

Factive islands revisited – experimental data on adjunct extraction

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Abstract: Factive verbs (*know, regret, remember*) are traditionally said to induce weak island effects, allowing the extraction of arguments, but not that of adjuncts, from the post-verbal clause. However, there are consistent differences between various types of factive verbs, for instance between the so-called cognitive factives (*know, find out, discover*) and emotive factives (*regret, resent, be sad*). The former are generally said to be more permissive and have even been reported to allow adjunct extraction. The current study tests the availability of adjunct extraction in the case of cognitive and emotive factive verbs in English, by means of a comprehension task. The results show that adjunct extraction is indeed banned, with no difference between the two sub-types of factive verbs.

Key words: island effects, weak islands, factive verbs, cognitive factives, emotive factives, adjunct extraction.

1. Introduction: aim and organization

Island effects have been a topic of great interest for decades, ever since Ross's 1967 seminal work. Not only do island effects impact a wide array of structures, from adjunct to subjects, complex NPs and many others, but they also give rise to an ever-growing debate on the factors that influence linguistic comprehension and production – at the core of this debate lies a simple (yet very complex) question: how much can we account for from a structural perspective and how much do other factors (e.g. processing factors, frequency, working memory, etc.) influence the acceptability (or grammaticality) of a given structure.

One example of island effect inducers are factive verbs (*know, regret, remember, etc.*), verbs that are traditionally argued to allow the extraction of arguments from their post-verbal clause, but that ban the extraction of adjuncts, being considered weak islands (Szabolcsi and den Dikken 2003). However, within the class of factive verbs themselves, there seem to be numerous differences between the so-

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called cognitive factives (*know, remember, etc.*) and emotive factives (*regret, resent, be sorry, etc.*) (Karttunen 1971, Hooper and Thompson 1973, Djarv 2019 and references therein). In general, cognitive factives are considered more permissive, allowing phenomena and structures that are deemed ungrammatical with emotive factives.

The aim of the present study is to investigate the behaviour of cognitive factives and emotive factives in English, with respect to extraction from the post-verbal clause. I will address two main questions: i) do factive verbs induce weak island effects? (i.e. is the extraction of adjuncts banned?) and ii) is there any difference between cognitive and emotive factives from the point of view of island effects?

The remainder of this paper is organized as follows: Section 2 gives a brief theoretical overview of islands, touching on the grammatical-reductionist analyses debate. Section 3 provides a description of some of the most prominent properties of factive verbs, with a focus on the differences between cognitive factives and emotive factives, as well as a theoretical background which captures the most influential analyses of these verbs. In section 4 I present an experimental study – a comprehension task, carried out with native speakers of English, meant to test the acceptability of long-distance movement from the post-verbal clause of cognitive and emotive factive verbs. A brief final section draws some tentative conclusions.

2. Islandhood and the grammatical-reductionist debate

Long distance dependencies and island effects in general have been at the core of several types of debates for decades.

On the one hand, the complexity of such phenomena stems from the wide array of structures they span. Ever since Ross's seminal work on islands, numerous constructions have been argued to disallow long distance dependencies. In some cases, the extraction of both arguments and adjuncts is disallowed, giving rise to the so-called strong islands – long distance movement is prohibited out of adjunct clauses, subjects, adjuncts, tensed *wh*-clauses, left branches or coordinated structures. On the other hand, arguments, but not adjuncts, can be extracted out of tenseless *wh*-questions, extraposed constituents, negative constructions, or the clausal complement of factive verbs. These are known in the literature as weak islands (Szabolcsi and den Dikken 2003).

For the last decades, many accounts have been put forth, meant to provide unitary explanations for as many of these islands as possible. Out of these, probably the most influential ones are Chomsky's (1973) Subjacency constraint, in which *wh*-dependencies which move over more than one bounding node are banned (a principle which can also account for some cross-linguistic variation

with respect to islandhood, given that in English these bounding nodes are said to be NP and IP, while in other languages, such as Italian, NP and CP) and the Empty Category Principle, which argues that extraction domains need to be properly governed (Chomsky 1981). While these two principles can neatly account for several types of islands (especially strong islands), they leave others unaccounted for. In addition to these, an ever-growing number of counter-examples and “exceptions” have led some researchers to question the possibility of accounting for all island effects in a unitary fashion and to suggest instead that island effects might simply be “epiphenomena” (Kluender 1998 and references therein).

