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Islands Effects Without Extraction: The Discourse Function of Constructions Predicts Island Status

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Abstract

Each grammatical construction has its own function, and typically multiple constructions are combined to express a message. When the functions of two constructions conflict in a way that cannot be reconciled, their combination is judged ungrammatical. Here we consider one such type of case: “syntactic island violations.” Specifically, we consider combinations of *wh*-questions with 11 other constructions. *Wh*-questions request direct information about a particular constituent. Using a new Discourse task, we quantify how directly 11 constructions convey information in simple declarative sentences. Results demonstrate acceptability judgments on the *wh*-questions correlate with the degree to which the 11 constructions convey information directly. Thus, we argue that degrees of unacceptability of “island violations” result from the extent to which the discourse functions of the constructions involved conflict ($N=240$).

Keywords: islands; discourse constraints; backgroundedness; communication

Islands

Each time we speak or sign, we need to choose a combination of words and grammatical constructions to express our intended message. In English, word order is used to convey who did what to whom, as in the example simple declarative sentence in (1). Non-canonical word orders are used to indicate special discourse functions. For instance, the passive sentence in (2) treats *mistakes* as the grammatical subject, thereby avoiding mention of the guilty party (possibly, *Greg*). The “it-cleft” construction is used in (3) to emphasize *Greg*’s role and imply his uniqueness in the given context as the person who made mistakes.

- (1) Greg made mistakes.
- (2) Mistakes were made.
- (3) It was Greg who made mistakes.

Like “it”-clefts, English *wh*-questions can position a phrase far away from its canonical position. In such cases, there is a Long-Distance semantic Dependency (LDD) between the overt and canonical position of a constituent, as indicated in (4) and (5) with underlines and underscores.

- (4) Tom thinks Greg stole TVs.
- (5) What did Tom think Greg stole _?

LDD constructions such as questions and clefts are often discussed as if a constituent (in [5], *what*) was “extracted”

from its canonical position and “moved” leftward in the sentence. Most researchers today acknowledge that any movement is purely metaphorical (Fodor, Bever & Garrett, 1974), though the terminology remains useful. Ross (1967) first observed that certain grammatical constructions resist LDDs holding between a subconstituent’s canonical position and a non-canonical position outside the construction. He dubbed such constructions “islands,” since constituents within an island seem unable to move off the island. For instance, notice that it is infelicitous to ask a question about an argument within the subject relative clause in (6): That is, speakers find (7) awkward at best and non-sensical at worst:

- (6) The door [that leads to the basement]_{RC} was closed_{_}.
- (7) Where does [the door that leads to _]_{RC} was closed?

The current work aims to address a question that has been debated for over half a century, namely the extent to which various constructions are islands to LDDs and *why* (Newmeyer, 2016; Chaves & Putnam, 2021). The explanation has been widely assumed to follow from purely formal constraints on movement (Abels, 2017; Chomsky, 1973). More recent work has argued that at least some islands may result from insufficient frequency in the input (Liu, Ryskin, Futrell, & Gibson, 2019; Dabrowska, Roland, & Theakston, 2009; Verhagen, 2005).

Another perspective, examined here, appeals to the function of island constructions: particularly the way island constructions package and present the information they convey. Erteschik-Shir (1979) first argued that information within an island is outside the focus domain of the sentence (“non-dominant” in her terminology) (see also Abeillé, Hemforth, Winckel, & Gibson, 2020; Deane, 1991; Goldberg, 2006; Kuno, 1972, 1987; Polinsky, 1998; Takami, 1989; Van Valin, 1998). The focus domain of a sentence includes information that is asserted, and is therefore negated by main clause negation (Halliday, 1967; Lambrecht, 1994). Goldberg (2006) clarifies that constraints on islands arise because of a clash between the functions of grammatical constructions that are combined: LDDs make a certain constituent prominent in the discourse, while island constructions ensure their content is “backgrounded.” It is infelicitous on this view for a speaker to make a constituent prominent in the discourse (via the LDD) and backgrounded (via the island construction). For example, if a speaker wishes

to ask where a door leads as is attempted in (7), it is infelicitous for the same speaker to have chosen to “bury” that information within a relative clause, which is typically backgrounded (i.e., not “at-issue”, Potts, 2004). If the speaker wishes to ask directly for information by using a *wh*-question, the constituent at-issue should belong to a construction that makes it prominent in the discourse as it is as part of the main clause verb phrase (see 8). In this case, combination with a *wh*-question (as in 9) is natural.

