

64 Strong vs. Weak Islands

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Abstract

The focus of the chapter is weak islands (WI), i.e. selective islands. Strong (absolute) islands are considered only to set the stage for the discussion of WIs. Up until the late 1980s nothing much beyond *wh*-islands had been thought to be a WI. Beginning with Relativized Minimality, an ever-growing range of WIs has been recognized. Thus, theories of weak islands have mushroomed, each coming with a significant set of new data and important new connections to other domains. The chapter emphasizes the correspondence between data sets and theories. Less attention is given to proposals that primarily recast the theoretical account of some narrow range of data.

Section 2 explains the distinction between absolute versus selective islands. Section 3 introduces a range of classical strong islands and various types of explanations, among them subjacency, repair by ellipsis, and processing. Sections 4, 5, and 6 enumerate the kind of extractions that are sensitive to WIs and the factors that induce a WI. Under the rubric of weak-island sensitivity, it discusses arguments vs. adjuncts, referential or existentially presupposing vs. non-referential expression, D-linking, individual vs. non-individual expressions and *how many*-phrases, functional readings and event-related readings, split constructions, negative polarity licensing, and cross-sentential anaphora. Under the rubric of weak-island inducers, it considers intervention effects due to *wh*-islands, negatives and other affective operators, response stance and non-stance in contrast to volunteered stance predicates, extraposition islands, VP-adverbs, and finally quantifier scope islands. Section 7 is devoted to various theories of islands, starting with ECP and subjacency, moving on to Relativized Minimality. Theoretical problems and the diversity of the data motivate the transition to the scope theory that comes in two versions, the algebraic semantic and the dynamic semantic ones. Section 8 concludes.

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1 Introduction

Dependencies between a gap and its antecedent constitute a central trait of natural language. In principle, such dependencies could be unconstrained, yet it is by now well known that there are constraints. Many of the constraints are known as islands, encapsulating the idea that it is difficult to get away from an island or to establish a dependency with something on that island. Islands are thus domains that make dependency formation unacceptable or at least degraded.

It is common to distinguish between strong and weak islands, informally:

- (1) **Strong islands:**
No extraction is allowed (constructions with an appropriate resumptive pronoun may be allowed).
- (2) **Weak islands (WI):**
Some phrases can extract, others cannot.

The fundamental work on islands is Ross (1986, originally a 1967 dissertation). Ross distinguished between transformations that move a constituent and leave behind a pro-form (i.e., a resumptive pronoun) and ones that ‘chop’ a constituent and move it without leaving anything behind. An example of the former is left dislocation (in Ross’s analysis left dislocation is not base generated). An example of chopping is topicalization. Of the two, only chopping operations are constrained by islands. Islands will be enclosed in angled brackets:

- (3) This kid, I must call <the teacher who punished him>.
- (4) *This kid, I must call <the teacher who punished ____>.

Diagnosing islands has become more complex since Ross, because it is assumed that there exist invisible pro-forms (empty resumptive pronouns), in addition to overt ones. We use ‘gap’ as a pretheoretical term that covers both traces and empty pronouns and notate the gap with blank underlines, as in (4).

The focus of this chapter is weak islands (WI). Strong islands are considered only to set the stage for the discussion of WIs. Up until the late 1980s nothing much beyond *wh*-islands had been thought to be a weak (selective) island. Beginning with Relativized Minimality, however, an ever-growing range of weak islands has been recognized. Thus, theories of weak islands have mushroomed, each coming with a significant set of new data and important new connections to other domains. The review of weak islands will emphasize the correspondence between data sets and theories. Less attention is given to proposals that primarily recast the theoretical account of some narrow range of data.

When studying islands, the nature of island constraints is a crucial issue. The constraints can either act as constraints on structure generation or as filters on generated structures (Phillips 2013a). That is, a constraint can be formulated such that it prevents a structure containing an island from being generated. Another alternative is to generate the structure, but then filter out those structures that do not obey the relevant filters in a given language. Formally these two possibilities are rather different and they also provide different theories of the grammar. On the first view, only structures that are grammatical will be acceptable. On the second view, the grammar machine can generate ungrammatical structures, but mechanisms are in place to ensure that such structures will not be produced.

Another issue, not discussed too much, is whether syntactic domains are islands or non-islands by default (Postal 1998). Put differently, is a syntactic domain transparent for any kind of long-distance dependency, or does a syntactic domain come with constraints on the kind of dependencies it allows? Postal argues in favor of non-island status being the default, and thus explores a view that rarely has been explored in formal work. We return to some of these issues throughout the text, and the reader should always keep them in mind when considering specific accounts of island phenomena.

This chapter is organized as follows. Section 2 introduces the distinction between absolute versus selective islands. Section 3 focuses on strong islands. It introduces a range of classical strong islands, and mentions various types of explanations found in the literature. Ways of salvaging strong island violations are also mentioned in subsection 3.3, although not discussed at length in this chapter. Subsection 3.4 elaborates on subjacency, focusing in particular on Cinque (1990). Repair by ellipsis is considered in subsection 3.5 and subsection 3.6 offers a brief note on processing accounts. Section 4 provides an overview of weak islands (WIs), that is, it enumerates the kind of extractions that are sensitive to WIs and the factors that induce a WI. Section 5 provides a comprehensive discussion of the kind of extractions that are sensitive to WIs: arguments vs. adjuncts (5.1), referential vs. non-referential / existential presupposition (5.2), the role of D-linking (5.3), individual vs. non-individual and *how many*-phrases (5.4), functional readings and event-related readings (5.5), individuals (5.6), split constructions (5.7), negative polarity licensing (5.8), and cross-sentential anaphora (5.9). Next, section 6 considers the contexts in which WIs arise. It discusses *wh*-islands (6.1), negatives and other affective operators (6.2), response stance and non-stance vs. volunteered stance predicates (6.3), extraposition islands (6.4), VP-adverbs (6.5), and finally scope islands (6.6). Section 7 is devoted to various theories of islands. First ECP and Subjacency are discussed, then we turn to Relativized Minimality. Some of the empirical problems with Relativized Minimality are discussed, motivating a transition to a semantic scope theory, in two versions, the algebraic semantic and the Dynamic Semantic ones. Section 8 concludes.

2 Absolute vs. selective islands

Although the notion of strong vs. weak islands as defined in (3) and (4) seems like a simple descriptive one, it is not. The goal of this section is to explain what the absolute versus selective distinction is and why it is sometimes a tricky distinction to make.

Consider the following examples involving *wh*-islands and adjunct islands; the differences between the extracted *wh*-phrases will be commented on momentarily.

- (5) a. *About which topic did John ask <who was talking ____>?
 b. *[?]Which topic did John ask <who was talking about ____>?
 c. *How did John ask <who behaved ____>?
- (6) a. *About which topic did you leave <because Mary talked ____>?
 b. *Which topic did you leave <because Mary talked about ____>?
 c. *How did you leave <because Mary behaved ____>?

(5) versus (6) might suggest that both *wh*-clauses and adjunct clauses are strong islands: the extraction of three different types of phrase was attempted and failed. On the other hand, it is easy to construct other examples in which some, but not other, phrases can extract. The percentage sign % indicates that there is variation among the speakers of English:

- (7) a. %About which topic did John ask <whether to talk ____>?

- b. Which topic did John ask <whether to talk about ____>?
 - c. *How did John ask <whether to behave ____>?
- (8)
- a. *About which topic did you leave <without talking ____>?
 - b. Which topic did you leave <without talking about ____>?
 - c. *How did you leave <without behaving ____>?

The difference between (5) versus (7) and (6) versus (8) involves Tense in the first place. While tensed clauses are themselves not islands, cf.

- (9) Which topic do you think that I talked about ____?

we see that the presence of Tense may considerably strengthen other islands. This fact must be systematically controlled for in the evaluation of various islands. (Chomsky 1986a briefly touches upon the role of Tense. Cinque 1990 uses it as an important test, and Manzini 1992 proposes a theory of its behavior.) Thus, the specific constructions in (5–6) may preclude the presence of any gaps, but this in itself does not mean that *wh*-complements and adjuncts per se are totally impenetrable. Shall we conclude now that *wh*-clauses and adjuncts per se are merely weak islands? Note a fine distinction: while adverb extraction is blocked in both, the infinitival *whether*-clause allows the extraction of both DPs and PPs (at least for some speakers), while the gerundival adjunct clause allows only DP-extraction.

The interpretation of this situation is a theoretical, rather than descriptive, matter. Making the implicit assumption that the PP vs. DP facts are highly consistent in each island type. Cinque (1990) argues that this difference warrants radically different analyses because a DP gap may be an empty resumptive pronoun but a PP gap cannot be. *Wh*-islands are indeed weak (selective); adjunct-islands on the other hand are strong (absolute) and the DP-gap that they may contain is an empty resumptive pronoun.

Cinque's distinction serves as a basic organizing principle in this chapter because it is typically taken for granted in the weak island literature: theories of weak islands do not try to account for the islands that Cinque classifies as strong.

(10) **Cinque's diagnostic of strong vs. weak islands:**

Among the domains that do not allow all standard extractions, those that allow a PP-gap are weak islands, and those that can at best contain a DP-gap are strong islands (and their DP-gap is an empty pronoun).

This is not the only possible way to cut the cake. For instance, Postal (1998), who uses the terms locked (absolute) and unlocked (selective) island, does not attribute this much significance to PP vs. DP. Following Ross, he assumes that extraction from unlocked islands always involves empty resumptive pronouns and subsumes Cinque's weak islands under this rubric.

A note on the data: question formation, relativization, and topicalization are all instances of *wh*-movement. Because the bulk of the literature to be surveyed focuses on examples involving question formation, this chapter follows the same practice, unless the discussion of a particular work requires us to do otherwise.

3 Strong islands

3.1 Classical strong islands

While recent literature has identified a host of weak islands, the classical inventory, with the exception of certain *wh*-islands, consists of strong ones. What follows is a list, sometimes interrupted by comments.

Complex DP (with relative clause):

- (11) *Which kid must you call <the teacher who punished ____>?
*Where must you call <the teacher who put the book ____>?
- (12) *This kid, you must call <the teacher who punished ____>.
*On the table, you must call <the teacher who put the book ____>.
- (13) *What size shoes did you call <the man who wears ____>?
- (14) *How did you call <the man who behaved ____>?

Complex DP (with complement clause):

- (15) *Which man did you hear <the rumor that my dog bit ____>?
*Where did you hear <the rumor that I put the book ____>?
- (16) *This man, I heard <the rumor that my dog bit ____>.
*On the table, I heard <the rumor that you put the book ____>.
- (17) *What size shoes did you hear <the rumor that I wear ____>?
- (18) *How did you hear <the rumor that I behaved ____>?

But just as it was possible to arrange for a DP-gap in adjuncts by removing Tense, the same is possible with Complex DPs if the definiteness of the head is removed. (Pollard and Sag 1994 assume, for this reason, that there is no need for a Complex DP constraint.) PP-gaps remain practically excluded.

- (19) a. ??What the police arrested <everyone who saw ____> was this video. (Postal 1998)
b. *I know in which building the police arrested <everyone who lives ____>.
- (20) a. ??Which man did they consider <rumors that Bob would betray ____>? (Rothstein 1988)
b. *About which man did they consider <rumors that Bob would talk ____>?

In distinction to Tense, definiteness may create an island by itself (Fiengo and Higginbotham 1981; Manzini 1992):

Definites:

- (21) *Which man did you discover <Mary's poem about ____>?
- (22) ??Which man did you discover <the poem about ____>?
- (23) Which man did you discover a poem about ____?

Subjects:

- (24) *Which man did <his visiting ____> shock you?
- (25) *Which book do you believe <the first chapter of ____> to be full of lies?
- (26) *Which man does <every friend of ____> admire Lincoln?

Adjuncts (see the discussion of Tense above):

- (27) *Which topic did you leave <because Mary talked about ____>?
- (28) a. Which topic did you leave <without talking about ____>?
 b. *About which topic did you leave <without talking ____>?

Postal (1994) argues that despite appearances, adjuncts do not contain CP gaps besides DP gaps:

- (29) We suggest ____ to our employees, <without actually requiring ____ of them>, that they wear a tie.

Coordinate structures, unless extraction is across-the-board:

- (30) *Which man did you invite <Mary and ____>?
- (31) *Which man did you invite <Mary and a friend of ____>?
- (32) Which man did you invite <a friend of ____ or a brother of ____>?