Such questions have given rise to at least two distinct lines of analysis. On the one hand, there are linguists who look at other modules of grammar (as well), in order to account for island effects, namely at semantics (Szabolcsi and Zwarts 1993, Abrusán 2011, Djarv 2019 and references therein), or pragmatics (Erteschik-Shir 1973, Kuno 1976, Oshima 2007, Ambridge and Goldberg 2008).

On the other hand, however, there are voices who argue that island effects are not grammatical in nature, but are triggered by other factors, such as processing load, working memory, frequency of structure and others (Kluender 1998 and references therein)². In the more radical variants of such reductionist accounts, at least some island effects are not at all caused by structural constraints. More specifically, while a structure might be, in principle, grammatical, the impossibility of comprehending (and producing) such constructions stems from (at least) two distinct factors: the complexity of structures with long distance dependencies, in addition to the complexity of island inducers themselves (complex subjects, relative clauses, etc.). To these authors, islands are not illicit, but simply “resource-hungry” (Phillips 2013).

Last, but by no means least, there are also more moderate accounts, which still account for island effects from a grammatical perspective, but acknowledge the influence that such processing factors might have on the comprehension and production of long-distance dependencies (Hofmeister *et al.* 2013 and references therein).

This paper focuses on factive verbs, a class of verbs which are traditionally said to ban the extraction of adjuncts, but not that of arguments, out of their clausal complement, giving rise to weak island effects. In the next section, I will briefly present some of the most influential structural analyses which have been put forth in order to account for factive islands, while also presenting some counter-examples which might challenge these accounts. More specifically, at least some factive verbs seem to allow even adjunct extraction.

² For an in-depth comparison between grammatical and reductionist approaches, see Phillips 2013.

3. Some properties of factive verbs

Factive verbs are verbs which entail the truth value of their complement, even under negation, and are often analyzed in contrast to non-factive verbs (*think, believe, etc.*), as can be seen in (1) below.

- (1) John doesn't regret that he lost his wallet. → He lost his wallet.
 John doesn't think that he lost his wallet. ↗ He lost his wallet.

However, ever since Karttunen 1971, researchers have discussed a series of contrasts between two sub-types of factives: the so-called cognitive factives (semi-factives in Karttunen's terminology) (*know, remember, realize*) and emotive factives (true factives in Karttunen's terminology) (*regret, be sorry, be sad*).

These two sub-types of factive verbs seem to differ not only from the point of view of their interpretation, but also from that of their syntactic behaviour.

3.1. Factive verbs and the cognitive-emotive split

First of all, although factive verbs in general are said to entail the truth value of their complement, their presupposition can be cancelled under different contexts for cognitive factives and emotive factives (Karttunen 1971, Djarv 2019 and references therein).

- (2) If I realize later that John ate my cookie, I'll ask him why he did it ↗
 John ate my cookie.
 If I regret later that I lied, I'll apologize. → I lied.
- (3) *John found out that they were going back to offline classes, but it later turned out that they weren't after all.
 John was happy that they were going back to offline classes, but it later turned out that they weren't after all.

In addition to that, these two sub-types of factive verbs also differ from the point of view of referentiality (Kiparsky and Kiparsky 1971, Kastner 2015). While cognitive factives are compatible with both referential and non-referential pro-forms, emotive factives are only compatible with referential pro-forms.

- (4) Mary is a terrible manager, which/as we all know.
 Mary is a terrible manager which/*as we all regret.

Cognitive factive verbs have also been described as more "permissive" with respect to other phenomena, such as complementizer omission (de Cuba 2018, Bilbiie *et al.* to appear).

- (5) John knows (that) his father is coming home.
John regrets *(that) his father is coming home.

A similar pattern arises in the case of main clause phenomena, such as topicalization, which seem to be possible in the case of cognitive factive verbs, but not in that of emotive factives (Karttunen 1971, Hooper and Thompson 1973, de Cuba 2018, Djarv 2019).

- (6) The scout discovered/*appreciated that beyond the hill, stood a large fortress. (example from Hooper and Thompson 1973)

Another interesting property that distinguishes cognitive factives from emotive factives is their ability to take subordinate clauses introduced by *wh*-elements (Lahiri 2002). While cognitive factives can take *wh*-subordinates in which the *wh*-element has been dislocated both from an argument and from an adjunct position, emotive factives are more restrictive.³

- (7) I know what to do.
I know what John did.
I know who saw John.
I know where John hid his treasure.
- (8) *I regret what to do.
I regret what I did.
*I regret who saw John.
*I regret where John hid his treasure.

