Variability in Adjunct Islands: An Experimental Study in Italian

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1. Introduction

In this paper I investigate a crucial issue for adjuncts, namely the possibility of extraction out of these domains. I challenge the idea that adjuncts are a uniform syntactic class and that their behaviour with respect to extraction phenomena is invariably that of strong islands. I show that extraction can be licensed, depending on (i) the level of attachment of the adjunct in the structure and (ii) the possibility of forming macro-events made by the matrix verb and the one contained in the adjunct.

Traditionally, adjuncts are considered as strong islands (Cinque 1990, Szabolcsi & Lohndal 2017), i.e. extraction from these domains should be universally banned, for both adjuncts, as in (1a), and arguments, as in (1b):

(1) a. * How did Mary leave [after Sara saw _]?
    b. * Which boy did Mary arrive [after Sara kissed _]?

Sentences like the ones in (1) are explained with different approaches, such as the Condition on Extraction Domain (Huang, 1982), Late Merge (Stepanov, 2007) and Multiple Spell-Out (Uriagereka, 1999). All these accounts turn out to be too strong, since their prediction is that subextraction from adjuncts should never be allowed.[1] However, several cases of licensed extraction have already been discussed by many scholars (Truswell 2007, 2011, Sheehan 2010 and Brown 2016 among others for English, Uriagereka 2011 and Fábregas & Jiménez-Fernández 2016 a, b for Spanish). See examples in (2) for extraction out of bare present participial adjuncts, in (3) for extraction out of adjectival secondary predicates and in (4) for extraction from prepositional adjuncts:

(2) a. Which play did you fall asleep [watching _]?
    b. ¿ Qué entró   [diciendo _] Juan?
       what entered saying   Juan
       'What did John came in saying?'   (Fábregas & Jiménez-Fernández, 2016a:1308)

(3) ¿ Con quién llegó   [enfadada _] Maria?
     with whom arrived angry   Maria
     'Whom did Mary arrive [angry with _] ?'   (Fábregas & Jiménez-Fernández, 2016b:42)

(4) a. What are you working so hard [in order to achieve _]?   (Boeckx, 2012:24)
    b. Which man did you return home [without talking to _]?   (Sheehan, 2010:141)

This paper addresses the possibility of extraction from adjuncts in another language, i.e. Italian, as well as some factors which are able to determine this acceptability.

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[1] This prediction is true not only for adjuncts, but also for subjects, at least in the case of the CED and the Multiple Spell-Out approach. In this case as well the prediction is not correct, given that extraction out of these domains seems to be possible in several cases cross-linguistically (Stepanov, 2007).

2. The experiment

In order to test extractability from prepositional adjuncts in Italian, I adopted an experimental method and worked with acceptability judgment data.

The experiment had a 2x2 factorial design crossing two factors: STRUCTURE and TENSE. In the STRUCTURE factor, extraction out of an adjunct island was compared to a grammatical extraction from a parasitic gap. This is different from many other experimental studies on islands (see Sprouse et al. 2016, among others), which for this effect usually compare islands to extraction from declaratives. I used parasitic gaps, even though they are more complex than declaratives, because they give rise to minimal contrasts and because several experimental studies proved that their acceptability ratings are usually comparable to declarative sentences (see Phillips 2006, Wagers & Phillips 2009).

For the TENSE factor, the embedded sentence contained either a finite tensed verb or a non-finite one. Notice that the presence of tense in the island domain is already considered as one of the major factors affecting the grammaticality of a sentence with extraction (see Cinque 1990 and Szabolcsi & Lohndal 2017, among others).

The four conditions were tested for three types of adjuncts, for a total of 12 sentences. Adjuncts were introduced by *dopo* (after), *senza* (without), and *prima* (before). The examples in (5) demonstrate the full paradigm for an item.

(5) a. Quale ragazzo Silvia ha guardato _ senza   salutare _ ?   (Parasitic Gap, - Tense)
      which boy   Silvia has looked   without   to.greet
      'Which boy did Silvia look without greeting?'
   b. Quale ragazzo Silvia ha guardato _ senza   che salutasse _ ?   (PG, + T)
       which boy   Silvia has looked   without that she.greeted
   c. Quale ragazzo Silvia è partita senza   salutare _ ?   (Island, - T)
       which boy   Silvia is left   without to.greet
      'Which boy did Silvia leave without greeting?'
   d. Quale ragazzo Silvia è partita senza   che salutasse _ ?   (I, + T)
       which boy   Silvia is left   without that she.greeted

There were two sentences for each condition in all adjuncts, for a total of 24 items. Fillers were also included, in a ratio of 1:1, for a total of 24 fillers of comparable length and varying acceptability: most of them were completely grammatical or ungrammatical, but the acceptability of some sentences was expected to fall in between. In doing so, participants were encouraged to use a large portion of the scale. Fillers consisted of both declaratives and questions, which were included so that the target items were not the only questions in the experiment. Every subject was therefore tested on a total of 48 items. Items were presented in a pseudo-randomized order, so that the same condition never appeared consecutively. They were distributed into two blocks, which were presented in a different order among participants.

