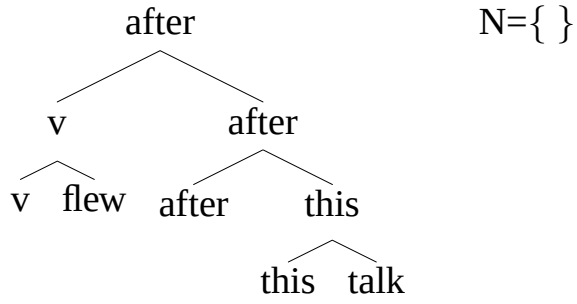
d. **Select:**
talk N={ v , after, this }
v flew

e. **Merge:**
this N = { v , after}
this talk v flew

f. **Merge:**



g. ***Merge:**

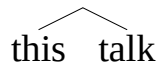


The projection rules require, as indicated, that it is the adjunct PP which projects in step (21g), and this forms a PP which does not conform to the well-formedness conditions on PPs in English.[6]

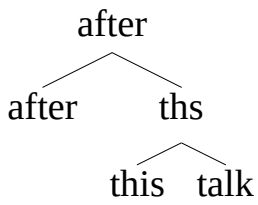
Instead of these two derivations, the one that is permitted by (14) is one in which, like (22), the adjunct is built up first and then later Merged onto the verb phrase.

(22) a. **Select:**
talk N = {v, flew, after, this}

b. **Merge:**
ths N = {v, left, after }

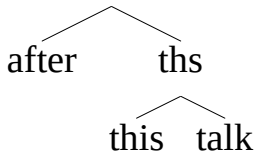


c. **Merge:**

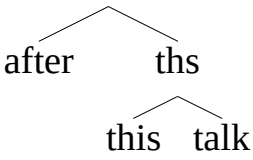


[6]Namely, PPs cannot begin with a VP in English.

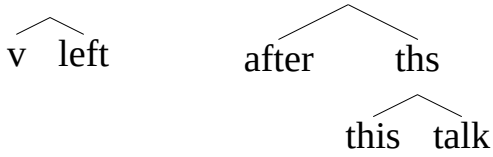
d. **Renumerate:**
N = {v, left, after }



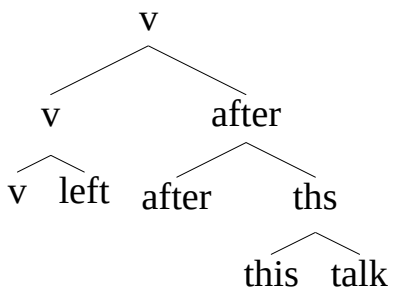
e. **Select:**
v N = {left, after }



f. **Merge:**
v N= { after }



g. **Merge:**
N = { }



Although there are a variety of other ways to build up this phrase, they will all involve constructing the adjunct PP, renumerating it, and then later introducing it into the phrase marker. In fact, this is quite general: no matter how complex the phrase marker, adjunct phrases will be forced to go through a step in which they are renumerated. This is how this procedure treats adjunct phrases and complement phrases differently.

Precisely the same consequence holds for subject phrases as well. If we maintain the standard assumption that subject arguments are not introduced into phrase markers as the sisters to heads, then a derivation like that in (19) will be blocked for subjects as well. And because subjects are like adjuncts in joining with a phrase that will project the subject's mother-node, the derivation in (21) is also inappropriate for subjects. In-

stead, in a fashion parallel to (22), subjects will have to be assembled first, renumerated, and then Merged onto the vP, or other phrase, that serves as their predicate.

By building the Projection Rules into the tree building algorithm, then, and importing the asymmetry that movement indicates Merge has, we are capable of forcing adjuncts and subjects to have a certain trajectory in their derivation that other phrases are not forced into. We are now able to answer the question what makes adjuncts and subjects a natural class: they are the phrases that are required to renumerate. But this does not yet answer the question why they are islands.