Going back however to the main topic of this paper, factive verbs are traditionally said to induce weak island effects, banning the extraction of adjuncts, but not that of arguments, from the post-verbal clause (Szabolcsi and den Dikken 2003).

- (9) a. What did John remember he had done?
b. *Where did John remember he had hidden the treasure?
- (10) a. What did John regret that he hid in the back yard?
b. *Where did John regret that he hid the treasure?

However, it seems to be the case that even with respect to extraction there are some differences between cognitive factives and emotive factive verbs, the former allowing subject and adjunct extraction more readily than the latter.

³The relation between the availability of *wh*-subordinates and long-distance movement is definitely worth exploring further, but I leave this for further research. For an in-depth analysis of embedded interrogatives, see Lahiri 2002 and reference therein.

- (11) ?Who did he remember stole the cookie? (example taken from Djarv 2019)
- (12) Big news! Archaeologists reveal new facts about the life and death of Caesar. So tell me – where did they {discover, learn} that Caesar was killed? (example taken from Djarv and Romero 2021)

3.2. Factive verbs – a theoretical background

As previously mentioned, for decades factive verbs have been primarily discussed in contrast with non-factive verbs, both from the point of view of their interpretation and from a structural perspective.

In recent years though, once the distinction between these two sub-types of factive verbs has become more apparent, new analyses have emerged, which could also address the ban (or lack thereof) on extraction.

In what follows I will provide a brief overview of some of the most influential syntactic analyses of factive verbs, to the aim of evaluating their explanatory power with respect to the cognitive-emotive split.

3.2.1. The nominal layer analysis – Kiparsky and Kiparsky 1971

Probably the most well-known and influential analysis of factive verbs was the one put forth by Kiparsky and Kiparsky (1971), who postulated an underlying syntactic difference between a verb such as *know* and one such as *think*. In their analysis, in contrast to non-factive verbs, factives have a silent noun *fact* in their structure, giving rise to a representation such as the one below.

- (13) John regretted that Mary left → John regretted the fact that Mary left.

The idea that factive verbs have a (silent) nominal in their structure can account for some of their properties, including their compatibility with “the fact” or with “it” (illustrated in (14) and (15) below), the fact that they can take gerunds as their complements (as seen in (16)), or that factive complements can appear in subject position (as shown in (17)).

- (14) I know the fact that you love me.
 (15) I regret it that you left so early.
 (16) I regret having eaten so much ice-cream.
 (17) That there is still some ice-cream in the fridge makes no sense to me.

Under such an analysis, the island effects induced by factive verbs would readily follow from the existence of a nominal node in their

structure, which the moved element would have to cross, and therefore movement would be blocked on account of the Subjacency Principle and the Empty Category Principle. However, while this analysis has great explanatory power with respect to the contrast between factives and non-factives, it leaves some questions unanswered. For instance, it cannot capture the differences between cognitive and emotive factives, not only in terms of extraction, but also judging by the other phenomena which were seen to distinguish the two sub-types of factives (e.g. null complementizers or main clause phenomena).

3.2.2 The reduced clause analysis – de Cuba 2007

The idea according to which factive verbs are more complex than non-factive ones has been therefore questioned in more recent analyses, which argue that post-verbal clauses of factive verbs have, in fact, a reduced structure. While details of such analyses differ (for a more in depth account, see Haegeman 2006, Haegeman and Ürögdi 2010, de Cuba 2007, de Cuba and Ürögdi 2010, de Cuba 2018), there are two main arguments that the proponents of the reduced clause analysis put forth: on the one hand, they argue that factive verbs take complements with a reduced left-periphery and, secondly, that it might not be factivity at all that is responsible for the behaviour of these verbs, but rather some other property, such as referentiality (de Cuba 2007, 2018) or presuppositionality (Kastner 2015). For Kastner, for instance, the difference between these concepts is of utmost importance – while factive verbs entail the truth value of their complement, presuppositional verbs merely entail its existence. In other words, presuppositional verbs can either be factive (*know, regret, remember*), or non-factive (*deny, confirm, verify*).

