

A Weak Adjectival Island in English

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Abstract

This paper identifies an adjectival island for *wh*-movement in English. In particular, *tough* movement structures are islands for *wh*-movement of an embedded adjective, though embedded nominals are less restricted. The paper argues that this island effect is semantic in nature because other sub-classes of adjectives behave differently than the *tough* movement adjectives. The resulting pattern is argued to be sensitive to the scalar properties of the adjectives in question, in particular whether the scale has an upper bound. The semantic analysis offered derives independent corroboration from its ability to explain the interaction of questioned adjectives with comparatives, other *wh*-phrases, and modal contexts.

1 The Problem

Tough movement adjectives (e.g., *tough*, *hard*, and *easy*) select infinitival complements, as illustrated by 1. The *tough* movement adjectives themselves can be questioned idiomatically, as shown by 2. However, such structures degrade when an adjective is questioned out of their infinitival complement. This fact is illustrated in 3. The judgment becomes even sharper when a degree phrase modifies the *tough* movement adjective, as in 4.

- (1) It was hard to seem amused.
- (2) How hard was it to seem amused?
- (3) *How amused was it hard to seem?

- (4) *How amused was it very hard to seem?

Sentences 1-4 all have expletive subjects. However, this fact does not drive the observed pattern of judgments. The same pattern appears when the *tough* movement adjectives are provided with lexical subjects in the raising to subject structures such as 5 and 6. Once again we find that it is possible to question such structures, as in 7, but that the structure degrades if the adjective within the infinitival complement undergoes *wh*-movement, as in 8-9.

- (5) It was easy to keep the children quiet.
(6) The children were easy to keep quiet.
(7) How easy were the children to make quiet?
(8) *How quiet were the children (very) easy to keep?
(9) *How quiet was it (very) easy to keep the children?

Together these observations tend to suggest that adjective+infinitive constructions constitute islands for *wh*-movement. Islands have been a target of research because they appear to offer a relatively clear view of the architecture of the linguistic faculty. On the common assumption that language acquisition is not systematically driven by access to negative evidence, island effects must be inferred from something other than the primary (positive) data that children have experience with. Islands thus occupy a position of privilege in poverty of the stimulus arguments that are the strongest argument for nativism (cf Crain & Nakayama (1987), Crain & Pietroski (2001)).

The purpose of this paper is to find an explanation for the island effects in 1-4. Classically, island effects (cf. Ross (1967)) have been attributed to autonomous syntactic principles that simplify complex representations (e.g., the Subjacency Condition of Chomsky (1981)) or disambiguate the application of elementary syntactic operations (such as the A/A Constraint of Chomsky (1968) or the Minimal Link Condition of Chomsky (1993)). However, no conceptual reason requires that they necessarily be syntactic artifacts. For that reason, there have been a variety of attempts to conceptualize their effects as deriving from some interpretative problem, sometimes involving pragmatic factors (e.g., Schachter (1973)) and other times involving formal semantic operations (e.g., Carlson (1987)).

A sense of the tension in the theoretical puzzle that we face when searching for a causal explanation for island effects can be drawn from the variety of explanations offered for *negative islands*. Ross (1984)

observes that there is an asymmetry in how affirmative and negative sentences interact with *wh*-movement. For example, both DPs and APs can be questioned from affirmative sentences like 10 and 11, as shown by 12 - 13.

- (10) The waiter served the fish with a fork.
- (11) The waiter served the fish elegantly.
- (12) Which fork did the waiter serve the fish with?
- (13) How elegantly did the waiter serve the fish?

Yet in negated sentences while *wh*-movement of the DP is acceptable, the parallel movement of an AP is blocked. Hence the asymmetry between 16 and 17.

- (14) The waiter didn't serve the fish with a fork.
- (15) The waiter didn't serve the fish elegantly.
- (16) Which fork didn't the waiter serve the fish with?
- (17) *How elegantly didn't the waiter serve the fish?

