

Wh-drop in child languages and adult ASL

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This paper deals with the dropping of wh-words (i.e., wh-drop) in child languages and adult ASL. Wh-drop has been reported in child Swedish, Dutch, German, French, Spanish and English, but we show that wh-drop rarely occurs in child Japanese based on the examination of natural speech data and the results of the experiments we conducted. We propose that the occurrence of wh-drop depends on the properties of wh-words in overt wh-movement languages and wh-in-situ languages. Furthermore, we suggest that wh-drop occurs due to the principle of least effort.

1. Introduction

This paper examines the dropping of wh-words in child languages and adult American Sign Language, which is called ASL. It has been reported that children frequently drop wh-words when acquiring V2 languages such as Swedish, Dutch and German. An example from child Swedish is shown in (1) :

- (1) _____ säger han ? (Tor 2;7 from Santelmann 1997)
 says he
 ‘(What) does he say?’

The underline shows that the wh-word, which should be in sentence-initial position, was not produced by the child. I refer to this dropping of wh-words as “wh-drop”. The occurrence of wh-drop is not allowed in the corresponding adult languages.

The question arises whether wh-drop occurs in any adult language. It has been reported that wh-drop is observed in adult ASL, as shown in (2). (Petronio & Lillo-Martin 1997):

- (2) Possible context: Speaker knows that addressee received several gifts from different people and somebody gave the earrings to the addressee.

_____ Topic ____ whq
 EARRINGS, e GIFT (Petronio & Lillo-Martin 1997)
 ‘Who gave you the earrings?’

In ASL, overt wh-words usually appear in wh-questions. However, when the content of the wh-word can be identified from the context, wh-drop occurs as in (2). The capital letters in (2) show the glosses of the manual markers, and the lines above show the nonmanual markers such as facial expressions and head movements.

With regard to wh-drop in child languages, it seems to occur not only in child V2 languages but also in child French, Spanish and English. However, wh-drop does not seem to occur in child Japanese. We will give a parametric account to explain the difference. Furthermore, we will suggest that a pragmatic principle lies in the occurrence of wh-drop in child speech and adult ASL. In section 2, let us examine wh-drop in child languages in detail.

2. Wh-drop in child languages

2.1. V2 languages (Swedish, Dutch and German)

Wh-drops in child Swedish, Dutch and German are examined in detail by Santelmann (1995, 1997), Van Kampen (1997), Felix (1980) among others.

The following are characteristics of wh-drop. First, as shown in (3), various kinds of wh-words are dropped in child Swedish, Dutch and German. We also find that wh-drop questions occur with different kinds of verbs and auxiliaries in various tenses. The verbs appear in sentence-initial position, which shows that V-to-C movement has occurred.

- (3) Swedish (Santelmann 1995, 1997)
- a. _____ sa du? (Embla 2;3)
 said you
 ‘(What) did you say?’
 - b. _____ har hänt? (Ask 2;3)
 has happened
 ‘(What) has happened?’
 - c. _____ gör apa då? (Tor 2;5)
 makes monkey then
 ‘(How) does the ape (go) then?’
 - d. _____ kan den inte komma in? (Ask 2;3)
 can it not come in
 ‘(Why) can it not come in?’

(4) Dutch (Van Kamen 1997)

- a. ____ lag mijn lepel nou? (Laura 3;6.26)
 lied my spoon then
 '(Where) was my spoon?'
 b. ____ heb dat daan nou? (Sarah 2;4.18)
 has that done then
 '(Who) has done that?'
 c. ____ kan dit nou in? (Laura 3;7.25)
 can this one then in
 '(How) can this one go in?'

(5) German (Felix 1980)

- a. (Father is fixing Bernie's toy car. The boy curiously watched the action.)
 Bernie: ____ macht du denn?
 do you then
 '(What) are you doing?'
 b. (Bernie's mother layed the table for four - instead of the usual three – people. Bernie curiously inspected the unaccustomed set-up and asked):
 Bernie: ____ sitz du denn?
 sit you then
 '(Where) do you sit?'
 c. (Bernie is busy doing a puzzle with wooden blocks. However, he is not very successful.)
 Bernie: kann das nicht: ____ geht das denn?
 can that not work that then
 'Cannot do that, (how) does that work?'

