Subject Islands in Slavic: The Syntactic Position Matters
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1 Introduction

Islands have long been known to differ in strength (weak, e.g., WH, CNPC, vs. strong islands, e.g., Subject, Adjunct). Strong islands have been shown to be penetrable by experimental researchers beginning with Hiramatsu 1999 and Snyder 2000 (see also Hiramatsu 2000, Braze 2002, Goodall 2004b, Kravtchenko et al. 2009, Francom 2009, Jurka 2009, among others).

Hiramatsu 1999 investigated strong islands and concluded that English Subject Islands, but not Adjunct Islands, satiate with repeated exposure. Transparency of certain subject islands has also been noted for Spanish and Japanese (for Spanish: Uriagereka 1988, Torrego 1985; for Japanese: Richards 2000, 2001; Fukaya 2003; Yoshida 2007).

An immediate question for theoretical linguists is what condition this result. Hiramatsu 1999 only considered subjects of unaccusatives. Given (1) and (2) from Chomsky 2008, it seems likely that other predicates may behave differently.

(1)  It was the CAR (not the TRUCK) of which the driver ___ was found/arrived late.

(2)  *It was the CAR (not the TRUCK) of which the driver ___ caused a riot/this accident.

Factors that may influence the transparency/opacity of Subject Islands:

1. Syntactic Structure (internal vs. external argument)
2. Information structure (topicality)
3. Processing (higher load for transitives)

To test these hypotheses, we consider 3 languages: English, Russian and Czech. The Slavic languages in particular are excellent test cases for the role of topicality: certain words orders are aligned with topic interpretations in Russian and Czech has a dedicated topic position.

2 Background on Subject Islands

2.1 Syntactic Questions

Syntacticians have been discussing subject islands as far back as Ross 1967 (Sentential Subject Constraint) and Chomsky 1973 (Generalized Subject Condition).

The approaches fall into two general categories with respect to island transparency:
The base position matters (extraction possible out of internal arguments only)

- Huang 1982 (CED)
- Chomsky 1986 (Barriers)
- Takahashi 1994: Shortest Move Constraint (SMC), Uniform Corollary on Adjunction (UCA) (combines subjacency and the CED)
- Uriagereka 1999, Nunes and Uriagereka 2000: Multiple Spell Out (MSO)
- Merchant 2001

Freezing (no extraction out of moved XP's)

- Wexler and Culicover 1981
- Stepanov 2001, 2007

Also, definiteness and d-linking have been argued to inhibit extraction (Cinque 1990, Chung 1994, Kluender 1998, 2004; Goodall 2004b). Extraction out of the relative clause in (3) is easier than out of the relative clause in (4). Kluender 1998 suggests that extraction is degraded out of definite DP's.

(3) That’s the article that we need to find someone who understands. IS PREFERRED OVER
(4) That’s the article that we need to find the reviewer who understands.

Many researchers have pointed out the correlation between definiteness and topichood (Gundel et al. 1993, Gundel 1988, Lambrecht 1994, among others many others). In Japanese, for example, topic marked phrases cannot include a wh-expression unless a contrastive reading is forced (this is part of ongoing work):

(5) Do-no kaisya-no zen:xyain-\{ga/*wa\} influenza-ni kakattesimatta no? which-GEN company-GEN entire:employee-NOM/TOP influenza-DAT came.down-PAST Q
Lit. 'All the employees of which company came down with (got infected by) influenza?'

We hypothesize that topichood may inhibit extraction from subject islands. Czech, in particular, is an excellent test case.

2.2 Experimental Approaches

Researchers have recently been probing the limits on the permeability of subject islands with several types of experimental studies: judgment tasks, timed reading tasks, eye tracking and satiation experiments (generally using judgment tasks).

Satiation Experiments:

- Hiramatsu 2000 (Subject Islands, but not Adjunct Islands satiate in English (she only looked at unaccusative subjects)
- Snyder 2000 (found satiation in English islands)
- Francom 2009 (replicated Snyder 2000 and found satiation effects)
- Sprouse 2009 (used Snyder's set up and design, but found no satiation)
- Goodall 2004b (looked as satiation in Spanish and English)
- Braze 2002 (used eye tracking methodology)
- Crawford (ongoing) (satiation on English at Harvard/UConn)
Judgment Tasks

- Kravtchenko et al. 2009 (Russian and English subject islands)
- Jurka 2009 (German subject islands)

Self-paced reading:

- Kravtchenko et al. 2009 (Russian and English subject islands)

2.3 Considering English, Russian and Czech

These languages all make distinct theoretical contributions to the experiment.

