Examining Island Effects with NP-Scrambling out of Four Types of Adjunct Clauses in Japanese

Introduction: Recent experimental studies suggest that the presence of island effects with extraction from adjunct clauses (henceforth *adjuncts*) depends on the type of extraction and adjuncts (Sprouse et al. 2016; Kush et al. 2019; Bondevik et al. 2021, Bondevik & Lohndal 2023; Nyvad et al. 2022). This study examined island effects with NP-scrambling out of four types of adjuncts in Japanese, *after*-adjuncts, *because*-adjuncts, conditionals with and without *if*. Although robust island effects have only been reported with *because*-adjuncts, our results show clear island effects with all four types of adjuncts, albeit being subliminal (Almeida 2014), as all condition means are above or around the middle-of-the-scale rating.

Background: The findings in recent experimental studies challenge the claim that extraction from adjuncts are universally banned (Huang 1982; Stepanov 2007). Sprouse et al. (2016) found island effects with both *wh*-question and relativization out of adjuncts in Italian, but only with *wh*-question in English. While extraction out of *because*- and *when*-adjuncts consistently show island effects (e.g., Bondevik & Lohndal 2023), extraction from conditionals has been shown to incur no island effects with Norwegian topicalization (Kush et al. 2019; Bondevic et al. 2021) and English relativization (Nyvad et al. 2022) and subliminal island effects with Norwegian relativization (Bondevik & Lohndal 2023). Similar observations have been made with NP-scrambling out of adjuncts in Japanese. Saito (1985) notes that NP-scrambling out of *after*-adjuncts shows mild degradation (1a) while that out of *because*-adjuncts is unacceptable (1b). Yoshida (2006) observes that NP-scrambling out of conditionals is acceptable with or without *moshi* 'if' (2).

(1) a. ??Sono hon-o$_1$ John-ga [Mary-ga t_1 yomi-oe-te kara] dekake-ta
that book-ACC J-NOM M-NOM read-finish-GER after go.out-PST
'John went out after Mary finished reading that book.'

b. *Sono hon-o$_1$ John-ga [minna-ga t_1 ka-u node] chigau hon-o kat-ta
that book-ACC J-NOM all-NOM buy-NPST because different book-ACC go.out-PST
('Because everyone buys that book, John bought a different book.') (Saito 1985, (147a-b))

(2) Dono ringo-o$_1$ Quinn-wa [moshi/Ø Stillman-ga t_1 tabe-ta-ra] okori-masu-ka
Which apple-ACC Q-TOP if S-NOM eat-PST-COND get.angry-POL-Q
'Which apple will Quinn get angry if Stillman eats?' (Yoshida 2006; (64a-b))

Yano (2019) and Fukuda et al. (2023) examined NP-scrambling out of *because*-adjuncts in Japanese with acceptability judgment experiments. While they both found island effects, no other adjunct types were examined. Fukuda et al. (2023) also found evidence for inter-speaker variation in island effects. Using the mean difference between the two non-island condition means (in-situ vs. scrambling), the study divided its participants between *scramblers*, whose size of the difference is below the average, and *non-scramblers*, whose size of the difference is above the average. The island effects were found only among *scramblers*, whose ratings are not significantly affected by the mere presence of scrambling.

Experiment: We examined island effects with NP-scrambling out of *after*-adjuncts, *because*-adjuncts, conditionals with and without *moshi* 'if', by setting up two 2 x 3 subexperiments with SCRAMBLING (in-situ vs. scrambling) and EMBEDDED STRUCTURE with three levels. Subexperiment A had (complement) CP, *after*-adjuncts, and *because*-adjuncts, while Subexperiment B had CP, conditionals without *moshi* 'if' and with *moshi* 'if'. Six lexicalizations were created for each condition, and the resulting 72 items were distributed into 6 lists and combined with 66 fillers. (3) and (4) show example items in the in-situ conditions from Subexperiments A and B, respectively, where the scrambled constituents are marked with squares.

(3) Toshokan-no shokuin-wa chomeena jidoo.sakka-ga takusan-no jidoomuke-no
Library-GEN faculty-TOP famous child.author-NOM many-GEN children-GEN
hon-o kifusi-te kure-{①ta-to/②ta-node/③te-kara} ureshi-soo da
book-ACC donate-GER give-{PST-COMP/PST-because/GER-after} happy-seem COPULA.NPST
'The librarian looks happy {① that/② because/③ after (≈ since)} the famous children's book author donated many children's books.'