3. To make an island

A clue to what it is about subjects and adjuncts that makes them islands is found in the behavior of focus projection. Focus projection is the mechanism that relates phrases which are "focus marked" with the word that will signal focus marking by way of its prosody. This word will typically be within the focus marked phrase and will bear the prosody it would have if it was itself focus marked;[7] see Selkirk (1996), Rochemont (1986) and reference cited therein. Thus, for instance, in (23b), *Jerry* is focus marked and it therefore bears the characteristic pitch accent on its first syllable that marks this.

(23) a. Who did your friend talk to yesterday?
b. My friend talked to [$_F$ Jérry] yesterday.

The same intonation is appropriate in (24b) as well, even though here it is the VP that is focus marked.

(24) a. What did your friend do yesterday?
b. My friend [$_F$ talked to Jérry] yesterday.

Note that in each of these cases, the material that is focused has been determined by matching it against the information sought in the preceding question. These are special cases of the general truth that material which conveys new information is focused. Focus, then, is essentially a semantic/pragmatic phenomenon. I adopt here the thesis defended in Jackendoff

[7]Indeed, Selkirk explains this by arguing that this word, and all the phrases that dominate it up to the highest focus marked phrase are themselves also focus marked. See Schwarzschild (1999) for some problems with this position, however.

(1972) that syntactic representations mediate the semantic to phonology mapping of focus. Phrases have a syntactic diacritic on them — *F* — that informs the semantic component to interpret these phrases as focused, and informs the phonological component to assign the appropriate prosody. It is in this second component, the syntax-to-PF mapping, that focus projection operates.

Focus projection is of interest to us because it is subject to the Adjunct Condition. As (24) indicates, it is possible for a word within a complement phrase to bear the prosody that indicates that a higher phrase is focus marked. But this is not possible if the word is within an adjunct clause, as the contrast between (24) and (25) indicates.

(25) a. What did Larry Summers do last Fall?
b. *He [$_F$ complained after someone criticized the bómbing].

Placing pitch accent on *bombing* is not sufficient to signal that the higher VP is focus marked; instead it is necessary to place pitch accent on *complained* as well. An answer to (25a) must have the prosody indicated in (26).

(26) He [$_F$ compláined] [$_F$ after someone criticized the bómbing].

The prosody in (25b) is appropriate only if this sentence is an answer to (27a), and therefore needs only to have the temporal adjunct focus marked.

(27) a. When did Larry Summers complain about Harvard's faculty?
b. He complained [$_F$ after someone criticized the bómbing].

Similarly, it is not possible for a sentence to be focus marked if this is signalled by pitch accent on a word within a subject. Thus, pitch accent on *bombing* is not sufficient to license the focus mark on the sentence in (28b) in the way that it can license the focus mark on the subject in (29b).

(28) a. What happened last Fall?
b. * [$_F$ [Criticism of the bómbing] bothered Summers].

(29) a. What bothered Larry Summers last Fall?
b. [[$_F$ Criticism of the bómbing] bothered Summers].

To license focus marking on the entire sentence, it is necessary to place pitch accent within the VP somewhere, as in (30b) for example.

(30) a. What happened last Fall?
b. [$_F$ [Criticism of the bómbing] bothered Súmmers last Fall].

Interestingly, other types of islands do not seem to have a similar effect on focus projection. I believe it is possible for a word within a wh-island to license focus marking on a phrase outside that island, as in (31).[8]

(31) a. What did Larry Summers do last Fall?
b. He [$_F$ asked if Harvard fáculty should question the bómbing].

Similarly, "derived" islands do not seem to inhibit focus projection, as indicated by the contrast between (28b) and (32b).

(32) a. What happened last Fall?
b. [$_F$ [Criticism of the bómbing] was discussed].

Unlike (28b), the subject in (32) originates in an object position, and this seems to enable it to license focus marking on the entire sentence. That movement operations do not affect focus projection has long been known — see Selkirk (1996) and Rochemont (1986) for some discussion – and we might exploit the copy theory of movement in explaining this fact. If focus projection can be calculated from the copy that is left in the underlying position of a moved phrase, then these facts will emerge. In fact, the thesis that movement leaves copies of the moved phrase in the underlying position will combine with the proposals I make below concerning focus projection to derive the desired consequence.

