Phillips 2006: The Real-Time Status of Island Phenomena

1 Introduction

Central question: how can/should/must we account for Island Constraints?

- Theoretical accounts have (mostly) been concerned with how we can give a unified characterization of all island phenomena (e.g. A-over-A principle, Subjacency)
- Processing studies have revolved around whether real-time structure building respects Island Constraints.
- These studies have often regarded all syntactic islands as equivalent, but as we know, this is probably not true cross-linguistically.
- **Focus:** Parasitic gap constructions (PGC): the presence of another WH-dependency ‘rescues’ an island constraint violation:\(^1\)

\[(3)\]
\[
\begin{align*}
a. & \text{ *What did the attempt to repair } t \text{ ultimately damage the car?} \\
b. & \text{ What did the attempt to repair the car ultimately damage } t? \\
c. & \text{ What did the attempt to repair } pg \text{ ultimately damage } t?
\end{align*}
\]

Conclusions

1. Gaps can occur inside islands (but not *all* islands)
2. The gap in (3c) precedes the “rescuing” gap, which presents an apparent look ahead problem for the incremental parser.

2 Island constraints in language processing

- A large body of research establishes the time-course of long distance dependencies.
  - The parser posits a gap as soon as a potential gap site can be identified (or even earlier).
- The various studies of the parser’s sensitivity to different islands have led to apparently conflicting conclusions (p. 798)
  - For example, in Stowe’s (1986) study of complex subject NPs found there was no filled gap-effect at *Greg’s* in sentences like (i) below.
  - No slowdown due to implausible V + fronted phrase combination in examples like (iii) below. (Traxler & Pickering 1996).

\(^1\)To avoid interface problems between \LaTeX{} and Paninew (that is, the potential to have lines not print), I will represent parasitic gaps with *pg* and the non-parasitic gap by *t.*
(i) The teacher asked what the silly story about Greg’s older brother was supposed to mean.

(iii) We like the city that the author who wrote unceasingly and with great dedication saw while waiting for a contract.

- There is also work arguing for the parser’s ability to create gaps inside islands using a variety of experimental methods: sentence matching, ERP studies, speeded-grammaticality tasks, eye-tracking, and self-paced reading.

- The prevailing opinion: the evidence supports the notion that island constraints take effect in parsing, and the contrary evidence is due to flawed experimental methods.

- Alternative solution: different results wrt island sensitivity reflect differences in the specific islands used across studies.

3 Processing Accounts of Island Constraints

- Some accounts of islands claim that island constraints ultimately derive from constraints on language processing.
  - Island constraints emerge as grammaticization of constraints on processing.
  - Constraints on LDD are not in the grammar at all and are just parsing problems.

- All accounts that derive island constraints from limitations on processing share an important prediction: island constraints should not be violated in real-time processing.

- If it can be shown that the parser posits gaps in islands, then this position would be difficult to argue.

4 Parasitic Gaps

- There are a number of ways a parser might approach a PGC like in (3c).
  - Wait until the licensing gap is found: avoids constructing ungrammatical parse, but sacrifices true incremental parsing.
  - Wait until the parser knows for sure that there is a gap—this is difficult if the V is optionally transitive.
  - Or, posit gaps exactly as a normal wh-dependency: allows full incrementality, but requires parasitic gaps to be in the grammar.

- Importantly, the distribution of PGC is restricted ⇒ some can’t be rescued.

(4) a. *What did the reporter that criticized t eventually praise the war? b. What did the reporter that criticized the war eventually praise t? c. *What did the reporter that criticized pg eventually praise t?
• An accurate and incremental parser would posit gaps inside an island only when the gap could be in a grammatical PGC.

• In order to parse PGC, the parser must . . .
  1. sacrifice incrementality,
  2. sacrifice grammatical accuracy, or...
  3. be equipped to posit gaps in environments that can support them.

5 Experiments

Experiment 1: off-line judgments

• Primary goal: compare acceptability of PGC with acceptability of the two individual gaps combining to form the PGC.

• Secondary goal: compare acceptability of island violations tested here with those in the other studies on p. 798.

• 51 Undergraduates with no syntax training (theoretical or psycholinguistic), naive to the purpose of the study.

• 5-point scale rating task.

• 2 ("finiteness") x 3 (gap type: good, bad, both), with 24 sets of items for PGC and 60 others testing the various island conditions from the studies on p. 798.

• The graph showing the results is on p. 806.

• Conclusion: PGC are a real phenomenon (=not marginal). Even the finite versions showed a slight “rescuing” effect.

Experiment 2: self-paced reading

• Goal 1: check whether a WH-dependency is constructed as soon as the parser encounters the verb inside the subject island without waiting for the licensing gap.