Although we have noted that V-to-C movement occurs in matrix wh-drop questions, it has been pointed out by Wode (1975) and Tracy (1991) that wh-drop occurs in wh-questions with a verb in sentence-final position in child German:

- (6) a. Henning, ____ diese Auto gehört? (2;8) (Wode 1975)
 Henning, this car belongs
 'Henning, (whom) does this car belong to?'
 b. ____ der Flöte is? (1;11) (Tracy 1991)
 the flute(recorder) is
 '(Where) is the flute?'

However, Gretch (1999) claims that (6) is not a true wh-drop. She shows that the dropping of wh-words occurs in adult German with verbs in final position as shown in (7).

- c. weet jij ik heet? (Laura 3;8.6)
 know you I call
 'Do you know (how) I am called? (=what my name is?)'

The occurrence of wh-drop in embedded clauses suggests that wh-drop may not be related to V-to-C movement. In the following subsections, we show that wh-drop also occurs in the non-V2 child languages.

2.2. French and Spanish

Wh-drop is reported in child French and Spanish by a few studies. Guillaume (1927), in his diary study, notes that, at the age of 1;10, his subject acquiring French dropped wh-words in spontaneous speech as in (11):

- (11) a. ____ il est? (1;10) (Guillaume 1927)
 he is
 'Where is he?'
 b. ____ il est l'autre de maman? (1;10)
 it is the other of mama
 'Where is it, mama's the other one?'

In (11), *Où est-ce que* 'where is-it that' in sentence-initial position seems to be dropped.

Hernández-Pina (1984) (cited in Pérez-Leroux 1993) reports that wh-drop questions appear in child Spanish as in (12).

- (12) a. ____ ta taza nene? (after two years)
 is cup child
 'Where is the child's cup?'
 b. don tá las papas?
 whe(re) are the potatoes
 'Whe(re) are the potatoes?'

In (12a), the wh-word *donde* 'where' is completely dropped, whereas in (12b), *donde* is partially dropped. Since wh-drop in child French and Spanish is only reported by those studies, further examination is needed.

2.3. English

2.3.1. Previous Studies

Wh-drop is reported in the spontaneous speech of children acquiring English by Radford (1990) as shown in (13):

- (13) a. ____ You got? (Harriet 1;6)
 'What have you got?'
 b. ____ Car going? (Jem 1;9)
 'Where is the car going?'
 c. ____ My shoes gone? (Jenny 1;10)
 'Where have my shoes gone?'

Brown and Fraser (1963) report that children dropped wh-words in sentence-initial position as in (14) when they were asked to repeat adult wh-questions in an elicited imitation experiment:

- (14) ADULT SENTENCES / CHILD'S IMITATION
 a. Where shall I go? / Go? (Eve 2;1)
 b. Where does it go? / Go? (Adam 2;4)
 c. Where does it go? / Does it go? (Helen 2;6)

However, wh-drop in child English has not been focused on very much and its frequency is unknown. To confirm the presence of wh-drop and to find out its frequency in child English, I conducted an experiment shown in 2.3.2.

2.3.2. Experiment 1: Child English

The subjects were 19 monolingual English-speaking children listed in Table 1.

Table 1: Number of the subjects and their ages

Age	2;9-2;11	3;1-3;11	4;0-4;11
Number	6	8	5

The experiment was a combination of a comprehension task and an elicited production task as shown in (15).

- (15) Example of a test sentence: matrix wh-question
 (showing a picture in which Pooh bear is hiding in a bucket)
 Experimenter : Who is hiding in the bucket?
 Child : Pooh.
 Experimenter : Yes! Can you ask Mommy/Mickey(doll)
 who is hiding in the bucket?
 Child : Mommy, who is hiding in the bucket?
 Mother: Pooh is hiding in the bucket.

First, the experimenter, who was a native speaker of English, asked a child a wh-question such as 'Who is hiding in the bucket?' with a picture, to see whether the child could comprehend the wh-question. Next, the experimenter asked the child, 'Can you ask Mommy who is hiding in the bucket?'. This tries to elicit a wh-question from the child to see if the child produce a wh-drop

question. The test sentences included 14 matrix wh-questions and 3 embedded wh-questions. The results for the matrix wh-questions are shown in Table 2.

