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Acquisition of an Adjunct Island inside *There*-Sentences[*]

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Abstract

In the past two decades, how children acquire adjunct island constraints has been a focal topic of research in language development (e.g., Otsu 1981, Crain and Fodor 1984, Goodluck et al. 1992, de Villiers et al. 1990, Adul-Karim 2000). Previous studies are concerned primarily with children's sensitivity to extraction from adjunct islands with a phonologically overt marker such as a relative pronoun (e.g., *which, who*) and a temporal complementizer (e.g., *when, after*) (see, among others, Otsu 1981, Goodluck et al. 1992). The present study examines children's knowledge of the Adjunct Island Constraint which is at work in a phonologically covert syntactic environment, namely, *there*-sentences with

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participial codas (e.g., *How was there a boy running?). A cross-sectional experiment was conducted with 14 monolingual English-speaking children ages from 3 to 6, and with 24 adult native speakers of English. The results show that participial codas constitute strong barriers both in child and adult grammars, lending support to the syntactic analyses that treat participial codas as adjunct islands (e.g., McNally 1997, Chomsky 2001), as opposed to predicates that are parts of small clauses (e.g., Stowell 1978, 1981). Another interesting finding is that younger children tend to give *why* interpretations to *how* questions. I offer a way of accounting for this phenomenon by pointing to the semantic versatility of *how* and its distributional parallel to *why*.

Key words: first language acquisition, *wh*-movement, adjunct island condition, *there*-existential sentences, participial codas, phonologically covert islands, relative clauses, small clauses, *why*-questions, *how*-questions.

1. Introduction

In the last two decades, how children acquire adjunct island constraints has been a focal topic of inquiry in language development (e.g., Otsu 1981, Crain and Fodor 1984, Goodluck et al. 1992, de Villiers and Roeper 1995, Abdulkarim 2000; see Goodluck and Rochemont 1992 for a survey). Existing studies are concerned with children's sensitivity to extraction from adjunct islands with phonologically overt markers. Otsu (1981), for instance, examines acquisition of tensed relative clauses with an overt relative marker (e.g., **What is Jim catching* [*a cat* [*that is*

climbing a tree with ___]]?) while Goodluck et al. (1991) investigate children's knowledge of the constraint that bans extraction from temporal adjunct clauses (e.g., **What did John read Dickens* [*before writing* __]?).

The present study examines how child's grammar behaves with respect to extraction from a phonologically covert barrier, namely, existential or *there* sentences in English. Some *there*-sentences contain an island, which is formed by the postcopular NP and the participial coda. *Coda* refers to the material following the post-copular NP. To illustrate, in (1) and (2) below, *running backwards* and *walking in a clumsy way* are the codas of each sentence.

(1) There was a boy running backwards.

(2) There was a bunch of boys walking in a clumsy way.

What is interesting about the *there*-existential sentences at hand is that they do not allow extraction of material inside the coda, as the ungrammaticality of (3) and (4) shows. (These sentences are intended to inquire about the manner of the running or the walking event, rather than the reason for it).

(3)a. Question: *How was there a boy running?

b. Expected answer: (He was running) backwards.

(4)a. Question: *How was there a bunch of boys walking?

b. Expected answer: (They were walking) in a clumsy way.

Note that extracting the same material from the corresponding non-*there* sentences is grammatical, as shown in (5) and (6). (The sentences may sound more natural if the boy(s) being referred to are made specific or salient.)

(5) Context: A boy was running backwards.

Question: How was a boy running?

Expected answer: (He was running) backwards.

(6) Context: A bunch of boys was walking on the street in a clumsy way.

Question: How was a bunch of boys walking on the street?

Expected answer: (They were walking) in a clumsy way.

The ungrammaticality of *there*-sentences like (3) and (4), in contrast to the grammaticality of non-*there* sentences like (5) and (6), poses at least three challenges for language acquisition. First, the child has to detect the difference between the copula in (3-4) and the one in (5-6): the former is an existential verb and the latter is an auxiliary verb expressing progressive aspect. Second, the child's grammar somehow has to "see" that the strings of words following the

copula in (3-4) contain an island, whereas the one in (5-6) does not. Detecting this syntactic difference can be a formidable task for a young child, as the target structure lacks an overt island marker such as a relative pronoun (e.g., *which*, *who*) or a temporal/logical connective (e.g., *when*, *because*). Third, to prevent producing sentences like (3a) and (4a), the child has to have an accurate knowledge of the Adjunct Island Condition given in (7) and, furthermore, apply it accurately in producing *wh*-questions.

(7) *The Adjunct Island Condition*[1]

If an XP is in an adjunct position, nothing may move out of it.