• Goal 2: determine whether the parser immediately distinguishes between infinitival subject islands (licit PCGs) and finite relative clauses (illicit PCGs).

• Same set of subjects as the ratings task.

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2For this paper/handout, “finiteness” is the term used to represent the difference between subjects nouns with infinitival complements and subject nouns modified by finite relative clauses.
• The experimental measure of construction of the WH-dependency involved detection of semantically implausible combinations of a verb and WH-phrase, which leads to measurable disruption of processing.

• 24 sets of 2x2 conditions manipulating plausibility and finiteness.
  – The school superintendent learned **which schools** the proposal to **expand** drastically and innovatively upon the current curriculum would overburden during the following semester.
  – The school superintendent learned **which high school students** the proposal to **expand** drastically and innovatively upon the current curriculum would overburden during the following semester.

• If the parser posits gaps inside the subject islands, then a plausibility-related slowdown is expected.

• Important note: none of the examples actually contained PGCs.

• The reading time experiment was actually administered before the off-line rating task, so the subjects were not primed in that respect.

### Plausibility Condition

• Students rated simplified versions of the stimuli in Exp. 2 for plausibility in order to ensure that the hypothetically implausible verb + WH-phrase combinations were indeed implausible.

• The questionnaire was also used to make sure the implausible combinations were equally implausible in both the finite and infinitival constructions.

• Results clearly showed a main effect of plausibility, with an additional marginally significant tendency for higher ratings in infinitival constructions.

<table>
<thead>
<tr>
<th></th>
<th>INFINITIVE</th>
<th>FINITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plausible</td>
<td>4.55 (0.87)</td>
<td>4.20 (1.10)</td>
</tr>
<tr>
<td>Implausible</td>
<td>2.56 (1.55)</td>
<td>2.63 (1.38)</td>
</tr>
</tbody>
</table>

Mean ratings with standard deviations in parentheses

### Results

• See graphs on p. 811.

• Crucially, there is a main effect of plausibility at the embedded verb in the infinitival cases, but not the finite cases.
6 Discussion

- The same active gap-creation mechanisms are at work in infinitival conditions as in simple clauses.
  - Immediate effect of semantic fit of the WH-word and the verb.
  - Even though the verbs were optionally transitive, the comprehender still posited a gap.

- The plausibility effect was not found in the finite relative clause condition, which suggests that the comprehender did not posit a gap in that position.

- Perhaps unsurprisingly, the type of island that allows PGCs is also the type of island in which the comprehender posited gaps.
  - Recall that both island violations received similarly low ratings for acceptability and plausibility.
  - Note that priming is not at work here, as the reading time experiment happened before the ratings study, and the reading time experiment did not actually have any examples of PGCs.

6.1 Island Constraints in Real-Time

- Experiment 2 showed that comprehenders posit gaps in some islands, but not others.

- Previous studies of island constraints in parsing have arrived at apparently conflicting conditions: could this be attributed to the difference in structures being tested?

- To answer this, we could consider the ratings given to the fillers from Exp. 1:
  - The highest ratings were given to good gaps (those from this study in addition to single WH-extraction).
  - The island gaps with the highest ratings included the infinitival forms from this study and the complex NP forms tested by Freedman and Forster (1985).
    Ex: The publicity manager knew what the casting agency had seen Johns picture of t.
  - The island gaps with lower scores (i.e. finite relative clauses, WH-islands, subjects with PPs) show no evidence for gap creation in the literature.

- There seems to be a correlation between degree of acceptability and the use of active gap-filling mechanisms in parsing.

- It seems the parser avoids positing gaps in environments that are unacceptable.

- One remaining question: do complex NP islands show the same active gap-creation effects?
  - If yes: we must concede that gap creation happens even in environments judged at least mildly unacceptable.
  - If no: we could maintain the hypothesis that gaps are only posited in places that could yield fully acceptable dependencies.
6.2 The Processing Account of Islands

- The badness of gaps inside islands that support PGCs simply cannot be due to constraints/limitations in the parser’s gap creation mechanisms.
- The unacceptability of gaps in these locations must be due to some additional representational constraint.
- Taken to its logical conclusion, perhaps mild gaps are due to some syntactic constraint, but severe gaps are an epiphenomena of parsing.
- Alternatively, perhaps processing difficulty is not itself sufficient to create a syntactic island, but could have a hand in explaining some of the variation in acceptability of different islands.

7 Conclusions

- PGCs are not marginal.
- Parsers actively create gaps inside subject islands only if they can be in a licit PGC.
- For theories of processing, this work indicates the parser accurately and incrementally implements the grammar of PGCs.
- For theories of island constraints, it indicates that those island phenomena cannot be reduced to constraints on processing.