Islands: A Mixed Analysis*

Yehuda N. Falk
Department of English
The Hebrew University of Jerusalem
msyfalk@mscc.huji.ac.il
http://pluto.mscc.huji.ac.il/~msyfalk/

1. Overview: Syntax vs. Pragmatics

Ever since Ross (1967), one of the topics that has dominated the literature on *wh* (long-distance dependency) constructions is that of "islands," regions of sentences which are opaque to *wh* dependencies.

(1) a. *This book, I know a student who read. [Complex NP Constraint]
b. *What did you eat bagels and? [Coordinate Structure Constraint]
c. *It was the Mets that I traveled to New York before I watched. [Adjunct Condition]
d. **Star Trek*, to watch is important. [Sentential Subject Condition]

While Ross simply listed types of structures which display this opacity, subsequent literature has attempted to discover unifying principles to explain islandhood. Despite these efforts, none has been entirely successful. The purpose of this paper is to discuss the source of island constraints, and to propose an LFG account of islands which differs somewhat from the standard account in Kaplan and Zaenen (1989).

The literature on islands can be basically split into two groups: those that provide a syntactic explanation and those that provide a pragmatic explanation. For example, consider the ill-formedness of (2).

(2) *Which word processor did you hear the rumor that Bill Gates uses?

In the transformational literature going back to Chomsky (1977), the ungrammaticality of this sentence is attributed to the inability of the *wh* phrase to move in local steps, due to the intervention of an NP (or DP) node. That is to say, it is seen as a technical structural limitation, purely syntactic in nature. Similarly, other islands are taken to be the result of the failure of local movement, and thus purely syntactic in nature.

Syntactic accounts of the ill-formedness of (2) are not limited to the transformational literature: one finds them also in LFG. The standard LFG account of the ill-formedness of (2), due to Kaplan and Zaenen (1989), traces it to constraints on the path between the two grammatical functions borne by the *wh* element: in English, the path is limited to COMP, XCOMP, and OBL_θ, but in this case it would have to go through OBJ. There are important differences between the transformational account and the LFG account. In LFG, islands are based on grammatical functions rather than on structural configurations, and they are the result of a language specific description of the path

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rather than inherent properties of the *wh* construction. This latter point means that different languages can have different islands. For example, as noted by Kroeger (1993) while English treats sentential subjects as islands, Tagalog allows *wh* constructions to cross sentential subjects,[1] and disallows sentential non-subjects on the path.

(3) a. Alin ng kotse ang sinabi mo kay Pedro
which LNK car NOM PERF.say.OV 2.SG.ERG DAT Pedro
na binili ni Linda ?
COMP PERF.buy.OV ERG Linda
*'Which car was that Linda bought said to Pedro by you?'

b. *Alin ng kotse ang nagsabi ka kay Pedro
which LNK car NOM PERF.say.AV 2.SG.NOM DAT Pedro
na binili ni Linda ?
COMP PERF.buy.OV ERG Linda
'Which car did you tell Pedro that Linda bought?'

However, while the transformational view assumes more cross-linguistic uniformity than is justified, the LFG approach is based on the idea that islands are essentially arbitrary and can display infinite variation. There is more cross-linguistic uniformity than is suggested by the LFG approach.

On the other side, it has been observed that the ill-formedness of (2) is not a fact to be viewed in isolation. It is correlated with the inability of the fronted element to be pragmatically prominent in the clause in which it appears. Viewed from this perspective, islands are not arbitrary constraints imposed by the syntax, but rather a consequence of the informational content of sentences.

The exact nature of the pragmatic prominence is a little vague in the literature. One formulation is that the main clause has to be a comment on the fronted element, and in (2) it cannot be so interpreted (Kuno 1976, 1987):

(4) a. In a discussion of different word processors:
A: What about TextMangler?
B: #I heard the rumor that Bill Gates uses it.

b. *As for TextMangler, I heard the rumor that Bill Gates uses it.

A slightly different version of this account is that of Erteschik-Shir and Lappin (1979), under which the crucial concept is "dominance," the property of being the item to which the speaker intends to draw the attention of the hearer. This can be tested by making it the topic of further discourse.

[1]The Tagalog facts are a little more complicated than this, due to the nature of subjecthood in the language. What is meant here by "subject" is "pivot" in the sense of such studies as Dixon (1994) and Falk (2006). Similarly, the use of the passive in the main clause in the translation of the Tagalog sentence is intended to be evocative of the subject/pivot status of the clause, but is not intended to suggest that the object-voice construction has all the properties of the English passive. In the glosses, AV is actor voice and OV is object voice.

(5) a. John said: "I heard the rumor that Bill Gates won't use TextMangler."
b. #… which is a lie, he will.

It has also been proposed that fronted elements must be associated with clauses that are focal (i.e. present new information), and in (2) the subordinate clause is presupposed (Van Valin and LaPolla 1997, Erteschik-Shir 1997). For present purposes, the differences between these are not important, and the tests provided by Kuno and by Erteschik-Shir and Lappin typically give the same result: the crucial point is pragmatic prominence. For the most part, this paper will use tests consistent with Kuno's formulation.[2]

In this study, I will examine the nature of islands in light of the tension between the syntactic and pragmatic approaches. I will conclude that neither is adequate on its own: rather, (some) islands are grammaticalizations (i.e. syntactic expressions) of the pragmatic "aboutness" constraint. It will also transpire that pragmatics is not the only extra-syntactic factor involved in islands.[3]

2. Test Case: The Complex NP Constraint

2.1.Evidence for Pragmatics

Returning to (2), which is a case of the Complex NP Constraint, the idea is that it is ungrammatical because of a pragmatic prominence constraint. The reason that (2) is ill-formed is that *you heard the rumor that Bill Gates uses (it)* cannot be construed as being about *which word processor*. If we consider the f-structure of the sentence, we can see why there might be such a constraint.