In this respect we can say that there are *negative* islands. Rizzi (1990) suggests that such negative island effects are a consequence of a difference in how DPs and APs are represented syntactically. The DPs in 18-17 have referential indices that the APs lack.¹ Extraction of DPs and APs interact differently with syntactic restriction on movement chains. Rizzi's syntactic account is criticized in Kroch (1989) for being unable to explain why verbs like *fail* in 18 also block *wh*-movement of an AP.

- (18) How much did you pay?
- (19) *How much did you fail to pay?

Kroch suggests that such questions presuppose the existence of a unique amount or degree that can be provided to make the question into a true statement. To the extent that this presupposition is implausible or otherwise infelicitous, the sentence will be rejected as unacceptable.

A different explanation for the negative island effect is offered by Rullmann (1995). Let us assume the treatment of questions in Karttunen (1977) (or Hamblin (1973)) in which *wh*-phrases involve existential quantification and the questions they appear in denote the set

¹For Rizzi this difference in indexing is a consequence of θ -role assignment. Cinque (1990) links the difference to pragmatic differences in how reference is achieved.

of true answers. From this perspective, a question like 20 has a semantic representation like 21 and, in a given model, might denote the propositions in 22.

(20) Who owns a car?

(21) $(P | (\exists x)(person(x)) \wedge (\exists y)(car(y)) \wedge owns(x, y) \wedge true(P))$

(22) (Jill owns a car, Sandy owns a car)

Rullmann (1995) analyzes *how* questions as introducing an operator asking for the the maximal degree or amount in the set of true propositions that make up the denotation of the question. A questions like 23 would have a semantic representation like 24. Suppose that Sydney weighs 130 pounds. The denotation of 24 will then include both 25 and 26. However, the question in 23 will only have the denotation in 25 because, while 26 is true it is not the maximal value.

(23) How much does Sydney weigh?

(24) $(P | (\exists d) \wedge weighs(sydney, d) \wedge \forall d'(d' > d) \neg weighs(sydney, d') \wedge true(P))$

(25) Sydney weighs 130 pounds.

(26) Sydney weighs 129 pounds.

Rullmann's contention is that the demand for the maximal value in the question's answer does not reflect the pragmatic force of cooperative maxims, but is a semantic effect. Questions like 27 that contain a negative island are unacceptable because their semantics requires a maximal amount or degree that makes them true, yet there is in principle no such upper bound. As a result 27 has no denotation.

(27) How much doesn't Sydney weigh?

Of course, in isolation any of these syntactic, semantic or pragmatic accounts of negative islands has *prima facie* plausibility. It is only when one considers how an explanation comports with other well motivated theoretical and empirical claims that reasons can be found for preferring one over its competitors.

I will argue here that the island effect in 1-4 results from the interaction of Rullmann's semantics of *how* questions with gradable adjectives. This account cannot be replicated by syntactic or pragmatic accounts in simple or natural terms if scales are semantic primitives paired with lexical items in approximately the way suggested by Kennedy & McNally (2005). And because the explanation that I offer

parallels the analysis of negative islands offered by Rullmann (1995), it provides some independent support for that usefulness of that approach to negative island effects in the general spirit of Fox & Hackl (2005).

2 The Problem as a (Pseudo) Superiority Effect

The island effect in 1-4 does not characterize all complements to adjectives. It is possible to perform *wh*-movement on complements to adjectives as in 28-29.

(28) Who was it hard(est) to vote for?

(29) Who was Jill anxious to vote for?

What makes 28 and 29 different from the sentences in 1-9 is that 28-29 do not involve *wh*-movement of an adjective. Instead 28-29 move a DP.

At first glance one might be tempted to attribute the asymmetry in extraction to the fact that an adjective moves across another adjective in the unacceptable sentences. The unacceptability of this configuration would then recall the familiar superiority effects in which an intervening phrase prevents movement of a more embedded phrase, as in 31.

(30) Who knows what Jill saw?

(31) *What does who know Jill saw?