Here, then, is the reason promised at the outset for setting up the adjunct condition so that it lumps together the islandhood of subject phrases and the islandhood of adjunct phrases, and sets these apart from the other islands. Because focus projection is sensitive to the islandhood of subjects and adjuncts, but not other islands, it reveals this particular partitioning. Of course, one may wonder if the behavior of focus projection should be taken to reveal anything about the behavior of movement operations. There is no *a prior* reason to think that constraints on one of these phenomena should be related to constraints on the other. I will offer an argument in section 4 on behalf of treating the constraints we see in these two processes as having the same source. But let us first examine how the

[8]Though Lisa Selkirk warns that this is not clearly true in the general case. Note that in this example it is necessary for there to be at least two pitch accents within the embedded clause, parallel to the case in (30b).

method of distinguishing adjuncts from complements that the tree building algorithm sketched in the previous section would apply to cases of focus projection.

Assuming that tree building algorithm introduced here, it is possible to describe focus projection as follows:

(33) FOCUS PROJECTION
If XP is focus marked, then XP must be constructed from a host which bears the prosody of focus marking.

Recall that the "host" is the word to which the tree building algorithm recursively adjoins items in the Numeration. In a case like (24), then, in which a focus-marked VP is signaled by pitch accent on a word within that VP's object, (33) would be satisfied under an application of the tree building algorithm like that in (34).[9]

(34) a. **N** = { my , v, talked, to, Jérry}

my friend

b. **Select:**

Jérry N = { my , v, talked, to}

my friend

c. **Merge:**

to N = { my , v, talked}

to Jérry my friend

d. **Merge:**

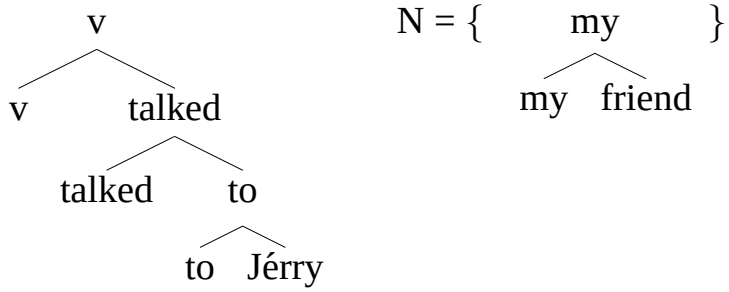
talked N = { my , v}

talked to my friend

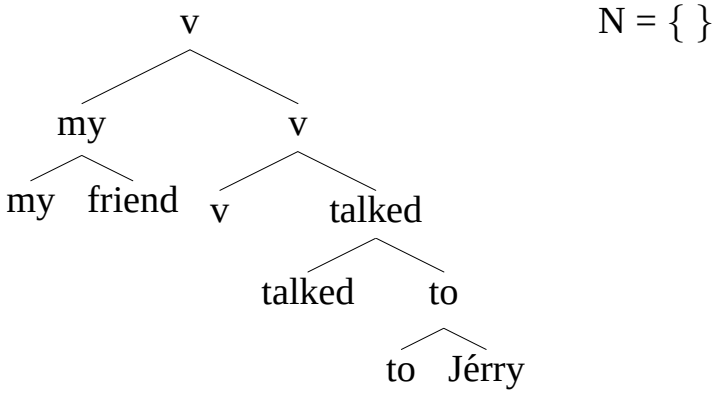
to Jérry

[9]We begin looking at the derivation of (24) at the point at which the subject DP has been constructed and renumerated. Additionally, I have suppressed various of the functional projections that go into building a finite clause; the result is that we must pretend that this sentence is a verb phrase.

e. **Merge:**



f. **Merge:**



Because *Jérry* is the host in this run of Merge operations, (33) allows this VP to be focus marked.