(6)
$$\begin{bmatrix} \text{FOCUS} & \begin{bmatrix} \text{DEF} & \text{WH} \\ \text{PRED} & \text{'word processor'} \end{bmatrix} \\ \text{TENSE} & \text{PST} \\ \text{SUBJ} & [\text{"you"}] \\ \text{PRED} & \text{'hear } \langle(\uparrow \text{SUBJ})(\uparrow \text{OBJ})\rangle\text{'} \\ \text{OBJ} & \begin{bmatrix} \text{DEF} & + \\ \text{PRED} & \text{'rumor } \langle(\uparrow \text{COMP})\rangle\text{'} \\ \text{COMP} & \begin{bmatrix} \text{SUBJ} & [\text{PRED} \quad \text{'Bill Gates'}] \\ \text{TENSE} & \text{FUT} \\ \text{PRED} & \text{'use } \langle(\uparrow \text{SUBJ})(\uparrow \text{OBJ})\rangle\text{'} \\ \text{OBJ} & \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Which word processor is a functional element of the main clause as well as of the subordinate clause. In this respect, it is similar to a raising nominal, which is also a functional element of two distinct clauses.

(7) a. Julius Caesar struck me as honest.
b. I found Julius Caesar (to be) boring.

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[2] I will not attempt to characterize pragmatic prominence formally in terms of i-structure.

[3] In addition to the considerations here; prosody also plays a role in some island constraints. For a case in Japanese (apparent *wh* island constraint and the "additional *wh* effect"), see Mycock (2006: 188€).

As noted by Postal (1974), these sentences are odd because there is an implication of direct perception of Julius Caesar by the speaker.[4] In other words, although *Julius Caesar* is not a thematic argument of the verb, it functions as an argument (SUBJ in (7a) and OBJ in (7b)), and thus displays argument-like properties. In the present case, *which word processor* functions in the main clause as a discourse-prominent element (FOCUS). Its inability to be discourse prominent in the main clause naturally causes the sentence to be ill-formed. In the case of long-distance dependency constructions, as in the case of raising, the syntactic designation of an element as having a grammatical function in a higher clause results in semantic/pragmatic properties appropriate to that grammatical function.

The pragmatic analysis of the CNPC is supported by the observation that changing the sentence in order to make a pragmatically prominent reading for the fronted element more plausible improves the *wh* construction. For example, replacing the definite article with the indefinite article improves the ability of the fronted element to be discourse prominent in the main clause.

(8) a. In a discussion of different word processors:
A: What about TextMangler?
B: ?I heard a rumor that Bill Gates uses it.

b. ?As for TextMangler, I heard a rumor that Bill Gates uses it.

The *wh* question is also improved:

(9) ?Which word processor did you hear a rumor that Bill Gates uses?

The amelioration when the indefinite article is used is a result of the fact that the definite article carries with it more semantic/pragmatic content (in the form of a claim of familiarity or identifiability) and is therefore less conducive to making something else pragmatically prominent.

In a related vein, the following contrast has often been noted:

(10) a. *Which word processor did you hear the claim that Bill Gates uses?
b. Which word processor did you make the claim that Bill Gates uses?

Here again, the contrast is matched by the possibilities of pragmatic prominence.

(11) a. A: What about TextMangler?
B: #I heard the claim that Bill Gates uses it.

b. A: What about TextMangler?
B: The newspaper made the claim that Bill Gates uses it.

This contrast appears to be related to the fact that *make the claim* is synonymous with

[4]For related discussion, see Bolinger (1967) and Borkin (1973), among others. On similarities between Raising and *wh* constructions, see Alsina (2008).

claim, and thus has less semantic weight to it than a sequence like *hear the claim*.

Outside of the Complex NP Condition, this correlation between semantic/pragmatic content and the ability of embedded elements to be pragmatically prominent can be seen most clearly in the distinction between bridge verbs and non-bridge verbs.

(12) a. A: What about TextMangler?
B: My friend said that Bill Gates uses it.

b. Which word processor did your friend say that Bill Gates uses?

(13) a. A: What about TextMangler?
B: #My friend whispered that Bill Gates uses it.

b. *Which word processor did your friend whisper that Bill Gates uses?

In (13) the use of the verb *whisper* makes the manner of speaking pragmatically prominent, and thus blocks the fronted element from assuming a prominent status. It is this pragmatic status that results in the inability of *whisper* to be a bridge verb.

An alternative explanation that has been proposed for CNPC effects is that they are the result of processing difficulties (e.g. Sag, Hofmeister, and Snider 2007). Teasing apart the effects of pragmatics and processing is difficult, not in the least because it is plausible that pragmatic infelicity itself impedes processing. The experiment reported by Sag, Hofmeister, and Snider provides mixed results:

> In contrast to the filler effects [i.e. using *which*+NP, which is more informative that *what* or *who*], which start early and remain significant throughout nearly the entire filler-gap dependency, manipulating the type of the island forming NP [definite vs. indefinite] generates only small and temporary effects during the processing of the filler-gap dependency. Because of the sporadic and temporary nature of these effects, further experimentation is required in order to understand the effect of NP type on the processing of the filler-gap dependencies. What can be said, however, is that NP type plays less of a role in processing than filler-informativity, at least in extractions out of complex NPs.