Such superiority effects, however, have classically been diagnosed in structures that contain two potential targets for a movement operation like *wh*-movement. In 30 there are two *wh*-phrases that could potentially be attracted to a clause initial C. In such circumstances, only the highest target is affected. In Chomsky (1993) the unacceptability of 31, and superiority effects more generally, are attributed to the Minimal Link Condition in 32.

(32) Minimal Link Condition:

K attracts α only if there is no closer β to K than α , such that K attracts β . (β is closer to H(K) than α iff β c-commands α and β is not in the minimal domain of CH where CH is the chain headed by γ , and γ is adjoined to H(K).)

The Minimal Link Condition clearly expresses the intuition that such phenomena arise in structures where a movement could apply ambiguously to two constituents.

It would be a mistake to modify 32 to prevent an adjective from moving over another adjective more generally. The difficulty is that the interpretation of DPs is also sensitive to the adjectival island. Amount DPs, like 33, are ambiguous between a *de dicto* amount having an interpretation like the paraphrase in 34, and a *de re* interpretation with an interpretation like 35, as noted in Kroch (1989).

- (33) Sandy needs to read three books.
- (34) The number of books that Sandy needs to read is three.
- (35) There are books that Sandy needs to read and they number three.

Similarly examples like 36 are have a comparable *de dicto/de re* ambiguity. The same pattern of judgments in 1 - 4 is exhibited by *de dicto* amount DPs. Examples like 38 are unacceptable on the *de dicto* interpretation. To the extent they are acceptable, they seem to require the *de re* interpretation.

- (36) It was hard to read three novels.
- (37) How hard was it to read three novels.
- (38) *How many novels was it hard to read?
- (39) *How many novels was it very hard to read?

From this perspective, the phenomenon in 1-4 is not a true superiority effect because there are not two targets for *wh*-movement in 3-4. Significantly, this effect is not syntactically uniform: it holds over APs and a subset of DPs. Because the island in 3-4 does not reduce to known syntactic restrictions such as the Minimal Link Condition (or the Subjacency Condition), I will pursue below the possibility that a semantic explanation is possible for the facts in 3-4, and that they constitute a semantic island.²

²Cinque (1990) notes that extraposed clauses in adjunct position are weak islands for movements as illustrated by sentences like *It is time to call Val* versus *It is time to get crazy*. Only the first gives rise to an acceptable *wh*-question. Compare *Who is it time to call?* versus **How crazy is it time to get*. The *tough*-movement adjectives form a constituent with their infinitival complement, as evidenced by their ability to front as a constituent: *how hard to arrive a little early would it be?*

3 A Semantic Solution

Kennedy & McNally (2005), building on earlier work by Knowles (1974) and Bolinger (1972), divide the class of gradable adjectives into distinct semantic sub-classes on the basis of the degree modifiers they co-occur with. They argue that such gradable adjectives denote a type of relation between individuals and degrees on a scale, as in 40. The expression $m_A(x)$ denotes the location of x on the scale of measurement invoked by the gradable adjective A . Degree phrases in general have a semantic value like 41, expressing a function from a gradable adjectival meaning, represented by the variable G , and properties of individuals. The degree phrase serves to saturate the degree argument in the meaning of the adjective specified in 40. There will be distinct kinds of degree phrases that differ in the restrictions they place on \mathbf{R} of 41.

$$(40) [A] = \lambda d \lambda x. m_A(x) = d$$

$$(41) [[Deg(P)]] = \lambda G \lambda x. \exists d [\mathbf{R}(d) \wedge G(d)(x)]$$

The typology of restrictions on \mathbf{R} is defined by the structure of the scale involved and whether \mathbf{R} is an absolute or relative scale. Specifically, scales are distinguished by whether they have an upper bound, a lower bound, both an upper and a lower bound, or neither on a scale, where that scale has the possibility of either being absolute or relative. *Very* is a degree phrase that uses a totally open scale (one with neither an upper nor a lower bound). *Much* uses a scale with a lower closed scale (one having a lower bound) while *completely* appeals to an upper closed scale (having an upper bound). The degree modifier *well* makes use of a totally closed scale (having both an upper and lower bound). When no overt degree phrase is present, Kennedy and McNally posit an abstract degree operator *pos* that is contextually bound. Absolute scales license different entailments from relative scales. An adjective, A , calling on an absolute scale with a minimum standard will treat α is A and α is not A as contradictory, and in this respect they differ from adjectives calling on a relative scale.