- \textit{English} was considered because extensive work on subject island permeability had already been conducted. But, it is difficult to test topicality and the base position of unaccusative subjects is not immediately apparent.

- \textit{Russian} is a good test case for structural position it has well-established unaccusativity diagnostics (Pesetsky 2000, Harves 2002, Kagan 2007, a.o.).

- \textit{Czech} is an excellent test case for topicality because Czech has a dedicated A-bar position for topics, and the base position of unaccusatives in Czech is well-defined in the syntax. Additionally, Czech has more constrained scrambling than Russian.

- We are also currently running \textit{Japanese} and \textit{Korean} (lexical markers are indicative of topic/non-topic distinctions but unaccusativity diagnostics are very weak), as well as \textit{Spanish} (good contrast between pre- and postverbal subject position; uncertainty about the A- vs. A-bar status of the preverbal subject, and earlier claims in the theoretical literature that Spanish does not show subject island effects (Uriagereka 1988))

(6) Table of Languages and Conditions

<table>
<thead>
<tr>
<th>Language</th>
<th>Visible Topic Position?</th>
<th>Visible Base Positions?</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Russian</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Czech</td>
<td>yes (structural)</td>
<td>yes</td>
</tr>
<tr>
<td>Japanese and Korean</td>
<td>yes (wa/nun marked)</td>
<td>no</td>
</tr>
<tr>
<td>Spanish</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

3 Designing the Czech Experiment\(^1\)

We use both judgment tasks and self-paced reading to evaluate pre- and postverbal subject islands of unaccusatives, unergatives, transitives. Speakers also evaluated grammatical control questions and statements, as well as extraction out of objects.

- Czech's dedicated topic position made it an important addition to Kravtchenko et al. 2009. Czech

\(^1\) This experiment is a continuation of Kravtchenko et al. 2009 work on Russian and English.
helps to tease apart the role of *topic* from that of *subject* in subject island permeability.

(7) Czech Clause Structure: Embedded CP

\[
\begin{array}{c}
\text{VP} \\
\text{V} \\
\text{CP} \\
\text{C} \\
\text{Ze} \\
\text{XP} \\
\text{topic} \\
\text{I} \\
\text{[EPP]} \\
\text{clitics} \\
\text{DP} \\
\text{'subject'} \\
\text{vP} \\
\text{'verb'} \\
\text{VP} \\
\text{t_1} \\
\text{'object'}
\end{array}
\]

**Designing the stimuli**

Predicate type: unaccusative, unergative and transitive. Passives were not used for Czech because they are fairly degraded, especially in colloquial Czech.

**Clitics**

- Clitics delineate the [Spec, IP] topic position:
  - In embedded clauses, clitics are often positioned complementizer-adjacent, but I needed them to delineate the initial position, so I used a configuration which may be slightly suboptimal (but was present in every token in the study). A corpus study indicates the following distribution of clitic/complementizer order in the Czech National Corpus (Hana 2007):
    - 10,000 instances: *C clitic XP*
    - 6,000: *C XP clitic*

- Choosing the clitic:
  - Czech has the following inventory:
    - pronominal (accusative, dative)
    - verbal: conditional and past participle person agreement marker (in 1st/2nd person)
  - I chose lexical reflexives for the unergatives and unaccusatives and dative benefactives for the transitives. All stimuli have clitics and all stimuli have the same number of words. It is an open question whether or not the lexical reflexive clitics and/or the benefactive clitics will increase the processing load for the speakers.

**Postverbal Position**

- The VS examples ended with the crucial element (either 'XP V S' (unaccusatives and unergatives) or 'O V S' (transitives)). The final position in the Czech clause is a focus
position and we felt that it was important to have the crucial element (the extractee) in the important position (speakers agreed). This factor overrode our concern about the 'wrap up' effect.