It also should be noted that the existence of CNPC effects in "in-situ" constructions, discussed in the next section, casts doubt on the basic explanation offered by the processing account, as there is no "filler" that needs to be kept in memory. At the very least, studies of the processing of in-situ *wh* constructions would be needed.

To conclude, I propose that the cases I have discussed in this section are accounted for by the following pragmatic prominence constraint on long-distance dependency constructions:

(14) If an element f bears a grammaticized discourse function in a nucleus n, it must be interpretable as pragmatically prominent in n.

2.2. The Return of Syntax, Part 1

The previous section establishes a role for pragmatics in island constraints. However, the pragmatic condition is a consequence of the syntactic analysis; an item must have a pragmatic relation with the main clause because it bears a discourse-related grammatical function in that clause. Returning for a moment to the analogy with raising constructions, the "direct perception" property (and analogous properties for other raising verbs) are not present in non-raising versions of the construction, in which the "raising nominal" is not part of the higher clause. The sentences in (15) do not share the oddness of (7) above, precisely because of the difference in the syntax.

(15) a. It struck me that Julius Caesar was honest.
b. I found (that) Julius Caesar was boring.

Thus, syntax retains a role as well.

The syntactic aspect of the pragmatic prominence condition is relevant when considering the analysis of "in situ" *wh* constructions. Consider the following from Iraqi Arabic (Wahba 1991: 255):

(16) a. Mona itmannat tištiri šeno?
Mona hoped to.buy what
'What did Mona hope to buy?'
b. Mona nasat tištiri šeno
Mona forgot to.buy what
'What did Mona forget to buy?'
(also: 'Mona forgot what to buy.')

The question is whether 'what' is syntactically a functional element of the main clause in these sentences. In other words, which of the following is the functional structure of (16a): (17a) in which 'what' is only an element of the lower clause, or (17b) in which it is also an element of the higher clause?

(17) a.
$$\begin{bmatrix} \text{SUBJ} & [\text{“Mona”}] \\ \text{PRED} & \text{‘hope } \langle(\uparrow \text{SUBJ})(\uparrow \text{COMP})\rangle\text{’} \\ \text{COMP} & \begin{bmatrix} \text{SUBJ} & [\text{PRED } \text{‘PRO’}] \\ \text{PRED} & \text{‘buy } \langle(\uparrow \text{SUBJ})(\uparrow \text{OBJ})\rangle\text{’} \\ \text{OBJ} & [\text{“what”}] \end{bmatrix} \end{bmatrix}$$

b.
$$\begin{bmatrix} \text{FOCUS} & [\text{“what”}] \\ \text{SUBJ} & [\text{“Mona”}] \\ \text{PRED} & \text{‘hope } \langle(\uparrow \text{SUBJ})(\uparrow \text{COMP})\rangle\text{’} \\ \text{COMP} & \begin{bmatrix} \text{SUBJ} & [\text{PRED } \text{‘PRO’}] \\ \text{PRED} & \text{‘buy } \langle(\uparrow \text{SUBJ})(\uparrow \text{OBJ})\rangle\text{’} \\ \text{OBJ} & \end{bmatrix} \end{bmatrix}$$

From the present perspective, the crucial point is that this construction obeys the CNPC.

(18) *Mona ʕurfit il- bint illi ištarat šeno ?
Mona knew the- girl who bought what
'What did Mona know the girl who bought?'

The ungrammaticality of this sentence is a result of 'what' being functionally a part of the main clause. That is to say, the correct f-structure is (17b).

A similar set of facts can be seen in Kikuyu (Bergvall 1983). In Kikuyu, both "in situ" and "movement" constructions are possible:

(19) a. Oɣweʃiːria Goɣe oiɣirɛ mahɛirɛ keŋaŋi oː?
you.think Ngũgĩ said they.gave crab who
'Who do you think Ngũgĩ said they gave a crab to?'
b. Noo oɣweʃiːria Goɣe oiɣirɛ mahɛirɛ keŋaŋi?
FOC.who you.think Ngũgĩ said they.gave crab
'Who do you think Ngũgĩ said they gave a crab to?'

As in Iraqi Arabic, Kikuyu in-situ obeys the CNPC:

(20) a. *Mɔːnirɛ moːdo orea otiniriɛ mahao mareko?
they.saw person DEM cut flowers which
'Which flowers did they see the person who cut?'
b. *Kamau ɔːnirɛ moːdo orea oringirɛ o?
Kamau saw person DEM hit who
'Who did Kamao see the person who hit?'

Not all "in situ" constructions are island sensitive. For example, in Egyptian Arabic (Kenstowicz and Wahba 1983) more conservative speakers obey islands and more progressive speakers do not. Thus, the following is grammatical for some speakers but not for others.

(21) %Fariid simiʕ išaaʕit inn Mona yimkin titgawwiz miin?
Fariid heard rumor that Mona might marry who
'Who did Fariid hear a rumor that Mona might marry?'