The present paper reports the results of a series of experiments that were conducted to examine children's sensitivity to covert islands inside *there*-sentences. The results show that children, as young as three, are remarkably sensitive to these islands. Another interesting finding is that younger children tend to interpret *how* as 'why' (abstract *why*) by answering it with a *because* clause, when it was in fact used to inquire about the manner of the event described by the sentence.

[1] For the detailed discussion of the workings of this condition, see, among others, Huang 1982, Johnson 2002, and Boeckx 2003.

The remainder of this paper proceeds as follows. Section 2 outlines the theoretical assumptions about the syntactic structure of *there*-sentences that were tested in this study. Section 3 presents details about the experiment design and results. Section 4 discusses implications of the findings. Finally, Section 5 summarizes and concludes the paper.

2. The Syntactic Structure of *There*-Existential Sentences

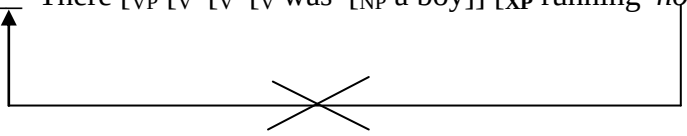
In the literature, there is no consensus among theorists as to the syntactic structure of *there*-existential sentences. This is evidenced by the fact that there are as many as four competing theories: (i) the ternary branching structure theory (Milsark 1974, 1977), (ii) the small clause analysis (Stowell 1978, 1981), (iii) the adjunct predicate analysis (McNally 1997); and (iv) the big NP theory (Jenkins 1975, Williams 1984, Chomsky 2001). These theories differ in their assumptions about the status of the coda. Among these theories, the adjunct predicate theory and the big NP theory account for the ungrammaticality of extraction from the coda of a *there*-existential sentence illustrated in (3-4); the other two theories do not capture the phenomenon because they analyze the coda as an argument and hence predict it to be transparent for extraction.

There is no doubt that the details of each theory have non-trivial repercussions for linguistic theory. But, for present purposes, it suffices that we have theories that correctly predict the impossibility of extracting material from a coda. Hence,

below, I only briefly review one representative adjunct predicate theory and one representative big NP theory, namely, McNally 1997 and Chomsky 2001, respectively.[2]

McNally (1997) proposes that the participle that follows the postcopular NP in a *there*-sentence is an adjunct secondary predicate. Under this analysis, the ungrammaticality of (3-4) follows, because the *how* in these sentences moves across an adjunct island XP, in violation of the Adjunct Island Condition, as depicted in (8). (The crossed-out lines below are meant to indicate the illicitness of the movement.)

(8) ___ There [$_{VP}$ [$_{V'}$ [$_{V'}$ [$_{V}$ was [$_{NP}$ a boy]] [**$_{XP}$** running *how*]]]]?



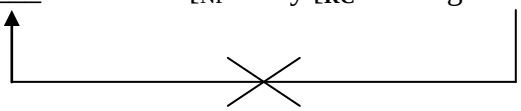
Unlike McNally, Chomsky (2001) analyzes the participle in *there*-sentences as a reduced relative clause (RC).[3] But this analysis also readily accounts for the ungrammaticality of (3-4): the extraction of *how* is prevented, because it would cross a complex NP formed by the head noun and the RC, thereby violating the

[2] For a detailed critique of each of the theories, see Kim 2002.

[3] Chomsky's account is, in fact, reminiscent of Jenkins' (1975) and Williams' (1984) proposals, although the technical machinery resorted to is not exactly the same.

Complex NP Constraint (Ross 1967), which is a kind of the Adjunct Island Condition. The illicit derivation of (3) is described in (9).

(9) ____ There was [$_{NP}$ a boy [$_{\mathbf{RC}}$ running *how*]]?



Obviously, McNally's account and Chomsky's account of *there*-sentences differ from each other in their technical details. But these differences are immaterial to our purposes, because they both analyze the participial codas as some sort of adjunct islands, thereby making the same predictions about the non-extractability of material inside them. Hence, this paper adopts both analyses for the *there*-sentences at hand while staying neutral as to their precise internal structures.

3. The Experiment

I conducted a series of cross-sectional studies to investigate how the child grammars behave with respect to participial codas inside *there*-sentences.

3.1. Participants

The subjects were 14 normally developing monolingual English-speaking children whose ages varied from 3 to 6. They were living in Western

Massachusetts, USA, at the time of the study. In addition, for control purposes, 24 adult native speakers of Standard American English were tested as well. The subjects were college students in Massachusetts at the time of the experiment.