The *tough*-movement adjectives call on relative scales. The sentences in 42 and 43 are not necessarily contradictory. They easily appear with the basis of the relative scale invoked by a *for* phrase, as in 44 and 45, when the foundation of the relative scale needs to be made more explicit.

- (42) It is tough for the poor to do all the work.
- (43) It isn't tough for the poor to do all the work.
- (44) For the rich it is tough for the poor to do all the work.
- (45) For the poor it is tough for the poor to do all the work.

Like other adjectives using relative scales, the *tough*-movement adjectives in 1-9 select the modifier *very*. On the terms of Kennedy and McNally's analysis, such adjectives semantically employ an open scale **R**. This observation opens an avenue for explaining the island effect in 1-9, if we examine more carefully the semantic analysis of *how*+adjective questions.

Recall the semantic explanation of negative islands offered in Rullmann (1995). On that explanation *how* questions necessarily require a scale with an upper bound because the question asks for the maximal point on the scale that satisfies the semantic formula. In structures like negatives, where there is a lower bound but not an upper bound, such questions are undefined because there is no maximal value that can be provided. In the present context, scalar adjectives that have degree phrases providing totally open or only lower closed scales will form an island, parallel to the way an island is induced by negation in Rullmann's analysis.

4 Evidence from Sub-Classes of Gradable Adjectives

The analysis just sketched attributes the island effect in 1-9 to the fact that *tough*-movement adjectives employ scales that are unbounded. This predicts that if we investigate an adjective that uses a scale with an upper bound the island effect will disappear. *Able* is an adjective that uses a totally closed scale. It is for this reason that it can co-occur with the degree modifier *well*.

- (46) Bill Gates was (well) able to be generous.
- (47) How able was Bill Gates to be generous?
- (48) How generous was Bill Gates able to be?

The pattern in 46-48 contrasts with what we observed earlier in 1-9. In particular the acceptability of 48 is particularly significant because it shows that *able*+infinitive constructions are not islands for

wh-movement of an adjective, suggesting that we were correct to link the unacceptability of 3 and 4 to the scale structure of *tough* movement adjectives.

The basic claim of our analysis can be tested further by examining other adjectives that Kennedy and McNally argue co-occur with degree modifiers associated with upper closed scales or with lower closed scales. Consider the adjectival form *known*. Kennedy and McNally argue that this adjective involves a totally closed scale. Their claim is supported by the fact that *known* has the ability to co-occur with the degree modifier *fully*, which crucially has an upper bound. On the terms of the analysis defended here, *known* should pattern with *able* and not form an island, in contrast to the *tough* movement adjectives.

(49) That drug was fully known to be dangerous.

(50) How dangerous was that drug (fully) known to be?

(51) The drug was partially known to be dangerous.

(52) *How dangerous was that drug partially know to be?

This prediction seems confirmed in 50. It derives further support from the oddness of 52 where the upper bound of the scale is explicitly excluded.

Comparative adjectives are modified by the degree phrase *much*. Kennedy and McNally argue that this degree modifier invokes a scale with a lower bound but not an upper bound. If this is correct, then our analysis predicts that comparatives should form islands for *how* questions. The sentences in 53-58 are designed to test this prediction. While the *than*+DP structure in 53 allows the DP to be extracted by *wh*-movement as in 56, *than*+AP forms an island for the extraction of *how* phrases.³

(53) I wonder if Hunter was more nervous than Kelly.

(54) I wonder if Hunter was more nervous than frightened.

³On the terms of my analysis, any *how* question should show the same sensitivity to comparatives. The examples below show that *how*+DP pattern, on the de dicto interpretation, similarly to 53-58.

i. This hospital has more patients than those other hospitals.

ii. Which other hospitals does this hospital have more patients than?