This means that in the more progressive variety, there is no FOCUS in the f-structure and the question is not a functional-uncertainty construction.[5] In English, in situ questions are not island-sensitive. Ginzburg and Sag (2000) observe that non-echo in-situ questions are possible in English given a situation where the question has pre-existent discourse accessibility. The following example, an actual utterance, is a CNPC violation:

[5]As Louise Mycock points out (personal communication) this means that speakers of the same language use different strategies for forming wh questions. I see no reason to consider this a problem with the analysis.

(22) Talk show host Michael Krasny, addressing a guest who has not said anything yet, about the interim chief of the US Attorney's office:
This is a position that is HOW IMPORTANT in your judgment, Rory?

I conclude from the foregoing that "in situ" *wh* constructions sometimes involve multiclausal multifunctionality, as in "*wh* movement" constructions, and sometimes not. In the examples we have seen here, Iraqi Arabic, Kikuyu and conservative Egyptian Arabic are multifunctional constructions (i.e. long distance dependencies), while English and progressive Egyptian Arabic are not. I thus disagree with Mycock (2005, 2006), who takes the position that there is no functional uncertainty in "in-situ" constructions.[6]

Obviously, there is much more to be said about "in situ" *wh* constructions. However, consideration of islands provides one piece of the puzzle concerning the analysis of "in-situ" constructions.

2.3. The Return of Syntax, Part 2

In addition to inducing the pragmatic prominence condition, syntax plays a more direct role in some islands. In this section I will discuss the Complex NP Condition facts in English when the *wh* element is part of a relative clause rather than a complement clause.

Complex NP Condition violations with relative clauses are usually crashingly bad.

(23) a. *Which word processor have you made fun of people who like?
b. *TextMangler is the word processor that I have made fun of people who like.

This unacceptability corresponds, not surprisingly, to an inability to bear pragmatic prominence.

(24)#As for TextMangler, I have made fun of many people who like it.

As with complement clauses, it is possible to ameliorate the pragmatic effect by reducing the semantic content of the main clause.

(25) a. As for TextMangler, there are many people who like it.
b. As for TextMangler, I know many people who like it.

In Danish (Erteschik-Shir and Lappin 1979), the judgments on CNPC violations match the pragmatic status:

(26) a. *Det har jeg drillet mange der har gjort.
that have I made.fun.of many who have done
'That, I have made fun of many who have done.'

[6] Mycock (2005) observes that the prosody in in-situ constructions marks the focus and the scope of interrogativity. It would be interesting to see if there are prosodic differences between the two varieties of Egyptian Arabic.

b. Det er der mange der kan lide.
that are there many who like
'That, there are many who like.'
c. Det kender jeg mange der kan lide.
that know I many who like
'That, I know many who like.'

However, in English the facts are not quite so congenial. With *there*, there is some amelioration, although speakers disagree on how much.

(27) a. ?Which word processor are there many people who like?
b. ?TextMangler is a word processor that there are many people who like.

However, in other cases, there is little or no amelioration.

(28) a. *Which word processor have you found many people who like?
b. *TextMangler is a word processor that I have found many people who like.

This lack of amelioration is unexpected given the pragmatics-based analysis.

I propose to account for this difference between CNPC with complement clauses and CNPC with relative clauses by hypothesizing that in the latter case, the pragmatically based constraint has been grammaticalized, and the syntax disallows LDD constructions into relative clauses. That is to say, the CNPC for relative clauses is, in English, a syntactic constraint which, while it has roots in pragmatics, is no longer dependent on pragmatics.

I thus reject the idea which is implicit in much of the literature that all islands must be accounted for by the same mechanisms. While it is sometimes claimed that the theory is simpler if islands are a unified phenomenon, this is only true if the islands in question display similar properties. What we have seen here is that the CNPC itself is not a uniform phenomenon. While all CNPC effects have their roots in pragmatics, and specifically in the ability of the LDD element to bear pragmatic prominence in the higher clause, the CNPC as it applies to relative clauses has undergone grammaticalization in English (but not in Danish).

3. Other Islands

3.1. Adjunct Condition

One of the most puzzling constraints on LDD constructions is the inability of an LDD construction to go into an adjunct (in transformational terms, the inability to extract from an adjunct). The basic facts are clear:

(29) a. *Which astronaut did you get to the moon [before]?
b. *Which book did you cancel your library card [without reading]?
c. *Which cubicle did you read the file [in]?
(cf. Which cubicle did you put the file in?)

However, closer investigation reveals that things are not so simple. Bouma, Malouf and

Sag (2001) question the very existence of the Adjunct Condition, on the basis of examples like:

(30) a. Which student is Roger capable of working [independently of]?
b. Which people can Robin run [nearly as fast as]?
c. Who does Kim write letters [more frequently than]?

Even more puzzling are contrasts such as:

(31) a. *Which book did you go to the library [in order to read]?
b. Which book did you go to the library [to read]?

Pragmatics does not help us with these grammaticality contrasts. In general, elements of adjuncts are difficult but not impossible to interpret as pragmatically prominent.

(32) a. A: What about Neil Armstrong?
B: ?#I got to the moon before him.

b. A: Tell me about the Olympic running team.
B: ?#Robin can run nearly as fast as them.