Table 2: Matrix wh-questions

	Correct responses with overt wh-words	Responses with wh-drop	Irrelevant responses
2-year-olds	42 (82.4%)	9 (17.6%)	33
3-year-olds	97 (98.0%)	2 (2.0%)	13
4-year-olds	62 (100.0%)	0 (0.0%)	8

Table 2 shows that 17.6% of all the wh-questions produced by the two-year-olds were wh-drop questions and that 2% of the wh-questions produced by the three-year-olds were wh-drop questions. Examples of wh-drop questions produced by the children are shown in (16). Words in parentheses show what was dropped.

- (16) a. (Who is) hiding in the bucket? (Brittney 2;9)
 b. (Which) dog is barking? (Brittany 2;9)
 c. (Why is the) mouse crying? (Brittany 2;9)
 d. (What is the) boy eating? (Ana 2;11)
 e. (Which car is) the cat driving? (Avery 3;1)

In the case of the embedded wh-questions, even older children produced wh-drop questions. An example of the task is shown in (17).

- (17) Example of a test sentence: embedded wh-question
 (Showing a picture of Pooh eating honey)
 Experimenter : Do you know what Pooh is eating?
 Child : Yes, honey.
 Experimenter : Can you ask Mommy/Mickey(doll),
 "Do you know what Pooh is eating?"
 Child : Mommy, do you know what Pooh is eating?

We used the phrase 'Do you know' to make embedded wh-questions. The results of the embedded wh-questions are shown in Table 3.

Table 3: Embedded wh-questions

	Correct responses with overt wh-words	wh-drop with "Do you know" at the beginning of the question	wh-drop without "Do you know"	Irrelevant responses
2-year-olds	6 (50.0%)	0 (0.0%)	6 (50.0%)	6
3-year-olds	15 (83.3%)	3 (16.7%)	0 (0.0%)	6
4-year-olds	12 (100.0%)	0 (0.0%)	0 (0.0%)	3

As Table 3 shows, in 50% of the embedded wh-questions produced by the two-year-olds, both 'do you know' and wh-words are dropped. Three-year-old children dropped only wh-words in 16.7% of the embedded wh-questions they produced. Examples of children's wh-drop questions without the phrase 'do you know' and with the phrase are shown in (18):

- (18) a. (Do you know what) Pooh is eating? (Brittney 2;9)
 b. You know (where) the cat is resting? (Austin 3;2)

To summarize, by conducting this experiment, we have confirmed that wh-drop occurs both in matrix wh-questions and embedded wh-questions in child English.

Next, let us examine Japanese, which is a typologically different language in that it does not have overt wh-movement and it allows the dropping of arguments such as subjects and objects.

2.4. Japanese

2.4.1. Experiment 2: Child Japanese

I conducted an experiment which was similar to the one in the previous section with 15 monolingual Japanese children, shown in Table 4.

Table 4 : Number of subjects and their ages

Age	2;5 -2;11	3;1 - 3;9	4;5 - 4;7
Number	6	6	3

The test sentences used in this experiment were 27 matrix wh-questions containing all kinds of wh-words in both sentence-initial position and sentence-medial position because Japanese allows scrambling of wh-words. The results for matrix wh-questions are shown in Table 5.

Table 5: Matrix wh-questions

	Correct responses with overt wh-word	Responses with wh-drop	Irrelevant responses
2-year-olds	117 (96.7%)	4 (3.3%)	34
3-year-olds	154 (100.0%)	0 (0.0%)	8
4-year-olds	78 (100.0%)	0 (0.0%)	0

Table 5 shows that only 3.3% of all the wh-questions produced by 2 two-year-old children were wh-drop questions. The children whose ages were 2;5 and 2;9 produced 4 wh-drop questions as shown in (19):

