Stepanov 2007: The End of CED? Minimalism and Extraction Domains

1 Introduction

- In English (and other languages), overt wh-extraction out of subjects or adjuncts (as opposed to objects) leads to degradation:

(1) Subject:
   a. *Who does [a picture of ti] hang on the wall?
   b. *Which car is [to park ti there] illegal?

(2) Object: Who did you see [a picture of ti]?

(3) Adjunct: *Who did Mary cry [after Peter hit ti]?

- Attempts to unify these facts led to things like Huang’s (1982) Conditions on Extraction Domains (CED):

  – CED: A phrase A may be extracted out of domain B only if B is properly governed.
  – The CED is essentially a distinction between complements and noncomplements.

- Formalizations like CED make a clear prediction: extraction out of subjects and adjuncts should pattern together.

- This prediction is not borne out: extraction out of subjects is attested in a variety of languages, but extraction out of adjuncts seems to be universally banned.

2 Formulations of CED

Barsiers/Subjacency

- Subjects and adjuncts are not L-marked (θ-marked by a lexical head), thus they are barriers to extraction.

- Stepanov asks: why should extractability depend on being licensed by a lexical head? Under classic GB, θ-theory and bounding theory were separate modules of the grammar, so there connection here is “largely stipulated.”

Connectedness

- Does not explain unavailability of extraction out of adjuncts, most of which are R-branching.

- Longobardi incorporates adjuncts by referring to a notion other than canonical government.

- Inadvertently or not, the original and revised connectedness explanations come close to giving up on the attempt to unify extraction out of subjects with extraction out of adjuncts.
Chain Uniformity: Takahashi 94

- Two fundamental assumptions:
  - **Chain Uniformity**: Chains must be uniform.
  - **Shortest Move**: Make the shortest move.

- Shortest Move has the effect of forcing elements undergoing A’-movement to undergo a series of adjunctions to each XP along its path.

- **Uniformity Corollary on Adjunction (UCA)**: Adjunction to a part of a nontrivial chain or coordination is not allowed.

- Example (1a) is repeated below in (8a), with its structure (after subject movement to Spec, IP) given in (8b):

  (8) a. *?Who does a picture of hang on the wall?
   b. (Who) does [IP [DP a picture of who] [VP [DP a picture of who] hang on the wall]]

- In accord with shortest move, the who must first adjoin to the DP dominating it, creating the structure in (9):

  (9) (Who) does [IP [DP who [DP a picture of who]] [VP [DP a picture of who] hang on the wall]]

- But, UCA does not allow the structure in (9), because who is adjoined to a nontrivial A-chain.

- However, moving who to the next highest maximal projection (IP) is a violation of Shortest Move. Each available option violates one of the principles, so the derivation cannot converge.

- Effectively formalizes Wexler & Culicover’s generalization that there can be no extraction out of moved domains.

- Important claim regarding adjuncts: they are a form of (covert) coordination.

Structure-Building Approach: Nunes & Uriagereka 2000

- If a phrase marker X was assembled in parallel with a phrase marker Y, and then X and Y merge and Y projects, then no extraction is ever possible from X.

- X and Y are *assembled in parallel* if there is a time where both X and Y exist but are unconnected.

- The difference is between a phrase marker that has been linearized before wh-extraction, and one that has not been.

- Early linearization is enforced by a PF requirement of convergence and Kayne’s Linear Correspondence Axiom, which says that linear order can only be established between syntactic objects if there is an asymmetric c-command relation.
Stepanov (2007)

(14) *Who does [a picture of t_who] hang on the wall?

- If the elements in [DP a picture of who] are not linearized before they merge with [V· hang on the wall], then the elements of the DP will never c-command the elements of the V', so no linear order can be established between them.

- On the other hand, if the DP is spelled out before it merges (or, at least, is linearized), then the entire DP can be treated as one morphological word, and it will stand in an asymmetric c-command relationship with V’, so linear order can be established.

- The same argument can be made for adjuncts.

- Importantly, this account does not make the claim that DPs always must be linearized as soon as they are complete, as extraction is possible out of an object DP.

(16) Who_i did you see [DP a picture of t_i]?

- In (16), the DP and V’ are not assembled in parallel, and the V asymmetrically c-commands all elements of the DP, so linear order can be established.

- Again, this approach rules out adjuncts and subjects by the same mechanism.

3 Empirical Challenge

- Given two separate domains (subject, adjunct) and two statuses wrt extraction (transparent, opaque), a complete typology predicts four possible languages:

<table>
<thead>
<tr>
<th></th>
<th>Lg. 1</th>
<th>Lg. 2</th>
<th>Lg. 3</th>
<th>Lg. 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>opaque</td>
<td>transparent</td>
<td>opaque</td>
<td>transparent</td>
</tr>
<tr>
<td>Adjunct</td>
<td>opaque</td>
<td>opaque</td>
<td>transparent</td>
<td>transparent</td>
</tr>
</tbody>
</table>

- English (and many other languages) represent the first case, where both domains are opaque.