Consider by contrast how the tree building algorithm will relate phrases to hosts in situations where an adjunct is involved. In these situations, as we have seen in the previous section, the hosts will be part of phrases that are necessarily Renumerated before larger phrases containing the adjunct, are built. What is unique about adjuncts, then, is that the hosts which they contain will be Renumerated before larger phrases, whose focus marking they could license, are build. It's Renumerating a host, then, that we want to disable it from being a licenser of focus marking. What is it about Renumeration that could have this effect?

On the Jackendovian model of focus marking adopted here, focus projection is a quintessential syntax to phonology mapping operation. It relates the syntactic diacritics of focus marking to the prosodic devices that signal the presence of that diacritic. Let us assume, therefore, that Renumeration has an effect on the syntax to phonology mapping. In particular, I propose:

(35) NUMERPHOLOGY
Elements in the Numeration get their syntax to phonology mapping values fixed.

Numerphology is a variety of the "cyclic Spell Out" hypothesis that is found in much current literature.[10] I intend it to mean that every item that is entered into the Numeration becomes subject to the procedures which govern the syntax to phonology mapping, and the relations those procedures establish become fixed. For instance, if (33) is to relate a focus marked phrase with an appropriately prosodically marked word within it, this will be indelibly done when that phrase becomes part of a Numeration. Thus, because an adjunct is put into the Numeration before the VP or sentence that contains it is built, any word within an adjunct that could license focus marking will be able to do so only with respect to phrases within the adjunct. Hence, the tree building algorithm requires adjuncts to be Renumerated before they are merged into the phrases that contain them, and Numerphology will force focus projection to be calculated and fixed at that point. Together, Numerphology, the formulation of Focus Projection in (33), and the tree building algorithm from the previous section, correctly block focus projection out of adjuncts and subjects.

This is far from a complete characterization of focus projection, as it leaves out important qualifications concerning, among other things, the influence of prosodic phrasing, and the influence the semantic interpretation of focus has. But there is one important respect in which these proposals are insufficient that I would like to try to address.

As it stands, the rather weak definition of Focus Projection in (33) horribly overgenerates. In addition to allowing the correct placement of pitch accent for the focus marked VP in (24), it would also allow pitch accent on the verb, as in (36), to signal focus marking.

(36) a. What did your friend do yesterday?
b. *My friend tálked to Jerry yesterday.

But, as indicated, this is incorrect. It is not, however, that pitch accent on a verb can never signal focus marking on the VP it projects; this is possible in (37), for example.

(37) a. What did your friend do yesterday?
b. He tálked.

The difference between these two examples seems to be nothing but the presence of the object. We might describe the situation, then, as a com-

[10] See the articles in the Epstein and Hornstein (1999), and Chomsky (2001), for example.

petition among the possible sites for pitch accent which favors placement within a complement phrase. When pitch accent can be placed within the complement of the focus marked-phrase, as in (36), then it must be. What's needed, then, is a tighter control on where pitch accent can fall that, among other things, expresses this competition.

Fortunately, expressing focus projection with (33) offers a very simple method of doing this. Because it requires that a focus marked phrase be constructed from the word that bears pitch accent, it will steer how phrases are constructed in a way that tracks focus projection. Consider how this will apply to phrases that have a complement, as in the VP *talk to Jerry yesterday*. When pitch accent falls on *Jerry*, this VP can be built in the way indicated in (34), by successively Merging items to *Jerry*, projecting phrases of the appropriate sort along the way. Consider by contrast how this VP will have to be built-up if pitch accent is to fall on *talked*. In this situation, the complement will have to be constructed prior to the formation of the VP and Merged into the VP later. We are looking at a derivation like (38).