3.2. Procedure

The subjects were presented with a story, which was accompanied by drawings that illustrated the content of the story in chronological order. Each story was followed by one test question. Every subject participated in two sessions with the contents of the stimuli varying and counterbalanced. The responses were cassette-tape-recorded to check against the on-site transcription at a later time.

3.3. Stimuli

3.3.1. Variables and hypotheses

The stimuli contained two kinds of variables: (i) *wh*-type, i.e., *how* vs. *why* question, and (ii) the presence or absence of *there* in the embedded clause. The test questions were potentially ambiguous: depending on the construal of the *wh*-element, either an upstairs (or embedding clause) construal or a downstairs (or embedded clause) construal was available.

How-questions were supposed to behave differently than *why*-questions depending on whether the embedded clause has the structure of a *there*-sentence

or not. When the embedded clause is a *there*-sentence, then the trace of *how* will not receive a downstairs construal, because it is located inside the adjunct island constituted by the postcopular NP and the coda, as shown in (11a). When the embedded clause does not contain *there*, however, both upstairs and downstairs construals will be available for *how*, because it does not move across an island, as shown in (11b).

(10) Construals of *how* (Below XP is shorthand for some sort of adjunct)

a. <u>From a sentence embedding a *there*-existential:</u>

***How*$_{\mathbf{i/*j}}$ did Johnny say to Mom $\mathbf{t_i}$ that **there** was [a bunch of guys [$_{\mathbf{XP}}$ walking $\mathbf{t_j}$]]?

b. <u>From a sentence embedding a non *there*-sentence:</u>

***How*$_{\mathbf{i/j}}$ did Johnny say to Mom $\mathbf{t_i}$ that a bunch of guys was [walking $\mathbf{t_j}$]?

In the case of *why*-questions, both upstairs and downstairs construals are available, regardless of the presence or absence of *there* in the embedded sentence. This is because, in both *there* and non-*there* sentences, *why* is located outside the adjunct island formed by the postcopular NP and the coda, and hence moving it will not violate the Adjunct Island Condition.

(11) Construals of *why*

a. <u>From a sentence embedding a *there*-existential:</u>

***Why*$_{\mathbf{i/j}}$** did Johnny say to Mom $\mathbf{t_i}$ that **there** was [a bunch of guys [$_{\mathbf{XP}}$ walking] $\mathbf{t_j}$?

b. <u>From a sentence embedding a non-*there*-sentence:</u>

***Why*$_{\mathbf{i/j}}$** did Johnny say to Mom $\mathbf{t_i}$ that was a bunch of guys was [walking] $\mathbf{t_j}$?

Given these syntactic assumptions about the stimuli, it was predicted that, if the child has an accurate knowledge of the Adjunct Island Condition, she will not allow downstairs construals for *how* in *there*-questions, while allowing them in non-*there* questions; in the case of *why*-questions, however, she will allow a downstairs construal for *why*, regardless of the presence or the absence of *there* in the test question.

The variables and the predictions of the experiment are summarized in Table 1.

Table 1. Question-types and expected construals for the *wh*-trace

Q-type	***How***	***Why***
There	**How** did Johnny say to Mom that there was an old dog running in the race? ✓How-say; *How-running.	**Why** did Johnny say to Dad that there was construction going on? ✓Why-say; ✓Why-construction going on.
Non-*there*	**How** did Johnny say to Mom that an old dog was running in the race? ✓How-say; ✓How-running.	**Why** did Johnny say to Dad that construction was going on today? ✓Why-say; ✓Why-construction going on.

3.3.2. Sample Stimuli (italicized areas were read emphatically)

Condition 1: Extraction of *how* referring to a manner adverbial

Story: Recently Johnny got a telescope. It's such a cool telescope that he can see things that are really far away. Today Johnny was looking outside through the telescope and he found something very interesting. There was a bunch of guys walking *shoulder to shoulder* on the street! Johnny wanted Mom to see it. But she was a bit far away in the kitchen. So he said *really loudly*, "Mom, come here and look at this! There's a bunch of guys walking

shoulder to shoulder!"

After the story was told, the child was asked one of the following questions (the grammaticality judgments reflect adult English speakers' intuitions):

Table 2. Sample *how*-questions

Question	**How** did Johnny say to Mom that **there** was a bunch of guys walking on the street?	**How** did Johnny say to Mom that a bunch of guys was walking on the street?
Upstairs construal	✓Loudly	✓Loudly
Downstairs construal	*Shoulder to shoulder	✓Shoulder to shoulder

Condition 2: Extraction of *why* referring to a *because*-clause

Story: Today there's going to be a parade in Johnny's town, *because the President of the United States is visiting.* Johnny heard that the President is going to pass by his house. He got really excited about it. So he got up early and went outside to see whether everything in front of his house looked nice and clean. But Johnny found that Dad's car was parked on the street. The car would block the parade! So Johnny went to Dad to ask him to move the

car. Johnny said, "Dad, there's going to be a parade today, *because the President is coming.* He's going to pass by our house but your car is going to be in the way. Could you please move the car?"