Briefly, following the line of Haegeman (2006), de Cuba (2007) argues that factivity is a semantic construal and syntactic differences that arise between classes of verbs should not be accounted for based on semantic concepts, but rather on a difference in syntactic structure.

From a structural standpoint, de Cuba makes a distinction between two types of clauses: referential clauses, as seen in (18), in which complementizer phrases (henceforth CPs) are said to be “referential entities that denote a proposition without illocutionary force” (de Cuba and Ürögdi 2010: 45) and non-referential clauses, illustrated in (19), which are seen as more complex, where the [cP[CP]] denotes “a non-referential semantic object denoting a speech act, i.e. an unresolved proposition or an open question” (de Cuba and Ürögdi 2010: 45).

(18) Referential clauses: V [CP]

(19) Non-referential clauses: V [cP [CP]] (structures taken from de Cuba and Ürögdi 2010: 42)

De Cuba's account has at least two main advantages: first of all, by postulating an additional layer in the case of non-referential clauses, the possibility of extraction, as well as that of main clause phenomena, can be straightforwardly accounted for in the case of non-referential clauses, due to the existence of the cP layer itself.

First of all, in order to account for the asymmetry between argument and adjunct extraction, de Cuba states that these two types of movement take place through different positions in the structure: while arguments move *through* Spec, CP, adjuncts are *adjoined* to the CP. Argument extraction is then possible both in the case of those verbs which take referential CPs, and in those that take non-referential cPs.

On the other hand, adjuncts need to adjoin to the CP and it seems to be the case that the operation of Adjoin is blocked in the case of those verbs that take referential clauses. This impossibility of adjoining is straightforwardly explained due to Chomsky's Adjunction Prohibition, according to which "Adjunction to a phrase which is s-selected by a lexical (open class) head is ungrammatical". (De Cuba and Ürögdi 2010: 58). Consequently, the contrast between (20a) and (20b) below can be explained as follows: in (19a), where the CP is selected by cP, not by the lexical verb directly, adjunction is possible. In (19b), on the other hand, given that the CP is directly selected by the verb, this movement operation is blocked, resulting in the ungrammaticality of adjunct extraction.

- (20) a. Why do you think [_{CP} [_{CP} t_{how} [_{CP} that John left__]]?
 b. Why do you regret * [_{CP} t_{how} [_{CP} that John left__]?

Another aspect which is relevant for the current study is related to the variable behaviour that some factive verbs seem to evince. Briefly, de Cuba argues that there is no one-to-one correspondence between factivity and referentiality, a factive verb being able, in principle, to take either a referential or a non-referential clause as its complement. This choice will mainly depend on whether the verb is used assertively or not. The fact that factives can be found with non-referential clauses can be seen in examples such as the one in (21), where a (cognitive) factive is used in an assertive context i.e. it can introduce information that is not in the Common Ground) (de Cuba 2017⁴);

- (21) Guess what? I discovered/noticed that there is a secret labyrinth under our building! (example taken from de Cuba 2017).

Following this line of reasoning, it becomes apparent why some verbs (i.e. cognitive factive verbs) seem to allow phenomena that have been traditionally associated with non-factive verbs, as seen in Section

⁴ For a similar intuition, see Djarv 2019.

3.1 above – in those cases, a cognitive factive will take a non-referential clause and constructions involving main clause phenomena or even adjunct extraction for instance will be possible.

Such an explanation can readily account for the examples reported by Djarv and Romero (2021), presented in (12) above and repeated for convenience below: the verb is interpreted assertively, introducing new information in the discourse and it takes a non-referential clause as its complement, a type of structure which, as seen, permits the extraction of adjuncts.

- (22) Big news! Archaeologists reveal new facts about the life and death of Caesar. So tell me – where did they {discover, learn} that Caesar was killed? (example taken from Djarv and Romero 2021)

3.2.3. Factivity vs presuppositionality – Kastner 2015

While the two lines presented above seem to be opposed, there are also some analyses which reconcile the two intuitions: the verbs previously referred to as “factive” have some type of nominal component in their structure, while their clausal complement is still truncated.

One such analysis was put forth by Kastner, who argues that presuppositionality is the property that influences the behaviour of these verbs, not factivity.

From a syntactic perspective, Kastner postulates the existence of three types of structures.