This relative inability of elements of adjuncts to be pragmatically prominent is presumably a consequence of the looser connection that an adjunct has to its clause, as opposed to arguments. (This is reflected, for example, in the representation of adjuncts in the theory of Van Valin and LaPolla 1997, in which adjuncts are in the periphery.) On the other hand, the pragmatic status of elements of adjuncts is not as straightforward as that of elements of complex NPs; the correct context can make the discourses in (32) better. This is why extraction from adjuncts is (at least sometimes) essentially acceptable. However, there is a grammaticality contrast which is not the result of the pragmatic facts.

A closer look reveals that the clearest cases of ungrammatical extraction from adjuncts involve adjuncts which are PPs. In (29) and (31a) the adjunct is a PP (following Jackendoff's 1973 analysis of PP, under which such words as *before* and *after* are prepositions), while in (30) it is an ADVP and (31b) it is an infinitive clause (CP on the analysis of Falk 2001). I propose that the syntax designates adjunct PPs as islands, but not other adjuncts.[7] This singling out of PP adjuncts may be related to the

[7]Dalrymple (2001: 394) cites the following example of a grammatical LDD involving a PP adjunct:

(i) This room, Julius teaches his class in.

It is possible that the PP following *teach* is an argument. One possible piece of evidence for this is that a prepositional passive is possible for *teach in*, just as it is for *sleep in*:, and *do so* treats it as an argument rather than an adjunct.

(ii) a. This room has never been taught in before.
b. This bed looks slept in.

The following examples, due to Alex Alsina (personal communication), may also involve an argument PP; if not, they pose a problem for the analysis proposed here.

fact that PPs can, and commonly do, function as both arguments and adjuncts with no superficial distinction. The syntactic designation of PP adjuncts as islands, based on the pragmatic status of adjuncts, may be a formal distinction between adjunct and argument PPs.

The designation of PP adjuncts as islands has some systematic exceptions. There are several semi-idiomatic *wh* expressions which include a preposition, such as *what…for*, *where…at*, and *what time…at*. For the first two of these, pied-piping of the preposition is not even possible.

(33) a. What did you study Minimalism for? (cf. *For what did you study Mininalism?)
b. Where did you buy that book at? (cf. *At where did you buy that book?)
c. What time did you leave the party at?

I should note in passing that the observation that syntactically enforced islandhood of adjuncts is limited to PPs does not undermine the argument of Kaplan and Zaenen (1989) that the syntactic designation of islands uses grammatical functions and not constituent structure. Kaplan and Zaenen argue that argument/adjunct contrasts in islandhood can be found in Icelandic, where there is no structural distinction between arguments and adjuncts. While it is true that I have come to the conclusion that (at least in English) only adjuncts that are PPs are syntactically islands, it is also true (for both English and Icelandic) that only PPs that are adjuncts are islands. Reference to grammatical functions is still required in the designation of islands.

3.2. Sentential Subject Condition

I turn next to the Sentential Subject Condition. Unlike the cases I have dealt with earlier, pragmatic prominence does not appear to be a factor here. Constituents of sentential subjects can be pragmatically prominent.[8] Note the following:

(34) Concerning that book on nuclear physics, reading it was really an eye opener.

(35) A: What about *Star Trek*?
B: Watching it can teach you a lot about outer space.

The islandhood of sentential subjects thus cannot be attributed to pragmatics.

A promising alternative has been proposed by Kuno (1973) and modified by

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(iii) a. What language do you want me to write the paper in?
b. Who would you like to watch the movie with?

[8]Erteschik-Shir and Lappin (1979) present evidence that allegedly shows that sentential subjects cannot be pragmatically prominent ("dominant" in their terminology). However, their data are problematic. For example, one of their examples is

(i) Bill said: That Sheila knew all along is likely.
a. which is a lie—it isn't
b. *which is a lie—she didn't

But (ib) is infelicitous here for semantic reasons: even if Sheila did not know all along, Bill's claim that she was likely to is not a lie. Their other examples suffer from similar defects.

Grosu (1981). According to the Kuno-Grosu proposal, the Sentential Subject Condition is a result of a perceptual problem rather than a pragmatic one: extracting from a subject results in an incomplete constituent clause-internally. Under this proposal, there is a syntactic condition the function of which is to prevent difficult-to-parse structures.

That completeness of constituents is implicated is suggested by Kuno's observation that (for some speakers at least)[9] pied piping a whole PP is better than having a stranded preposition. (Grammaticality markings are those in Kuno.)

(36) a. Of which cars were the hoods damaged in the explosion?
b. *Which cars were the hoods of damaged by the explosion?
a. Which cars did the explosion damage the hoods of?

(37) a. Learning the spellings of some words is difficult.
b. *Which words is learning the spelling of difficult?
c. ?Of which words is learning the spelling difficult?

(38) a. Discussing anything serious with him is impossible.
b. *He is the kind of man who discussing anything serious with is impossible.
c. ?He is the kind of man with whom discussing anything serious is impossible.

(39) a. Playing war with these toy guns is very dangerous.
b. *You shouldn't give your children toy guns which playing war with is very dangerous.
c. ?You shouldn't give your children toy guns with which playing war is very dangerous.

Kuno and Grosu note that for some speakers the constraint applies to non-subjects as well, as long as they are not final constituents.

(40) a. *Here is something which doing strikes Mary as repulsive.
b. *Here is something which Mary considers doing repulsive.
c. Here is something which Mary has objected to doing (on numerous occasions).