- (19) a. Okaasan, raion-kun (nande) naiteru no? (Koji 2;5)
 Mommy, lion (why) cry-PROG Q
 ‘Mommy, (why) is the lion crying?’
- b. (doushite) zou-san naiteru no? (Koji 2;5)
 (why) elephant cry-PROG Q
 ‘Why is the elephant crying?’
- c. (naze) Naiteru no?(naze) kore, kore naiteru no?
 (why) cry-PROG Q (why) this, this cry-PROG Q
 (naze) kore naiteru no? (Koji 2;5)
 (why) this cry-PROG Q
 ‘(Why is this) crying? (Why is) this, this crying? (Why is) this crying?’
- d. Mama (itsu) nenne-suru no? (Maimi 2;9)
 mommy (when) sleep Q
 ‘(When does) Mommy sleep?’

We have also tested two embedded wh-questions with the subjects in Table 6. The results are shown in Table 7.

Table 6: Number of subjects and their ages

Age	2;5 -2;11	3;1 - 3;9	4;5 - 4;7
Number	4	4	3

Table 7: Embedded wh-questions

	Correct responses with overt wh-word	Responses with wh-drop	Irrelavant responses
2-year-olds	1 (100.0%)	0 (0.0%)	7
3-year-olds	2 (100.0%)	0 (0.0%)	6
4-year-olds	5 (100.0%)	0 (0.0%)	1

Table 7 shows that wh-drop did not occur in embedded wh-questions in child Japanese.

In addition, I conducted an experiment with 5 Japanese children by using the same test sentences and pictures as were used in the first experiment in child English which we have seen in section 2.3. The result was that no wh-drop questions were found.

2.4.2. Natural speech data of Japanese children

To see whether wh-drop occurs in Japanese children’s natural speech, Yamakoshi (1999) examined longitudinal speech data of one child, Akifumi (1;5.7-3;0.0), taken from the CHILDES database (MacWhinney 1995, Oshima-Takane & MacWhinney 1995) and cross-sectional speech data of four

children collected by Cornell University language acquisition lab. The subjects are shown in Table 8.

Table 8: Information on the cross-sectional speech data

Subject	Age	#utterances	Total #Wh Qs
Hiroko	2;2	279	10
Kuniyuki	2;5	394	6
Goichiro	2;7	450	15
Takayuki	2;10	484	47

We found that wh-drop questions were not observed in these children's natural speech.

In sum, wh-drop rarely occurs in child Japanese. In the next section, we look at wh-drop questions in adult American Sign Language.

3. Wh-questions and wh-drop in adult American Sign Language (ASL)

As I mentioned briefly in section 1, ASL normally has overt wh-words in wh-questions. As shown in (20), wh-words often appear in both sentence-initial and final positions. Wh-words also appear in either position as shown in (21) and (22). It can also appear in wh-in-situ position as shown in (23).

- (20) _____ whq
 WHAT JOHN BUY YESTERDAY WHAT
 'What did John buy yesterday?' (Petronio & Lillo-Martin 1997)
- (21) _____ whq
 TEACHER LIPREAD YESTERDAY WHO
 'Who did the teacher lipread yesterday?' (Neidle et al. 2000)
- (22) _____ whq
 WHO BILL SEE YESTERDAY
 'Who did Bill see yesterday?' (Crain & Lillo-Martin 1999)
- (23) _____ whq
 TEACHER LIPREAD WHO YESTERDAY
 'Who did the teacher lipread yesterday?' (Neidle et al. 2000)

Petronio & Lillo-Martin (1997) point out that wh-drop occurs in adult ASL when the content of the dropped wh-word can be identified from its context. Examples are in (24):

- (24) a. Possible context: Speaker knows that addressee received several gifts from different people and that somebody gave the earring to the addressee.
 _____ topic _____ whq
 EARRINGS, *e* GIFT
 ‘Who gave you the earrings?’ (Petronio & Lillo-Martin 1997)
- b. Possible context: Speaker knows addressee isn’t feeling well, possibly due to something unhealthy s/he ate.
 _____ topic _____ whq
 BREAKFAST, EAT *e*
 ‘As for breakfast, what did you eat?’ (P & L 1997)
- c. _____ whq
 NAME
 ‘What’s your name?’ (P & L 1997)
- d. _____ whq
 TIME
 ‘What time is it?’ (P & L 1997)

In (24a), the possible context is that the speaker knows addressee received several gifts from different people and somebody gave the earrings to the addressee. The italicized ‘e’ indicates that wh-drop occurs. In (24b), the speaker knows that the addressee ate something bad, but the speaker does not know what it was. The content of the dropped wh-word ‘what’ is recoverable from the situational context, and thus wh-drop occurs. Because (24c) and (24d) are frequently used wh-questions, the contents of the dropped wh-words must be easily identified, and wh-drop occurs.