However, DP-gaps are acceptable under various circumstances (see Postal 1998):

- (33) This is the beer that I <bought ____, loaded ____ into the car, went home, and then fell asleep>.
 (Jacobson 1996)

The status of tensed constituent *wh*-complements seems to vary cross-linguistically. Some speakers of English reject extractions from them entirely, whereas others find them tolerable. Likewise, they are rejected by speakers of Dutch, whereas they are acceptable in Scandinavian languages (see Engdahl and Ejerhed 1982) and in Hungarian. (Hungarian has object pro-drop, but only for singulars, thus we know that the gap in (34c) is not a dropped pronoun.) This variation is not well understood (though see Bayer 1984, 1996: section 6.6.4).

Tensed constituent *wh*-complements (in some languages/dialects):

- (34) a. %Which man did John ask <who invited>?
 b. *Welke man heb jij je afgevraagd <wie – gezien heeft>? Dutch
 which man have you self asked who seen has
 c. Mely fiúkat találgattad, hogy <ki látta ____>? Hungarian
 which boys were-guessing-you that who saw

Left branches:

- (35) *Which (man's) did you see <____ picture>?

As (35) shows, it is often difficult to extract from the left branch of a structure (Ross 1986). But comparable examples are perfect in other languages:

- (36) Combien as-tu lu <____ de livres>? French
 how many have-you read of books

(37) Cuius legis <___ librum>? Latin
 whose read-you book

(38) Kinek olvastad <___ a könyvét>? Hungarian
 who-dative read-you the book + agr

Whether all the counter-examples are well understood, the Left Branch condition seems like a less plausible generalization than the others. See Corver (1990).

Finally, some islands constrain left-extraction but not Right Node Raising, indicating that the latter may not be an extraction (Postal 1998):

(39) I patted <the dog that bit ___> and hit <the dog that adored ___> the man who stole my beloved cat.

We will not discuss the relation between *wh*-in-situ and islands.

3.2 *Types of explanations for strong islands*

The standard explanation of the islandhood of Complex DPs, Subjects, *Wh*-complements, and Left Branches is in terms of Subadjacency: movement out of them results in ungrammatical sentences because movement crosses more than one bounding node (barrier); see sections 3.4 and 7.2. Adjunct islands are standardly explained by Huang's (1982a) Condition on Extraction Domains, hence by the Empty Category Principle: an extraction domain needs to be properly governed. Likewise, Pesetsky (1982) subsumes the Coordinate Structure Constraint under the path containment version of the ECP (see section 7.2). Manzini (1992) is the only attempt to unify the effect of Definiteness and Tense with other locality phenomena: D and T block dependencies based on Case-addresses, which, in her theory, DPs otherwise rely on to escape from islands.

3.3 *Ways of salvaging strong island violations*

As has been mentioned, a strong island violation can sometimes be salvaged by resorting to the resumptive pronoun strategy (whether the pronoun is overt or empty). In addition, the gap in the island may be parasitic on a well-behaved trace of movement, e.g.:

(40) Which papers did you file ___ <without reading ___>?

(41) He is a man who <everyone who knows ___> admires ___.

See also Engdahl (1983), Kayne (1983), Chomsky (1982, 1986a), Cinque (1990), among others.

Finally, the island itself may be pied-piped, overtly or at Logical Form:

(42) a. *Whose did you visit <___ brother's sister>?
 b. <Whose brother's sister> did you visit?

Pied-piping at LF has been proposed for apparent violations of Complex DPs in *wh*-in-situ languages in Pesetsky (1987a), and for apparent violations of a single adjunct island in among others, Cinque (1990). These matters are not discussed here further.

3.4 More on Subjacency

Subjacency is classically understood as a condition on movement and requires that movement not cross more than one bounding node. Bounding nodes were originally defined as a list: NP and S (= DP and IP) in English (Chomsky 1973b, 1977); NP and S' (= DP and CP) in Italian (Rizzi 1978b). Chomsky (1986a) redefines bounding nodes as barriers. An XP is a blocking category for α iff it is not theta-marked by a sister lexical head and dominates α . β is a barrier for α iff (i) β is a blocking category for α but not IP, or (ii) β is the first XP that dominates a blocking category for α . Chain-formation (which takes the place of movement) requires 1-subjacency: no more than one barrier may be crossed. (For an excellent introduction to *Barriers* as well as other theories of locality, see Roberts 1997a.) The modern incarnation of subjacency and bounding nodes are phases (Boeckx 2008). The core idea is that a phase is a limited domain of a derivation, and when that domain has been completed, it is impossible to extract from it. Phases have so far had limited empirical coverage in terms of the range of island data (see Uriagereka 1999, Chomsky 2008, Müller 2011 and Boeckx 2012 for some applications). It is also not really clear whether phases are substantially different in the sense of going beyond a notational alternative to earlier assumptions. For reasons of space we do not discuss this complex issue.

Common to all approaches since subjacency is the assumption that there is successive cyclic movement, which is used to calculate whether certain derivations are allowed or not. See den Dikken (2010) for arguments that successive cyclic movement through [Spec, CP] does not exist.

Adopting Rizzi's (1990b) Relativized Minimality (the pertinent aspects of which will be discussed when we turn to Weak Islands), Cinque (1990) proposes two important changes in the understanding of strong islands: (i) strong islands constrain binding chains, not necessarily movement, and (ii) not only government but also binding chains require 0-subjacency (no barrier may be crossed).

3.4.1 Cinque (1990)

We now take a closer look at some aspects of Cinque's proposal, because they are fundamental in defining the division of labor between theories of strong and weak islands as assumed in most of the literature. Following Obenauer (1984/1985), Cinque observes that both parasitic gaps and gaps inside strong islands are restricted to the category DP and takes this to indicate that these gaps are not variables, but A-bar bound empty pronominals: *pro*. These *pros* are not moved in syntax but must move at LF (like some kind of abstract *wh*-phrase). But instead of moving on its own, it pied-pipes the minimal island it is contained in. This accounts for the fact that, if all goes well, one strong island can be evaded.

Now recall the contrast between tensed and gerundival adjunct islands:

(43) *Which topic did you leave <because Mary talked about ____>?

(44) Which topic did you leave <without talking about ____>?

Bona fide cases of pied-piping are also constrained by Tense (Nanni and Stillings 1978):

(45) *They bought a car that their son might drive which was a surprise to them.
'they bought a car and the fact that their son might drive it was a surprise to them'

(46) The elegant parties, to be admitted to one of which was a privilege, had usually been held at Delmonico's.

Cinque (1990: 139) stipulates that Tensed Inflection weakly blocks the upward percolation of features, such as a [+wh]-feature, which Cinque argues is relevant for pied-piping. Thus,

even one island cannot be pied-piped by *pro* if it is tensed. Cinque predicts that at most one island can be evaded: strong islands cannot be compounded.

- (47) *the book that we left Russia <without being arrested <after distributing ____>>

The reason is that the movement of the pied-piped domain continues to be sensitive to islands (can at best be parasitic on overt movement). Postal (1998) notes, though, that an adjunct island can be compounded with a complex DP (see further section 3.4.3):

- (48) It was Lucille that Mike went home <without criticizing <anyone who defended ____>>.

- (49) It was Lucille that Mike criticized <everyone who went home <without defending ____>>.

To summarize, the observation that certain islands only contain DP gaps leads Cinque to a theory according to which these islands are strong, and the DP gap is not a trace of movement but A-bar bound *pro*. This contrasts with Weak Islands, which may also contain PP gaps. The latter must be traces since, according to Cinque, human languages generally lack resumptive pronouns of category PP. The behavior of weak islands is explained by considerations that do not apply to strong islands in Cinque's work and in the many other proposals this chapter will review. Thus, the DP–PP distinction carries a great burden in deciding which data are to be accounted for by each theory.

3.4.2 Some intriguing similarities between SIs and WIs

While the division of labor so determined has proven very useful in the literature, it may be worth pointing out some intriguing similarities between the phrases that may or may not escape from the two types of islands. First, there is dialectal variation among speakers of English regarding the acceptability of PP-extraction out of *wh*-islands (one of the weak islands). Unfortunately, no systematic empirical study of this variation exists, to our knowledge, wherefore it is difficult to assess its significance for Cinque's theory.

Second, consider the following contrast:

***Wh*-phrase associated with *pro* in a strong island:**

- (50) Which politician did you go to England <after meeting ____>?

- (51) *How much water did you make the pasta <after boiling ____>?

***Wh*-phrase associated with a variable in a weak island:**

- (52) a. Which politician did John ask <whether to worry ____>?
b. *About which politician did John ask <whether to worry ____>?

- (53) a. *How much gravy did John ask <whether to cook ____>?
b. *With how much gravy did John ask <whether to cook ____>?

In both cases the *wh*-phrase needs to be referential in some sense. But the reasons are different. In the case of strong islands, the *wh*-phrase needs to be of the kind that resumptive pronouns tend to associate with; in the case of weak islands, it has to carry a referential index and corefer with its variable (see section 7.3). Interestingly, there is variation among languages; Dutch allows for the counterpart of (52b) (thanks to an anonymous reviewer).

- (54) Over welke politicus vroeg Jan <of hij zich zorgen moest maken ____>?

about which politician asked Jan if he REFL worry must make

It is not clear how to capture this difference between English and Dutch.

Cinque (1990) characterizes the suitable *wh*-phrases rather similarly in the two cases, but neither this book nor any subsequent work known to us addresses the question whether the two requirements are exactly identical. Cinque (p.c., 1998) has kindly suggested the following contrast between a weak and a strong island:

- (55) a. ?*Quanti pazienti volevi sapere <se ogni dottore avesse potuto visitare ____>?*
'How many patients did you want to know whether each doctor had been able to examine?'
b. **Quanti pazienti vuoi incontrare <ogni dottore che abbia visitato ____>?*
'How many patients do you want to meet each doctor who examined?'

But the exact generalization remains an open question. One proposal that attempts to unify weak and strong islands is Starke (2001).

Starke argues that a version of Relativized Minimality (Rizzi 1990b) is all that is needed to unify islands, in addition to the assumption that syntactic features are organized into a feature-tree rather than being a haphazard set (Starke 2001: 5). Weak islands, according to Starke, are about features of the same class not being able to cross a member of the same class. That is, a sequence such as $\alpha\beta \dots \alpha \dots \alpha\beta$ is licit because $\alpha\beta$ does not cross a member of the same class. However, a sequence such as $\alpha \dots \alpha\beta \dots \alpha$ is illicit because $\alpha\beta$ is a subclass of α . The same logic entails that sequences such as $\alpha_i \dots \alpha_j \dots \alpha_i$ and $\alpha\beta \dots \alpha\beta \dots \alpha\beta$ are ruled out. Thus we can see that " α is a 'selective blocker': it blocks some items but lets others through" (Starke 2001: 8). Starke shows how this can derive a wide range of weak islands involving quantifiers, though it is not clear whether the account can be generalized to all the facts discussed in section 7.

3.5 Repair by ellipsis

Ross (1969) discovered what has become known as repair by ellipsis, the fact that island violations can be repaired if the island undergoes ellipsis. (56) from Ross (1969) illustrates sluicing and (57) an island violation that has been repaired by ellipsis.

- (56) He is writing something, but you can't imagine what ~~<he is writing>~~.
(57) They want to hire someone who speaks a Balkan language, but I don't remember which (Balkan language) ~~<they want to hire someone who speaks>~~.

Merchant (2001) extensively studies this sluicing construction and draws general conclusions about the nature of ellipsis and the identity requirement for ellipsis. For our purposes, the important point is that he argues extensively for a movement and deletion analysis of sluicing, where there is ordinary *wh*-movement followed by deletion, thus arguing against the LF copying account in Chung et al. (1995).

Chomsky (1972) suggests that a * is assigned to an island when it is crossed by a movement operation. Coupled with a filter prohibiting structures containing a * in the output, this accounts for why islands can be repaired by ellipsis: deletion removes the * and salvages the derivation. Merchant does not adopt this technology, mainly because it predicts that any island containing a * should be repaired by ellipsis. VP deletion cannot be repaired (Merchant 2001: 5).

- (58) *They want to hire someone who speaks a Balkan language, but I don't remember which they do ~~<want to hire someone who speaks>~~.

Merchant argues in favor of a heterogeneous theory, where some islands are due to PF violations whereas others are due to LF violations. See Lasnik (2005) and other work by Lasnik for further discussion of the empirical details.