And this is also true (although less sharply) with non-clauses:

(41) a. John handed a picture of Mary to Bill.
b. ??Who did John hand a picture of to Bill?

(42) a ?*Here is someone who the parents of have been murdered by assassins.
b. ?*Here is someone who John has turned the parents of down.
c. Here is someone who John dislikes the parents of (intensely).

[9] I find these examples ungrammatical.

The idea that the Sentential Subject Condition is the result of an incomplete non-final constituent is supported by its behavior in Spanish and Catalan (Alex Alsina, personal communication). In these languages, subjects can either be sentence-initial or sentence-final. Extraction is possible out of sentence-final subjects, but not sentence-initial subjects, as shown in the following Catalan sentences.

(43) a. Quines ulleres et sorprèn [que porti __]?
which glasses you surprise that I.wear
'Which glasses does it surprise you that I wear?'

b. *Quines ulleres [que porti __] et sorprèn?
which glasses that I.wear you surprise

Finally, a suggestive piece of evidence, cited by Grosu, is that SOV languages, in which all constituents are non-final, typically lack the Sentential Subject Condition. Grosu suggests that this is because they would have to rule out extraction from everything. Note the following examples of violations:

(44) Japanese (Haig 1976)

a. Kore wa kare ga tokumei de kaita koto ga yoku sirarete
this TOP he NOM pseudonym with wrote NOM well known
iru bun desu.
is article is
'This is the article that that he wrote (it) using a pseudonym is well known.'

b. Bob ga tabeta koto ga akiraka de aru yori takusan no
Bob NOM ate that NOM clear is than many GEN
imo o Paul wa tabeta.
potatoes ACC Paul TOP ate
Paul ate more potatoes than [[that Bob ate ___] is obvious].

(45) Imababura Quechua (Cole 1982)
Ima- ta- taj ali Juan wajcha- man kara- shka- ka ?
what- ACC- Q good Juan orphan- to give- NMNL- TOP
'What is it good that Juan gave to the orphans?' (Literally: 'What is that Juan gave to the orphans good?')

These languages do obey other island constraints; note the following examples from Imbabura Quechua, drawn from Cole (1982):

(46) a. CNPC
*Ima- ta- taj riku- rka- ngui randi- shka runa- ta ?
what- ACC- Q see- PST- 2 buy- NMNL man- ACC
'What did you see the man who bought?'

b. Left-Branch Condition
*Pi- paj- taj riku- rka- ngui alku- ta ?
who- of- Q see- PST- 2 dog- ACC
'Whose did you see dog?'

c. Coordinate Structure Constraint

*Pi- ta- taj riku- rka- ngui y Marya- ta mirkadu- pi ?
who- ACC- Q see- PST- 2 and María- ACC market- in
'Who did you see and María in the market?'

An exception to this is Navajo, in which some speakers obey the Sentential Subject Condition and others do not (Platero 1974).[10]

(47) ?Łéechąą'í iisxį- (n)ígíí shi- ł bééhózin- ígíí nahał'in.
dog PFCTV.3.kill- NMNL me- with is.known- REL IMPFC.3.bark
'The dog that I know to have killed (something) barked.'

However, as one would expect given the Kuno/Grosu analysis, the constraint is not limited to subjects in Navajo.

(48) ?Łéechąą'í nishxash- ígíí yinii'- ęę nahał'in.
dog 2.PERF.3.bite- NMNL PFCTV.1.hear- REL IMPFC.3.bark
'The dog that I heard bit you is barking.'

I conclude that the Sentential Subject Condition (in its various forms) is a syntactic constraint that prevents the creation of sentences that are difficult to parse. Like the (relative-clause) Complex NP Constraint and the Adjunct Condition, which prevent the creation of pragmatically awkward sentences, the Sentential Subject Condition is the grammaticalization of a non-syntactic property.

4. Formal Expression of Islands

4.1. Preliminaries

Given that (some) islands are enforced syntactically, the question is how this is expressed formally. The standard LFG approach, originally proposed by Kaplan and Zaenen (1989), is to restrict the grammatical functions on the *wh* path. For example, Kaplan and Zaenen incorporate the Adjunct Condition into the *wh*-paths of Icelandic and English as follows:

(49) Icelandic: $(\uparrow \text{TOPIC}) = (\uparrow (\text{GF}-\text{ADJ})^* \text{GF})$
English: $(\uparrow \text{TOPIC}) = (\uparrow \{\text{COMP},\text{XCOMP}\}^* (\text{GF}-\text{COMP}))$

In both of these cases, the LDD path is restricted so as not to include the function ADJ, thus resulting (inter alia) in the Adjunct Condition. However, as we have seen, islands such as the Adjunct Condition are more complicated than this, and a simple enumeration of possible grammatical functions on the path is inadequate. The path

[10]Interestingly, these are internally-headed relative clauses. Navajo has both internally- and externally-headed relative clauses, but the internally headed ones are more common. Island constraints work the same in both. In the case of the "Sentential Subject Condition" (an unfelicitous name for the Navajo implementation, since it applies to non-subjects as well), this is an example of how grammaticalization of a constraint results in the original motivation being obscured. In internally-headed relative clauses, parsing should not be an issue, since the clause is structurally complete, but the constraint has been extended to it.

specified for English, for example, will rule out grammatical cases of extraction from adjuncts as well as ungrammatical ones. In addition, the specification of the path in terms of grammatical functions is inadequate. For example, Dalrymple (2001) specifies the path in English as (47):

(50) $\{ \text{XCOMP} \mid \underset{(\rightarrow \text{LDD}) \neq -}{\text{COMP}} \mid \underset{(\rightarrow \text{TENSE})}{\text{OBJ}} \}^* \{ (\text{ADJ} \underset{\neg(\rightarrow \text{TENSE})}{\in}) (\text{GF}) \mid \text{GF} \}$

Unlike Kaplan and Zaenen, Dalrymple enhances the specification of the path with off-path constraints. The result is a rather complicated specification in which every possible grammatical function on the path is specified individually, and most of them with additional off-path constraints.