After the story, the child was asked one of the following questions (again, the grammaticality of the sentences reflects adult speakers' intuitions):

Table 3. Sample *why*-questions

Question	**Why** did Johnny say to Dad that **there** was a parade taking place today?	**Why** did Johnny say to Dad that a parade was taking place today?
Upstairs construal	✓Because he wanted him to move his car.	✓Because he wanted him to move his car.
Downstairs construal	✓Because the President was coming to town.	✓Because the President was coming to town.

3.4. Results

3.4.1. Results from the Children

There are three notable findings from the data from the children. First, in the case of *how*-questions, the presence or absence of *there* in the embedded clause influenced the ratio of long-distance (LD) answers or the downstairs construal

(DC) of the *wh*-element. As shown in Table 4, the children allowed for LD extraction of *how* from non-*there*-sentences but *never* from *there*-sentences. When it comes to *why*-questions, however, *there* did not have an effect on the ratio of LD answers.

Table 4. The ratio of children's long-distance answers

Q-type	***There***	**Non-*there***
How (n = 28)	0%	25 %
Why (n = 28)	64.3%	53.5%

Second, some children gave "I don't know" answers to *how*-questions and the rate was considerably higher in response to questions containing *there* in the embedded clause than to questions without *there*. In contrast, the children *never* gave "I don't know" answers to *why*-questions, regardless of the presence or absence of *there* in the test question. The results are summarized in Table 5.

Table 5. The ratio of children's "I don't know" answers

Q-type	***There***	**Non-*there***
How (n = 28)	28.6%	3.6 %
Why (n = 28)	0%	0%

Third, a number of children answered *how*-questions with *because*-clauses as if they interpreted *how* as 'why'. Notably, the rate for this interpretation was higher when the expletive *there* was absent in the question, as shown in Table 6.

Table 6. The ratio of children's "because" answers to *how*-questions

Q-type	***There***	**Non-*there***
How (n = 28)	17.8%	39.2%

3.4.2. Statistical Significance of the Results

A 2x2 repeated measures ANOVA was conducted to test the effects of *there* and *wh*-type on the probability of a LD answer. Although the main effect of the variable *there* was not significant, the main effect of *wh*-type was highly significant ($F(2,26) = 13.65$, $p < .0001$). The means reveal that the main differences lie in the relatively few LD responses to *how*-questions. In addition, there is a significant interaction between the presence of *there* and the type of *wh*-question on the likelihood of a LD answer ($F(2,26) = 3.37$, $p < .05$). The means show that the interaction is caused by the preference for LD extraction over *there* in the *why*-questions but never in the *how*-questions.

Two further ANOVA's were conducted to test the effects of the presence of *there* on the likelihood of *I don't know* and *because* answers. The first ANOVA showed no main effect of *there* on the likelihood of a *because* answer but the

trend is in the right direction. The second ANOVA showed a main effect of *there* on the likelihood of a *I don't know* response ($F(1,13) = 8.27$, $p < .015$).

3.4.3. Results from the Adult Control Group

Unlike the children, the adults did not give *I don't know* or *because* answers in response to *how*-questions. Therefore, the adults' responses to *how*-questions had only two types of answers at most. In answer to *how*-questions containing *there* in the embedded clause, the adults preferred the short distance (SD) or upper clause construal (UC) readings as much as 98% of the time, allowing the LD or DC readings only 2% of the time. On the other hand, in answering *how*-questions without the expletive *there* inside, their answers were evenly split between SD and LD readings. As was the case with the children, the presence of *there* in the test question had no impact on the adults' responses to *why*-questions. These results are summarized in Table 7.

Table 7. The adults' ratio for long-distance or downstairs construal answers

Q-type	***There***	**Non-*there***
How (n = 48)	2%	52.1%
Why (n = 48)	43.7%	33.4%

3.5. Discussion

The obtained results have at least four important implications. First, the fact that the children *never* allowed a LD or downstairs construal for *how* in *there*-questions and the adults allowed it only 2% of the time strongly suggests that, in both groups' grammars, the participial codas in *there*-sentences constitute some sort of island. This lends support to syntactic theories that analyze participial codas as adjunct islands such as the adjunct predicate analysis (e.g., McNally 1997) and the big NP analysis (e.g., Chomsky 2001).