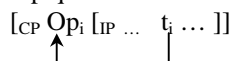
It seems that the dropped wh-word can be identified not only from its situational context but also from the non-manual marker. In (24), the lines with whq corresponds to the non-manual marker involving furrowed brows and the head tilt. This non-manual marker for wh-questions is clearly different from the non-manual marker for yes/no questions, which corresponds to raised brows and the head tilt. Because the marker for wh-questions and yes/no questions are distinct, for instance, (24b) is correctly interpreted as a wh-question even if the wh-word is dropped, not as a yes/no question which would mean ‘Did you eat breakfast?’. In the next section, we try to give an analysis for why wh-drop occurs in adult ASL and some child languages.

4. Analysis

The first question we would like to consider is why wh-drop occurs in some child languages and adult ASL. Based on the facts that wh-questions with overt wh-words are also observed in those child languages and adult ASL, we propose that the occurrence of wh-drop is due to the use of a null wh-operator. In some child languages and adult ASL, a null wh-operator is allowed. Let us

postulate that they have the parametric value [+ null wh]. This null wh-operator has a [+wh] feature, and as shown in (25), it moves from base-generated position to CP specifier position like overt wh-movement:

(25) Wh-drop question in children's languages and adult ASL



The second question is why wh-drop rarely occurs in child Japanese. In other words, child Japanese chooses the parametric value [- null wh]. We propose that child Japanese does not allow a null wh-operator due to a property of Japanese wh-words.

Tsai (1994), among others, proposes that the structures of wh-questions in those languages are shown in (26):

- (26) a. English type : $[{}_{\text{CP}} [{}_{\text{PP/DP}} \text{wh}(x)\text{-Op}_{x[Q]}]_k [{}_{\text{IP}} \dots t_k \dots]]$
 b. Japanese type : $[{}_{\text{CP}} \text{Op}_{x[Q]} [{}_{\text{IP}} \dots [{}_{\text{PP/DP}} t_x [\dots \text{wh}(x) \dots] \dots]]$
 c. Chinese type : $[{}_{\text{CP}} \text{Op}_{x[Q]} [{}_{\text{IP}} \dots \text{wh}(x) \dots]]$

In English, as shown in (26a), the operator is not separable from the wh-word itself, and thus the whole wh-phrase has to move to the CP specifier position for feature-checking. In contrast, in Japanese, the operator is inserted in the DP specifier, and it is separated from the wh-word itself. Therefore a wh-phrase does not move and only the null operator moves from the DP specifier position to the CP specifier position for feature-checking. In Chinese, the null operator is inserted in the CP specifier position, hence it is separated from the wh-word itself, and neither the null operator or the wh-word moves.

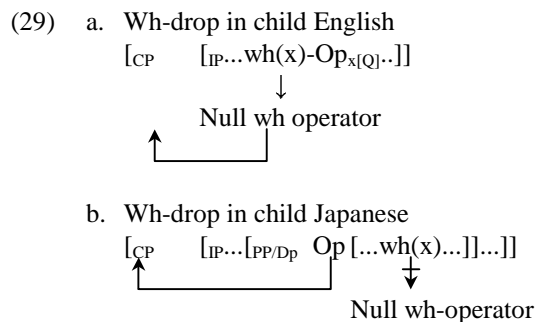
Based on his proposal, the generalization in (27) can be made:

- (27) a. In languages where wh-movement occurs overtly, such as English, a wh-word itself is not separable from an operator.
 b. In languages where wh-movement does not occur overtly, such as Japanese and Chinese, a wh-word is separated from an operator.