I propose to dispense with the inclusion of specific grammatical functions in the path, and instead use off-path conditions exclusively to impose island constraints. The key is an f-structure feature originally proposed by Zaenen (1983), and named [BND] there and [LDD] in Dalrymple (2001) (as in (47)). In this study, I will refer to the feature as [WHPATH].

4.2. The Feature [WHPATH]

The [WHPATH] feature was originally introduced to provide an account of phenomena which occur along the *wh* path (sometimes called morphological signaling; cf. Dalrymple 2001). As generally presented, it ranges over the values '+' and '−': an f-structure contained within a *wh* path is [WHPATH +], while one which is not is [WHPATH −]. Path phenomena, such as Kikuyu downstep deletion and Irish complementizer selection (Zaenen 1983) are realizations of the feature [WHPATH +]. However, a closer look reveals that the [WHPATH] feature needs to be more complicated. In some languages, *wh* path phenomena are sensitive to where in the *wh* path an f-structure is.

As an example, consider the third-person SUBJ pronoun in Ewe (Collins 1994). If it is not on a *wh* path, it is *é*.

(51) a. É/*Wo ʃo Kɔsi.
he hit Kɔsi
'He hit Kɔsi.'

b. Kofi gblɔ be é/*wo ʃo Kɔsi.
Kofi said that he hit Kɔsi
'Kofi said that he hit Kɔsi.'

If it is the top (or outermost) clause of a *wh* path, it is *wo*.[11]

(52) Kofi biɛ ⟦be lamata *é/wo ʃo Kɔsi.⟧
Kofi asked that why he hit Kɔsi
'Kofi asked why he hit Kɔsi.'

[11] I use double brackets to mark the boundaries of the *wh* path.

If it is an embedded clause in the *wh* path, either form is grammatical.

(53) ⟦ Kofi ɛ me gblɔ [be é/wo ʃo]⟧.
Kofi FOC I said that he hit
'It was Kofi that I said that he hit.'

Of course, below the *wh* path, only *é* is grammatical.

(54) ⟦ Kofi ɛ me gblɔ na⟧ be é/*wo ʃo Kɔsi.
Kofi FOC I said to that he hit Kɔsi
'It was Kofi that I told that he hit Kɔsi.'

Consider also Duala (Epée 1976). In fronting constructions, the particle *no* (glossed here as WHPATH) is inserted after the first verbal element in the clause. This includes topicalization, relativization, and *wh* questions when the *wh* is fronted, but not in situ.

(55) a. ⟦ Nu moto nde Kuo a bodi no kalati kiele.⟧
that man FOC Kuo he give WHPATH book yesterday
'It's that man Kuo gave a book to yesterday.'

b. Muto ⟦na tondi no⟧ a si tondi mba.
woman I love WHPATH she not love me
'The woman I love doesn't love me.'

c. (i) Kuo a po njika ponda.
Kuo he come WH time
'At what time will Kuo arrive?'

(ii) ⟦ Njika ponda Kuo a po no?⟧
WH time Kuo he come WHPATH
'At what time will Kuo arrive?'

d. Na si bi ⟦nga wenge nde Kuo a ben no kekise. ⟧
I not know if today FOC Kuo he have WHPATH exam
'I don't know if it's today that Kuo has an exam.'

e. Baise Kuo ⟦nje a pula no⟧.
ask Kuo what he want WHPATH
'Ask Kuo what he wants.'

This marking only appears in the top clause of a *wh* construction. Other clauses do not have the *no* marking.

(56) a. ⟦ Ni kalati nde na ta no na kwalane Kuo [na
that book FOC I PST WHPATH I tell Kuo that
a- angamene wana].⟧
he- must bring
'That's the book I told Kuo he should bring.'

b. ⟦ Njika ponda o mende no pula [na Kuo a keke
WH time you FUT WHPATH want that Kuo he try
wanea wa mo]?⟧
bring you it
'When will you want Kuo to try to bring it to you?'

c. Buńa ⟦na si ta no n- oŋgele [na Kuo a po]⟧, a poi.
day I not PST WHPATH I- think that Kuo he come he come
'The day I was not expecting Kuo to arrive, he did arrive.'

d. ⟦ Kuo nde o kwadi no [na a po weŋge]? ⟧
Kuo FOC you say WHPATH that he come today
'Is it Kuo you said would arrive today?'

The Ewe and Duala facts require us to distinguish between the top clause of the *wh* path and the rest of the path. I(n addition, Duala (along with other languages, such as Kikuyu) shows us that we need to distinguish between specification of the *wh* path in in-situ constructions from that in ex-situ constructions; in-situ constructions do not trigger path phenomena.