There are also other locality violations that cannot be repaired by ellipsis. Consider Serbo-Croatian. Serbo-Croatian exhibits superiority effects, also in indirect questions (Bošković 1997: 7)

- (59) a. Jovan i Marko ne znaju ko je koga istukao.
 Jovan and Marko not know who is whom beaten
 ‘Jovan and Marko do not know who beat whom.’
 b. *? Jovan i Marko ne znaju koga je ko istukao.
 Jovan and Marko not know whom is who beaten

As Boeckx and Lasnik (2006: 152) point out (see also Stjepanović 1999), superiority effects show up in sluicing contexts (60), even though *wh*-island effects disappear in Serbo-Croatian as in English.

- (60) a. Somebody bought something, but ...
 b. i. Ivan i Marko ne znaju ko šta.
 Ivan and Marko not know who what
 ‘Ivan and Marko don’t know who what’
 ii. *Ivan i Marko ne znaju šta ko
 Ivan and Marko not know what who

Furthermore, Merchant (2001: 104-106) shows that the impossibility of preposition stranding holds even when the sluiced *wh*-phrase appears to associate into an island. Here is one of his Greek examples.

- (61) I mitera tou Gianni tha thimosi an milisi me kapjon
 the mother of Giannis FUTURE get.angry if he.talks with someone
 apo tin taksi tou, alla dhe thimame *(me) pjon.
 from the class his but not I.remember with who
 ‘Giannis’s mother will get angry if he talks with someone from his class, but I don’t remember who.’

Thus it is not the case that ellipsis can repair all islands, which questions the claim that islands are purely phonological phenomena.

3.6 Processing accounts

In recent years, many scholars have proposed that islands should not receive a formal grammatical account. Following Phillips (2013a), we call approaches that argue against grammatical constraints *reductionist* accounts. For example, it is argued that the unacceptability of *wh*-dependencies across subject boundaries, below, is due to a parsing difficulty and not a grammatical difficulty (Pritchett 1991, Kluender 1998, 2005).

- (62) *What did the attempt to learn about ultimately confuse the students?

Phillips reminds us that it is important to distinguish between *reductionist* and *grounded* accounts of syntactic phenomena. A grounded constraint is a syntactic constraint whose motivation comes from the fact that it increases language processing difficulty. A reductionist constraint claims that there is no need for any formal syntactic constraints. Hofmeister and

Sag (2010), and references therein, is a good representative of the reductionist approach, and Fodor (1978) and Berwick and Weinberg (1984) of the grounded approach. For detailed discussion, see Phillips (2013b).

4 Weak islands: a preview

The historical starting point is the assumption, made in Huang (1982a), Lasnik and Saito (1984, 1992), Chomsky (1986a), that the paradigmatic (if not the only) case of weak (selective) islands is *wh*-islands, and the expressions whose extraction is sensitive to WIs are adjuncts, as opposed to arguments. Since *Barriers*, a number of new theories of weak islands have appeared in quick succession. What makes this process especially interesting is the fact that practically each theory comes with a significant new set of data. The survey below will reflect this spirit. The critical data come in two dimensions:

- (A) What extractions are sensitive to WIs?
- (B) What induces a WI?

Much of the literature can be conveniently surveyed along the dimensions in (A) and (B). We will thus begin by drawing ever-widening circles of data, first for (A), then for (B). The third part of the discussion will review what theories account for what data sets. Sections 5 and 6 are not simple data surveys, though. Detailed and often theoretical arguments will be put forth as to why exactly the proposed generalizations hold. Also, when certain pieces of literature offer important analyses of WI-phenomena without proposing their own overall theory of WI, they will be summarized in these sections. In both these sections and in section 7, where we turn to theories, we will see that the proposals are less and less syntactic. Some of them include pragmatic or semantic factors in the description of what expressions are WI-sensitive or WI-inducers, although they formulate the explanation in syntactic terms. Others even derive the explanation from semantics. The data to be discussed are as follows:

Ad (A) What extractions are sensitive to WIs:

- (A1) Arguments vs. adjuncts.
- (A2) Referential vs. non-referential.
- (A3) Re-evaluating the role of D-linking.
- (A4) Individual vs. non-individual, and *how many*-phrases.
- (A5) Functional readings and event-related readings.
- (A6) Individuals: is it being type *e* that matters?
- (A7) Split constructions.
- (A8) Negative polarity item (NPI) licensing.
- (A9) Cross-sentential anaphora.

Ad (B) What induces a WI:

- (B1) *Wh*-islands.
- (B2) Negatives and other affective operators.
- (B3) Response stance and non-stance vs. volunteered stance predicates.
- (B4) Extraposition islands.
- (B5) VP-adverbs.
- (B6) Scope islands.

Section 7 presents the theories that account for these data and generalizations. To anticipate, the division of labor is as follows: when a theory accounts for only some of the data falling under some generalization, the generalization is marked with a percentage sign (%):

- ECP and Subjacency for (A1)–(B1)
- Relativized Minimality for (A2, A7)–(B1, B2, B3%, B4, B5%)
- Scope Theory, algebraic version for (A3, A4, A5, A6, A7%)–(B1, B2, B3, B5, B6)
- Scope Theory, dynamic semantic version (A4, A5, A7, A8, A9)–(B1, B2, B3, B5, B6)

5 What extractions are sensitive to WIs? (A)

Here we survey the main distinctions that have been found useful in describing what extractions are sensitive to WIs. To keep new information manageable, *wh*-islands will be used to illustrate the phenomena. Two other familiar WIs, negative and factive islands, will be added where necessary (e.g., because subject extraction out of a *wh*-island may be independently ungrammatical). The full set of WIs is much greater, though, and will be presented when dimension (B) is addressed.

5.1 Arguments vs. adjuncts (A1)

Huang (1982a), Lasnik and Saito (1984, 1992), and Chomsky (1986a) draw the distinction between arguments (claimed not to be sensitive to WIs) and adjuncts (claimed to be sensitive to them):

- (63) a. Which problem did John ask <how to phrase ____>?
 b. *How did John ask <which problem to phrase ____>?
 ‘what is the manner such that John asked which problem to phrase in that manner’

In addition to *how*, *why* and, to a somewhat lesser extent, *when* are WI-sensitive adjuncts.

- (64) *Why did John ask <whether to fire him ____>?
 ‘What is the reason such that John asked whether it is a good reason for firing him’
 (65) ?When did John ask <whether to fire him ____>?
 ‘What is the time such that John asked whether it is a good time for firing him’

Where does not fit the picture very well because its WI-sensitivity does not depend much on whether it is subcategorized for (as with *put*) or not (as with *read*):

- (66) ?Where did John ask <whether to put/read this book ____>?
 ‘What is the location such that John asked whether to put this book there/whether to read this book there’

The morphological constitution of these *wh*-words may also play a role. It has been noted that when counterparts of *why* and *when* have an articulated PP structure in a language, they extract better. Korean, Japanese, and Hungarian are cases in point.

5.2 Referential vs. non-referential/Existential presupposition (A2)

A major revision of the argument/adjunct distinction is prompted by observations by Ross (1984), Kroch (1989a), Comorovski (1989), Rizzi (1990b), Cinque (1990), Obenauer (1992), and Kiss (1993). In a nutshell, the claim is that originating in an argument position is not enough: a successful extractee must also be referential in some sense. Some subcategorized for, and thus, presumably, argumental, XPs are unexpectedly WI-sensitive:

(67) *What did John ask whether these pearls cost ____? (Ross)
cf. *These pearls cost.

(68) *How did John ask whether to behave ____? (Rizzi)
cf. *John behaved.

According to Rizzi (1990b), amount and manner phrases may be arguments but they do not have the theta-roles of event-participants (referential theta-roles). On the other hand, as events take place in time and space, Rizzi surmises that the event specification may license a temporal and locative index that accounts for the fact, noted above, that such phrases are less sensitive to WIs than manners and reasons.

On the basis of the fact that expletive *wh*-phrases do not have referential theta-roles, Rizzi (1992) extends this reasoning to partial *wh*-movement, which is blocked by a negative island (for cross-linguistic variation, see Dayal 1994):

(69) Was glaubst du (*nicht), mit wem Jakob jetzt spricht?
what think you (*not) with whom Jacob now talks
'With whom do(n't) you think Jacob is talking now?'

Drawing from work by Kroch and Comorovski, Cinque (1990) makes a finer distinction that involves pragmatics: a referential *wh*-phrase, in addition to having a referential theta-role, needs to be Discourse-linked, i.e., drawn from a pre-established set.

Some of the most persuasive examples involve *how many*-phrases:

(70) *How many books are you wondering <whether to write ____ next year>?

(71) How many books on the list are they wondering <whether to publish ____ next year>?

(72) *How many points are you wondering <whether to earn ____>?

(73) How many points are the jurors debating <whether to take off ____>?

The good examples involve a contextually established set of books or a specific range of points that figure skating jurors conventionally assign to mistakes in the program. Similar contrasts are easy to construct with other *wh*-phrases, including adjuncts. For instance, although *how*-extraction out of a *wh*-island or a negative island is by default bad, it becomes rather acceptable given a contextually specified checklist of ways to solve the problem:

(74) How are you wondering <whether to solve the problem ____>?
(OK when choosing from salient checklist)

(75) How did <no student solve the problem ____>?
(OK when choosing from salient checklist)

In a similar spirit, Kiss (1993) assumes that specificity in the sense of Enç (1991) is a prerequisite for extraction out of a *wh*-island.

We might say that these proposals define WI-sensitivity in terms that combine syntax with pragmatics. In the name of philological correctness it should be mentioned that Kroch's influential paper apparently had more than one version, and the 'official, unpublished' version gives a different explanation than the one Cinque relies on. According to Kroch, what saves (71) is not that the *how many*-phrase is D-linked but, rather, the fact that the context licenses the existential presupposition that there is a particular amount such that you are wondering whether to publish that amount.

A similar interpretive contrast is pointed out in Obenauer (1992). He characterizes it in terms of specificity and correlates it with a difference in agreement with the past participle. The split construction (*combien . . . de fautes* 'how many . . . errors') never allows agreement and only the non-specific reading is available. In the non-split construction, on the specific reading agreement is optional: *Dis-moi combien de fautes tu as fait/faites* 'Tell me how many (of the typical, expected) errors you made', and on the non-specific reading, which asks about the number of errors, participle agreement is excluded.

Fox and Hackl (2007) note that negative degree islands become acceptable if an existential modal is placed in the scope of negation, or a universal modal above the negation.

- (76) a. How many children are you not allowed to have?
b. How many children are you required not to have?

A universal modal in the scope of negation does not carry the same obviation effect:

- (77) *How fast is John not required to drive?

Abrusán (2011a,b) develops a new account to these data and to *wh*-islands with degree-constructions, as well as presuppositional and negative islands. Based on two assumptions, (i) the domain of manners contains contraries, (ii) degree expressions range over intervals, she argues that presuppositional and negative islands are predicted to lead to a presupposition failure in any context.

5.3 Re-evaluating the role of D-linking (A3)

The pragmatic argument is very powerful: indeed, almost any *wh*-phrase (save for *why*, perhaps) can be made immune to WIs by D-linking. But it has been argued that D-linking is not the discriminating factor. Szabolcsi and Zwarts (1993) argue that the moral of the salient-checklist examples is different from what Kroch and Cinque draw from them. The checklist in effect turns elements of a non-individuated domain into discrete individuals. D-linking may thus play an important role in transforming a domain but, they claim, it is not D-linking itself but the emergent set of individuals that is decisive. Likewise, the pragmatic approach predicts that *wh-the-hell* can never be extracted out of a weak island, because it is aggressively non-D-linked, in the words of Pesetsky (1987a). Szabolcsi and Zwarts (1993) submit that it is an independent property of *wh-the-hell* that makes it difficult to extract from WIs. For example,

- (78) Who the hell saw John?

Unless it is a rhetorical question, (78) is felicitous only if we have unquestionable evidence that someone saw John and merely wish to identify the person. The requirement of unquestionable evidence is often difficult to fulfil in the complex situations described by WI-violations:

- (79) ??Who the hell are you wondering <whether to invite ____>?

On the other hand, when such evidence is available, a WI-violation by *wh-the-hell* is acceptable. E.g., seeing someone rifling through a dictionary, one may felicitously ask,

- (80) What the hell do you still <not know <how to spell ____>>?