- (8) The door [that was closed]_{RC} leads to the basement.
 (9) Where does the door that was closed lead to ___?

Ambridge & Goldberg (2008) clarify that backgroundedness is a matter of degree so that the degree of LDD unacceptability should correlate with the extent to which a constituent’s canonical position is backgrounded. We observe that backgrounded constructions are, to varying degrees, ill-suited to provide *direct cooperative* responses to prompts for information (Morgan, 1975; Goldberg, 2006).

To test the discourse explanation, we designed a new Discourse task. Each trial in the task prompted participants for certain information (e.g., *Tell me why Nicole is so happy today*). Participants were then asked to select which of two sentences was the “more direct and cooperative” response. Sample stimuli used in the Discourse task are provided in Table 1.

Table 1: Example stimuli in Discourse Task

Tell me why Ali got up so early.	
His rowing club that meets at the lake starts at 6:00. (Main Clause)	His rowing club that starts at 6:00 meets at the lake. (Relative Clause)
Tell me why that puppy is so happy.	
The owner got Fido outside by giving him treats. (By Adjunct)	The owner got Fido outside while giving him treats. (While Adjunct)
Tell me what you did in the garden.	
I planted a tree without watering it. (Parasitic coreference)	I planted a tree without watering the flowers. (Non-parasitic reference)
Tell me why Iris took time off from school.	
Dan heard that she wasn't feeling well. (“Bridge” Verb)	Dan hated that she wasn't feeling well. (“Non-bridge” Verb)

Critically, both response options on each trial included the requested information and only differed in *how* the requested information was provided. The sentences were minimally different and neither contained any island violations. One response provided the requested information within a

construction that was hypothesized to be an “island” while the other provided the requested information within a construction that was hypothesized to be a non-island. An acceptability survey reported below, confirmed there was no systematic difference in acceptability between the two types of responses.

We created the set of *wh*-questions, a particular type of LDD construction, by questioning constituents within 11 types of constructions included in the Discourse task. Table 2 provides example stimuli for each of the 11 constructions tested: a declarative sentence and a corresponding *wh*-question. Several of the construction types are generally considered islands (e.g., relative clauses, clausal adjuncts), others are not (main clauses, “bridge” verb complements). But we do not presuppose which constructions are islands or to what extent.

Table 2. Example declarative response sentences (no island violations) and *wh*-questions (potential island violations)

Constructions	Example Declarative & Wh-Question
Main Clauses	The door that leads to the basement was closed. Where does the door that was closed lead to _?
Relative Clauses	The door that was closed leads to the basement. Where does the door that leads to _ was closed?
By Adjuncts	He researched it by comparing prices. What did he research the question by comparing _?
Time Adjuncts	He researched it after comparing prices. What did he research the question after comparing _?
DO Recipients	She showed Sam the portrait. Who did she show _ the portrait?
PO Recipients	She showed the portrait to Sam. Who did she show the portrait to _?
Bridge Verb compls	Alicia believed he got hired in Hawaii. What did Alicia believe that he got _ in Hawaii?
Nonbridge Verb compls	Alicia forgot he got hired in Hawaii. What did Alicia forget he got _ in Hawaii?
Parasitic Gaps	She read the paper before putting it in the drawer. What did she read _ before putting _ in the drawer?
Nonparasitic Gaps	She read the paper before putting it in the drawer. What did she read the paper before putting _ in the drawer?
Single Conjunctions	She loved eating and skiing. What did she love eating and _?

Our goal is to determine whether the degree of island status, as measured by acceptability on *wh*-questions, is predicted by an independent test that depends on the constructions’ functions; it involves declarative sentences only and no island violations. We predict an interaction: results on the Discourse task should predict ratings on the *wh*-questions more than they predict ratings on the declarative responses. This would be quite striking since the Discourse task includes the declarative sentences and not the *wh*-questions.

If the hypothesis is confirmed, it would provide support for the claim that island violations involve a clash of functions of the constructions involved. Relevantly, *wh*-questions require that the *wh*-argument is the focus of the sentence: the primary reason to ask a *wh*-question is to elicit information about a particular constituent. Certain other constructions are designed to background information to varying degrees, the content they convey is taken for granted or less “at-issue” (Potts, 2004). Once the functions of constructions are appreciated, the discourse hypothesis is straightforward: it should be infelicitous for a speaker to simultaneously choose to foreground and background the same constituent.