Eighty native speakers of Italian participated in the experiment. They were undergraduate students at the University of Venice (age-range 18-25) with no training in formal syntax.[2]

Items were presented in a written form. Participants were asked to judge the acceptability of the sentences on a 7-point Likert scale, where 7 indicates perfect acceptability, and 1 total unacceptability. Before beginning the experiment, participants were provided with instructions on how to use the scale: they were asked to rate 6 or 7 sentences they found perfectly acceptable, to give 1 or 2 to sentences they found completely unacceptable and incomprehensible, and to assign 3-5 to sentences that were somewhere in between. They were also instructed to judge the sentences on the basis of their native-speaker intuition, rather than any prescriptive rules, and to go with their first instinct instead of spending time thinking about their answers. Moreover, the first five experimental items were used as a pre-test phase and were then excluded from the statistical analysis. The practice items were not marked as such: participants did not know these were practice items.

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[2] Students were all enrolled in an introductory linguistics course which did not introduce them to island effects. Furthermore, the experiment was administered prior to the discussion of syntactic structures.

For statistical analysis, raw ratings of each individual subject, including both target and filler items, were first transformed into *z*-scores in order to avoid potential scale biases between participants. Linear mixed-effects models were then ran on the transformed data with the R statistical package lme4 (Bates et al. 2015). The fixed effect predictors included STRUCTURE and TENSE, as well as their interaction, and the random effects included subjects and items. All predictors were sum coded before the data analysis, with [+ island] and [+ tense] coded as 1, and [- island] and [- tense] coded as -1.

Overall results of *z*-scores are summarized in Table 1 and 2. These show an expected pattern since both STRUCTURE and TENSE are significant factors, as well as their interaction.

	after	*before*	*without*
parasitic gap, -tense	0.24	0.44	0.89
parasitic gap, +tense	-0.21	-0.24	-0.23
island, -tense	-0.94	-0.93	-0.41
island, + tense	-1.03	-0.97	-0.71

Table 1: Means of *z*-score ratings for each condition and item.

	after	*before*	*without*
Main effect of STRUCTURE	***	***	*
Main effect of TENSE	*	**	**
STRUCTURE x TENSE	**	**	***

Table 2: Mixed-effect model for each adjunct type.

For the STRUCTURE factor, statistical analysis revealed that sentences with islands are significantly less acceptable than parasitic gaps, in all adjunct types (for the case of *after*: $\beta = -0.5$, *s.e.* $= 0.09$, $p < 0.002$, *before*: $\beta = -0.52$, *s.e.* $= 0.08$, $p < .0003$, and *without*: $\beta = -0.44$, *s.e.* $= 0.09$, $p < 0.02$).

As for the TENSE factor, sentences with a finite verb in the adjunct were rated significantly lower than sentences with non-finite tense (*after*: $\beta = -0.13$, *s.e.* $= 0.09$, $p < 0.03$, *before*: $\beta = -0.18$, *s.e.* $= 0.09$, $p < 0.03$, and *without*: $\beta = -0.35$, *s.e.* $= 0.09$, $p < 0.01$). This result was expected; we might thus assume that there is something syntactically special about T°/TP interacting with adjunction and inducing the island effect. For reasons of space I will not discuss it further here.

Finally, also the interaction between structure and tense was significant in all the cases considered (*after*: $\beta = 0.09$, *s.e.* $= 0.15$, $p < 0.009$, *before*: $\beta = 0.16$, *s.e.* $= 0.06$, $p < 0.003$, and *without*: $\beta = 0.21$, *s.e.* $= 0.03$, $p < 0.003$).

3. Discussion

A crucial point regarding these results is that there are several ways that show that there is variation among the adjuncts proposed here, in various respects: (i) the effect of STRUCTURE, (ii) the case of parasitic gaps, and (iii) inter-speaker variation. I will briefly discuss each of them in the following section.