Perhaps the clearest example demonstrating the significance of individuals, in distinction to D-linking, comes from Dobrovie-Sorin (1994c). Clitic doubling in Romanian signals D-linking, and indeed, it enables a *how many*-phrase to extract from a factive island:

- (81) Pe câte femei regreti <că le ai iubit ____>?
'how many (of the) women are such that you regret having loved them'

On the other hand, *câte femei* 'how many women' can be extracted even if it is not doubled by *le* and, consequently, is not D-linked. It turns out that the critical factor is whether it is interpreted as quantifying over numbers of women (case (i), which is bad) or over individual women (case (ii), which is OK):

- (82) Câte femei regreti <că ai iubit ____>?
(i) *'for what number, you regret having loved that number of women'
(ii) 'how many women are such that you regret having loved them'

These data lead to the conclusion that semantics, rather than pragmatics, plays the real role in the characterization of WI-sensitivity.

5.4 Individual vs. non-individual, and how many-phrases (A4)

Szabolcsi and Zwarts argue that the individual/non-individual distinction is what sets apart WI-escaping *which/what*-phrases from manners, reasons, amounts, and other WI-sensitive expressions (when the latter are not individuated by contextual brute force). A very similar conclusion is reached by many authors, specifically in connection with the ambiguity of *how many*-phrases. Dobrovie-Sorin proposes to split QR into two Logical Form operations: NPR (the raising of noun phrases with a quantifier feature) and DR (the raising of determiners). The first leaves an individual variable and is immune to WIs. The second leaves a higher order, determiner-type variable and is sensitive to WIs. (NPR may be followed by DR but that does not matter in relation to island escaping.) The distinction is of course highly reminiscent of the contrast between overt *combien* extraction and *combien de N* extraction (Obenauer 1984/1985):

- (83) Combien as-tu (*beaucoup) consulté ____ de livres?
how many have-you (*a lot) consulted ____ of books
(84) Combien de livres as-tu (beaucoup) consulté ____?
how many of books have-you (a lot) consulted

The overt extraction of *combien* 'how many' is blocked by WIs, whereas the overt extraction of the full noun phrase (generally) is not; see also Rizzi (2000a) for a similar case of 'splitting' in Italian, involving *wh-d'altro* 'wh else'. The finer point that Dobrovie-Sorin makes is that *combien de livres* is in itself ambiguous between an amount and an individual reading, and the amount reading is absent when *combien de livres* is (grammatically) extracted out of a WI, exactly as was observed in connection with *câte femei*:

- (85) Combien de livres as-tu consulté ____?
ambiguous (DR/NPR)

- (86) Combien de livres as-tu beaucoup consulté ____?
not ambiguous (*DR/NPR)

In fact, even overt *combien de N* extraction out of a WI may be ungrammatical when, as the object of a verb of creation, the phrase can only have an amount reading (Szabolcsi and Zwarts 1993).

- (87) Combien de cercles as-tu (*beaucoup) dessiné ____?
how many circles have-you (*a lot) drawn

The same interpretive contrast holds for non-*wh* numeral phrases whose amount reading is produced by DR, and whose individual reading is produced by NPR, at Logical Form (Dobrovie-Sorin 1994c):

- (88) John read fifty books.
(i) 'John read books. Their number was fifty.'
(ii) 'There are fifty books such that John read them.'
- (89) John didn't read fifty books.
(i) *'John didn't read books. Their number was fifty.'
(ii) 'There are fifty books such that John didn't read them.'

Agreement facts in Italian clefts appear to support the claim that the amount/individual distinction has its own independent existence: amount readings, as opposed to individual readings, lack number agreement (F. Beghelli's observation, quoted in Szabolcsi and Zwarts 1993):

- (90) È cinque donne che (*non) ho invitato. (amount)
is five women that (*not) have-I invited
- (91) Sono cinque donne che (non) ho invitato. (individual)
are five women that (not) have-I invited

It is interesting to note that mass expressions are more irrevocably WI-sensitive than count ones, and abstract ones are more WI-sensitive than concrete ones. Thus, the following have no individual readings.

- (92) a. How much milk did(*n't) you spill on your dress?
b. How much pain did(*n't) you suffer?

The pragmatic proposal would make this natural (mass and abstract denotations are difficult to D-link), but since we saw that D-linking is not a panacea magna, the explanation must lie elsewhere. Dobrovie-Sorin (1994c) proposes a thorough analysis of the amount–individual ambiguity of *how many*-phrases in terms of distinguishing the raising of determiners (DR) and the raising of noun phrases with a quantifier feature (NPR). But she does not develop a new theory of WIs; rather, she simply assumes that DR, unlike NPR, is sensitive to WIs. Other authors who identify individuality as the crucial factor are Aoun (1986), Frampton (1990), Rullmann (1995b), and Cresti (1995).

An important difference between the approaches of Dobrovie-Sorin and Szabolcsi and Zwarts on the one hand, and Frampton, Rullmann, and Cresti, on the other, is that the former posit an amount–individual ambiguity even in sentences where *how many N* does not interact with another scopal expression, whereas the latter do not. Cresti addresses the ambiguity manifested in what Longobardi (1987) called scope reconstruction facts:

- (93) How many people do you think I should talk to ____?
- (i) ‘For what number n : you think it should be the case that there are n -many people that I talk to.’
 - (ii) ‘For what number n : there are n -many people x such that you think I should talk to x .’

Cresti (and in a very similar proposal, Rullmann 1995b) derives the two readings without actual reconstruction. In the derivations below, x is a trace of type e (individuals), and X is a trace of the same type as *N-many people* (intensionalized generalized quantifiers). Working bottom-up, each trace is bound by a lambda-operator to allow the next trace or the moved phrase itself to enter the chain. The lowest, argument, position of the chain is always occupied by a trace x of the individual type, but intermediate traces may make one switch to the higher type X . The scope difference with respect to *should* is due to the fact that in (i), the switch from x to X takes place within the scope of *should*, whereas in (ii), *should* has a trace x of the individual type within its scope.

- (94) (i) Narrow scope (amount):
 $[_{CP} \text{ how many people } \lambda X[_{IP} \dots \text{ think } [_{CP} X \lambda X[_{IP} \dots \text{ should } [_{VP} X \lambda x[_{VP} \dots x \dots]]]]]]$
- (ii) Wide scope (individual):
 $[_{CP} \text{ how many people } \lambda X[_{IP} X \lambda x[_{IP} \dots \text{ think } [_{CP} x \lambda x[_{IP} \dots \text{ should } [_{VP} \dots x \dots]]]]]]$

If *wonder whether* replaces *think that*, in derivation (i) it inescapably has a higher type trace X in its scope; in derivation (ii), it can have a trace x of the individual type in its scope. Cresti stipulates that when CP constitutes a *wh*-island, the trace adjoined to CP must be of the individual type. This rules the *wonder*-version of (94i) out.

- (95) (i) *Narrow scope (amount):
 $[_{CP} \text{ how many people } \lambda X[_{IP} \dots \text{ wonder } [_{CP} X \lambda X[_{IP} \dots \text{ should } [_{VP} X \lambda x[_{VP} \dots x \dots]]]]]]$
- (ii) Wide scope (individual):
 $[_{CP} \text{ how many people } \lambda X[_{IP} X \lambda x[_{IP} \dots \text{ wonder } [_{CP} x \lambda x[_{IP} \dots \text{ should } [_{VP} \dots x \dots]]]]]]$

Cresti (1995) proposes a novel analysis of scope-reconstruction facts related to *how many*-phrases and extends it to a new domain: functional readings. But she does not develop a new theory of WIs: she simply stipulates that only a variable of type e may be adjoined to a CP that constitutes a *wh*-island. The question as to why this is so and how this proposal might extend to WIs other than *wh*-islands is not addressed by Cresti.

5.5 Functional readings and event-related readings (A5)

Cresti (1995) adds a set of novel data to the inventory of WI-sensitive expressions: *wh*-phrases on the functional reading, which obtains in a quantificational context, illustrated in (96i).

- (96) Which book did no student read?
- (i) ‘Which f , f a function from people to books, no student x read $f(x)$?’
 Answer: No student _{i} read her _{i} mother’s book.
 - (ii) ‘Which y , y a book, no student read y ?’
 Answer: No student read *War and Peace*.

When the *wh*-phrase contains a reflexive, only the functional reading is possible:

- (97) Which book about herself did no politician read?
(i) Answer: No politician_i read the book her_i aide wrote.
(ii) Answer: *No politician read this book.

The functional reading (98i) is sensitive to *wh*-islands, whereas the non-functional reading of the same *wh*-phrase (98ii) is not:

- (98) I know which book you wonder whether no/any student read.
(i) *I know that you wonder whether no/any student_i read her_i mother's book.
(ii) I know that you wonder whether no/any student read *War and Peace*.

This would be impossible to explain on the earlier, syntactic or pragmatic, theories. Cresti argues that on the functional reading, the trace of *which book (about herself)* must be of a higher order, functional type, as opposed to the individual type. Functional readings neatly fall under the individual vs. higher order generalization.

Another set of new data that might be accounted for along these lines involves event-related readings (Krifka 1990). Notice that on reading (99ii), each ship counts as many as the number of times it passes through the lock:

- (99) Four thousand ships passed through the lock last year.
(i) Object-related: 'there are 4,000 distinct ships that passed through the lock'.
(ii) Event-related: 'there were 4,000 lock traversals by ships'.

Doetjes and Honcoop (1997) observe that the event-related reading is sensitive to WIs, negative islands among them:

- (100) How many ships <___ didn't pass through the lock>?
(i) Object-related: okay.
(ii) Event-related: ungrammatical.

The authors analyze event-related readings as quantification over <event, object> pairs. The WI-sensitivity of such pairs might be explained with reference to the fact that they are not of type *e* – although Doetjes and Honcoop themselves offer a different explanation, namely, one in terms of an algebraic notion of individuals.

5.6 *Individuals: is it being of type e that matters? (A6)*

The contrasts above can indeed be accounted for by defining the critical property in terms of logical type: type *e* (the type of individuals) versus higher types (the types of determiners, generalized quantifiers, functions from sets to sets, event-object pairs, etc.). The following data, however, are not easily amenable to this account.

Szabolcsi and Zwarts (1993) observe that arguments and adjuncts of non-iterable ('one-time-only') predicates must denote collectives. The absence of the distributive interpretation is indicated by the unacceptability of distributing the preposition or *did* over the members of the conjunction:

- (101) Which relatives did you hear this rumor from?
From my aunt and from my uncle.
(102) Which relatives did you get this present from?
From my aunt and (*from) my uncle.

- (103) Which soldiers visited this house?
Jones and Smith did./Jones did and Smith did.
- (104) Which soldiers destroyed this house?
Jones and Smith did./*Jones did and Smith did.

Surprisingly, these collectives are sensitive to weak islands. Example (106), which involves extraction from a factive island, is acceptable only if we are willing to give up the natural ‘one-time-only’ interpretation of the predicate and assume that the same present (token) was given to you several times by different relatives. Likewise, (108) is acceptable only if we assume that the same house can be destroyed more than once:

- (105) Which relative(s) do you <regret that you heard this rumor from ____>?
- (106) ??Which relative(s) do you <regret that you got this present from ____>?
- (107) Which soldier(s) <didn’t visit this house ____>?
- (108) ??Which soldier(s) <didn’t destroy this house ____>?

These contrasts are problematic for all the accounts reviewed above. *Which N(s)* in the non-iterative context is clearly an argument, not an adjunct. It is an event-participant. It is in all probability D-linked. Finally, it ranges over things of the same logical type as it does in the iterative context.

There are two standard approaches to collectives. According to Link (1983), collectives are plural individuals. They are entities of the same type *e* as singular individuals, but they have an internal part-whole structure. According to Scha (1981), collectives are sets of individuals (type <*e*,*t*>) – but singular individuals like John are also treated as sets, namely, singletons. In other words, logical type does not discriminate between WI-sensitive and WI-immune *which N(s)*. Either both are type *e* or both are type <*e*,*t*> (or fancier reincarnations thereof). Thus, a different definition of the pertinent notion of individualhood is needed; one that singles out almost, but not exactly, the same things as the type theoretic one. This need is underscored by the fact that the relevance of being type *e* is merely stipulated, but not explained, in Cresti’s work. An alternative proposal in terms of algebraic structure is made by Szabolcsi and Zwarts (1993) (see section 7.5.1).