If results show that the Discourse task predicts acceptability of *wh*-questions, it will present a challenge to accounts of islands that depend on movement, because the current Discourse task involves no illicit “movement” of any kind. Evidence for the current hypothesis would also present a challenge to a general account of island effects based on how familiarity or frequent particular constructions are, because familiarity can be expected to correlate strongly with the acceptability ratings on declarative sentences (Liu, et al., 2019; Sprouse, Wagers, & Philips, 2012; Robenalt & Goldberg, 2015). Therefore, if the Discourse task predicts ratings on the *wh*-questions more than on the corresponding declaratives, it would provide a textbook example of a “super-additive” effect that does not depend on familiarity (Sprouse et al., 2012). Moreover, while one or two potential island constructions, particularly the contrast between “non-bridge” and “bridge” verb complements, may lend themselves to an account based on frequency (Kothari, 2008; Liu et al. 2019; cf. Ambridge & Goldberg, 2008), other contrasts included here do not. For example, when testing whether relative clauses serve as a felicitous construction in which to convey the requested information directly, both response options contain a main clause and a relative clause (recall the first example in Table 2). The only difference is whether the requested information is provided in the relative clause or in the main clause. Thus, if the hypothesis is confirmed and sentences containing “island” constructions are less-well suited for conveying key information, it will support the claim that island constraints are the result of the discourse function of the constructions involved.

Below we explain the experiment in three parts, since different participants were involved in each. We collected 1) acceptability judgments on 84 declarative sentences, 2) acceptability judgments on a corresponding set of 84 *wh*-questions, and 3) decisions in a 2 alternative forced choice task between pairs of the same 84 declarative sentences in 1.

Experiment

Preregistration The number of participants, exclusion criteria, stopping rule and analyses were preregistered at <https://aspredicted.org/2bv9s.pdf>.

Norming: Declarative Acceptability Judgments

Participants A group of 82 participants took part via the Cloud Research platform as a front end on Mechanical Turk (Litman et al. 2017). 11 participants were excluded for less than 75% accuracy on catch trials. Based on demographics provided, mean age = 36.4; 30 participants self-identified as female; 50 as male; 65 as white, 9 as Black, 5 as Asian, 1 as Native American.

Stimuli We created 6 declarative sentences for each of 5 constructions generally taken to be islands and 12 declarative sentences for a variety of temporal adjuncts, also presumed to be islands. We matched the resulting 42 sentence with 42 highly similar sentences that conveyed the same or very similar information using constructions commonly assumed to be non-islands. Potential island constructions were: relative clauses; clausal complements of non-“bridge” verbs; non-finite temporal adjuncts, *without*-adjuncts that involved no co-referential argument in the main clause (so were not a candidate for a parasitic gap), and conjunctions in which only one conjunct provided the information requested. A final “island” type, the recipient argument of a double object construction, was included because it was predicted to be an island by Erteschik-Shir (1979) and Goldberg (2006). Non-island types conveyed the requested information in main clauses, complements of “bridge” verbs; in both conjuncts; in a non-finite *by*-adjunct (Namboodiripad, et al., this volume); the recipient argument of a prepositional dative (Goldberg, 2006); or in both main clause and *without* adjunct (a candidate for a parasitic gap).

We used traditional classifications into islands and non-island constructions only to create the stimuli: The main analyses do not rely on *a priori* assumptions about island status. Instead, the acceptability of *wh*-questions in comparison to the declaratives was assessed separately.

Procedure Each of the 84 active, declarative response sentences was quasi-randomly assigned to one of 4 lists of 21 target sentences, with the stipulation that no participant judged more than one of any highly similar pair of sentences. Sentence order was randomized for each participant. Ratings were based on a 7-point scale. 12 fillers, intended to be unacceptable, were included as catch trials on all lists.

Results As expected, since there were no island violations in any sentences, standard island status did not predict zscored acceptability ratings on the declarative sentences.

Specifically, to test whether the mean acceptability of responses within the constructions generally assumed to be islands--i.e., hypothesized to be unacceptable if combined with a long-distance dependency construction--differed from the minimally different sentences that included constructions standardly considered non-islands, linear mixed effects models were fit to the data. This confirmed, as expected, that status as a traditional island did not predict averaged zscores on the declarative responses ($\beta = -.03, t = -0.45, p = .65$). Zscores eliminated the need for random by-participant intercepts (a model including random slopes did not converge). Random intercepts were included for items. Regardless, judgments on declarative sentences are included in the main analysis to test for the predicted interaction.