*iii. *How many other hospitals does this hospital have more patients than?*

- (55) I wonder how much more nervous Hunter was than Kelly?
- (56) I wonder who Hunter was more nervous than?
- (57) I wonder how much more nervous Hunter was than frightened?
- (58) *I wonder how much more frightened Hunter was nervous than?

5 Corroboration from Multiple Questions

The analysis outlined in this section is able to make sense of an otherwise puzzling gap in English multiple *wh*-questions. It is commonly noted that English exhibits multiple *wh*-questions like 59.

- (59) Who read what?
- (60) Val read *Pride and Prejudice*, Sandy read *Mansfield Park*, and Chris read *Sense and Sensibility*.

Semantically, these questions seem to require pair-wise answers like 60. (Higginbotham & May 1981) provide a treatment of questions like 59 that involves performing *wh*-movement of *what* at Logical Form (LF) followed by an operation 'absorbing' the two *wh*-phrases to produce a single quantifier ranging over pairs. Reinhart (1998) argues that the LF account is incompatible with the framework of Chomsky (1993) and that the force of the LF structure resulting from absorption can be semantically achieved without LF movement because it is semantically indistinguishable from unselective binding in the sense of Lewis (1975) and Heim (1982). Let us assume the correctness of Reinhart's analysis.

From this vantage point, it is significant to note that multiple *how* questions are unacceptable, as shown in 61-62.

- (61) *How hard is it to be how rich?
- (62) *How likely is Val to be how rich?
- (63) $(P|\exists[d_i d_j]likely(rich(jill)(d_j))(d_i))$

The puzzle that these multiple *how* questions present is why the existential quantifier could not unselectively bind both degree variables introduced by the two gradable adjectives in these structures, as in 63. However, on the terms of our analysis *how*+Adj requires a unique, maximum value d on a scale \mathbf{R} such that $\varphi(d)$ is true; this

requirement is inconsistent with multiple paired values on \mathbf{R} since \mathbf{R} does not impose an ordering on such pairs.

Important confirmation of this line of analysis comes from examples like 64.

(64) Who was how late?

Because *wh*-DPs like *who* do not make use of a scale, *how* is able to do its semantic work of finding a maximal value d on a scale \mathbf{R} such that $\varphi(d)$ holds. We are thus in a position to predict that combinations of such a *wh*-DP and a scalar *how*+Adj should be improved in comparison with 61 or 62. This claim seems to be broadly on the right track.

6 Modal Contexts

6.1 A Challenge from *Likely*

It is worth noting that the adjectival form *likely* poses a potential challenge to the analysis offered in the preceding section. To appreciate the potential problem consider examples like 65. While it is possible to question *likely*, as in 66, it also seems acceptable to extract a questioned adjective from the infinitival complement, as in 67.

(65) The train is likely to arrive late.

(66) How likely is the train to arrive late?

(67) How late is the train likely to arrive?

(68) How late is the train most likely to arrive?

(69) *How late is the train very likely to arrive?

The acceptability of 67 is a potential challenge because *likely* can co-occur with the degree modifier *very*, much as the *tough* movement do. From this perspective it would seem that 65 should form an island, making the acceptability of 67 somewhat surprising.

These facts suggest that *likely* is paired with two semantic representations in the lexicon. One representation employs a closed scale while the other uses an open scale. Essentially we are distinguishing one semantic representation involving probability ranging over a closed scale from impossibility to necessity from a second semantic representation appealing to a state of epistemic confidence that is open. The closed scale *likely* is compatible with the extraction of the *how*-phrase

in 68. Indeed 67 and 68 seem to be cognitively synonymous. The open scale counterpart is incompatible with extraction of a *how* phrase. This claim is corroborated by the relative unacceptability of 69. This example employs the degree modifier *very*, which co-occurs with open scales.

A similar point can be made by examining the sentences in 70-71.