5.7 Split constructions (A7)

Obenauer (1984/1985) demonstrated that one kind of split construction, *combien*-extraction, is sensitive to WIs. The same holds for Dutch *wat voor*- and *wat aan*-split and their German counterparts, in the judgment of Beermann (1997), Corver (1990), and Honcoop (1998). (M. den Dikken (p.c.) informs us that minor additions may improve the examples, e.g., *wat . . . voor een soort boek*.)

- (109) Wat voor een boek heeft Jan gelezen ____?
what for a book has John read
- (110) Wat heeft Jan ____ voor een boek gelezen?
what has John for a book read
- (111) ??Wat voor een boek vroeg jij je af <of je ____ moest lezen>?
‘What kind of book did you wonder whether you should read?’

- (112) *Wat vroeg jij je af <of je ____ voor en boek moest lezen>?
 ‘What kind of book did you wonder whether you should read?’
- (113) a. Wat heb jij ____ aan boeken gelezen?
 what have you on books read
 b. Alles wat jij ____ aan boeken hebt gelezen past op één
 everything what you on books have read fits on one
 klein plankje.
 small shelf
- (114) *Wat vroeg jij je af <of Jan ____ aan boeken heeft gelezen>?
 what wondered you if John on books has read
 ‘What books did you wonder whether John has read?’

Because *combien*-extraction inescapably yields an amount as opposed to an individual interpretation, this datum falls under the proposed generalizations earlier. The same may hold of the WI-sensitivity of *wat voor*-split, on the assumption that kinds are not individuals. But *wat aan*-phrases have an individual reading. Thus, *wat aan*-split suggests that split constructions are WI-sensitive, over and beyond whether they range over individuals or not.

5.8 Negative polarity (NPI) licensing (A8)

It has been known since Linebarger (1987) that the licensing relation between negative polarity items and their triggers is blocked by a variety of interveners. Honcoop (1998) argues that it is blocked by the same interveners that create WIs.

- (115) John didn’t give the beggar a red cent.
 trigger: *not*; NPI: *a red cent*
- (116) *Mary didn’t ask <whether John gave the beggar a red cent>.
- (117) *Mary didn’t regret <that John gave the beggar a red cent>.

The *wh*-island and factive island tests give the desired result but, as Honcoop points out, the results may be irrelevant. To make sure that the NPI is not licensed by the intervener itself, a ‘sensitive’ NPI like *a red cent* needs to be used; but *a red cent* may require a clause-mate trigger, and these contexts block Neg-raising (Neg-lowering) as well. Thus, the conclusive demonstration of the WI-sensitivity of NPIs comes from a less-known set of WIs: scope islands. Scope islands are detailed in (B6).

- (118) *John didn’t give <every beggar a red cent>.
- (119) *John didn’t give <at most three beggars a red cent>.
- (120) *John didn’t give <exactly three beggars a red cent>.

Honcoop’s proposal that the blocking of NPI-licensing is a WI-phenomenon is very interesting for two reasons. One, this is the very first systematic explanation of the NPI-blocking facts. Two, the WI data base is now extended in a substantial and exciting manner. (P. Postal (p.c.) points out that Ross (1986, originally a 1967 dissertation) characterized NPIs as island-sensitive.)

5.9 Cross-sentential anaphora (A9)

Honcoop (1998) also observes an uncanny similarity between the expressions that create WIs and those that block cross-sentential anaphora when they take scope over the indefinite, e.g.:

(121) I saw a man_i in the park. He_i was tall.

(122) *I didn't see a man_i in the park. He_i was tall.

The pertinent data are surveyed in section 7.5.2. We might list them here, along with the data in (A8), as new WI facts, but because Honcoop's proposal is to reduce the explanation of WI effects to that of the anaphora facts, it is expedient to discuss them along with his theory.

6 What contexts constitute weak islands? (B)

As was mentioned earlier, *wh*-islands are the classical WIs. Relativized Minimality revolutionized the study of WIs by bringing a host of further WIs within the scope of the theory. These include negative and factive islands, affective (downward entailing) operators, extraposition islands, etc. But this was only the beginning.

It is important to ask whether WI-sensitive extractions and WI-inducers are uniform in the sense that if a particular extraction is blocked by some weak island, it is blocked by all weak islands. The answer is generally assumed to be yes, as long as the relevant constructions can be checked at all. Therefore, in demonstrating what contexts constitute WIs, we will not check the effect against the full range of WI-sensitive extractions reviewed above. We always pick one case that seems convincing enough. We assume that the choice is by and large arbitrary.

6.1 Wh-islands (B1)

As was mentioned in section 3.1, infinitival, modal, or subjunctive, *whether*-complements are the weakest islands, as illustrated by English below. Tensed constituent *wh*-questions are often strong islands. The cross-linguistic and cross-dialectal variation is poorly understood.

- (123) a. Which man are you wondering <whether to invite ____>?
b. *How are you wondering <whether to behave ____>?

6.2 Negatives and other affective operators (B2)

That negatives block extraction was observed as early as in Williams (1974), together with the fact that only unstressed negatives do (the latter remains un-accounted for in the literature):

(124) *I asked how John <didn't behave ____>.

(125) I asked how John did NOT behave ____.

The island-inducing effect of negatives was analyzed systematically in Ross (1984), who called them Inner Islands:

(126) What did <no imitation pearls touch ____>?

(127) *What did <no imitation pearls cost ____>?

Rizzi (1990b) observes that the generalization extends to all items that are affective operators (i.e., NPI triggers) in the sense of Klima (1964).

(128) *How did <few men think that you behaved ____>?

(129) *How did <only John think that you behaved ____>?

(130) *How did <you deny that you behaved ____>?

In terms of Ladusaw (1980), affective operators are downward entailing (on the whole, or have such a component, as is the case with *only*). Compare:

(131) No one/Few men/Only John had ever been here.

(132) I deny that you have ever been here.

How does double negation behave in this context? Does it cancel out? Szabolcsi and Zwarts (1993) observe that in at least one case it does, but generally not. (The island-sensitivity of *as*-extraction comes from Rizzi 1990b.) See also Kuno and Takami (1997):

(133) John is our hero, as no one denies ____.

(134) *How did <no one deny that you behaved ____>?

Rullmann (1995b) proposes a semantic explanation of the blocking effect of downward entailing operators. Because this theory is not intended to extend to other WIs (Rullmann regards those a matter of syntax), it is reviewed here, rather than in the theory section.

The proposal is essentially a generalization of Rullmann's account of maximality and intervention effects in comparatives. To see that comparatives give rise to maximality effects, consider (135), which means that John swam faster than the maximal speed at which Bill can run.

- (135) a. John swam faster than Bill could run.
b. John swam faster than MAX({d: Bill could run d-fast})

where MAX is defined as the least upper bound of the set it operates on (i.e., $\text{MAX}(\{1,2,3,4,5\}) = 5$, etc.). This account of the semantics of comparatives almost immediately explains the following contrast:

- (136) a. John weighs more than Bill weighs.
b. John weighs more than everybody else weighs.
c. John weighs more than most people/many people/at least five people weigh.
d. John weighs more than Bill always/often weighs.
- (137) a. *John weighs more than Bill doesn't weigh.
b. *John weighs more than nobody weighs.
c. *John weighs more than few people/fewer than five people/at most five people weigh.
d. *John weighs more than Bill never/seldom weighs.

The account runs as follows. In both (138a) and (139a) the sets of degrees are finite and contain a maximum. However, those in (138b) and (139b) are infinite, and therefore do not contain a maximum.

- (138) a. {d: at least five people weigh d-much}
 b. {d: fewer than five people weigh d-much}
- (139) a. {d: somebody weighs d-much}
 b. {d: nobody weighs d-much}

Rullmann then argues that *wh*-questions in general give rise to maximality/exhaustivity effects as well. For example, a question that asks us to specify the maximal speed at which John can run is informally represented as follows:

- (140) a. How fast can John run?
 b. which d [d = MAX({d': John can run d'-fast})]

If so, then the ill-formedness of the following, for example, can be explained along the same lines as the ill-formedness of the examples above.

- (141) *How fast can't John run?

What explains then that *wh*-adjuncts such as *how* and *why* are also sensitive to WIs? Consider first (142), which shows that *who*, contrary to *how* and *why*, is not sensitive to WIs. Given maximality/exhaustivity, (142a) asks for the maximal plural individual (sum) that attended the party. Question (142b) then asks for the sum of all people who were not at the party. To exclude irrelevant individuals such as Aristotle and Yeltsin from consideration, *who* must be D-linked.

- (142) a. Who was at the party yesterday?
 b. Who was not at the party yesterday?

The fact that *how* and *why* cannot be extracted across negation and quantificational expressions follows from the fact that *how* and *why* cannot be D-linked.

6.3 *Response stance and non-stance in contrast to volunteered stance predicates (B3)*

That factive contexts are WIs is well known from Cinque (1990). This is just a special case, though, as Hegarty (1992b) points out. The full picture is presented in Cattell (1978). Cattell distinguishes response stance, non-stance, and volunteered stance predicates. Response stance includes, alongside *deny*, items like *accept*, *confirm*, *verify*, *admit*, etc. Non-stance includes a big class of factives: *realize*, *know*, *regret*, *remember*, *surprise*, *notice*, etc. Finally, volunteered stance includes *think*, *believe*, *suspect*, *allege*, *assume*, *claim*, etc. Cattell's generalization is that the first two classes generally block adjunct extraction:

- (143) *How did you accept that he behaved ____?
 also: deny, confirm, verify, admit, . . .
- (144) *How did you realize that he behaved ____?
 also: know, regret, remember, surprise, notice, . . .

- (145) How did you think that he behaved ____?
also: believe, suspect, allege, assume, claim, . . .

6.4 *Extraposition islands (B4)*

Again, this is one of the cases discussed in Cinque (1990). Whether extraposition islands constitute a separate case is not immediately evident, since they are over-whelmingly also factive islands, e.g.:

- (146) *How <is it a scandal that he behaved ____>?

But here is at least one extraposition island quoted by Cinque that is not factive:

- (147) *How <is it time to behave ____>?

On the other hand, the following extrapositions involve non-factive, non-negative predicates and do not appear to create islands (P. Postal, p.c.).

- (148) How much wine is it possible/legal/fun/dangerous to drink ____ at a party?

This seems to indicate that extraposition per se is not the culprit. It is unclear to us exactly what makes *it is time to . . .* an island. Further relevant examples can be drawn from Heavy NP Shift.

6.5 *VP-adverbs (B5)*

Obenauer (1984/85) examines the following pattern:

- (149) J'ai beaucoup conduit [____ de camions].
I have a lot driven of trucks.
'I drove many trucks.'

Although the phrase *beaucoup de camions* would be grammatical, Obenauer argues in careful detail that VP-initial *beaucoup* is not an extracted determiner but a VP-adverb. The quantified interpretation 'many trucks' is obtained through quantification of V in terms of 'many times'. He calls this phenomenon QAD (quantification at a distance). The presence of the adverb nevertheless blocks *combien*-extraction:

- (150) *Combien as-tu <beaucoup consulté [____ de livres]>?

The analysis according to which a VP-initial quantifier renders split constructions ungrammatical without being derivationally related to the empty determiner slot of the DP is corroborated by the fact that iterative adverbs also block *wat voor* split (De Swart 1992):

- (151) *Wat heb je < twee keer [____ voor boeken] gelezen >?
what have you two times for books read

It may be interesting to point out that these adverbs block *how*-extraction as well:

- (152) *How did you <behave a lot ____>?
*How did you <behave twice ____>?

6.6 Scope islands (B6)

At least one important subset of the islands above, namely, *wh*-islands, negative (affective) islands, and adverbial islands, can easily be described as intervention islands: the WI is induced by the intervention of a certain element between the final locus of the extracted phrase and its extraction site. The intervention of other operators seems harmless, e.g., *every boy* may intervene between *how* and its extraction site, without making the sentence ungrammatical.

(153) How did every boy behave ____?

As we shall see, Rizzi's (1990b) generalization is that bad interveners are A-bar specifiers. Expressions in A-specifier or adjoined position do not matter. Universals are adjoined to some projection by QR, hence they cannot matter. But it turns out that the grammaticality of (153) type extractions is misleading. *Every boy* is an operator that may scope either below or above a *wh*-phrase; it may even be scopally independent from it. Let us illustrate the three possibilities with an example where the *wh*-phrase is immune to WIs:

(154) Which book did every boy read ____?

- (i) every > wh
'For every boy, which book did he read?'
- (ii) wh > every
'Which book is such that every boy read it?'
- (iii) independent scope (uniformity presupposition)
'Taking for granted that every boy read the same book, what was this book?'