Quantifying Island status: Question Judgment Task

In order to provide an objective measure of island-status, we used the declarative sentences from the norming task just described (and used in the Discourse task) to create a set of *wh*-questions. Each questioned a constituent that appeared within the construction of interest in the corresponding declarative. (Recall sample *wh*-question stimuli from Table 1). Acceptability judgments on the *wh*-questions were collected from a new group of participants. Island status was treated as a gradient, rather than binary, factor.

Participants 80 new participants took part in the survey, again using Cloud Research on AMT. As before, 12 participants were excluded for accuracy below 75% on catch trials. Based on demographics provided, mean age = 34.9; 32 participants self-identified as female, 47 as male, one chose not to disclose gender. 57 identified as white, 5 as Black, 13 as Asian, 1 as Native American, 1 as Pacific Native.

Procedure The procedure was identical to the Declarative Acceptability Judgment task, except acceptability judgments were collected on the 84 *wh*-questions rather than declarative sentences. Again, each participant rated one of 4 lists of 21 questions for acceptability with the stipulation that no participant judged more than one of any pair of highly similar questions. Twelve filler questions were again used as catch trials, presented in randomized order.

Results Figure 1 displays the mean acceptability judgments for each of the 11 constructions tested. As expected, *wh*-questions involving “extraction” out of traditional islands (leftward constructions in Figure 1) were judged less acceptable than the *wh*-questions out of constructions usually assumed to be non-islands (rightward constructions in Figure 1). Specifically, linear mixed effects models were fit to determine the extent to which status as a traditional island predicted averaged zscores on questions, with random intercepts included for items ($\beta = -.55, t = -3.72, p < .0001$).

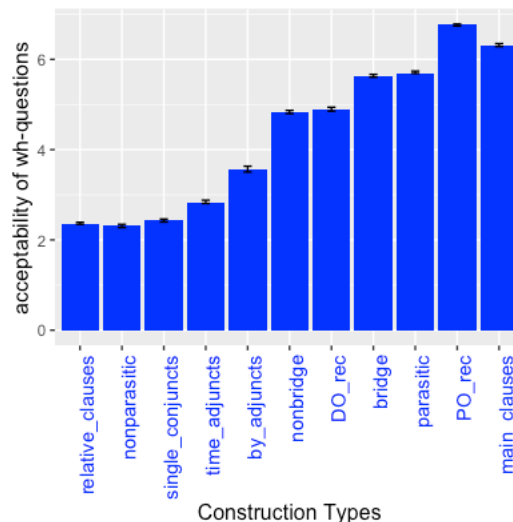


Figure 1: Mean acceptability ratings for each of 11 construction types used.

Yet nothing hinges in the current context on an *a priori* classification of constructions into islands and non-islands. We are instead interested in whether acceptability of *wh*-questions correlates with performance on the independent Discourse task which includes only declarative sentences and no island violations. We now turn to this key task.

Discourse Task: Choose the more “direct and cooperative” response

Participants 80 new participants took part via Cloud Research on Mechanical Turk. As planned, 4 were excluded for scoring less than 75% on catch trials. Mean age = 36.19; 31 participants identified as female, 49 male; 60 white, 7 Black, 2 Asian, 2 multi-racial, 9 unspecified.

Stimuli 42 trials contained a prompt for information (e.g., *Tell me why Crystal didn't go downstairs*) and a 2-alternative forced-choice task that provided two potential responses (recall Table 2). Responses were comprised of declarative sentences that had been normed separately. One response sentence provided the requested information within a traditional “island” construction, while the other was minimally different, and provided the same or similar content, but within a traditional non-island construction.

Procedure Participants were asked to choose which response was more “direct and cooperative.” Each participant saw one of two lists of 21 trials and four fillers, divided semi-randomly to avoid overlap in content within a list. Order of presentation was randomized for each participant.

Results To measure how direct and cooperative each response is judged when prompted to supply information from a target construction, we calculated the proportion of

times participants chose that response in the Discourse task. We predicted that constructions that were more likely to be judged to provide more direct and appropriate responses would be more available for *wh*-extraction (i.e., less “island” like). As shown in Figure 2, this predicted effect was confirmed: The probability of a declarative sentence being selected as a direct and cooperative response (x-axis) predicted judgments on *wh*-questions (y-axis, in Blue), and did not predict the acceptability of the responses themselves (Red).