- (70) The stone seemed (very/?completely/100%/absolutely) certain to look valuable.
- (71) How valuable did the stone seem certain to look?
- (72) *How valuable did the stone seem very certain to look?
- (73) How valuable did the stone seem 100%/absolutely certain to look?

The adjective *certain* co-occurs with degree modifiers typically of both open scales (*very*) and closed scales (*completely/absolutely*). Extraction is less natural in the open scale 72 than when an explicit closed scale modifier is used, as in 73. When the default phonologically null degree modifier is employed, as in 71, it is interpreted on a par with 73.

6.2 Generics

Consider the adjective *good* in 74-77. Unlike the adjective *likely*, this form does not behave ambiguously with respect to the degree modifiers it co-occurs with. Examples 74 and 75 suggest that *good* is an open scale adjective because of its ability to co-occur exclusively with *very*.

- (74) It is (very/*completely) good to arrive early (usually).
- (75) It was (very/*completely) good to arrive early yesterday.
- (76) How early is it good to arrive (usually)?
- (77) *How early was it good to arrive yesterday?

Surprisingly, examples 76 and 77 exhibit an asymmetry in the acceptability of extracting *how*+ADJ. Our assumptions about the semantics of *how* questions leads us to expect that they should not extract from the infinitival complement of open scale adjectives, such as in 77. This fact leaves the acceptability of 76 awaiting explanation.

The difference between 76 and 77 involves how the present and past tense statements are interpreted.⁴ While the past tense 75 is interpreted as a claim about an event located earlier in time to the moment of speech, 74 is a habitual or a deontic statement that is evaluated with respect to a modal base. Following the general outlines of the analysis of such sentences provided in Krifka *et al.* (1995), example 74 will be interpreted with its information in a tripart relation between an abstract habitual or generic operator (GEN), a restrictor and the matrix clause, much like an adverb. The habitual interpretation of 74 is approximately 78.

(78) Whenever you arrive it is (very) good to arrive early.

Here an operator with universal force, limited by the content of its restrictor made more or less explicit in this paraphrase (and augmented by any further pragmatic conditions), binds a situation variable that the matrix bears a relation to, as in 79.

(79) GEN[x,s] (s = situation of arrival containing x)
(early(arrive(x)) in s)

For our purposes it is important that the operator in these habitual sentences has universal force.⁵

Fox & Hackl (2005) show that predicates employing open scales become closed under universal modal operators. More formally, assume that φ is a property evaluated with respect to a degree d on a scale \mathbf{R} in a world w , i.e. $\lambda d.\varphi(d)(w)$, and that \mathbf{R} is an open, monotone increasing scale in every world. It will then be the case that $\lambda d.\Box\varphi(d)(w)$ defines an upper bound on the scale \mathbf{R} . Intuitively, if worlds are mapped onto \mathbf{R} , there will be a degree d that serves as an upper bound where $\lambda d.\varphi(d)(w)$ is true in every world and beyond which it is not.⁶

⁴I note here that putting 3-4 in present tense and interpreting them generically, even with the help of an adverb like *usually*, improves them but does not make them as acceptable as 76. I do not have a good explanation of this apparent fact.

⁵The deontic interpretation would similarly need to involve an operator with universal force in order for the explanation offered here to go through.

⁶It seems that 76 is synonymous with *How early is it best to arrive?* This fact parallels the pattern we observed in 67-68 involving *likely*.

7 Negation and Informativeness in Modal Contexts

Consider the examples 80 and 81.

- (80) How high is it necessary to count?
- (81) *How high is it possible to count?
- (82) How long is it necessary for your paper to be?
- (83) How long is it possible for your paper to be?