Second, given the rather complex syntactic structures proposed by these theories and the absence of an overt indicator for a barrier in the surface structure, one can conclude that young children have a remarkably sophisticated knowledge of the syntactic structure of *there*-sentences containing a participial coda.

Third, the data from the children strongly suggest that the island constraint that prevents the extraction of *how* over the expletive *there* is quite robust; otherwise, we cannot explain the fact that no children, including three year olds, allowed extraction of *how* from *there*-sentences.

Fourth, children's high percentage of *I don't know* answers to *how*-questions containing *there* seems highly suggestive of their knowledge of the Adjunct Island Condition, because it can be taken to mean that the children were able to detect the complexity of the structure that contains a barrier. The argument for this analysis comes from some of the previous research on *wh*-extraction. Authors

like Goodluck et al. (1992), de Villiers et al. (1990), Roeper and de Villiers (1994) have reported that younger children have a strong preference for LD extraction. That is, if they were given a choice between an upper clause and a downstairs construal for a *wh*-element, they would opt for the latter. Suppose my subjects also had this tendency. Then it seems natural to posit that they gave *I don't know* answers to *how*-questions containing an island precisely because they noticed something very "strange" about the downstairs construal of *how* across the island. With the reading they are looking for unavailable, they were in a way forced to say *I don't know*. In other words, for them, *I don't know* was an assertion that the given question is not computable in their grammars.

4. Implications of the present study

In this section, I discuss some of the implications of the present study, in particular their bearings on acquisition theory. I first compare the findings of the present study with those of Otsu's (1981). I then touch upon children's tendency to interpret *how*-questions as *why*-questions by answering them with *because* clauses.

4.1 Comparison with Otsu's (1981) study

In the present study, one of the syntactic analyses we adopted for the *there*-sentences at issue was the big NP theory (although we also concluded that the

adjunct predicate theory would work as well). Since the big NP theory analyzes the participial coda as a reduced relative clause, one can argue that the present study in fact tested whether children obey a version of Ross's (1967) Complex NP Constraint, which can be subsumed under the Adjunct Island Condition. Interestingly, the results of the present study seem at odds with the findings of Otsu's (1981) study, which also examined acquisition of the Complex NP Constraint. In what follows, I compare Otsu's study and the present one, and suggest a way to explain their differences.

Otsu examined children's knowledge of the Complex NP Constraint by testing whether they allow extraction of the object of the preposition from a relative clause, as illustrated in (12).

(12) *$\mathbf{What_i}$ is Jim catching [$_{NP}$ [$_{NP}$ a cat] [$_{CP}$ that is climbing a tree with $\mathbf{t_i}$]]?

Questions like (12) are potentially ambiguous because, depending on the construal of the *wh*-element, the PP can be interpreted as the modifier of the main verb or that of the verb inside the relative clause. Hence, in Otsu's study, the prediction was that, if the child has accurate knowledge of the Complex NP Constraint, then she will only give an upstairs construal to a *wh*-trace.

Otsu found that, surprisingly enough, quite a number of the children associated *wh*-elements as the gaps inside relative clauses, in violation of the Complex NP Constraint, and this behavior persisted even after age 5.

These findings are rather perplexing from the standard theory of barriers (or islands), because relative clauses are not theta-marked and hence extraction from them is predicted to be ungrammatical (see, among others, Chomsky 1986 and Lasnik and Saito 1992).[4] Furthermore, Otsu's results seem in conflict with the present study's finding that even 3 year-olds seem to obey the Complex NP Constraint imposed on *there*-sentences that contain participial codas.

Why did these two studies produce such different results, despite the fact that they both tested acquisition of a similar kind of Adjunct island Condition?

A closer look at the experiment designs of the two studies reveals two important differences between them. First, Otsu's study tested extraction of arguments from adjuncts, while the present study examined extraction of adjuncts from adjuncts, as shown in paradigm (13). What is extracted from (13a) is the

[4] Several authors have attempted to account for the puzzling results of Otsu's study by reanalyzing the children's errors. For example, Crain and Fodor (1985) attribute them to the processing strategy while Goodluck et al. (1992) entertain the possibility that children may not use movement to form relative clauses until age 5 (that is, if there is no movement, then there would be no violation of the Adjunct Island Condition).

object of the preposition *with*, whereas the extracted phrase in (13b) is a manner adverbial which modifies the VP *walking*.