Reading (i) is often called a pair-list reading: it is answered by a list of pairs: 'Bill read *Dubliners*, Jim read *Ulysses*, . . .'. Readings (ii) and (iii) both ask for a single book that was read by every boy, but differ as to the possibility of what else each boy may have read. For instance, if Bill read *Jurassic Park* and *Tom Jones*, Jim read *Jurassic Park* and *Airframe*, and so on, reading (ii) is felicitous and the answer is '*Jurassic Park*'. Reading (iii) is not felicitous in the same situation: it presupposes that each boy read just one book, moreover, the same one, and merely asks to identify the book. The question is, are these three readings equally possible when *every boy* interacts with a WI-sensitive expression, rather than a *which*-phrase?

De Swart (1992) and Kiss (1993) make the fundamental observation that universals are harmless only when they (i) scope above or (iii) independently of the sensitive *wh*-phrase. When they scope below it (ii), they induce a WI. Kiss states the generalization for non-specific extractees, De Swart for split constructions:

(155) How did every boy behave ____?

- (i) every > wh
'For every boy, how did he behave?'
- (ii) wh > every
*'What was the common element in the boys' non-uniform behavior?'
- (iii) independent
'Taking for granted that every boy behaved the same way, what was it like?'

(156) Combien ont-ils tous lu ____ de livres?

- (i) *'For each of them, how many books did he read.'
- (ii) *'For what n, they all read n or more books.'
- (iii) 'They all read the same number of books; what (which) number was it?'

Because (156) contains a floated quantifier, it lacks an every > wh reading (i). It does have an independent reading (iii), especially if there is a contextually salient list of numbers. But

crucially, it lacks reading (ii) where the universal would be scoping under *wh*. (Thanks to D. Sportiche and M. Starke for discussion regarding (156).) In sum, the fundamental observation is that it is not so much the nature of the syntactic position (A-bar specifier vs. other) but the scope of the intervener that matters: an operator that scopes between the WI-sensitive extractee and its extraction site blocks the extraction.

Why does the mere presence of the previously reviewed operators induce a WI? Because, for reasons of their own, they are unable to scope above (or independently of) the extracted phrase. For instance, *no one* or *twice* never induce pair-list questions at all:

- (157) Which book did no one read?
 *‘For no one, tell me which book he/she read.’
- (158) Which book did you read twice?
 *‘For two occasions, tell me which book you read then.’

Following Kiss’s and De Swart’s insight, this point is demonstrated systematically in Szabolcsi and Zwarts (1993). Some further descriptive caution is in order, however. Based on a detailed investigation of pair-list readings, Szabolcsi (1997a) shows that the same quantifier may or may not induce a WI, depending on the syntactic context. *Fewer/more than five boys* blocks *how*-extraction in a matrix question and in a complement of *wonder* or *ask*, but not in a complement of *find out*. The presence of *only* in (161) enhances the felicity of this reading.

- (159) *How did fewer than five boys behave ____?
- (160) *I wonder how fewer than five boys behaved ____.
- (161) I only found out how fewer than five boys behaved ____.
 ‘I only found out about fewer than five boys how each behaved’
- (162) ??How did more than five boys behave ____?
- (163) ??I wonder how more than five boys behaved ____.
- (164) I found out how more than five boys behaved ____.
 ‘I found out about more than five boys how each behaved.’

These data correlate with the fact that these quantifiers are only capable of inducing a pair-list reading in *find out*-complements (irrespective of WIs):

- (165) Which book did more than five boys read?
 *‘For more than five boys, tell me which book each read.’
- (166) I wonder which book more than five boys read.
 *‘For more than five boys, tell me which book each read.’
- (167) I found out which book more than five boys read.
 ‘I found out about more than five boys which book each read.’

If inducing a pair-list reading can be described as the quantifier scoping above the *wh*-phrase, the WI data fall out. *More/fewer than five boys* can scope above the *wh*-phrase in *find out*-complements, hence it does not induce a WI. It cannot scope above the *wh*-phrase in the matrix or in *wonder*-complements, thus it causes a WI.

In what follows, the designation scope island will be used to refer specifically to the above data, although Szabolcsi and Zwarts (1993) argue that the scope generalization can be extended to most of the other island-inducers as well.

Finally, quantifier intervention data discussed in Beck (1996b) and Kennedy (1997b) are, plausibly, special cases of weak islands, although the authors do not relate them to the weak island phenomenology. One reason may be that they are not aware of the exact range of interveners that create weak islands. See Abels and Martí (2010) for further discussion.

7 Theories

7.1 Introduction

There are a lot of theories of islands. In this section, we focus on the move from Subjacency to relativized minimality, and then on semantic theories of islands. Semantic and/or pragmatic approaches go back at least to Erteschik-Shir (1973) and Kuno (1976), who focus on information structure, and more recently e.g., Trueswell (2007) identifies semantic factors for extraction out of adjuncts. We start by highlighting problems with Subjacency and Relativized Minimality, before we turn to a theory based on scope and intervention.

7.2 ECP and Subjacency for (A1)–(B1)

The historical starting point is the assumption, made in Huang (1982a), Lasnik and Saito (1984, 1992), Chomsky (1986a), that the paradigmatic (if not the only) case of weak (selective) islands is *wh*-islands (A1), and the expressions whose extraction is sensitive to WIs are adjuncts, as opposed to arguments (B1).

(168) Which problem are you wondering how to [t' [phrase t]]?

(169) ?Which student did he wonder whether to [t' [consider [t intelligent]]]?

(170) How have you [t'' [decided [t' to [t' [phrase the problem t]]]]]?

(171) *How are you [t'' wondering [which problem to t' [phrase t]]]?
'what is the manner such that you are wondering which problem to phrase in that manner'

In all four examples, the lowest trace *t* is properly governed by *t'*, an intermediate trace adjoined to the closest VP. The distinction between arguments and adjuncts is drawn in the following way. An empty category in argument position is indelibly marked as to whether it is properly governed at S-structure. Thus in (168–169), *t* is marked as properly governed. Trace *t'* itself is not properly governed when it is separated from its antecedent by a *wh*-island (since government requires 0-subjacency). However, intermediate traces can delete before Logical Form, because they are not needed for interpretation. Thus in (168–169), the only trace that must appear at LF is *t*, which is legitimate. On the other hand, non-argumental (adjunct) empty categories are marked for proper government as late as at LF, therefore intermediate traces need to be retained. In (170), the antecedent government chain <how, *t''*, *t'*, *t*> is unbroken by any subjacency violation. But in (171), *t''* does not govern *t'*, since they are separated by a *wh*-island. Trace *t'* cannot be deleted as *t* would then not be governed. Thus, on the whole, the extraction of an adjunct out of a *wh*-island inescapably involves an empty category that is not properly governed. As Cinque (1990) puts it, this theory forces adjuncts to move strictly successive cyclically, whereas arguments may, in effect, undergo long movement.

We see that this theory of weak islands is purely syntactic. The extraction of a phrase is sensitive to *wh*-islands simply because it originates in a non-argument position. Likewise, a moved *wh*-phrase creates an island purely with its bulk – by occupying the specifier position of CP and thus preventing the non-argument extraction from proceeding through that position.

7.3 *Relativized Minimality for (A2, A3)–(B1, B2, B3%, B4, B5%)*

The fact that a fronted *wh*-phrase blocks certain extractions can be attributed to the fact that, by occupying an escape hatch, it gives rise to a subjacency violation. But this explanation does not extend to negation or VP-adverbs, for instance: they do not occupy any escape hatch whatsoever. Relativized Minimality (Rizzi 1990b, 2001, Cinque 1990) is a particularly exciting theory because it pulls together a host of new islands and seeks to provide a unified account. Specifically, it seeks to account, besides *wh*-islands (B1), also for negative and affective islands (B2), factive islands, a subset of those discussed in (B3), extraposition islands (B4), and the islands created by VP-adverbs (B5). The expressions that are sensitive to WIs are defined as non-referential, as in (A2), which includes split constructions, as in (A3).

Rizzi (1990b) builds primarily on the theoretical analysis of QAD in Obenauer (1984/1985). Obenauer's insight is that a local relation between an operator and its variable is blocked by the intervention of any third party that may be derivationally totally unrelated to them but is sufficiently similar to the operator. In the same spirit, Relativized Minimality is a representational theory of 'like' intervention. This is the basic intuition as to what expressions create WIs. (For recent versions of Relativized Minimality, see the Minimal Link Condition in Chomsky 1995c and its revision in Manzini 1998.)

The assumption that WI-sensitive operators need to be connected to their variable by a series of local relations, while WI-immune operators may be linked to their variable long-distance is retained and is recast in the following way. Rizzi assumes that there are two (non-exclusive) ways to connect an operator and its variable:

- (172) (a) binding;
(b) a chain of government relations.

Binding is an arbitrarily long-distance relation that requires the identity of referential indices; consequently, only operators that are referential can use it. Non-referential operators need to rely on a government chain. Rizzi makes intervention relevant specifically for government. Consequently, 'like' interveners block the government relation between a non-referential operator and its variable. This is the basic intuition as to what expressions are sensitive to WIs. Rizzi (1990b) defines referential operators as those that bear an event-participant thematic role like Agent, Patient, etc. Cinque (1990) adds the requirement that the operator must be Discourse-linked. Non-referential *wh*-phrases are those that bear a role like Reason, Manner, Measure, etc. or are not D-linked.

The role of intervention is technically explicated as follows. *Barriers* incorporates a notion of minimality: a governor cannot govern into the domain of another, closer governor. Minimality is defined rigidly: only an intervening head governor counts, and it blocks both head and antecedent government. Rizzi proposes to relativize minimality to the kind of relation that obtains between governor and governee:

- (173) **Relativized Minimality:**
X α -governs Y only if there is no Z such that
(i) Z is a typical potential α -governor for Y, and
(ii) Z c-commands Y and does not c-command X.

Rizzi finds it useful to distinguish four kinds of value for α : head government, antecedent government in an A-chain, antecedent government in an A-bar chain, and antecedent

government in a head-chain. Since we are concerned with chains headed by a *wh*-phrase in A-bar specifier position, all and only A-bar specifiers are relevant interveners.

Rizzi analyzes *whether*, *who*, *beaucoup*, *not*, *no one*, *only John*, and *deny* as A-bar specifiers, at S-structure or at LF. In contrast, he points out that *everyone* and *two men* acquire their scope by adjunction, according to May (1985), so they are predicted not to block non-referential extraction. Extraposition islands and factive islands (and the other islands noted by Cattell, not mentioned by Rizzi or Cinque) are not covered by these considerations. To account for these, Cinque adds that the clause from which extraction occurs must be a sister of a theta-marking [+V] head.

While the general idea is very insightful, there are some analytical problems with this execution. One is the movement of *deny*, a head, to an A-bar specifier position at LF, and the assumption that the complement of *regret* is not a sister to the verb. These have an alternative solution within Relativized Minimality, however: the adoption of Progovac's (1988) and Melvold's (1991) proposals to place empty operators in the [Spec, CP] of the complements of *deny* and *regret*, which then serve as standard interveners.

More important perhaps is the problem posed by the cross-linguistic variation in the syntax of negation, attributed to the fact that the negative particle may be a head, a specifier, or an adjunct. This would suggest that the island-creating effect of negation varies accordingly, but it does not: we are not aware of any language in which negation does not create a weak island. Rizzi (1992) proposes to solve this problem by assuming an empty A-bar specifier when NEG is a head, and an empty head when NEG is a specifier. This proposal may well be correct, but it makes the original distinction of Relativized Minimality vacuous: how do we tell the effects of a head from a specifier? But there is a more important problem. The class of WI-inducers cannot be identified as intervening A-bar specifiers.

7.4 From Relativized Minimality to a scope theory

7.4.1 A major problem with Relativized Minimality

Recall a crucial background assumption of Relativized Minimality. The theory of LF that it relies on is that of May (1985). According to this theory, structure (usually) does not disambiguate scope. Example (174), for instance, is assigned a single structure in which *how* is higher than *everyone*, but they govern each other, so they can be interpreted in either scope order or even independently. The adoption of this theory for the purposes of Relativized Minimality results in the assumption that it does not matter which reading of the sentence we are considering; all we have to know is that *everyone* is in an adjoined position, so its intervention between *how* and its trace must be harmless. The question (175) is also assigned a single structure, but *no one* occupies an A-bar specifier position in it, whence it must block *how*-extraction.