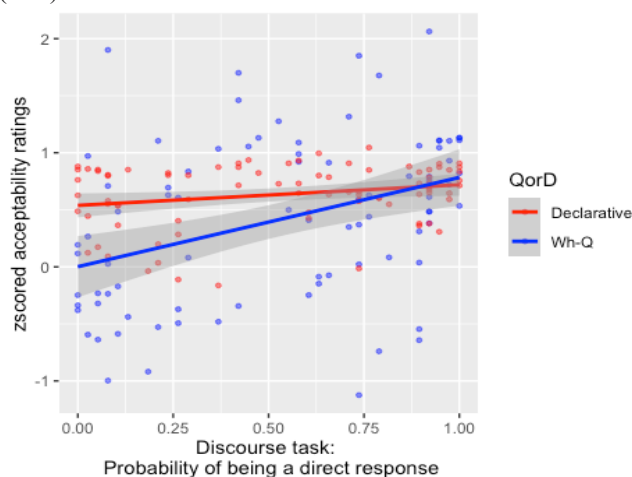


Figure 2: Discourse responses predict the acceptability of *wh*-questions more than the acceptability of the declarative responses themselves

Specifically, linear mixed effects models were fit to determine if averaged z-scored acceptability ratings were predicted by Sentence Type (Declarative vs. *wh*-Q), the Discourse-based response preference, and their predicted interaction with random intercepts for items and construction type included. Random intercepts for subjects are omitted because each person data was z-scored to provide a continuous measure. Results confirm the hypothesized interaction: the discourse task predicts the acceptability of *wh*-questions more than the acceptability of the declarative responses ($\beta = .48, t = 7.43, p < .0001$). Model comparison also confirmed that including the interaction provided a better fit to the data than an additive model ($\chi^2 = 55.64, p < .0001$). This is especially striking since there were no *wh*-questions in the Discourse task: response sentences were comprised only of the declarative sentences.

Another way to visualize the results is to consider Difference scores—the difference in acceptability between each declarative stimulus and its corresponding *wh*-question, with scores averaged across items for each construction type. We can then analyze whether Difference scores correlate with results from the Discourse task. They do, as shown in Figure 3.

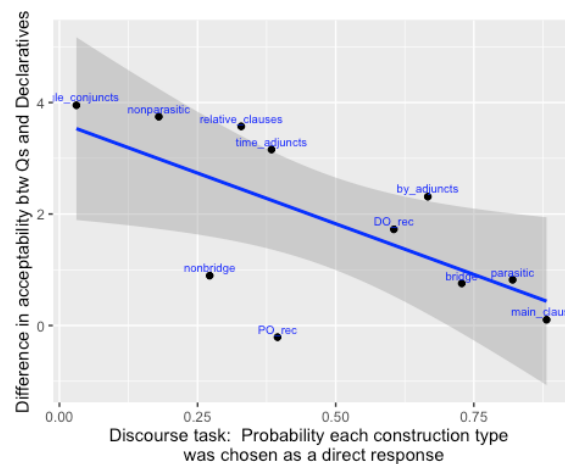


Figure 3: Correlation between the probability of choosing a declarative construction type as a direct response and the Difference in acceptability between *wh*-questions and declarative stimuli, presented by construction type.

Specifically, the more likely participants were to decide that a construction type provided the requested information directly, the less difference there was between the averaged z-scored acceptability judgments of the declarative stimulus and *wh*-question ($\beta = -.60, z = -2.87, p = .005$).

Limitations

Two constructions are outliers in the correlation evident in Figure 2: non-bridge verb complements, and the recipient of the prepositional dative. Although sentences with “bridge” verbs (e.g., *believed, heard*) were more likely to be chosen as direct responses than sentences with “non-bridge” verbs (e.g., *forgot, hated*), the difference in acceptability between *wh*-questions and declaratives was less different for non-bridge verbs than that would predict. Liu et al. (2022) had observed that acceptability of *wh*-questions from clausal complements was well-predicted by the acceptability of declarative sentences, and that in turn, the acceptability of both was predicted by the frequency of the verb + clausal complement. At the same time, the current finding, that complements of “bridge” verbs provide more direct responses, raises the possibility that the frequency of verb + clausal complements may itself be influenced by discourse factors. That is, it may be that verbs that more frequently appear with clausal complements are more likely to make their complement clauses prominent in the discourse (see also Chaves & Putnam, 2021). We leave this issue aside for future work.

The other outlier evident in Figure 2 is the recipient argument of prepositional datives: Results show that it is decidedly easier to question the prepositional recipient than the double object recipient (the prepositional recipient is less island-like). Yet the double object construction was more likely to be chosen as a direct response in the Discourse task. For instance, when prompted with: *Tell me who saw her new*

painting: participants were more likely to choose *She showed Sam the portrait* than *She showed the portrait to Sam*. Future work is needed to determine whether participants in the Discourse task were implicitly assigning contrastive focal stress to the recipient of the double object (*She showed SAM the portrait*).