(13) a. A token test question from Otsu's study:

What$_i$ is Jim catching a cat that is climbing a tree [$_{PP}$ with **t$_i$**]?

b. A token test question from the present study:

How$_i$ did Johnny say to Mom that there was a boy [$_{VP}$ walking **t$_i$**]?

In standard syntactic theory, extraction of arguments and extraction of adjuncts are predicted to be radically different from each other because the trace of an argument is theta-marked but the trace of an adjunct is not (Chomsky 1986, Rizzi 1990). Recent research in language development has shown that child grammar is more lenient with argument extraction than adjunct extraction (e.g., de Villiers and Roeper 1995). It is therefore not so surprising that the two studies have produced quite different results.[5]

[5] As suggested in Rizzi 1990 and Chung 1994, among others, the argument vs. adjunct asymmetry in *wh*-movement can be recast as stemming from the referential vs. non-referential properties of the *wh*-element at issue. If we adopt this view, we can offer a slightly different account of the children's treatment of sentences like (13a) and (13b). As an anonymous reviewer suggests, we can, for example, hypothesize that children treated *what* in (13a) as a D(iscourse)-linked element and thus allowed it to undergo some sort of pure Match-Driven Movement, i.e., movement without Agree, in the sense of Boeckx (2003); in the case of *how* in (13b), however, they did not

The other difference between Otsu's study and the present study is that the former tested extraction from tensed clauses, while the latter tested extraction from non-tensed phrases, which may not even be full clauses, as shown in (14).

(14) a. **What$_i$** is Jim catching [$_{NP}$ [$_{NP}$ a cat] [$_{CP}$ that [$_{\mathbf{IP}}$ **<u>is</u>** climbing a tree [$_{PP}$ with **t$_i$**]]]]?

b. **How$_i$** did Johnny say to Mom that there was [$_{NP}$ [$_{NP}$ a boy] [$_{\mathbf{XP}}$ walking **t$_i$**]]?

Since some complement clauses can be theta-marked by the matrix clause predicate, as shown in (15), it is plausible that some children misanalyze clausal adjuncts, especially those headed by *that*, as complement clauses rather than as adjuncts.

(15) a. Jim knows that a cat is climbing a tree.

b. Jim thinks that a cat is climbing a tree.

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give it the same kind of treatment, because it cannot receive a referential interpretation and thus cannot be D-linked. It would be interesting to investigate, in future research, how the D-linked potential of a *wh*-element obviates subjacency effects, in both child language and adult language.

If this kind of misanalysis of *that* is indeed available for some children, it is then predicted that they will allow extraction of material from relative clauses which are headed by *that*. They are nonetheless predicted to disallow extraction from tenseless phrasal adjuncts, however, because, in those cases, there is no complementizer present in the extraction domain and hence there will be no trigger for a similar misanalysis.

These differences between Otsu's study and the present study explain why they produced seemingly conflicting results. This is because they in fact examined quite different syntactic structures even though they both aimed at testing the robustness of a kind of Adjunct Island Condition.

4.2. Some Thoughts on *How* and *Why*

As reported above, younger children who participated in the present study had a tendency to answer *how*-questions with *because*-clauses, suggesting that they interpreted *how* as some sort of 'why' (abstract *why*). Some of the data illustrating this phenomenon are given in (16-17) (the numbers inside the parentheses indicate the children's age followed by month).

(16)a. **How** did Johnny say to Mom that there was a bunch of guys walking on the street?

Because they were walking with their arms around (3;08).

b. **How** did Johnny say to Mom that a bunch of guys was walking on the street?

Because he yelled (3;10).

Because he wanted his mom to see it, because it was so cool (4;03).

Because they were wearing the same suits on their body (4;07).

(17)a. **How** did Johnny say to Mom that there was an old dog running in the race?

I think **because** he wanted his mom to see the dog (4;03).

Because he was behind all the dog (4;09).

b. **How** did Johnny say to Mom that an old dog was running in the race?

Because he was there (3;10).

Because the dog was slow (5;00).

Younger children's tendency to interpret *how* as 'why' was in fact also noted by de Villiers (1992), who studied children's treatment of *why* questions. The following are data from her Table 2.

(18)a. **How** did the dog run?

Because black dogs are fast.

Because he had so much might.

Because he was using his paws.

b. **How** did the dog climb who barked?

Because he had a ladder.

Because he wanted to save the cat.

de Villiers takes the above data to suggest that children treat *how*-questions as if they meant *how-come*-questions (p. 158). This is a highly plausible hypothesis because *how-come*-questions do seem to have a similar semantics to *why*-questions. But we cannot adopt this analysis to account for the behavior of the younger children who participated in the present study. The reason is that, unlike *why*-questions, *how-come*-questions do not allow downstairs readings, as shown in (19-20),[6] so if the children had treated *how*-questions as concealed *how-come*-questions, then they would have allowed only upstairs readings for them, contrary to fact, as shown in (16-17).