- As mentioned, there are many languages (see pp. 89-91 of the paper) where extraction out of subjects is allowed. These languages instantiate the second type, as extraction out of adjuncts is still banned.

- There do not appear to be cases of wh-extraction out of adjuncts, so the third and fourth groups are not known to be attested.

- How, oh how, will we account for the languages in group 2?
4 Inadequacies of theories in §2

**Barriers/Subjacency & Connectedness**

- One option is to stipulate that Infl is (a) lexical and (b) can govern the subject.
- A similar proposal was that Infl governs obligatorily in different directions depending on the language (rightward for e.g. English, leftward for e.g. Japanese).
- Another option is to suggest the subject is VP (vP?) internal in languages that allow subject extraction. They would then be properly governed.

**Structure-Building Approach: Nunes & Uriagereka 2000**

- As discussed, the approach taken here unifies extraction out of subjects with extraction out of adjuncts: given the languages that allow extraction out of subjects, this is clearly a problem.
- This theory undergenerates by wrongly predicting subject extraction to be ungrammatical.

(33) \[ {Op} [Ahmet-in  t_{i}  git-me-si]-nin  ben-i  üz-dü-ğ-ü]  ev.  
    \[
    \text{Ahmet-GEN}  \quad \text{go-inf-agr-GEN I-ACC sadden-PAST-COMP-AGR}  \quad \text{house}  
    \]
    \[
    \text{Lit. ‘The house [which [that Ahmet went to \_] saddened me].’}  \quad (\text{Turkish})  
    \]

- The DP subject \( [Ahmet-in  Op  git-me-si] \) must be assembled in parallel with the V’ (or v’), and the V’ will project, so extraction from the DP should be banned.
- This theory also has trouble with extraction out of “subjects” of There Insertion in English:

(34) Who is there a picture of \( t \) on the wall?  
(35) There is \( [SC  \quad [\text{DP a picture of who}] \quad [\text{on the wall}]] \)

- The DP and PP in (35) are assembled in parallel, but when they merge, it is not the label of the DP that projects, because small clauses do not have the distribution of PPs.
- To accommodate languages like Turkish, one is basically forced to say subjects are complements, which is demonstrably problematic.
- Alternatively, one could stipulate that subjects need not be linearized at PF before merging with the rest of the structure.

**Chain Uniformity: Takahashi 94**

- Recall that Takahashi’s account was driven by the UCA and Shortest Move.
- Takahashi argues that the subject remains in VP in Japanese \( \Rightarrow wh \)-elements can adjoin to subject DPs, as they are trivial (=not) chains.
- Drawback: proposing that adjuncts are part of conjunctions with the VP they modify, which is clearly a stipulation.
– This has the unfortunate consequence of ruling out simple adjuncts as well:

(39) How did John fix the car?

• While Takahashi’s attempt is intended to be uniform, the disjunction of two items not constituting a natural class (nontrivial chains or conjunctions) leads one to wonder why a principle of grammar would put them together (and not two other unrelated things).

5 Interim Conclusion

• Unifying our explanations of the unavailability of extraction out of subjects and adjuncts is not imposed on us \textit{a priori}.

• Since they pattern differently, perhaps extraction out of subjects and adjuncts could/should be ruled out by different mechanisms.

6 “Eclectic Approach” Part 1: Chain Uniformity and Subjects

• Stepanov adopts Takahashi’s analysis of subjects that makes use of Chain Uniformity.

• He goes on to propose that Chain Uniformity is a PF requirement.

Further consequences of Chain Uniformity

(40) ??Who do you believe [a picture of t] to be on sale?

(41) a. ??[Vowel Harmony], I think that [articles about t], you should read t.

b. ?*Who, do you think that [pictures of t] John wanted t?

c. *Why do you wonder [how likely to fix the car t] John is?

• Extraction out of ECM subjects is degraded (40).

• Topicalization or \textit{wh}-extraction out of topicalized phrases is degraded (41a, b).

• Extraction out of a \textit{wh}-phrase in Spec,CP is degraded (41c).

• All of these constitute examples of something being extracted from a \textit{moved domain}.

• There is no language-specific rule that governs whether or not extraction is allowed out of subjects: if the subject is \textit{in situ}, we expect extraction from it to be allowed.

– In German, extraction out of subjects is precluded just where the subject has undergone overt movement:

(43) Subject remains \textit{in situ}
a. [Mit wem], würde [t, Schach spielen zu dürfen] dich mehr freuen?
     with whom would chess to.play to be.allowed you more please
     ‘Who would [to be allowed to play chess with ___] please you more?’

b. [Welches Buch], hat [t zu lesen] dir mehr spass gemacht?
     which book has to read you more fun made
     ‘Which book was [to read ___] more fun?’

(44) wh-extraction out of an embedded V2 clause (=subject moved)
a. *[Mit wem], hat sie gesagt [t, Schach spielen zu dürfen] würde sie sehr freuen?
     With whom has she said chess to.play to be.allowed would her much please?
     Intended: ‘Who did she say that [to play chess with ___] would please her?

b. *[Welches Buch], sagte sie [CP [t zu lesen] [hat [ihr spass gemacht]]]?
     which book said she to read had her fun made
     Intended: ‘Which book did she say that [___ to read] was fun?’