(174) How did everyone behave?

(175) *How did no one behave?

As seen in section 6.6, results by Kiss (1993) and De Swart (1992) indicate that the assumption that distributive universals qua interveners are harmless is wrong. Their scope does matter: sentences like (176) are ungrammatical on the reading where the universal takes narrower scope than the *wh*-phrase.

(176) Combien ont-ils tous lu de livres?
 how many have-they all read of books
 *‘For what number n, they all read n or more books.’

7.4.2 *Scopal intervention*

Kiss (1993) and De Swart (1992) propose that any operator that scopes between the sensitive expression and its trace blocks the relation. Kiss identifies the class of sensitive expressions as non-specifics in the sense of Enç (1991), including nominals and adverbials. (See also Frampton 1991.) De Swart identifies sensitive expressions as those whose operator part is split off from the restrictive clause:

The Scope Generalization:

- (177) Specificity Filter: if Op_i is an operator which has scope over Op_j and binds a variable in the scope of Op_j , then Op_i must be specific. (Kiss)
- (178) A quantifier Q_1 can only separate a quantifier Q_2 from its restrictive clause if Q_1 has wide scope over Q_2 (or is scopally independent from Q_2). (De Swart)

These generalizations put the WI phenomenon in an entirely new light. Just as Relativized Minimality was based on the observation that the range of WI-inducers is much wider than Subadjacency can account for, the Scope Generalization expresses the observation that both the range and the nature of WI-inducers is different from what Relativized Minimality can take care of. We come back to the possible theoretical explanation of the generalization in section 7.5.

What is the coverage of these proposals? As regards island-sensitive expressions, Kiss's proposal that non-specific operators are island-sensitive essentially covers the classical data (A3, A4, A7) and event-related readings (A5), but it is not easy to see how functional *wh*-phrases (A5) and collectives (A6) can be said to be generally non-specific, since their determiner may be *which*; also, why the trigger – NPI relation (A8) might fall under the generalization is not obvious. De Swart's generalization is stated with reference to splitting: here the question is what data, beyond the classical ones (A7) might be analyzed as involving splitting.

As regards WI-inducers, it is easy to see that, with the obvious exception of purely syntactic WI-inducers like *it is time to . . .* extraposition and some of the constructions discussed by Postal, the known WI-inducers are scope-bearing operators and thus fall under the Kiss/De Swart proposal. The problem may be, rather, that there are expressions that some well-established theory or other classifies as scope-bearing operators which nevertheless do not induce WIs. Examples are indefinite DPs and intensional verbs like *want*:

(179) How did a boy behave ___?

(180) How do you want me to behave ___?

Clearly, there are two ways out. One is to adopt analyses according to which indefinites and intensional operators are not scopal expressions. Another is to draw some principled demarcation line between scopal expressions, predicting some of them to be innocuous.

7.4.3 *Prospects for a revision of Relativized Minimality*

We have seen that in order to capture the Scope Generalization, LF ought to disambiguate scope. But according to May (1985) it does not. Although this feature played a major role in diverting attention from some critical data, it is not very difficult to fix. It is not too difficult to imagine a scope theory which produces disambiguated LFs.

A second, more serious, aspect of the problem is that, if the spirit of Relativized Minimality is to be maintained, QR cannot be an adjunction rule. In Rizzi's proposal, movement to an A-bar specifier position is hindered only by an intervening A-bar specifier. QR should move the quantifier into an A-bar specifier position. This in turn requires that quantifiers all have designated landing sites. This requires a much more radical departure from

May (1985). A theory that at least partially fulfils this expectation has been proposed by Beghelli and Stowell (1997). According to this theory, quantifier scope is a by-product of feature checking. Definites and specific indefinites check features in positions called RefP and ShareP; distributive universals check features in DistP. But Beghelli and Stowell argue, with equal force, that modified numeral (counting) QPs do not have comparable features and never move beyond their Case position. This accounts for the fact that they only marginally take inverse scope. This is a major stumbling block in the way of a revision of Relativized Minimality, because, as we saw above, *more/fewer than five boys* is as much of a WI-inducer as narrow scope *every boy*. But then it is difficult to see how the positions of, say, universals and modified numerals can be brought under a single heading. Likewise, if one goes beyond quantifiers, it is not obvious how all of Cattell's WI-creating predicates (B.3) can be placed in a position (or can be associated with an operator in a position) that falls under the same generalization. In other words, the Scope Generalization implies a radical widening of the set of WI-inducers, and it is not at all clear how all these fit a single syntactic recipe.

The syntactic recipe does not necessarily have to make reference to A-bar specifier. But the beauty of Relativized Minimality was that it established a very tight connection between the properties that make extractees WI-sensitive and the properties that make interveners WI-inducers. The revision should recapture this explanatory connection. In fact, it is also not obvious how all WI-sensitive expressions fit a single syntactic recipe. Note that, alongside non-individual *wh*-phrases, WI-sensitive expressions include the amount and the event-related readings of numerical QPs, functionally interpreted *which*-phrases, definite dependents of one-time-only predicates, and negative polarity items. A somewhat different version of Relativized Minimality is to be found in Rizzi (2000a).

7.5 The Scope Theory

Kiss's and De Swart's generalizations suggest that the explanation of WI-phenomena should, at least to a great extent, be semantic. They themselves do not propose such explanations: as we saw above, the proposals are presented in terms of filters.

There have been two different lines of research that attempted to explain the Scope Generalization in formal semantic terms. Szabolcsi and Zwarts (1993) can be viewed, to some extent, as an attempt to provide a formal semantic explanation of Kiss's generalization. Honcoop (1998), on the other hand, can be viewed as an attempt to provide an extension and a formal semantic explanation of de Swart's generalization.

Szabolcsi and Zwarts (1993) was reprinted, with the addition of a handful of useful notes, as Szabolcsi and Zwarts (1997). In the discussion below, the latter, slightly expanded, version is assumed.

7.5.1 An algebraic approach to scopal intervention, for (A3, A4, A5, A6, A7%)–(B1, B2, B3, B5, B6)

The main contribution of Szabolcsi and Zwarts (1993, 1997) is an explanation of why certain expressions (the WI-sensitive ones) are unable to scope above certain others (the WI-inducers). They argue that scope assignment can go wrong in a directly semantic way, namely, it may produce a result that is strictly incoherent. They assimilate the ungrammaticality of *How much milk didn't you drink?* to the combination of a numeral with a mass noun, as in *six airs*. In both cases, interpreting the construction requires us to perform an operation, counting or complement formation, on a denotation which does not lend itself to that operation.

The nature of the argument can be best illustrated by way of examples. Overt *wh*-extraction creates a syntactic configuration with an extraction domain D containing a gap α . Let D contain a scopal element β , which the filler of the gap is supposed to scope over.

(181) [which books_i [_D did [_e n't] you read [_e –_i]]]

(182) [how much milk_i [_D did [_e n't] you drink [_e -_i]]]

To calculate the denotation of the whole sentence, the denotation of D needs to be calculated. The question is whether this is possible, in view of what α and β are. Szabolcsi and Zwarts propose to cash out the contribution of the narrow-scope element β in terms of the operation(s) that β wants to perform. For instance, *n't* wants to take the complement of the denotation of D minus β . If D minus β denotes a set of individuals, all is well. Sets of individuals form a Boolean algebra, in which the three well-known set-theoretic operations, union, intersection, and complement are defined. If, however, D minus β denotes in an operation-wise poorer structure, a non-Boolean lattice (no complement operation) or a join semilattice (neither complement, nor intersection, only union), then a β that requires performing those operations cannot scope over D minus β .

In other words, the fatal effect of β is due to the fact that it crashes the semantic computation of its own scope. How does the nature of the wider-scoping expression come into play? The kind of denotation D minus β has is to a large extent determined by what kind of gap α it contains. (Somewhat anachronistically, let us notate gaps as deleted copies.) *You read* [_e ~~which books~~] denotes the set of books you read. But *you drink* [_e ~~how much milk~~] arguably does not denote **a set of amounts**; Szabolcsi and Zwarts argue it denotes just **the amount** of milk that you drank. Now *n't you drink* [_e ~~how much milk~~] should denote the complement of that. But the complement of an amount is not defined. The string whose denotation cannot be computed is incoherent.

How does this work with quantifiers as WI-inducers? Universal quantification is cashed out by performing intersections. Suppose there are altogether three girls, Kati, Mari, and Juli. To interpret *Which book did every girl read?* the sets of books that Kati, Mari, and Juli read have to be intersected, so as to find the shared elements. Precisely because intersection is defined for sets, the denotation of *every girl read* [_e ~~which books~~] can be calculated. But consider (183) and (184):

(183) [how much milk_i [_D did [_e every girl] drink [_e -_i]]]

(184) [how_i [_D did [_e every girl] behave [_e -_i]]]

Szabolcsi and Zwarts argue that both amounts and manners form join semi-lattices, in which only union is defined. If so, the denotations of *every girl drink* [_e ~~how much milk~~] and *every girl behave* [_e ~~how~~] cannot be calculated.

Recall the claim (A3, A4) that expressions that escape WIs are individuals, and those sensitive to WIs are non-individuals. Szabolcsi and Zwarts argue that the relevant notion of individuals is algebraic: individuals are discrete entities that can be collected into sets that form Boolean algebras. Non-individuals, in turn, are expressions that cannot be collected into such sets, either because they are non-referential, like expletives and idiom chunks, or because they denote entities that form poorer structures: lattices (with union and intersection), join semi-lattices (with union), or just partially ordered sets without any of these operations.

Szabolcsi and Zwarts argue, often on the basis of independent proposals in the literature, that the whole gamut of WI-sensitive expressions that Relativized Minimality brought to light (reasons, manners, amounts, non-referential expressions, (A3, A4)) are non-individuals in this sense. Likewise, the collective arguments of one-time-only predicates discussed in (A6) are non-individuals: according to one standard analysis, collectives form join semi-lattices. Recall that the WI-sensitivity of collectives was problematic for all other theories: they have referential theta-roles, can be definite and D-linked, and are of type e. Going beyond those data, Doetjes and Honcoop (1997) argue that the <event, object> pairs relevant in event-related readings (A5) form join semi-lattices. Events are standardly thought to form such structures (there is no event that is part of all other events), and the pairs inherit this structure

from the event component. A similar reasoning is applied to functional readings in Honcoop (2000).

Turning to WI-inducers, Szabolcsi and Zwarts argue that the calculation of the semantic effect of all the relevant WI-inducers involves, possibly in combination with union and other non-Boolean operations, the formation of complements and/or intersections. Specifically, the calculation of the semantic effect of *wh*-expressions, response stance and non-stance predicates, universal and numerical quantifiers (whether DPs or adverbs) involves at least intersection, and that of negative and other affective operators involves at least complement. This covers the data of B1, B2, B3, B5, and B6. In other words, it is argued that all these islands are scope islands (this means that the label used for (B6) is in fact too narrow).

On the other hand, plain existentials like *a man* rely only on union, the operation that even join semi-lattices have, and is thus predicted not to cause trouble although it may well be analyzed as scopal. Intensional operators like *want* and *should* are harmless interveners; Szabolcsi and Zwarts suggest that they are not quantifiers over worlds; Lassiter (2012) supports this with reference to a scalar semantics of modality. In other words, because this theory does not take the notion of a scopal element to be an unanalyzed primitive, it is capable of distinguishing between scopal interveners that are WI-inducers and ones that are not.

7.5.2 *A Dynamic Semantic approach to scopal intervention (A4, A5, A7, A8, A9)–(B1, B2, B3, B5, B6)*

Honcoop (1998) proposes an alternative account of the Scope Generalization. This account is based on a novel empirical observation. The observation is that almost the same scopal interveners that create WIs also make an indefinite within their scope inaccessible to non-c-commanded pronominal anaphora. To see what inaccessibility is, compare (185) and (186). In (185), the non-c-commanded pronoun can refer back to the indefinite. In (186), where the indefinite is crucially within the scope of negation, the pronoun cannot refer back to it:

(185) I have a new coat_i. It_i is blue.

(186) *I don't have a new coat_i. It_i is blue.

Modal subordination improves the examples. This, however, is an independent phenomenon that should be abstracted away from when constructing the basic data.

(187) I don't have a new coat_i yet. But I know that it_i will be blue.

Now consider the following sets of examples.

The indefinite is within the scope of a *wh*-phrase, cf. (B1):

(188) *Who has a new coat_i? It_i is blue.