(19)a. **How come** Johnny said to Dad that there was a bunch of guys walking?

✓Because he thought it was cool (UC reading).

*Because they were walking shoulder to shoulder (DC reading).

[6] Obviously, *how-come*-questions differ from *why*-questions in yet another way: they do not trigger Subject-Auxiliary inversion.

b. **How come** Johnny said to Mom that there was an old dog running?

✓Because he felt sorry for her (UC).

*Because the dog was behind all the other dogs (DC).

(20)a. **Why** did Johnny say to Dad that there was a bunch of guys walking?

✓Because he thought it was cool (UC reading).

✓Because they were walking shoulder to shoulder (DC reading).

b. **Why** did Johnny say to Mom that there was an old dog running?

✓Because he felt sorry for her (UC).

✓Because the dog was behind all the other dogs (DC).

If the children who participated in my study did not equate *how*-questions with *how-come*-questions, what is then responsible for their peculiar interpretation of *how*-questions?

I claim that younger children treat *how*-questions as some sort of 'why' questions that receive a 'manner/reason' interpretation. Further, I argue that this mistreatment comes from the syntactic and semantic properties of 'how' (abstract *how*), which make it look like a kin of 'why' to young children.

In terms of its syntactic behavior, 'how' exhibits a parallel behavior to 'why.' As has been noted by Huang (1982), in Chinese (and also in Korean and Japanese), 'how' forms a natural class with 'why', distinct from 'when' and

'where': while 'when' and 'where' can occur as arguments of postpositions and can be extracted across barriers, just like 'who' and 'what', 'how and 'why' cannot. On the basis of this difference, Huang classifies 'how' and 'why' as non-nominal operators while treating 'when' and 'where' as nominal operators (for details, see Huang 1982, Chapter 7).

Huang further suggests that this classification of *wh*-operators may also hold for English, because *when* and *where* can both occur as the objects of prepositions but *why* and *how* cannot, as shown in (21) and (22), respectively.

(21)a. **From where** did he come? (Huang's (41), p.536)

b. **Since when** have you been here?

(22)a. ***For why** did he come?

b. ***By how** did he come?

Turning now to the semantics of 'how', it receives manner interpretations most saliently but, precisely because of its ability to receive manner interpretations, it seems able to receive 'why'-like interpretations as well.[7] To see

[7] An anonymous reviewer raised the question of why children never seem to confuse *why* for *how*. I think the reason for this behavior is that the semantics of *why* is more or less fixed, invariably

this, consider first (23-24). In these discourses, the *how*-questions can be more or less paraphrased as matrix-scope bearing *why*-questions, for they mean something like 'in what way the proposition *p* denoted by the embedded sentence became true' or 'in what way you came to know that *p*.' [8, 9]

(23) A: How is it that John didn't get the wedding invitation?

B: Well, it's because Mary forgot to mail it to him.

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denoting the reason for a proposition or an eventuality and never denoting anything that has to do with the manner of an eventuality.

[8] I am hedging here because not every instance of *how* receiving a 'why'-like interpretation can be replaced by *why*. For instance, when *why* replaces *how* in (24), the discourse becomes rather odd, as shown in (i).

(i) A: #/??**Why** do you know that John will come to the party?

B: **Because** he told me so.

The oddity of (iA) seems to come from the fact that the question inquires about the manner in which the hearer came to know that John is coming to the party, rather than the reason for having that knowledge. Asking about the reason for knowing that *p* seems a bit unnatural in an ordinary conversational setting. Such an inquiry seems to be felicitous only in limited contexts: e.g., during a legal trial where it might be legitimate and relevant to ask about the purpose of having certain knowledge.

[9] I thank an anonymous reviewer for pointing out the fact that *how*-questions like (24A) only bear matrix scope.

(24) A: How do you know that John will come to the party?

B: Because he told me so.

'How' can also receive a 'why'-like interpretation as a fixed expression such as *how so* or *how come*. For instance, *how so* can be paraphrased as *please explain* or simply as *why*, as illustrated in (25).

(25) A: It looks like the party will be really boring.

B: How so? (= Please explain/why)

A: Only boring people RSVPed.

In the above case, the *how so* question asks the hearer to spell out the basis upon which she made the assertion that the party will be boring, and it can therefore be viewed as a disguised *why* question.