3.1. Cases of variability among adjuncts

As seen in section 2.4, statistical analysis revealed a significant effect of STRUCTURE on each of the adjuncts considered in this test. However, this effect is much weaker in the case of the adjunct introduced by *without*, whereas extraction from the others is completely ruled out. Figure 1 shows this difference:

means of *z*-score ratings are compared for the three adjuncts in the island condition with non-finite tensed adjunct.
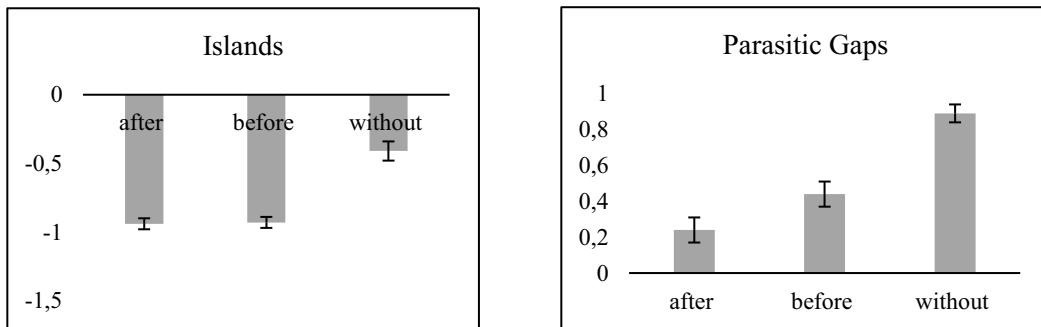

Figure 1, 2: *Z*-score acceptability judgments comparing extraction from each adjunct type for both the island and the parasitic gap condition.

Surprisingly, the same distinction holds for parasitic gaps, i.e. structures which should be equally acceptable and licensed. However, acceptability judgments show that there is a difference among the adjuncts considered (see Figure 2): extraction out of *without* is completely grammatical, but the same cannot be said of the other adjuncts, which are much more degraded. The fact that such a distinction affects not only degraded or unacceptable cases of extraction, but also cases that should be licensed is an important piece of evidence proving that there is a difference among adjuncts.

As noted by Den Dikken et al. (2007) in some cases, acceptability judgment studies tend to hide the fact that people may have different grammars, in the sense of different I-languages. This seems to be the case here. I will take the case of extraction out of the adjunct islands introduced by *without* as an example: if we look at the statistical analysis discussed in the previous section, we know that there is an effect of STRUCTURE, and that this effect is significant (even though it is much weaker than in the other adjuncts). What is missing from this picture is the fact that in this case I found inter-speaker variation: the entire range 1-7 was used. Even though many participants considered this kind of sentence ungrammatical, to some others it was acceptable, whereas for the majority of the speakers it fell in the area of partial acceptability. Crucially, this kind of variability is not present in the same condition for the adjuncts introduced by *after* and *before*, where judgments are mostly uniform.[3] I will take sentences in (6) as an example:

(6) a. Quale ragazza Gianni è partito [senza salutare _]?
     which girl   Gianni is left   without to.greet
     'Which girls did John leave without greeting?'
  b. ?? Quali dolci   Luca è scappato [dopo aver rubato _]?
      which sweets Luca is run.away after to.have stolen
      'Which sweets did Luca run away after having stolen?'

(6a) presents inter-speaker variability, but the same is not true for (6b). Compare Figure 3 and 4, which represent single *z*-score judgments of the eighty participants for the items in (6a) and (6b), respectively. We can see that in the case of *without* acceptability judgments are not uniform and actually spread both above and below the 0 line, namely they are in both the 'good' and the 'bad' areas of the graph, while in the case of *after* all judgments are in the same (unacceptable) area.

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[3] See also Kush et al. (2017) for similar results in *whether* islands in Norwegian. Inter-speaker variation is there accounted for with the presence of different grammars among individuals.
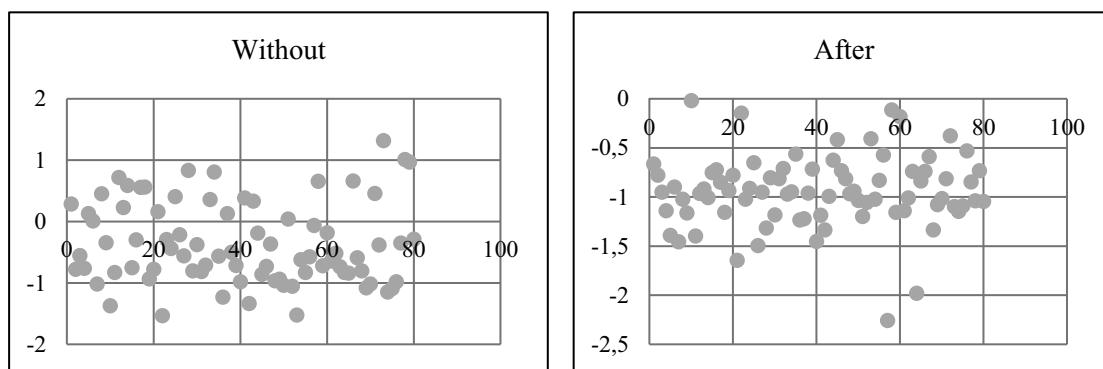
Figure 3 and 4: single acceptability judgments for the island condition with non-finite tense.