- (23) a. Selected embedded non-presuppositionals: [V CP]: believe that he is right
 b. Selected embedded presuppositionals: [V [_{DP} Δ CP]]: regret that he is right
 c. Overt definite presuppositionals: [V [_{DP} D [_{NP} [_{NP} N] CP]]]: regret the fact that he is right (description taken from Kastner 2015)

As can be seen in (23b), selected embedded presuppositionals have a presuppositional determiner Δ in their structure, which corresponds to the discourse referent. Recall that presuppositional verbs entail the existence of their complement – the discourse referent already exists and it is simply updated with new information. This definite determiner “licenses a Force with a presuppositional feature, and a presuppositional Force does not license Topic or Focus” (Kastner 2015). When discussing the nature of Δ, Kastner proposes an alternative as well: Δ might also select a Fin directly, which would explain why these sentences are interpreted non-assertively.

Kastner’s analysis has a series of advantages: on the one hand, it seems to reconcile two intuitions which were, to some extent,

opposed: some verbs do have a nominal element in their component (along the lines of Kiparsky and Kiparsky 1971), while still giving rise to clauses with a reduced left periphery.

From a structural perspective, this analysis can also neatly account for a series of contrasts, such as those related to referentiality or main clause phenomena.

As far as extraction is concerned, Kastner also reconciles a syntactic analysis with semantic intuitions (along the lines of Honcoop 1998, in Kastner 2015). Briefly, for Honcoop one of the differences between factives and non-factives lies in the ability of the former, but not the latter, to introduce discourse referents. Only such constructions will enable what is known as Existential Disclosure, which heavily influences the acceptability of extraction (i.e. when Existential Disclosure is not possible, extraction is ungrammatical). The difference between arguments and adjuncts stems from the fact that the latter cannot introduce new referents in the discourse.

While for now I remain agnostic as to which of these two analyses has more explanatory power, there is (at least) one common aspect which is important for the current study: as it might be the case that it is not factivity which is responsible for the distinct syntactic behaviour, of these verbs, we might expect verbs that traditionally belong to the class of factives to evince distinct properties. As was seen in Section 2, this intuition seems to be borne out by the data.

Let us return now to the main question which this study is trying to answer: is there any difference between cognitive factives and emotive factives with respect to adjunct extraction? In the light of previous analyses, we might indeed expect cognitive factives to select simpler structures and to be more permissive with respect to adjunct extraction than emotive factives.

The next section provides experimental data meant to test this hypothesis.

4. Factive verbs and islandhood – experimental data

4.1. Aim

The aim of this study is to investigate the distinction (if any) between the island effects imposed by cognitive factive verbs and those imposed by emotive factives. As seen in the previous section, while argument extraction, irrespective of the type of factive verb, is grammatical, adjunct extraction is traditionally disallowed. However, the extraction data provided by Djarv and Romero (2021) and reported in (12) above, indicate that, at least in the case of cognitive factive, the movement of adjuncts could in fact be possible.

4.2. Materials and procedure

This experiment is inherently a truth value judgement task (Abrams *et al.* 1978), but also includes another widely used method, namely the question-after-story design. The question after story design has been frequently used in the study of island effects, (de Villiers and Roeper 1991 and references therein), whether we refer to production or comprehension tasks. However, taking into account the way in which the current experiment was carried out (online questionnaires), using these two designs combined ensured that, on the one hand, the test captured more than mere preferences and, on the other, the test items could not be interpreted as involving short distance movement – when the adjunct undergoes short distance movement, as can be seen in (24), the structure is in fact grammatical. Only long-distance movement of adjuncts results in ungrammaticality.

(24) When did John remember ___ that he had an appointment?

As will be seen in the test items presented below, the truth value judgement design favours a long-distance movement reading, giving rise to the construction under investigation.

Briefly, the experiment had the following design⁵: respondents were reading short contexts, in which a story was being told. Respondents knew that Paddington, the bear, was reading the same story and that, at the end of the story, the puppet would be asked a question. At the end of each story, the puppet answered the question and respondents were asked to state whether the puppet was right or wrong. By having the puppet answer the question, I was able to control that the respondent did not interpret the structure as involving short-distance movement. Two of the test items, showcasing adjunct extraction from the post-verbal clause of cognitive and emotive factives respectively, can be seen in (25) and (26) below.

(25) Emma was watching Tom and Jerry in the living room. After a couple of scenes, she said: “I’ve already seen this episode at the kindergarten!”, so she told her Mom:

- Mommy, can I watch another one?