(38) a. **N** = { v, tálked, to, Jerry}

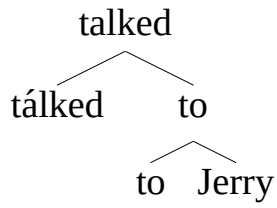
b. **Select:**
Jerry N = { v, tálked, to}

c. **Merge:**
to N = { v, tálked}
to Jerry

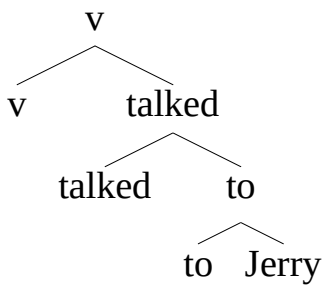
d. **Renumerate:**
N = { v, tálked, to }
to Jerry

e. **Select:**
tálked N = { v, to }
to Jerry

f. **Merge:**



g. **Merge:**



This derivation contains more steps than one in which the VP is built up from *Jerry* directly; there are the additional steps involved in renumerating the complement and starting over with a new host. Therefore to force pitch accent into the complement of a focus marked phrase, and to do so only when that complement is present, it is sufficient to make reference to this difference in the derivations involved, perhaps with something like (39).

(39) SHORTNESS
Construct phrases with the minimal number of steps.

This will dramatically cut down the ways in which focus projection can proceed, not only shoring up this particular deficiency, but also weeding out many of the options that are otherwise incorrectly permitted.

One thing to note is that if Shortness is to be a general solution to the problem of favoring pitch accent within a complement to the focus marked phrase, then it will be necessary to independently force complements to heads to always be phrases. This is partly what makes Shortness succeed in the verb-complement case we've just examined. As a consequence, it will not spread, for example, to correctly distinguish (40b) from (40c), under the assumption expressed in the derivations up to now that *to Jerry* is formed by Merging *to* and *Jerry* directly.

(40) a. What did you friend do yesterday?
b. He talked to Jérry.

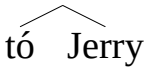
c. *He talked tó Jerry.

This is because building the VP *talked to Jerry* from the host *Jerry* will have the same number of steps as building it from *to*, if *to* and *Jerry* are the only terminals within the PP they form. To see this, compare how this VP is built from *Jerry* in (34) with how it is built from the host *to* in (41).

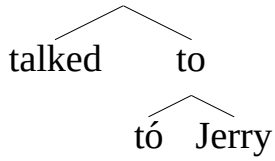
(41) a. **N** = { talked, tó, Jerry}

b. **Select:**
tó N = { talked, Jerry }

c. **Merge:**
to N = { talked }



d. **Merge:**
talked N = { }



The derivations in (34) and (41) have the same number of steps in them. For these cases to be correctly distinguished, then, it is necessary to assume that *Jerry* is part of a phrase whose other contents are phonetically null. We might adopt the proposal in Longobardi (1994), for instance, that there is a determiner hidden in noun phrases of this sort; or we might take recourse to one of the many other functional heads thought to be hidden within DPs. In any case, what these considerations indicate is that the method of steering the placement of pitch accent proposed here makes it very sensitive to the syntax of the phrases involved, opening up many venues for testing its validity.

But our more immediate concern is what focus projection teaches us about the source of the adjunct island condition as it applies to movement operations. What I have suggested is that focus projection indicates that adjunct islands are a syntax-to-PF phenomenon — they arise because Numerphology requires that phrases which are entered into the Numeration get their syntax-to-PF information fixed and the tree building algorithm requires that adjuncts get entered into the Numeration before they

are merged into the phrase that contains them. This blocks focus projection out of adjuncts, as shown in this section, but how does it prevent movement out of adjuncts?

Recall that the tree building algorithm adopted here does nothing more than fix the hierarchical relationships among terms in a phrase marker. It does not fix the linear order these terms will have. Let us assume, as Chomsky (1995) does, that the linear order of terms is also fixed as part of the syntax-to-PF mapping. Moreover, let us adopt the commonplace assumption that this linearization process respects the hierarchical relations by never letting daughters of some term, X, have material between them that is not also a daughter of X. (That is, in the idiom of phrase marker trees, don't let lines cross.) Because the tree building algorithm allows only binary branching trees, this can be guaranteed with:

(42) BASIC LINEARIZATION PRINCIPLE
Sisters must be adjacent.

Under these assumptions, the islandhood of adjuncts will be derived for movement in the same what that it has been here derived for focus projection. Once an adjunct is built and renumerated, Numerphology will force all of the terms within that adjunct to have their linear position fixed. As a consequence, every term within that adjunctmust surface adjacent to some other term within that adjunct. Under the reasonable assumption that movement out of the adjunct would require the moved term to no longer be adjacent to material within the adjunct, this will preclude movement from the adjunct.