(189) *Do you have a new coat_i? It_i is blue.

The indefinite is within the scope of negation or some other affective operator, cf. (B2):

(190) *I don't have a new coat_i. It_i is blue.

(191) *Nobody has a new coat_i. It_i is blue.

(192) *Less than two people have a new coat_i. It_i is blue.

(193) *I deny that I have a new coat_i. It_i is blue.

(194) Only John has a new coat_i. It_i is blue.

The indefinite is within the scope of a VP-adverbs, cf. (B5):

(195) *I twice had a Norwegian boyfriend_i. He_i was tall.

The indefinite is within the scope of a quantifier (which does not fall under the above), cf. (B6):

(196) *Every kid has a new coat_i. It_i is blue.

(197) *Most kids have a new coat_i. It_i is blue.

(198) *More than one kid has a new coat_i. It_i is blue.

(199) *Exactly five kids have a new coat_i. It_i is blue.

(200) Exactly one kid has a new coat_i. It_i is blue.

Only John and *exactly one kid* appear to go against the rule, but it can be argued that in these cases, anaphora is based on an inference facilitated by unicity, not on the same mechanism that accounts for (185).

The domain within which there are indeed great differences is that of intensional operators and (non-affective) response-stance, non-stance, and volunteered-stance predicates (B3). Here, operators that do not induce WIs may create an inaccessible domain for anaphora, and vice versa. For example:

(201) *I regret that I have a new coat_i. It_i is blue.

(202) I confirmed that he had a new coat_i. It_i was blue. (*confirm* induces a WI)

(203) I remember that he had a new coat_i. It_i was blue. (*remember* induces a WI)

(204) I know that he had a new coat_i. It_i was blue. (*know* induces a WI)

(205) *I believe that he had a new coat_i. It_i was blue. (*believe* induces no WI)

(206) *I imagined that he had a new coat_i. It_i was blue. (*imagine* induces no WI)

(207) *I want to have a new coat_i. It_i is blue. (*want* induces no WI)

Honcoop argues that the striking similarity between the two sets of troublemakers calls for a unified theory. (Naturally, the last set needs an explanation.) Inspired by De Swart (1992), Honcoop takes split constructions to be the paradigmatic WI-sensitive expressions and proposes an analysis for them that relies on particular assumptions of Dynamic Semantics (Groenendijk and Stokhof 1990; Dekker 1993; Chierchia 1995b). In what follows, the basic idea is presented without the formalism.

Just like Discourse Representation Theory (DRT: Kamp 1981a; Kamp and Reyle 1993), Dynamic Semantics seeks to account for the ability of indefinites to antecede non-c-commanded pronouns. But while DRT does so by interpreting indefinites as variables that pronouns may corefer with, Dynamic Semantics maintains that indefinites are existentially quantified noun phrases and bind the pronoun, although in a logically novel (dynamic)

fashion. How this works does not concern us here. Relevant to us is the problem posed by pairs like those in (208).

- (208) a. Usually, a new coat is expensive.
b. Most new coats are expensive.

The (a) sentence can be interpreted as the (b) sentence, which shows that an indefinite can apparently act as a variable bound by an adverb of quantification. This is not a problem for DRT but it is for Dynamic Semantics. If indefinites are existentially quantified, such binding is possible only if the existential quantifier can be removed. What is needed is an operation that removes the existential quantifier and turns *a new coat* into an expression denoting the property of being a new coat; a property that *usually* can take as its restriction much like *most* does. The operation that performs the trick is called Existential Disclosure (ED). How ED works is important to us. Roughly, it maps (209a) to (209b), the set of *x*'s such that each *x* is identical to some new coat or other. In turn, (209b) is equivalent to (209c), the set of new coats:

- (209) Existential Disclosure (ED):
a. there exists a new coat \Rightarrow_{ED}
b. $\{x: \text{there exists a new coat}_i \text{ and } it_i \text{ is identical to } x\}$
c. $\{x: x \text{ is a new coat}\}$

It is crucial in the mapping from (a) to (b) that the proposition *it is identical to x* is added and *a new coat* binds *it*. Clearly, *a new coat* does not c-command *it*. Therefore, this binding and, consequently, the applicability of ED can only be well-formed in contexts that allow cross-sentential anaphora. If the indefinite is inside an inaccessible domain and the pronoun is outside, binding, and ED, are not possible:

- (210) $*\{x: \dots OP [\dots \text{indefinite}_i \dots] \text{ and } it_i \text{ is identical to } x\}$

where OP creates an inaccessible domain for anaphora.

Honcoop's insight can now be summarized as follows. The operator in split constructions is related to the indefinite in the same way as an adverb of quantification is related to the indefinite it binds. In other words, *voor een boek* needs to be turned into a property that serves as the restriction of *wat*, to yield the interpretation 'what kind of book':

- (211) Usually, *a new coat* is expensive.
(212) Wat denk jij dat Peter voor een boek heeft gelezen?
what think you that Peter for a book has read
'What kind of book do you think Peter read?'

But then ED is needed in both cases. Furthermore, in both cases ED is blocked if an expression that creates an inaccessible domain for pronominal anaphora intervenes scopally between the operator and the indefinite.

To summarize, given the reasonable assumption that the operator in split constructions uses the indefinite as its restriction, Dynamic Semantics augmented with Existential Disclosure automatically predicts that interveners that create inaccessible domains make splitting ungrammatical. Therefore, if the differences between the sets of WI-inducers and inaccessible domain inducers can be explained away, the Scope Generalization for classical split constructions falls out. Furthermore, any other construction that can be assimilated to splitting in the relevant respect is predicted to be subject to the same constraint.

Honcoop's work goes beyond De Swart's in two important respects: (i) the fatal effect of scopal intervention between the operator and its restriction is explained, not just stipulated, and (ii) it is argued that the same explanation carries over to various constructions that are not trivially split: at least to partial *wh*-movement, event-related readings, and NPI licensing.

To demonstrate the applicability of his proposal, Honcoop (1998) offers a series of innovative semantic analyses that would be difficult to do justice to here. Only the gist of some analyses is given and the reader is referred to the book for further details. Event-related readings (A5) involve quantification over event–object pairs. But both event arguments and indefinites come with their own existential quantifiers. These need to be removed in order for the pair to be formed. Removal is by ED. NPI licensing (A8) cannot be directly assimilated to splitting: although NPIs themselves may be treated as indefinites, not all licensors can be analyzed as unselectively binding them. However, all NPIs are associated with a scalar implicature. This requires computing entailment relations between alternative propositions, and the formation of these alternatives requires an application of ED.

The discrepancy between the inducers of WIs and inaccessible domains, surveyed in (201–207), is resolved by (i) providing an intensionalized version of ED; (ii) assuming that volunteered stance predicates introduce the meaning of their complement as a 'discourse referent'; and (iii) offering an E-type analysis of the anaphoric pronouns whose antecedent is in a response stance or non-stance context.

Pesetsky (2000) points out a further intriguing connection, arguing that *wh*-in-situ can be linked to a [wh]-marked complementizer in two distinct ways: by covert movement and by feature movement. *Wh*-phrases in situ generally have to undergo LF *wh*-movement (covert movement), and all phrases that are sensitive to superiority constraints must undergo such movement. *Which*-phrases do not move because they are not sensitive to superiority constraints.

- (213) a. Who did only John introduce to whom?
 b. Which boy did Mary introduce which girl to?
 c. ??Which boy did only Mary introduce which girl to?

Instead, such *which*-phrases are interpreted through what Pesetsky calls feature movement. He observes that the cases that he classifies as feature movement are vulnerable to intervention effects of the sort described in Beck (1996b). Pesetsky construes feature movement as an instance of an operator getting separated from its restriction, and refers to Honcoop (1998) as a theory that predicts that such a constellation will be sensitive to intervention. Since in Honcoop's theory, split constructions are sensitive to weak islands irrespective of whether they receive non-individual interpretations, if Pesetsky is correct, his book adds a whole new set of data to support this feature of Honcoop's theory.

Beck (2006) develops an analysis of intervention effects. Her analysis is semantic and relates intervention effects to the evaluation of focus, which she claims is the interpretational strategy that underlies Pesetsky's feature movement (p. 22). Beck's theory assumes that *wh*-phrases are interpreted by way of the same mechanism as focus. When the semantic properties of *wh*-phrases interfere with focus evaluation, an intervention effect is created. Focus evaluation applies to all foci and reduces their contribution to their unfocused semantics. Since *wh*-phrases do not have such an "unfocused" semantics, uninterpretability of the structure as a whole ensues. Beck's theory ensures that a *wh*-phrase can never have a focus-sensitive operator other than a question operator as its closest c-commanding binder.

7.5.3 *How do the two scope theories compare?*

In the cases where they are applicable at all, both the algebraic approach and the Dynamic Semantic (ED) approach get the weak island effects for free. This is because they both reduce the effect to independent semantic facts. Provided that the proposals are internally logically correct, the semantic facts they point out will constrain the range of expressible meanings,

irrespective of whether their consequences overlap with those of other syntactic or semantic considerations. It is thus possible for both theories to be correct at the same time, and their correctness is also compatible with the correctness of some other, say syntactic, explanation of some of the data.

With this important methodological comment in mind, let us ask how the two theories compare in coverage. There are data that both theories can account for, and there are data that only one or the other can. Let us start with WI-sensitive expressions. The algebraic approach can explain the WI-sensitivity of *how* (and probably, of *why* and other comparable expressions), while there seems to be no reason to assimilate them to split constructions under the ED-approach. There are expressions that denote amounts but are – at least overtly – not split: for instance (87) *Combien de cercles as-tu (*beaucoup) dessin  ?* and (92) *How much pain did(*n't) you suffer?* These fall naturally under the algebraic approach, and also under the ED-approach if the latter assumes that they involve covert split into ‘for what number n/degree d’ and ‘n many/d much NP’. The ED-approach is clearly good at accounting for their overtly split counterparts; the algebraic one is burdened with a need to explain why splitting forces an amount reading even on otherwise potentially ambiguous phrases.

Honcoop argues that *wat voor een boek* and *wat . . . voor een boek* have exactly the same readings, but that the non-split version is never WI-sensitive. These data fall only under the ED-theory; same for the *wat aan*-facts, because this construction has only an individual reading. Of the more exotic data, event-related readings can be equally well accounted for on both approaches (both analyses are due to Honcoop). The WI-sensitivity of collective arguments and adjuncts of one-time-only predicates is predicted only by the algebraic approach. The fact that WI-inducers block NPI-licensing is accounted for by the ED-theory alone.

Turning to WI-inducers, islands caused by a +wh XP can, in principle, be accounted for by both theories but, as Honcoop points out, the tentative analysis in Szabolcsi and Zwarts (1997) does not extend to *whether*-islands. Both proposals account for the fact that response stance and non-stance, but not volunteered stance predicates induce WIs, but Szabolcsi and Zwarts offer only suggestions regarding the analysis. The observation that a set of quantifiers and other operators induce WIs is at the heart of both theories: naturally, both account for it equally well. The more interesting question is a deeper one: why is it that precisely those expressions whose algebraic semantic definition involves intersection and/or complement-formation create inaccessible domains for cross-sentential anaphora? Honcoop addresses this question and proposes, although in a preliminary fashion, that the algebraic properties can be used to explain the relevant Dynamic Semantic properties. If this line of reasoning is correct, the two theories may be viewed, to some extent, as two sides of the same coin.

8 Conclusion

There are two points that we would like to highlight in conclusion. The first point is that *wh*-islands are the classical example of weak islands, and adjuncts are the classical example of expressions that cannot escape from weak islands. The initial account of the facts was purely syntactic. But it has been demonstrated, first by Relativized Minimality and then by the Scope Theory, that huge sets of further data pattern along the same lines, calling for a unified explanation. Although we still do not have a fully unified theory at our disposal, it seems true beyond reasonable doubt that a substantial portion of this large phenomenon is genuinely semantic in nature.

The second point is that there is some syntactic residue: at least some extraposition islands do not fall under the Scope Theory. Moreover, as was pointed out in section 3, in retrospect it does not seem entirely clear whether the presupposed demarcation line between weak and strong islands is as solid as one might want it to be.

It is to be hoped that further research will resolve the relation between these sets of data.

SEE ALSO: Bridge Phenomena, D-linking and Specificity, Discontinuous Quantifiers
Primarily in French, Extraction from Complex DP and Detachment, Multiple Wh Questions,
Quantifier Scope Ambiguities, Resumption, Wh-in-situ

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