Storyteller: Paddington, where did Emma remember that she had seen the episode?

Paddington: At the kindergarten.

(26) Philip had a cat called Cookie. One day, Cookie ran in the garden, while Philip was not at home. His parents went to the kindergarten and told him: “Honey, we have some bad news: Cookie ran away...”.

⁵ The current experiment is a pilot study for a task designed to test island effects in language acquisition.

Philip started crying and asked his parents:
 - Do you think we'll ever find him again?

Storyteller: Paddington, where did Philip get sad that Cookie had run away?

Paddington: In the garden.

Importantly, due to the design of the experiment (more specifically, to the use of broader contexts), the verbs under investigation could not be interpreted as being assertive – the information was clearly present in the discourse. If the test items had been used in isolation, respondents could have possibly interpreted them as being non-referential, in which case, as seen in Section 3, factive verbs can allow for adjunct extraction.

The task included 8 test items: 4 tested adjunct extraction from the post-verbal clause of cognitive factives and 4 tested adjunct extraction from the post-verbal clause of emotive factives. For each sub-class of factive verbs, 4 verbs were used: *remember*, *realize*, *find out*, *discover* and *regret*, *get annoyed*, *get sad*, *get upset* respectively. The *wh*-elements extracted were of the *when* and *where* type, as *how* and *why* are generally said to be more difficult to extract, even with other types of islands (Oshima 2007).

Other than the test items, the experiment included 8 control items, using the same verbs, but where short distance movement was targeted, and 4 distractors.

These items were divided between two variants of this questionnaire, in such a way that each respondent evaluated each verb either in a context with long distance movement or in one with short distance movement.

4.3. Participants

60 native speakers of English (mean age 40.6) took part in this task, all naïve with respect to the aim of the experiment.

4.4. Results

The results, summarized in Figure 1, show, first of all, that adjunct extraction from the post-verbal clause of both cognitive and emotive factives is generally disallowed.

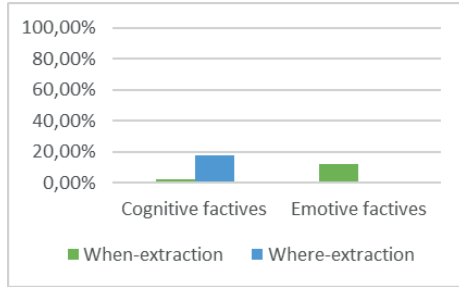


Figure 1: Percentages of acceptability of adjunct extraction

More specifically, adjunct long-distance movement was only accepted in 7.8% of cases – 9.8% of test items involving cognitive factive verbs were deemed correct, whereas the acceptability rate with respect to emotive factive verbs was only 5.8%. Figure 1 also shows the difference in acceptability between *when*-extraction and *where*-extraction – in the case of cognitive factive verbs, *where*-extraction was accepted in 17.64% of cases, while *when*-extraction had an acceptability rate of 1.96%. When looking at emotive factive verbs, respondents judged 11.74% of test items targeting *when* adjuncts as true, but rejected all test items targeting *where* adjuncts.

A more in-depth statistic analysis provided a more detailed picture. The results were analysed based on a logic generalized mixed model in Jamovi, using the gamlj module. The test targeted a fixed effect of predicate type (COGNITIVE vs. EMOTIVE). Participants were added as random effects. The analysis did not include any data-points from the four filler items and no data points were excluded from the analysis itself.

The results, summarized in Figure 2 below, show that there is no clear contrast between the acceptability of long-distance movement in the case of cognitive factive verbs and emotive factive verbs – there was no main effect of predicate type ($p=0.149$, $\beta =0.4737$, $SE=0.518$).

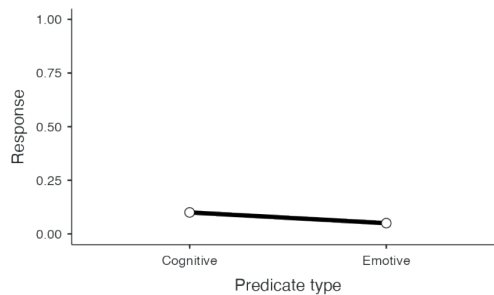


Figure 2: Difference in acceptability between cognitive and emotive predicates with respect to adjunct extraction

A contrast which was, interesting, however, was that between *when* and *where* extraction. While *when* adjuncts were more readily accepted in the case of cognitive factives, the reverse pattern emerged in the case of emotive factives. I leave an analysis of this pattern, together with a study on other types of adjuncts, to further research.