Based on this generalization, I propose the following:

- (28) a. In languages where wh-movement occurs overtly, such as in English,
 a. wh-word is not separable from an operator.
 → Thus children can use the null wh operator instead of an overt wh-word, and wh-drop occurs.
 b. In languages where wh-movement does not occur overtly, such as in Japanese, a wh-word is separated from an operator. In other words, a wh-word itself is not an operator.
 → Thus children do not use the null wh operator instead of an overt wh-word and as a result, wh-drop does not occur.

More specifically, let us consider English and Japanese schematically in (29):



In English, wh-movement occurs overtly, and an operator is not separable from a wh-word itself. Thus, as shown in (29a), an overt wh-word, i.e. overt wh-operator, can be replaced by a null wh operator in child English and it moves to the CP specifier position. As a result, wh-drop occurs in child English.

In Japanese, however, wh-movement does not occur overtly, and an operator is separated from a wh-word. A wh-word itself is not an operator. Therefore children do not replace an overt wh-word by the null wh operator as shown in (29b), and wh-drop does not occur in child Japanese.

The occurrence of wh-drop is summarized in Table 9:

Table 9:

Types of wh-movement	Obligatory overt wh-movement	Optional overt wh-movement	No overt wh-movement
Child Languages	English, Swedish, Dutch, German, Spanish	French, (adult) ASL	Japanese
The occurrence of wh-drop	O	O	X

One problem with this analysis of wh-drop in child Japanese is that certain adjunct wh-words such as ‘why’ in Japanese are said to be an operator based on the fact that island-effects are observed with the wh-word. This fact is also observed in Chinese. This is problematic for my analysis, since it predicts that wh-drop should occur with the wh-word ‘why’ in child Japanese. Although we have seen in section 2.4 that wh-drop occurred with ‘when’ and ‘why’ only a few times in the experiment of child Japanese, I leave this matter open for a future research.

The last question is why wh-drop occurs only in some child languages and adult ASL, but not in adult spoken languages. I suggest that the effect of an economy condition or a pragmatic principle such as the principle of least effort in (30) is stronger in child languages and adult ASL than in adult spoken languages.¹

¹ Rizzi (2000) tries to explain the null subject phenomenon in finite clauses in child speech by

- (30) The principle of least effort (Haiman 1983)
Delete or shorten linguistic expressions which convey the information that is already known.

In the course of language acquisition, it is possible to assume that the effect of the principle of least effort or an economy condition is stronger than in adult spoken languages and that children prefer phonologically shorter expressions. Therefore null *wh* operator is used when it is available and *wh*-drop occurs.

Also in adult ASL, there is a plausible reason to suppose that the effect of the principle of least effort is stronger than in spoken languages. According to Diane Lillo-Martin (p.c.), ASL signers try to make sentences shorter because signing manually takes longer than speaking.

We need to investigate further the more detailed contents of the principle of least effort or an economy condition and how it applies in the course of language acquisition and in languages like ASL which have a different modality from spoken languages.

Acknowledgments

This paper was presented at CONSOLE 9 held at Lund University, Sweden, on December 9, 2000. I thank the audience of CONSOLE 9 for their valuable comments. I would also like to thank Noriko Terazu Imanishi, Barbara Lust, Yukio Otsu, Tetsuya Sano, Yasuhiro Shirai and John Whitman for their valuable comments on the earlier versions of this paper. All remaining errors are my own.

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proposing that an economy condition in (i) prevails in the course of language acquisition :

- (i) *Structural Economy* (Rizzi 2000)

Use the minimum of structure consistent with well-formedness constraints.

According to Rizzi, root clauses are CPs for adults, but children generate truncated root clauses, IPs, due to structural economy. When the root clause is IP, the empty category, i.e. a null subject, does not have an identification requirement if it is in the IP specifier because it is in a position which is not c-commanded by any other category, and thus a null subject occurs.

It seems that structural economy and the principle of least effort both have something in common since they both try to explain why children prefer phonologically shorter expressions and allow null elements which are not allowed in adult speech. Although structural economy is a grammatical principle and the principle of least effort is a pragmatic principle, it might be possible to make the two principles into one economy principle.

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