

Extraction from Complex NP islands: An experimental perspective

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Overview: Since Ross (1967), much effort has gone into explaining islands, domains out of which it is generally not possible to extract a constituent via A' movement. This generalization is confirmed in both on- and off-line studies on sentence processing. The human parser turns out to be a highly predictive system that actively maintains hypotheses about upcoming material and attempts to resolve dependencies quickly. This predictive behavior is notably absent in islands (Stowe 1986; M. Pickering et al. 1994; Traxler and M. J. Pickering 1996; Phillips 2006), which suggests that despite its anticipatory nature, the human parser does not consider islands to be viable domains within which to resolve a dependency whose head is outside the island.

While many examples involving extraction from islands are clearly unacceptable, within the Complex NP subtype of island, multiple factors can conspire to significantly improve the acceptability of what is expected to be an island-violating extraction, as in (1) (Chung and McCloskey 1983). Factors associated with improved extraction in English and other languages include being embedded in an indefinite, non-presupposed, and in situ DP (Chomsky 1973; Diesing 1992; Lindahl 2015); having a topic-comment information structure in which the extracted phrase is the topic and the sub-clause it originated in is the comment (Engdahl 1997); having a raising relative clause (Hulsey and Sauerland 2006; Sichel to appear); and more.

- (1) a. * [Who₁ does the president own stock in the company₂ [that t_1 started t_2]]?
b. ? Violence is something₁ [that there are many Americans [who₂ t_2 condone t_1]].

The goal of this research is to determine whether the parser is actually willing to construct movement dependencies across Complex NP island boundaries when various factors conspire to make that island boundary more transparent, and if so, to examine the online processing in such cases. We present the results of two acceptability judgment experiments aimed at determining what factors increase Complex NP island transparency.

Experiment 1: We tested if the definiteness of the DP containing an island affected sentence acceptability with an acceptability judgment task involving a 1-6 Likert scale. 32 item sets were constructed using a $2 \times 2 \times 2$ design, crossing dependency length (SHORT, LONG), embedded clause type (ISLAND, NON-ISLAND), and definiteness of an intervening DP (DEFINITE, INDEFINITE). (2) shows a sample item set. All experimental items were constituent questions.

- (2) a. Who __ predicted [NON-ISL that **the/a** lending crisis would trigger the recession]?
b. What did Peter predict [NON-ISL that **the/a** lending crisis would trigger __]?
c. Who __ predicted **the/a** lending crisis [ISL that would trigger the recession]?
d. What did Peter predict **the/a** lending crisis [ISL that would trigger __]?

Average ratings are illustrated in Figure 1. Within the two ungrammatical conditions, the indefinite condition was rated lower on average than the definite condition, but this was the case across the board. The relationship between the conditions' ratings remains relatively constant, illustrated by the ratings in all indefinite conditions being shifted down as a whole.

A cumulative link mixed effects model showed a significant interaction ($p < 0.05$) between embedded clause type and extraction length, which is the expected island effect, but showed no significant interaction between embedded clause type, extraction length, and definiteness ($p = 0.87$), which means that there was no improvement from extracting from an indefinite DP.

Experiment 2: Next, we tested if the position or presuppositionality of the embedding DP affected acceptability using another acceptability judgment task. 24 item sets were constructed using a 3x2 design, crossing dependency type (MOVEMENT, ANAPHORIC) with the status of the intermediate subject (expletive *there*, INDEFINITE DP, DEFINITE DP). Experimental sentences were declarative clauses with either a copular or attitude matrix verb, as illustrated in (3).

- (3) a. The pres. is someone that there are [many Americans who supported ___ in the election] living in rural areas.
 b. The pres. thinks that there are [many Americans who supported him in the election] living in rural areas.
 c. The pres. is someone that [many Americans who supported ___ in the election] are living in rural areas.
 d. The pres. thinks that [many Americans who supported him in the election] are living in rural areas.
 e. The pres. is someone that [the Americans who supported ___ in the election] are living in rural areas.
 f. The pres. thinks that [the Americans who supported him in the election] are living in rural areas.

Average ratings are illustrated in Figure 2. A cumulative link simple effects model showed a significant effect of dependency type ($p < 0.05$) (island effect), as well as a significant effect of dependency type on the intermediate subject = *there* conditions ($p < 0.05$). This means that there was a significantly lower penalty for extracting from the Complex NP island in these conditions compared to the indefinite and definite intermediate subject conditions.

Conclusions and future research: Experiment 1 found no evidence that the definiteness of the containing DP affects Complex NP island transparency. Experiment 2 found that while the existential conditions with *there* were rated lower generally, there was a significantly lower penalty of extracting from a RC in those conditions, suggesting that the properties associated with existential clauses affect the transparency of a Complex NP island in the DP pivot of the existential—possibly the in situ, non-presupposed nature of the containing DP.

Future experiments will investigate the on-line processing of Complex NP islands whose sentential context make extraction from that island more possible (as in Experiment 2). In particular, we plan to investigate whether the presence of these properties is enough to allow predictive parsing across the island boundary, using a factorial design similar to Experiment 2 modified for self-paced reading and eye-tracking while reading.

Selected references: Chomsky, N. (1973). “Cond’ns on transformations.” In: *A Fest. for M. Halle*. Chung, S. and McCloskey, J. (1983). “On the interpretation...”. In *L.I.* Sichel, I. (to appear). “Anat. of a counterexample” In: *L.I.*

Figure 1: Experiment 1 mean ratings

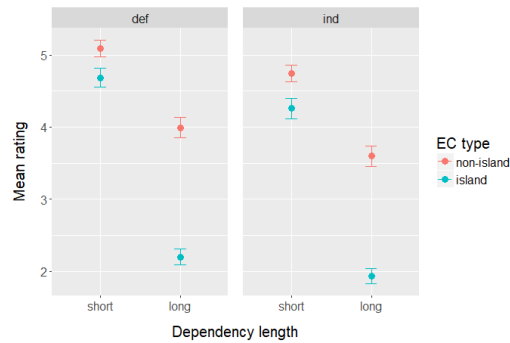


Figure 2: Experiment 2 mean ratings