4. Conclusion

The proposals here are built on the following logic. First, we observe that there is a similarity in the processes which adjoin one phrase to another in the context of movement and in the context of Chomsky's tree building algorithm. If that similarity is strengthened to identity in one particular way, then it has the consequence of introducing adjuncts into a phrase marker differently than it does complements. My way of distinguishing adjuncts from complements, then, flows from the thesis that the similarity in movement and tree building should be built into the grammar in the particular way that I propose.

That this distinction has the consequence of making islands out of adjuncts is, I have suggested, a consequence of the way that the tree building algorithm interacts with the syntax-to-PF interface. In its essentials, the

proposal is that phrase markers are built in pieces, and the pieces then assembled. Every time a piece is set aside for later assembly, its syntax-to-PF mapping is calculated and set. Because the tree building algorithm forces adjuncts to be pieces, they will undergo this syntax-to-PF mapping in isolation, preventing them from interacting with material outside the adjunct in any syntax-to-PF way. Assume that linear ordering is a syntax-to-PF phenomenon, and this will block movement from adjuncts.

That we should view the islandhood of adjuncts as a consequence of the syntax-to-PF mapping rests on the observation that Focus Projection obeys the adjunct island condition. I do not think there should be any controversy about whether Focus Projection is a syntax-to-PF phenomenon; if syntax has anything to do with it, then what else could it be? So I will not dwell on that part of the argument. But there could be some worry that the apparent similarity in the constraints on focus projection and movement is merely accidental. My conclusion that adjuncts are islands for movement because of how they are interpreted by PF rests on the assumption that adjuncts are islands for movement for the same reason that they are islands for focus projection. But this isn't obviously true at all. If we look at the full set of constraints on focus projection and compare them to the full suite of constraints on movement, it's quite clear that they vary significantly. The fact that there is an overlap with respect to adjuncts could have no more significance than that these portions of their behavior are featured in this paper.

Let me conclude, then, by addressing this issue. Is there any reason to believe that focus projection and movement are subject to the very same force responsible for making adjuncts islands?

One way of testing this hypothesis is to manufacture examples in which movement and focus projection are forced to compete because of the Adjunct Condition. Consider, for example, a scenario in which focus projection and movement are pitched against each other for access to a complement. If their sensitivity to adjunct islands is a result of the same cause, then such a scenario might exist. This doesn't settle the issue, of course, as it leaves open the possibility that they come to be sensitive to the islandhood of adjuncts through different means. But it will at least indicate that it is the adjunct status of adjuncts that makes these phrases island for both movement and focus projection.

I can think of one environment where such a scenario might be manufactured. It occurs in cases where a verb has two complements. According

to the mechanism for building phrase markers sketched in section 2, there can be at most one complement for any given phrase. In contexts, then, where there are apparently two complements, one of these must actually be an adjunct. This may be surprising, as in such cases it certainly appears that neither "complement" is an island for extraction:

(43) a. Who did you give [a book about John] [to]?
b. Who did you give [a book about] [to John]?

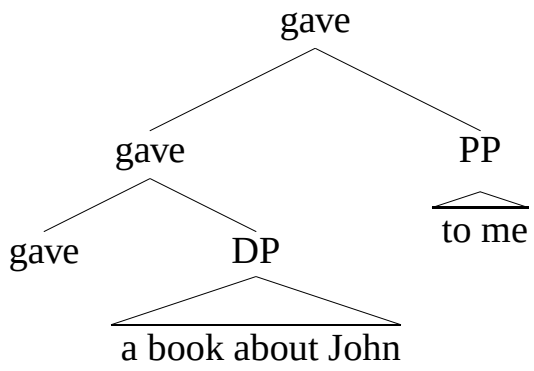
Similarly, focus projection is possible from a term within either complement:

(44) a. What did Sally do yesterday?
b. She [$_F$ gave [a book about Jóhn] [to me]].
c. She [$_F$ gave [a book about me] [to Jóhn]].