- There is concern about a 'wrap up' effect. For the current stimuli, there is extra-clausal material at the end of the stimulus, but we are looking into whether the wrap up effect might influence the clause final or stimulus final portion.

**Experimental Issues**

The keyboard

- We initially used regular keyboards, but discovered that they were not sensitive enough to calculate the msec needed for the timed reading tasks. We are now using a gaming keyboard (Arctosa) that is more accurate for the reading time results.

**Webspr**

- We were using both Linger (non-web based for local speakers) and webspr (it is what Ibex uses). Webspr did not record the time for the final word, which was needed to consider the VS word orders.
- After the webspr problems, we added extra-clausal material: 'he said' to questions and 'right?' to statements.

**4 Experimental Results: Czech**

- Acceptability rating task (5 point scale for Russian and English, 7 point for Czech)
- Self-paced reading task
- All three experiments had the following design:²
  - Pre- and postverbal extraction
  - Wh-extraction out of transitive, unaccusative and unergative subjects, and objects (Russian also included passives)³
  - Grammatical control questions (no island extraction) (Czech also included control statements.)

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² See Appendix A for a more detailed discussion of the experimental designs.
³ Passives are a difficult case because they tend to be infrequent in the languages we are considering. In Czech, passives tend to be quite degraded in the colloquial language, so we did not use them. In English, they are infrequent and, also, be, as well as get passives give away the structure, as opposed to other transitives or intransitives: 'What did Janet wonder that the conference on ___ considered outdated?' vs. 'What did Janet wonder that the conference on ___ was convened in March?'
4.1 Czech Results: Unaccusative advantage

- Unaccusative extraction is more felicitous than extraction with other types of predicates (unergatives and transitives).

(8) Judgment Task

![Graph showing effects on JT]

Unaccusatives are rated higher (p<.036)
Statements are rated higher (p<.00001)
VS sentences were rated lower (p<.00001)

Possible explanation: Base position: the unaccusative 'subject' is initially merged into the structure as a complement to the verb.

Surprisingly, VS sentences are rated lower than SV sentences. These examples may sound strange without context because they would be interpreted as presentational. Later we will see that they are read faster.
Unaccusative VS are faster than transitive VS (p<.022)
Unergative VS are faster than transitive VS (p<.019)
4.2 Objects vs. Subjects

(10) **Object Extraction vs. Subject Extraction: Reading Task: Graph 2**

Both unaccusative subjects and transitive objects behave the same when both word orders are compared. This is an expected result due to the fact that unaccusative subjects, like transitive objects, are internal arguments.

However, for the unaccusative SV word order we find different results. This suggests that unaccusative subjects and transitive objects do not always behave the same. It's not enough to be an internal argument. The fact that the unaccusative argument is a surface subject appears to give you an advantage for topichood, making the unaccusative subjects stronger islands, and, thus, slower to read.
4.3 Czech Results: Topic disadvantage

*Topicality* is a factor in subject island permeability.

Preverbal subjects are stronger islands than postverbal, which suggests that topicality has an effect on subject islandhood.

(11) **Reading Task:** Graph 3

<table>
<thead>
<tr>
<th>Sentence Type</th>
<th>Mean Effect</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unaccusatives</td>
<td>-120</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unergatives</td>
<td>-100</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>VS</td>
<td>0</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Questions</td>
<td>20</td>
<td>&lt;.014</td>
</tr>
<tr>
<td>Statements</td>
<td>30</td>
<td>&lt;.014</td>
</tr>
</tbody>
</table>

**VS are faster than SV (p<.00001)**

Unaccusatives are slower than transitives (p<.0001)

Unergatives are slower than transitives (p<.014)
4.4 Transitive Disadvantage

*Complexity of argument structure:* Transitive islands are strong, suggesting that transitives may have a longer processing time. VS transitives are slower than both unaccusative and unergative VS.

(12) **Reading Task:** Graph 1, repeated

Unaccusative VS AND Unergative VS are faster than transitive VS ((p<.022), (p<.019))
5 Bringing in Russian and English Results

Unaccusative advantage:

For English the unaccusative advantage is approaching significance. Like in Czech, unaccusative extraction is preferred in the English judgments task (p>0.28). In the reading task, the unaccusative was marginally better than the unergative (p>0.07) (transitive cannot be compared to other conditions due to the object vs. preposition contrast). For Russian the unaccusative advantage is approaching significance, as well.