As expected, there was a clear contrast between the acceptability of short distance-movement and that of long-distance movement, the former being permitted across the board. The difference between the control items and the test items reached statistic significance ($p < 0.0.1$, $\beta = 0.00627$ SE=0.313).

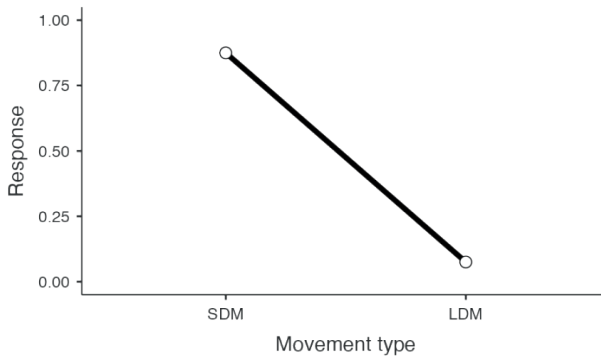


Figure 3: Difference in acceptability between short distance movement and long-distance movement across predicate types

4.5. Discussion

Taking into account the many syntactic differences noted in the literature between cognitive factives and emotive factives and building on de Cuba's (2007) and Kastner's (2015) analyses, cognitive factive verbs could be seen as more "flexible", being liable to occur in simpler or more complex configurations (i.e. a configuration with or without a fully articulated left periphery). When they appear in a configuration with a fully articulated left periphery, extraction (even of adjuncts) should in principle be available. However, such an interpretation seems to be possible only in those cases where these verbs are used assertively and introduce new information in the discourse.

The results of the current experiment show that, when the verb does not introduce new information in the common ground, when the discourse referent is already present, long-distance movement out of the clausal complement of factive verbs is disallowed, irrespective of verb type (i.e. cognitive or emotive factive verbs). Therefore, the study brings further experimental evidence to a long line of theoretical accounts, which consider factive verbs to be indeed weak islands.

From a structural perspective, when used as presuppositional/referential, both cognitive and emotive factive verbs select a clause with a reduced left periphery, which renders long-distance movement ungrammatical, along the line of De Cuba 2007 or Kastner 2015, as presented in Section 3.2. above.

5. Some (tentative) conclusions and questions for further research

The aim of the current paper was to investigate the behaviour of factive verbs as island inducers and to test whether cognitive factive verbs and emotive factive verbs differ from the point of view of the availability of adjunct extraction. The results of this comprehension task indicate that there is no difference between the two sub-types of factive verbs.

While the results neatly confirm the hypotheses of many studies which see factive verbs as weak island inducers, there are also a series of questions that need to be addressed and which I leave for further research.

First and foremost, from a purely structural perspective, if there is no difference between cognitive and emotive factive verbs with respect to adjunct extraction (at least when the verb is interpreted as presuppositional/referential), how could we account for the other syntactic differences which seem to hold between these two sub-types of factive verbs? Recall that, at least with respect to complementizer omission, main clause phenomena and *wh*-subordinates, cognitive factive verbs seem to be more flexible than emotive factives.

Secondly, in recent years, an increasing number of studies have reported differences between the comprehension and production of the same phenomenon – in the light of such studies, I leave it for further research to test factive islands in production as well.

Lastly, the ongoing debate between grammatical and reductionist accounts cannot be ignored – recall that, while for decades islands have been discussed from mainly syntactic, semantic or pragmatic perspectives, more recently researchers have taken into account the influence of other factors (i.e. processing load, working memory, frequency) on the acceptability of such constructions.

True enough, in an experiment on factive islands, Liu *et al.* (2022) show that not only are such constructions difficult to process, but also rare – consequently, the combination of a low frequency of the verb frame itself (factive verbs are more rarely used with subordinate clauses) and a higher complexity of construction type (interrogatives being harder to process than declaratives) renders the structures difficult to process and produce. I take the liberty of interpreting their conclusions as follows: factive islands out of which adjuncts are extracted are not necessarily illicit, but, perhaps (highly) unlikely.

In the light of such studies, it would be interesting to see (i) what other factors influence the acceptability of extraction and (ii) whether, by decreasing these processing costs, acceptability rates would increase. I leave these questions for further research.

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