3.2. Levels of attachment

These observations show that adjuncts are not to be considered a uniform group, but a heterogeneous one. The island effect can be weaker or stronger, depending on the adjunct used. In the cases investigated here, we can state that *without* is much weaker than *after* and *before*.[4]

Notice that the sentences investigated here were equal in several aspects: all of the them represent a case of extraction from adjuncts, the extracted element is a DP argument made by a complex *wh*-constituent rather than a simple *wh-* word, in every example there is an intervening overt subject, and the verbs used for both the matrix and the embedded sentence are similar. Hence, the difference between them should be attributed to the adjunct itself, and in particular to its syntax. Thus, it seems that we cannot account for adjuncts by means of a uniform condition, but we have to take a step further and divide this class according to some criteria. I claim that one of the criteria is the level of attachment of the adjunct domain: the point of merging may vary depending on the adjunct, and this is (also, but crucially not the only aspect) what makes a domain opaque or transparent.[5]

The crucial distinction may be based on the phase/non-phase difference: when the adjunct merges to a phase head, i.e. *v*P, we have an opaque domain, whereas when it merges to a non-phase head, i.e. VP, the domain is transparent and no island effect arises. In the cases presented here we might say that whereas *after* is attached to the *v*P, and is therefore an opaque domain, *without* is instead connected to VP and for this reason extraction is allowed.

However, this idea is to be integrated with a more fine grained analysis of the levels of attachment in the verbal domain, since events can combine to form complex structures made of a single macro-event instead of two different ones, as in the Single Even Grouping (Truswell, 2011).[6] This is what happens in a sentence like (6a): the event introduced by the adjunct is combined with the one of the main verb, creating a complex event structure, and voiding in this way the islandhood of the adjunct. Crucially, the creation of a complex event structure has to be combined with another factor, i.e. the point of merging of that adjunct: if the adjunct is merged lower in VP, than extraction is allowed, as in (6a), whereas if the adjunct is attached higher to *v*P, extraction is not possible, even though a complex event structure is formed, as in the case of (6b).

The presence of inter-speaker variation in a sentence like (6a) tells us that we cannot reduce grammar to a standard, non-existent language: the notion of standard language is an abstraction and must be qualified. We have to explain *why* there are such differences among subjects, and how to account for them in a generative framework. In the case of this study, the differences may be connected to the fact that adjuncts are assigned to a different point of merger, but also to the fact that some participants fail to analyse the events as combined: for some of them there is no complex structure, and hence the events are

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[4] The fact that (some) adjuncts have a weaker island effect was already detected by some authors, from a theoretical point of view (see Cinque 1990) and from an experimental one (Heestand et al. 2012, Polinsky et al. 2013).

[5] See Haegeman (2012) for a similar conclusion for central adverbial clause, as well as Sheehan (2010) and Brown (2016) for similar hypotheses based on the possibility of extraction out of adjuncts.

[6] See also the analysis of telicity as telic pairs in Giorgi & Pianesi (2001) and Higginbotham (2009).

analysed as different and not connected (see also Truswell 2011 for a similar point). For reasons of space, I will not explore this hypothesis further.

4. Conclusions

In this study I have shown that adjuncts are not always strong islands, and that they are not a uniform class. I suggest that a suitable criterion to divide adjuncts is their point of merging to the structure. Their level of attachment is also connected to the possibility of analysing the two events described in the matrix clause and in the adjunct as a unique complex structure, which allows also extraction from these domains.

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Proceedings of the 36th West Coast Conference on Formal Linguistics

edited by Richard Stockwell, Maura O'Leary, Zhongshi Xu, and Z.L. Zhou

Cascadilla Proceedings Project   Somerville, MA   2019

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Dal Farra, Chiara. 2019. Variability in Adjunct Islands: An Experimental Study in Italian. In *Proceedings of the 36th West Coast Conference on Formal Linguistics*, ed. Richard Stockwell et al., 115-120. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #3453.