Topic disadvantage:

Russian, but not English, shows some indication of a topic disadvantage. In the judgment task, passive VS is rated better than passive SV (p=.023), and Unaccusative VS is better than SV (p=.003). In the reading task, VS is faster than SV as well (p=.035; p=.024).

Transitive disadvantage:

Russian shows the same transitive disadvantage as Czech. Passive, unaccusative, and unergative are better than transitive (p=.021, p<.005, p<.043). In the reading task, passive, unaccusative and unergative VS are faster than transitive VS (p<.003 for each).

German also shows the transitive disadvantage (Jurka 2009).

6 Theoretical Implications

Three main results are found:

- Unaccusative subjects are weaker islands
- Topics are stronger islands
- Transitives have a greater processing cost

- The fact that unaccusative subjects are weaker islands suggests that the base position matters. Unaccusative subjects are merged into the structure as objects, and, as such, allow extraction. Further support for this idea comes from the fact that in Czech, unaccusative subjects and direct objects are identical in terms of the processing load in extraction (in the VS context). For unaccusative SV structures, the results suggest that unaccusative subjects retain some 'subject' qualities that objects lack.
  - In Russian, where the passive was also tested, postverbal subjects of unaccusatives and postverbal subjects of passives are similar in RTs (however, extraction out of preverbal subjects of unaccusatives is slower than extraction out of subjects of passives)

- The transitivity effect can be argued to stem from semantic (additional thematic role) or syntactic complexity (additional structure). These put more processing load on the reader.

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4 Graphs of the experimental results can be found in Appendix B.
• The Czech and Russian results suggest that elements that are interpreted as topics are stronger islands than those which are not. A subset of unaccusative results support this as well, since VS unaccusative subjects are not good topics (unaccusatives tend to be thematic structures).
  o In Czech, the preclitic position (in which preverbal subjects are located) is strongly associated with a topic interpretation; it is an A-bar position associated with both ‘vanilla’ topics or contrastive topics. The results from Russian are a bit more tentative, given the fact that Russian exhibits more rampant scrambling.5

7 Conclusion

• Subject islands vary in strength depending on the structural position of the subject: unaccusative subjects particularly in VS contexts, are judged and processed as more transparent, resembling objects. This supports the notion that extraction targets the base rather than the derived position (Merchant 2001).

This is not the only story, however.

• Transitivity adds an additional processing load, as evidenced by the fact that VS unergatives and unaccusatives are processed faster than VS transitives. Similar results are shown in Jurka 2009.

• ALL preverbal elements were difficult to extract from for Czech, Russian and English, not just unaccusative subjects. Subjects of transitives and unergatives are located in specifier positions, regardless of the surface position of the verb; this suggests that base position isn't the only factor in subject island strength. Topicality is an important factor, as well.
  o We hypothesize that the opacity of subject islands is sensitive to the difference between A- (subject) and A-bar (topic) positions, but more languages need to be investigated to determine the exact nature of this effect.

• The fact that topics are stronger islands is potentially an argument for freezing effects, since these elements in Czech and Russian have moved into an A-bar position, however, this cannot be the whole story due to the unaccusative advantage and due to the fact that fronted objects are transparent for extraction (they are in an A-bar position). Topicality and structural position are thus both relevant to determining the transparency of an island.

8 Appendix A: Details on the Experimental Design

Russian Experiment

• 37 native speaker subjects
• 50 items
• 5x3 design
  o pre- and post-verbal extraction

5 The postverbal domain in Slavic contains non-topics, while the preverbal position is more likely to host a topic referent. In Russian, there seem to be several structural positions for A-bar topics (cf. King 1995), but overall preverbal DPs are more likely than postverbal ones to receive a topic interpretation, and such DPs are also stronger islands.
wh-extraction out of transitive, unaccusative, unergative and passive subjects, and transitive objects
grammatical control wh questions