(4) a. Sono tenisupreiyaa-wa raibaru senshu-ga kenshutsufukanoona shinshu-no
That tennis-player-TOP rival athlete-NOM undetectable new-GEN
yakubutsu-o shiyooshi-te i-ru-to fungaishi-ta
drug-ACC use-GER be-NPST-COMP get.angry-PST
'That tennis player got angry that the rival player is using a new undetectable drug.'

b. Sono tenisupreiyaa-wa {Ø/moshi} raibaru senshu-ga
That tennis-player-TOP {Ø/if} rival athlete-NOM
kenshutsufukanoona shinshu-no yakubutsu-o shiyooshi-te i-ta-ra fungaisu-ru-daroo
undetectable new-GEN drug-ACC use-GER be-PST-COND get.angry-NPST-MOD
'That tennis player would get angry if the rival player were using a new undetectable drug.'

101 self-proclaimed Japanese native speakers judged each sentence with a 7-point scale online, and raw scores were z-score-transformed. Following Fukuda et al. (2023), participants were divided into two groups, *scramblers* and *non-scramblers*, following the procedure described above. Figures 1 and 2 show the results of Subexperiments A and B, respectively.

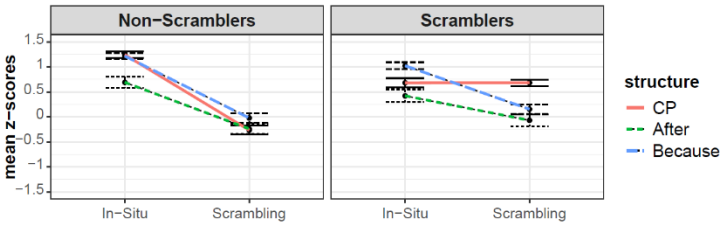

Figure 1: Mean z-scores from Subexperiment A

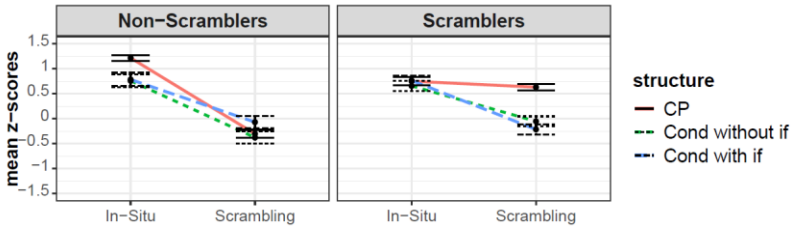

Figure 2: Mean z-scores from Subexperiment B

Analysis: Four linear mixed effects models were run for scramblers and non-scramblers in Subexperiments A and B, with EXTRACTION (in-situ or scrambling) and EMBEDDED STRUCTURE (Subexperiment A: CP, *after*-adjunct or *because*-adjunct; Subexperiment B: CP, conditional without *if*, or conditional with *if*) as fixed factors and participants and items as random factors, using R (Bates et al. 2015). Following the factorial definition of island effects (e.g., Sprouse 2007, Sprouse et al. 2011), the presence of a significant interaction between the two fixed factors is taken as evidence for island effects.

Results: Subexperiment A: With scramblers, significant interactions are found with *after*-adjuncts ($p < 0.01$) and *because*-adjuncts ($p < 0.01$), showing robust island effects. However, all condition means including the mean of the island condition are above the zero z-score, i.e., the middle-of-the-scale rating, making the effects subliminal (Almeida 2014). With non-scramblers, the interaction is significant only with *after*-adjuncts ($p < 0.01$) and not with *because*-adjuncts ($p = .28$). The significant interaction with *after*-adjuncts is due to the facts that the means of the two scrambling conditions are virtually the same while there is a gap between the two means of the in-situ conditions. **Subexperiment B**: Within scramblers, significant interactions are found with conditionals without *if* ($p < 0.01$) and with *if* ($p < 0.01$), again showing robust island effects. With non-scramblers, the interaction is significant with conditionals without *if* ($p < 0.01$) but not with *if* ($p = .07$). Again, the significant interaction with conditionals without *if* is for the wrong reason – there is virtually no difference between the means of the two scrambling conditions while there is a gap between the means of the two in-situ conditions.

Discussion: Our findings suggest all four types of adjuncts examined in this study are islands with NP-scrambling in Japanese, despite the previous claim that only *because*-adjuncts are islands. At the same time, the distribution of the condition means suggest that the observed island effects are subliminal, which partially accounts for the observations in previous studies. Unlike English and Norwegian, conditionals are not more transparent to NP-scrambling than the other adjuncts in Japanese. This suggests fine-grained differences in the underlying structures of adjuncts across languages - while conditionals and other adjuncts may share similar structures in Japanese, they may involve different structures in English and Norwegian.

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