We have operationalized “island” status in the current work on the basis of a particular type of long-distance dependency construction: *wh*-questions. Other work has emphasized that different LDD constructions serve different functions and they do not all behave alike (Abeillé, Hemforth, Winkel, & Gibson, 2020; Postal, 1994; Ross, 1987; Sag, 2010). Therefore, judgments on LDDs other than *wh*-questions, and perhaps other discourse contexts are required to investigate the discourse explanation in more depth. We sacrificed the number of items included for each construction type in order to test a wide range of constructions. Therefore, future work will include a greater number of items for each construction in order to investigate variation within each construction type.

Discussion and Conclusions

The current work investigates *why* and *to what extent* certain constructions are infelicitous when combined with a long-distance dependency construction (here, a *wh*-question). We specifically investigated the role of the constructions’ discourse function in explaining such island violations. Results are consistent with the following explanation: it is infelicitous for a speaker to simultaneously choose to treat a constituent as both prominent in the discourse (ensured by the *wh*-question) and backgrounded in the discourse (as measured by the Discourse task). That is, *wh*-questions make a *wh*-phrase the focus of the utterance and therefore prominent or at-issue. The 11 constructions tested here varied in how backgrounded the information they conveyed was. To estimate this, we introduced a new Discourse task. As hypothesized, when asked to choose the more direct and cooperative response to a prompt for information, participants avoided responses in which the requested information was conveyed in a construction that turned out to be difficult to “extract” from in a *wh*-question. That is, results demonstrate that the more directly a construction conveys information, the less island-like it is. Put differently, declarative stimuli that are ill-suited for providing at-issue information, are also ill-suited for *wh*-extraction.

No interference between tasks was possible because separate groups of participants took part in a) the Discourse task, b) the declarative acceptability judgment task, and c) the *wh*-question acceptability task. Thus results are consistent with the claim that traditional island violations exist because the functions of the constructions being combined are incompatible to varying extents.

The current findings challenge the claim that island effects are the result of illicit syntactic movement, since the same effects were predicted by the Discourse task which included *no island violations*. Therefore an appeal to

movement of constituents cannot explain the results of the Discourse task. One possible approach would be to add discourse functions to trees as inaudible nodes, thereby treating discourse functions as if they were atomic syntactic categories. However, aside from being *ad hoc*, it is unclear how this approach could predict the gradient nature of the effect. Current results also undermine a general explanation in terms of frequency or familiarity. If familiarity were responsible for the judgments, we would expect declarative sentences containing island constructions to be significantly less acceptable than those containing non-islands. Yet acceptability ratings did not distinguish the two types of declarative sentences. That is, the Discourse task predicted island status (as operationalized in *wh*-question ratings) but not the acceptability of the declarative sentences used in the task itself. In addition, the Discourse task correlated well with judgments on parasitic gaps and single conjuncts, two island types that have appeared particularly mysterious for structural and frequency-based accounts.

The discourse-based explanation of islands suggests a possible explanation for classic cases that have been considered exceptions, as they share the same surface syntax as island violations but are nonetheless acceptable. For instance, (5) appears to violate a constraint against extracting a single conjunct yet the question is nonetheless reasonably acceptable (Lakoff, 1986).

- (1) What did he go to the store and buy __?

Based on current results, we predict that a corresponding declarative sentence such as (6) should be a reasonably direct response to a prompt for information about a single conjunct, such as “Tell me what he got for dessert.”

- (2) He went to the store and bought a pie.

Relatedly, constructions in other languages need to be tested to see if they are associated with analogous discourse functions, and if so, whether judgments on LDDs pattern accordingly (Christensen & Nyvad, 2014; Kush, Lohndal, & Sprouse 2019; Stepanov, Mušič, & Stateva, 2018).

The current results demonstrate that the same constructions that do not provide requested information directly are treated as “islands” to extraction in *wh*-questions to a corresponding degree. That is, so-called “island” constructions, at least in English, do not convey information in a direct way: People prefer to answer prompts for information by providing the requested information in constructions that are less island-like. That is, constraints on extraction from particular constructions correlate with the discourse functions of those constructions. More generally, in order to understand how constructions interact, it is critical to understand their functions. To do otherwise is like trying to understand a hammer and screwdriver without considering nails and screws.

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