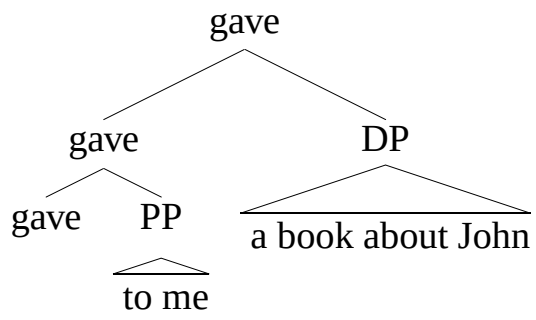
We might even see these sorts of examples as a challenge to the overall typology of islands presupposed here.

In fact all that these cases illustrate is that either of the two phrases may be the complement, and which is the complement is not prejudiced by the surface linear order. The principles which linearize postverbal phrases are capable of placing an adjunct between a verb and its complement, as has been long recognized. More concretely, we may assume that either of the underlying arrangements in (45) may give rise to the linear order of terms found in (44b).

(45) a.



b.



There is plenty of independent support for this — in particular, there are many diagnostics for constituency that indicate that a verb may form a constituent with the second of its two complements that excludes the first complement. I will take this to be uncontroversial.

So here is an environment where either of two phrases may be a complement, but not both. Thus we should expect extraction from both phrases will be ungrammatical, and we should expect, similarly, that focus projection from both phrases will be blocked. It is not possible to test the prediction that extraction from both is ungrammatical in English, as there are independent properties of extraction which will prevent these cases. Similarly, there is a prohibition on "overmarking" focus that will block focus projection from both these complements.[11]

More directly interesting for our purposes, however, is the expectation that movement out of one of these phrases should not be simultaneously possible with focus projection out of the other. I will try to design an environment in which this expectation can be tested. What is required is a situation in which sentences that involve a movement operation are simultaneously in a context that calls for their VPs to be focus marked. One such environment arises when there is a list of sentences, each one of which presents new information by virtue of its focus marked VP, and each of the sentences is a question. This might happen in nature, for example, during the bedtime ritual that parents and their young children frequently engage in. Consider a situation in which a father is sharing with his child in a bedtime storybook filled with interesting pictures. We might hear an exchange like that in (46).

(46) a. Dad: Let's see what the mouse did in this picture. What did the mouse [$_F$ give to the cát]?
b. Child: a book about cat-food!
c. Dad: What did the mouse [$_F$ read to the giráffe]?

[11] See (Schwarzschild, 1999, p. 156) for a condition that would also block these scenarios.

d. Child: a book about trees!
e. Dad: What did the mouse [$_F$ send to the snáke]?
f. Child: a book about mice!!

As indicated, each of father's questions involve a focus-marked VP, by virtue of the list that these sentences are forming, and an object DP has moved out of these VPs to form the question. In each case, note, the focus marking on the VP is signaled by pitch accent within the complement PP. These sentences, then, have the ingredients we are in need of.

What we should expect is a contrast between (46) and a parallel situation in which the wh-phrase moves out of an object. If the method of deriving the adjunct condition proposed in this paper is correct, this scenario should force either the direct object or the indirect object to be an island, consequently blocking ether focus projection or movement. This does indeed seem to be the case. Compare (46) with (47).

(47) a. Dad: Let's see what the mouse did in this picture.
What did the mouse [$_F$ give a book about to the cát]?
b. Child: cat-food!
c. *Dad: What did the mouse [$_F$ read a book about to the giráffe]?
d. Child: trees!
e. *Dad: What did the mouse [$_F$ send a book about to the snáke]?
f. Child: mice!!

Instead, pitch accent is required in quite a few additional places for these questions to be uttered correctly. I think at least the noun of the direct object needs pitch accent, and the main verb may as well.