We observe in 80 and 81 that the universal modal adjective allows *how* questions in a way that the existential modal does not.⁷ We attribute the acceptability of 80 to the claim by Fox & Hackl (2005) mentioned above that universal modals semantically close predicates involving open scales. Of course, it *is* possible to find pragmatic contexts where the contrast between the universal modal and the existential modal, such as 80 and 81, is neutralized. A reliable colleague informed me that a certain philosophy journal has restrictions on the length of manuscripts it will consider for publication; this was news worth relating because in addition to the customary maximum limit on length there was also a minimum limit. In this context it seems perfectly acceptable to ask *how* questions like 82 and 83. The scale invoked by the predicate *long* is in every possible world fixed as a close scale. This makes *how* questions in both 82 and 83 semantically well-formed.

It is somewhat surprising that when a negative is added to such examples, as in 84 through 87, the *how* questions do not invert the pattern in 80 through 83. Instead the meaningfulness of the questions is significantly degraded.

- (84) *How high is it unnecessary to count?
- (85) *How high is it impossible to count?
- (86) *How long is it unnecessary for your paper to be?
- (87) *How long is it impossible for your paper to be?

To explain why negation is not serving to close an open scale of possible worlds it is useful to consider briefly sentences like 88 observed by Beck & Rullmann (1999).

⁷Sentences like 81 become interpretable if we supply some temporal bound such as *in three minutes* and are only uninterpretable without such bounds.

- (88) How many eggs are sufficient to make this cake?
(89) How many eggs are insufficient to make this cake?

Sentences like 88 are surprising from the perspective of Rullmann (1995). If three eggs are needed to make the cake, then it seems that *sufficient* establishes an upper open scale. The treatment of *how* questions in Rullmann (1995) would then lead us to expect that 88 should be uninterpretable, on a par with examples like 1 through 4 that we started this paper with. Yet clearly 88 are completely acceptable. This consideration leads Fox & Hackl (2005) to impose a further requirement on the semantics on *how* questions. Instead of stipulating that a *how* question introduce an operator asking for the maximal degree or amount in the set of true propositions that make up the denotation of the question, they require that it introduce an operator asking for the maximally informative degree or amount among those true propositions. The negative questions in 84 through 87 share the property that there is no maximally informative degree of height or length in the answer set of these questions. This is true in principle in 84 and 85, and it is true because only closed scale page counts are informative to writers in 86 and 87.

Requiring that the *how* operator asks for a maximally informative degree will allow us to make sense of what seems to constitute appropriate answers to questions like 90 and (91).

- (90) How late is it possible for the train to be?
(91) How late is it impossible for the train to be?

A question like 90 can only be interpreted if it is assumed that the scale of lateness is not unbounded in every possible world. It asks for the maximally informative degree in those possible worlds. The most informative answer to 91 would be a statement like *more than three hours* that invokes an lower closed scale. Answers that designate a time as an upper bound (*three hours* for example) are inappropriate because they are not maximally informative.

8 Conclusion

In the preceding discussion we have observed that infinitival complements to *tough*-movement adjectives are islands for *wh*-movement of adjectives. Because we were unable to assimilate this observation with syntactic restrictions on movement and because the island effect

seemed to vary with semantic subclasses of adjectives, we gave the island effect a semantic explanation. In the spirit of Fox & Hackl (2005), our semantic analysis was built on the semantics of *how* questions offered in Rullmann (1995) and in that way assimilated the island effect to negative islands.

This semantic account can be thought of as partially pragmatic because it modifies Rullmann's original proposal to calculate maximal degrees not in the abstract but in terms of informativeness. The limited interaction of pragmatic and semantic properties on this account can be usefully distinguished from other accounts that are purely pragmatic. For example Kuno & Takami (1997) give an account of negative islands effects in terms of pragmatic informativeness. Negated *how* questions ask for information that is not typically useful in natural communicative settings and hence are disfavored. Such a pragmatic theory will have difficulty explaining why the adjectival island effects observed in this paper cluster with the negative island effects in a principled way because it makes no claim about upper and lower bounds of scalar predicates. Similarly, such purely pragmatic accounts will be poorly positioned to offer a principled explanation for the modulation of the pattern in modal and generic statements. The explanation would be mediated through the unanalyzed construct of natural communicative settings. Only such a typology of communicative settings would give predictive content to such a purely pragmatic account.

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