It is important to note that this 'why'-like behavior of 'how' is also attested in languages other than English. To take Korean, for example, the Korean translations of the English questions in (23-24) also contain *ettehkey*, which corresponds to *how*, as shown in (26-27).[10]

[10] Again, just like their English counterparts, 'how' questions in Korean do not always seem to be replaceable by 'why' questions. For instance, (27A) becomes odd when *ettehkey* 'how' is replaced by *way* 'why,' as shown in (i).

(26)A: Jon-i ettehkey kyelhon chotaycang-ul mos
J.-NOM how wedding invitation-ACC not
pat-ass-ci?
receive-past-Q?
'How is it that John didn't receive the wedding invitation?'
B: Umm, Mary-ka chotaycang-ul pwuchici an-h-ass-tay.
Well, M.-NOM invitation-ACC mail not-do-pst-hear.say.
'Well, I hear that Mary didn't mail him the invitation.'

(27)A: Jon-i phathi-e o-l-kes-ul ne-nun **ettehkey** a-ni?
J.-NOM party-to come-that-ACC you-TOP **how** know-Q
'How do you know that John will come to the party?"
B: **Waynamyen** ku-ka na-ekey kulehkey malha-ess-e
Because he-NOM I-DAT so say-PAST-DCL
'Because he told me so.'

(i) A: #/??Jon-i phathi-e o-l-kes-ul ne-nun **way** a-ni?
J.-NOM party-to come-that-ACC you-TOP why know-Q
Lit.: 'Why do you know that John will come to the party?"
B: **Waynamyen** ku-ka na-ekey kulehkey malha-ess-e
Because he-NOM I-DAT so say-PAST-DCL
'Because he told me so.'

I submit that the versatile semantics of 'how,' in conjunction with its syntactic parallel to 'why,' can provide sufficient reason for younger children to hypothesize, at least initially, that 'how' is a kin of 'why' which receives manner/reason interpretations. This may explain why children allowed for both upstairs and downstairs construals of the trace of *how*, even though the occurrences of *how* that receives a 'why'-like interpretation can only have matrix clause construals in adult language, as we saw above in the behavior of *how-come* and 'how is it that *p*' questions. That is, children allow for both construals for 'why'-like *how*-questions, because, for them, *how* has the same syntactic behavior as *why* and thus can have various scopal possibilities that grammar permits for 'why.'

To the extent that this reasoning is valid, we can predict that children's misanalysis of *how* will persist until a later stage of language development.[11] It will be important to find out, in future research, what triggers a precise

[11] In addition to receiving *why*-like interpretations, *how* can also receive *what*-like interpretations as well. For instance, consider the following:

(i) How about going to the movies? (= What about going to the movies?)

(ii) How do you mean by that? (= What do you mean by that?) (In British English)

This overlap between *how* and *what* lends yet additional support for the claim that *how* has quite a versatile semantics and hence it will take a while for young children to acquire the full spectrum of its meanings.

differentiation between *how* and *why*, and what leads children to see the fixed scope of *how*-questions that receive *why*-like interpretations.

5. Summary and conclusion

The present study examined children's knowledge of the Adjunct Island Condition that is at work in a phonologically covert syntactic environment, namely, *there*-sentences with participial codas. The obtained data suggest that participial codas constitute strong barriers both in child and adult grammars, supporting the syntactic analyses that treat them as adjunct islands (e.g., McNally 1997, Jenkins 1975, Williams 1984, Chomsky 2001), as opposed to predicates of some sort (e.g., Milsark 1974, 1977, Stowell 1978, 1981). Given that children, even as young as three, never allowed extraction from participial codas of *there*-sentences, we can conclude that they have a remarkably sophisticated knowledge of the syntactic structures involved and the workings of the Adjunct Island Condition.

The results of the present study are somewhat at odds with the results obtained in Otsu's (1981) study, which also tested a version of the Adjunct Island Condition. I accounted for the discrepancy between the two studies by pointing out that even though they both examined acquisition of an island condition, they in fact tested quite different syntactic structures: Otsu's study tested argument

extraction from a tensed clause while the present one tested adjunct extraction from a non-tensed clause.

Another interesting finding of the present study was that younger children tend to give 'why' interpretations to *how*-questions. I suggested that this phenomenon is due to the combination of two factors: (i) *how* parallels *why* in its syntactic distributions; and (ii) it replaces some meanings of *why* by being used, for instance, to inquire about the manner in which one comes to know that *p*.

I hope that future research will elucidate for how long younger children's misanalysis of 'how' persists, and what triggers an accurate acquisition of the syntax and semantics of 'how.' I also hope that cross-linguistic work on 'how' vs. 'why' will uncover further similarities and differences between them and the acquisition processes thereof.

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