Czech Experiment
- completed an acceptability rating (7 point scale) and self-paced reading task
- 1.8:1 ratio of fillers to stimuli, mixture of grammatical and ungrammatical sentences in the fillers.
- 30 native speaker subjects for reading task and 69 for judgment task
- 36 items
- 4x3x2 design
  - pre- and post-verbal extraction
  - wh-extraction out of transitive, unaccusative and unergative subjects, and objects
  - grammatical control wh-questions
  - grammatical controls statements

English Experiment
- 28 native speaker subjects
- 36 items
- 3x2 design
  - pre- and post-verbal extraction
  - wh-extraction out of transitive, unaccusative and unergative subjects, and objects
  - grammatical control wh-questions

8 Appendix B: Experimental Results Graphs for English and Russian

(9) **English Reading Times** (msec): Spill Over Region[^6]

<table>
<thead>
<tr>
<th>Condition</th>
<th>Exp.</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unaccusative</td>
<td>453.07</td>
<td>397.17</td>
</tr>
<tr>
<td>Transitive</td>
<td>508.86</td>
<td>410.81</td>
</tr>
<tr>
<td>Unergative</td>
<td>468.77</td>
<td>411.17</td>
</tr>
</tbody>
</table>

Unaccusative is marginally better than unergative (p=.07) (transitive cannot be compared to other conditions due to the object vs. preposition contrast)

[^6]: The spill-over region was one word.
(10) **English Judgment Task: (1-5)**

Unaccusative extraction is better than unergative (p>0.28), but not significantly.

(11) **Russian Reading Time (msec): Verb**

VS better than SV (p=.035; p=.024) ( Passive, unaccusative and unergative), VS are better than transitive VS (p<.003 for each)

(12) **Russian Judgment Task (1-5):**

Passive VS better than SV (p=.023), Unaccusative VS better than SV (p=.003). Passive, unaccusative, and unergative better than transitive (p=.021; p=.005; p=.043)
9 Appendix C: Example Stimuli

Russian:

Passive:
(1) *Kakie on prosit, čtoby s utra byli ubrany __ komnaty?*  (VS)
   what-kind.PL he is-asking, that in morning were cleaned __ rooms?
   “What kind of rooms is he asking to be cleaned in the morning?”

Transitive:
(2) *Kakie on prosit, čtoby __ fonari osveshali dorogu?*  (SV)
   what-kind.PL he is-asking, that __ streetlights illuminated road?
   “What kind of streetlights is he asking (to be used) to illuminate the road?”

Unergative:
(3) *Kakie ona prosit, čtoby __ vrači dezhurili zavtra?*  (SV)
   what-kind.PL she is-asking, that __ doctors be-on-call tomorrow?
   “What kind of doctors is she asking to be on call tomorrow?”

Unaccusative:
(4) *Kakie on prosit, čtoby večerom zvonili __ kolokola?*  (VS)
   what-kind.PL he is-asking, that in evening rang __ bells?
   “What kind of bells is he asking to ring (be rung) in the evening?”

Czech:

Transitive:
(5) *Jaké si myslíš, že auto __ nabouraly holky?* ptal se Jan.
   what-kind-of REFL.CL think COMP car 2SG.CL crashed girls asked REFL.CL Jan
   ‘What kind of __ do you think that __ girls crashed car? asked Jan.’

Unergative:
(6) *Jací jsi řekl, že na zem __ sedli __ studenti?* ....
   what-kind-of AUX.2SG said COMP on floor REFL.CL sat students
   ‘What kind of __ did you say that __ students sat on the floor? asked Jan.’

Unaccusative:
(7) *Jací jsi řekl, že na jevišti __ ukázali __ herci?* ....
   what-kind-of AUX.2SG said COMP on stage REFL.CL appeared actors
   ‘What kind of __ did you say that __ actors appeared on the stage? asked Jan.’

English:

Transitive:
(8) Janet wonders *what the conference on __ ignored the proposals for a week.*

Unergative:
(9) Janet wonders *what the conference on __ succeeded for a week.*
Unaccusative
(10) Janet wonders what the conference on ___ lasted for a week.

References
Kravitchenko, E., Polinsky, M., Xiang, M. 2009. Are all Subject Islands Created Equal? CUNY Human Sentence Processing Conference, UC Davis.