• A third domain where Chain Uniformity might explain the unavailability of extraction is in
presupposed DPs.

• In cases where a presupposed DP seems to undergo movement, extraction is not allowed.

• However, as with subjects, chain uniformity provides a loophole: if the DP remains in situ,
then extraction should be possible.

6.1 Why PF?

• At PF, chains created by movement are subject to deletion (under identity) of all copies but
the highest.

• Constituents must be linearized, and this happens at PF.

• Linearization involves a precedence relation (asymmetric c-command), which is by defini-
tion asymmetric and irreflexive.

• Consider a sentence involving movement before PF deletion of the copies:

(57) John was [arrested John].

• Linearization forces us to say that John both precedes and follows was, which violates the
asymmetry property of the precedence relation.

• It also forces us to say that John precedes itself, which violates irreflexivity.

• To allow linearization, one copy of a chain must be deleted.

• It is not clear to me how this is relevant to the impossibility of subject extraction: it does
not seem to address why chains must be uniform, or why adjunction to a nontrival chain is
problematic.
7 “Eclectic Approach” part 2: Late Adjunction

- Claim: Adjunct Condition effects are a result of the difference in syntactic behavior of adjuncts and nonadjuncts.

- Stepanov points to a multitude of citations that he claims show that adjuncts can/must be Merged late.

Late Adjunction Hypothesis (LAH)

- Stepanov (2001) argues that adjuncts must be Merged postcyclically.

- Least Tampering Condition (LTC): given a choice of operations applying to a syntactic object \( \alpha \), select the one that does not change the set of c-command relations within \( \alpha \).
  
  - Substitution (=not adjunction) Merge does not alter the c-command relations, it merely adds structure on top.
  
  - Adjunction Merge (“pair”-merge) is different.

- Suppose we adjoin Z to some Y, yielding the segmented structure in (58).

- The merger of Z does not affect c-command relations if one assumes Reinhart’s (1976) definition of c-command:
  
  \[ \alpha \text{ c-commands } \beta \text{ iff neither } \alpha \text{ nor } \beta \text{ dominates the other and the first branching node that dominates } \alpha \text{ dominates } \beta. \]

- But, if we Substitution Merge F above that, yielding (60), Z and Y will now c-command each other.

\[
\begin{align*}
\text{(58) } & Y \\
& \quad Z \quad Y \\
& \quad W \quad X_{\text{max}} \\
\text{max} \\
\text{(60) } & F_{\text{max}} \\
& \quad F \quad Y \\
& \quad Z \quad Y \\
& \quad W \quad X_{\text{max}} \\
\end{align*}
\]

- By the LTC, “this Merger is excluded in favor of a derivation where F is merged directly with Y when Z isn’t yet present.”

- LTC is taken to be an economy condition, which means it is only violated if necessary to reach convergence.

- Therefore, all Substitution Merges will happen before Pair Merge (adjunction).

- In order to determine what the LAH applies to, Stepanov argues that we need a way to determine whether a phrase marker enters the derivation via Substitution or Pair Merge.
• His answer is features: if the element being merged has any uninterpretable Case of *wh* features, then it must enter the derivation by substitution. If not, it must enter by Pair-merge.

(61)  
   a. John fixed the car with a hammer.
   b. How? With what did John fix the car?

• *with a hammer* contains no uninterpretable features in its label, so it enters the derivation by pair merge, and is thus a structural adjunct.

• *how* and *with what* have uninterpretable *wh*-features in their label, so they must enter the derivation via substitution *(as a specifier).*

LAH and Adjunct Condition Effects

• Presumably, an adjunct like *after Peter fixed what* has no uninterpretable features in its label *(after)*, so it must be merged postcyclically.

• This means it will not be merged with the rest of the phrase in time for the *wh*-phrase to check the EPP feature on C$_Q$.

(62)  
   [CP Q [IP John go to bed]]
   [Adj after Peter fixed what]

• Notice, if the *wh*-phrase is in a “closer” relationship with the head, the label of the adjunct could end up with the *wh*-feature, thus forcing it to merge cyclically and opening the door for *wh*-movement. *(e.g. in *wh*-PPs)*

• Once the adjuncts have been merged (postcyclically), this account predicts that *wh*-movement should be possible.

(66) Who left after Bill read what?

• The *what* in (66) remains *in situ*, but notice that it can have a matrix reading, where it is associated with the C$_Q$ of the matrix clause, rather than the embedded clause.

• This may be the reason we can get “pair-list” answers like “*Mark* left after Bill read The Shining” or “*Clyde* left after Bill read Sense and Sensibility.

• This could be taken as evidence for movement of *what* at LF.

8 Conclusion

• Subject Islands have a PF-related nature and are excluded via Chain Uniformity/part of Takahashi’s UCA.

• Adjunct islands are a consequence of syntactic properties of structural adjuncts: they are merged late.