I propose that the [WHPATH] feature has a value consisting of at least one subfeature: [±TOP]. I leave open the possibility that there is a second subfeature: [±BOTTOM],[12] but will not be using it here. I further propose that there are two versions of the *wh* path feature, one for ex-situ constructions and one for in-situ constructions. We can refer to these features as [$\text{WHPATH}_{\text{High}}$] and [$\text{WHPATH}_{\text{Low}}$], with the *high* and *low* referring to the position in which the *wh* element is overtly expressed. The path phenomena of Ewe and Duala can be handled straightforwardly using this feature:

(57) a. Ewe 3rd person SUBJ pronoun: *é* (↑ $\text{WHPATH}_{\text{High}}$)≠[+T]
wo (↑ $\text{WHPATH}_{\text{High}}$)

b. Duala marker *no*: (↑ $\text{WHPATH}_{\text{High}}$)=[+T]

I conjecture that *wh* path phenomena are a kind of aid to parsing *wh* constructions. When the fronted *wh* element is encountered, it needs to be kept in memory and an argument function needs to be found for it. Since in-situ constructions are parsed differently—the *wh* element is in its argument position, which thus does not need to be found, and there is no fronted element to be kept in memory—they do not signal the presence of a *wh* path overtly. Formally, this is accomplished by the two varieties of the [WHPATH] feature. For the purpose of imposing island constraints, there is (usually) no difference between the two varieties.

[12]It is plausible that the bottom of a *wh* path is specially marked, just as the top is. I am not aware of any unequivocal evidence from *wh* path phenomena, but this does not negate the existence of the feature. The variety of Spanish discussed in Torrego (1984) distinguishes the lowest clause of a *wh* construction from others, but the data are problematic (Alex Alsina, personal communication). If both of these features exist, they combine to create the following four possibilities:

(i)
- [+T, −B]: the top of a construction in which the wh path spans more than one clause.
- [−T, +B]: the bottom of a construction in which the wh path spans more than one clause.
- [−T, −B]: the middle of a construction in which the wh path spans more than two clauses.
- [+T, +B]: a clause containing a one-clause wh construction.

4.3. [WHPATH] and Islands

Given the [WHPATH] feature, the structure of (multiclausal) *wh* constructions can be uniformly defined with the following structure.

(58)

top	*middle*	*bottom*
$(\rightarrow \text{WHPATH}) = [+\text{T}]$	$(\rightarrow \text{WHPATH}) = [-\text{T}]$	$(\rightarrow \text{WHPATH}) = [-\text{T}]$

This structure, under which the off-path constraints refer only to the WHPATH feature, will be incorporated into the functional uncertainty equations that license *wh* constructions.

Under such a system, syntactic island constraints are imposed by manipulating the value of the [WHPATH] feature. The phrase structure rules of English, for example, will include functional annotations such as the following:

(59) a. $\text{NP} \rightarrow$

NP	CP
$\uparrow = \downarrow$	$\downarrow \in (\uparrow \text{ADJ})$
$(\downarrow \text{SUBJ FORM}) \neq \text{THERE} \Rightarrow (\downarrow \text{WHPATH}) \neq [-\text{T}]$	

b. $\text{VP} \rightarrow$

VP	PP
$\uparrow = \downarrow$	$\downarrow \in (\uparrow \text{ADJ})$
$(\downarrow \text{WHPATH}) \neq [-\text{T}]$	

c. $\text{S} \rightarrow$

NP	VP
$(\uparrow \text{SUBJ}) = \downarrow$	$\uparrow = \downarrow$
$(\downarrow \text{WHPATH}) \neq [-\text{T}]$	

These equations prevent island f-structures from being the continuation (i.e. non-top) of a *wh* construction

In-situ and ex-situ constructions generally behave the same with regard to island constraints. However, since the facts of *wh* path phenomena force us to distinguish between [$\text{WHPATH}_{\text{High}}$] and [$\text{WHPATH}_{\text{Low}}$], the possibility exists of a distinction in island constraints. One language in which such a difference exists is Iraqi Arabic (Ouhalla 1996: 678): the CNPC constraint with regard to relative clauses is only imposed syntactically on the in-situ construction:[13]

(60) a. *ʕurfut Mona il- bint illi ištarat šeno ?
knew Mona the- girl who bought what
'What did Mona know the girl who bought?'

b. ??Šeno ʕurfut Mona il- bint illi ištarat ?
What knew Mona the- girl who bought
'What did Mona know the girl who bought?'

In the framework proposed here, Iraqi Arabic has phrase-structure rules such as the following.

[13]This is also true of *wh* islands and finite-clause islands. It is not surprising that a language would choose a uniform treatment for different islands.

(61) $\text{NP} \rightarrow \underset{\uparrow=\downarrow}{\text{NP}} \quad \underset{\substack{\downarrow \in (\uparrow \text{ ADJ}) \\ (\downarrow \text{ WHPATH}_{\text{Low}}) \neq [-\text{T}]}}{\text{CP}}$

It is instructive that in Iraqi Arabic, it is the in-situ construction that has the syntactic constraint. It shows that syntactic island constraints are not constraints on extraction, or the result of increased processing complexity that results from trying to find a gap in which to place a filler.

5. Conclusion

Island effects are primarily the result of non-syntactic properties of constructions: pragmatics, prosody, processing, etc. In some cases, they become grammaticalized as constraints on the *wh* path, through the [WHPATH] feature.

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