(48) a. Dad: Let's see what the mouse did in this picture. What did the mouse [$_F$ gíve a bóok about to the cát]?
b. Child: cat-food!
c. Dad: What did the mouse [$_F$ réad a bóok about to the giráffe]?
d. Child: trees!
e. Dad: What did the mouse [$_F$ sénd a bóok about to the snáke]?
f. Child: mice!!

The particular pattern of pitch accent in (48) does not follow from anything that has been proposed here. But an informal way of thinking about what is happening in (48) is to see the additional pitch accents as being required to license focus marking on smaller pieces of the VP. In other

words, maybe the newness of the VP is being achieved by focus marking its parts individually, and the proliferation of pitch accents is the consequence.

Even if the particular pattern of pitch accents in (48) is not understood, the unavailability of the intonation in (47) is what is predicted. For the direct object not to be an island for extraction it will have to occupy the complement position, and this will mean the indirect object must be in adjunct position. This will make the indirect object an island for focus projection, and the pitch accent on the noun within cannot therefore license focus marking on the VP. The best this pitch accent can do is license focus marking on the indirect object itself; the remainder of the VP must get focus marked through some other means.

These examples are no doubt too complex for the necessary controls on all potentially relevant factors to be present. Still, if they are representative, then they suggest that it is correct to subject movement operations and focus projection to one and the same adjunct condition. With luck, the proposals in this paper have moved us closer to that goal.

References:

Chomsky, Noam. 1986. *Barriers*, MIT Press, Cambridge.

Chomsky, Noam. 1995. 'Bare phrase structure', in Gert Webelhuth (ed.), 'Government and Binding Theory and the Minimalist Program', Blackwell, Cambridge, Massachusetts., pp. 385–439.

Chomsky, Noam. 2001. 'Derivation by phase', in Michael Kenstowicz (ed.), 'Ken Hale: A Life in Linguistics', MIT Press, Cambridge, Massachusetts, pp. 1–52.

Epstein, Samuel and Norbert Hornstein. 1999. *Working minimalism*, MIT Press, Cambridge, Massachusetts.

Huang, C.T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar*, Ph.D. thesis, Massachusetts Institute of Technology, Cambridge, Mass.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*, MIT Press, Cambridge, MA.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*, MIT Press, Cambridge, Mass.

Lasnik, Howard and Mamoru Saito. 1984. 'On the nature of proper government', *Linguistic Inquiry* **15**, pp. 235–290.

Lasnik, Howard and Mamoru Saito. 1992. *Move α: Conditions on Its Application and Output*, MIT Press, Cambridge, Mass.

Longobardi, Giuseppe. 1994. 'Reference and proper names', *Linguistic Inquiry* **25**, pp. 609–665.

Müller, Gereon and Wolfgang Sternefeld. 1993. 'Improper movement and unambiguous binding', *Linguistic Inquiry* **24** (3), pp. 461–507.

Rochemont, Michael. 1986. *Focus in generative grammar*, John Benjamins Publishing Company.

Schwarzschild, Roger. 1999. 'GIVENness, AVOIDF and other constraints on the placement o f accents', *Natural Language Semantics* **7**, pp. 141–177.

Selkirk, Elizabeth. 1996. 'Sentence prosody: Intonation, stress, and phrasing', in John Goldsmith (ed.), 'The Handbook of Phonological Theory', chap. 16, Blackwell, London, pp. 550–569.

Stepanov, Arthur. 2000. 'The timing of adjunction', in Mako Hirotani, Andries Coetzee, Nancy Hall and Ji-Yung Kim (eds.), 'Proceedings of NELS 30', Graduate Linguistics Society Association, University of Massachusetts at Amherst, pp. 597–611.

Takano, Yuji. 2000. 'Illicit remnant movement: An argument for feature-driven movement', *Linguistic Inquiry* **31**, pp. 141–156.

Uriagereka, Juan. 1999. ‘Multiple spell-out’, in Samuel Epstein and Norbert Hornstein (eds.), ‘Working minimalism’, MIT Press, Cambridge, Mass., pp. 251–282.
Wexler, Ken and Peter Culicover. 1981. *Formal principles of language acquisition*, MIT Press, Cambridge, Mass.