

THE PARAMETER OF *WH*-INFINITIVES: A VIEW FROM CHILD ENGLISH*

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1. Introduction

With the goal of accounting for the origin and evolution of human language, the Minimalist Program seeks to simplify the mechanisms and primitives ascribed to biologically-determined UG (e.g. Berwick & Chomsky 2016, Chomsky 2019). As one such attempt, the possibility has been pursued that innate options for language variation (*parameters*) do not exist within the generative computational system, and that the locus of variation is confined to the process of externalization and to the lexicon (more specifically, to the properties of functional categories).¹ Recent studies on the cross-linguistic variation of infinitival *wh*-questions and infinitival relatives by Sabel (2015, 2020) are consistent with this possibility: Based on synchronic and diachronic evidence, Sabel argues that these *wh*-infinitives are available only in those languages that permit prepositional infinitival complementizers, and that both of these properties stem from the morphological properties of the infinitival C-system.

In this study, I will evaluate the validity of Sabel's (2015, 2020) parametric proposal by bringing data from child language acquisition. Evidence from child English suggests that Sabel's analysis is on the right track, which in turn suggests that the time course of child language acquisition is potentially an important ground to evaluate theoretical proposals concerning the parameters of variation permitted by human language.

2. Parametric Variation of *Wh*-infinitives: Sabel (2015, 2020)

The availability of embedded infinitival *wh*-questions and embedded infinitival polar

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¹ The possibility that the source of parametric variation is restricted to functional elements in the lexicon was first formulated by Borer (1984) and was then adopted by Chomsky (1995), thereby known as the Borer-Chomsky Conjecture. See Chomsky (2017) for approaches to (re)formulating parameters within the Minimalist Program.

questions is subject to cross-linguistic variation: These infinitival interrogatives are possible in English but not in German, as shown in (1) and (2).

- (1) a. Lisa has decided [*who* to visit *t*].
 b. Lisa has decided [*whether* to visit him or not].
- (2) a. *Lisa hat entschieden [*was* Tom *t* zu sagen].
 Lisa has decided what Tom_{DAT} to say
 ‘Lisa has decided what to say to Tom.’
- b. *Lisa hat entschieden [*ob* Tom etwas zu sagen].
 Lisa has decided whether Tom_{DAT} something_{ACC} to say
 ‘Lisa has decided whether to say something to Tom.’ (Sabel 2015: 313)

In addition, infinitival relative clauses are permitted in English but not in German, as illustrated by the contrast between (3a) and (4a).

- (3) a. This is a topic [*about which* to argue *t*].
 b. This is a topic [*about which* one can argue *t*].
- (4) a. *Lisa sucht das Messer [*mit dem* Käse *t* zu schneiden].
 Lisa seeks the knife_{ACC} with the_{DAT} cheese_{ACC} to cut
 ‘Lisa seeks the knife with which to cut the cheese.’
- b. Lisa sucht das Messer [*mit dem* man Käse *t* schneidet].
 Lisa seeks the knife_{ACC} with the_{DAT} one_{NOM} cheese_{ACC} cuts
 ‘Lisa seeks the knife with which one cuts the cheese.’ (Sabel 2015: 314)

Sabel (2015, 2020) argues that the possibility of interrogative and relative-clause formation with infinitives (*wh*-infinitives) is closely connected to the availability of infinitives with phonetically-realized prepositional complementizers. More specifically, he suggests that the formation of *wh*-infinitives is permitted only in those languages that have overt prepositional subordinators in the infinitival C-system. Thus, while English allows for the realization of the prepositional complementizer *for* in the infinitival C-system of complement and relative clauses, German excludes such overt complementizers in infinitival complement clauses. The relevant examples are provided in (5) and (6).

- (5) a. I want [_{CP} (for) [_{TP} John to win]].
 b. There is someone [_{CP} for [_{TP} John to talk to]].

- (6) *dass sie versuchte [_{CP} um [_{TP} das Buch zu lesen]].
 that she_{NOM} tried COMP the book to read

‘... that she tried to read the book.’

(Sabel 2015: 317)

According to Sabel (2015, 2020), diachronic evidence suggests that the availability of prepositional complementizer (PC) construction as in (5) constitutes a necessary, but not a sufficient condition for the existence of *wh*-infinitives. In Middle English (ME), *for* starts to introduce purposive clauses as a complementizer. Before the ME period, no *wh*-infinitives are attested, but they are found after the ME period, that is, after *for* introduces complement clauses as a complementizer. Thus, ME should be regarded as a language that has the PC construction but does not permit *wh*-infinitives. Sabel’s (2015, 2020) cross-linguistic survey including ME is summarized in the table in (7).

- (7) Sabel’s (2015, 2020) Cross-linguistic Survey:

Language	<i>Wh</i> -infinitives?	PC Construction?
English	YES	YES
Polish	YES	YES
Spanish	YES	YES
European Portuguese	YES	YES
Middle English	NO	YES
German	NO	NO
Swedish	NO	NO
Norwegian	NO	NO
Danish	NO	NO

Based on the cross-linguistic observation summarized in (7), Sabel (2015, 2020) formulates the *wh*-infinitive generalization as in (8).

- (8) **The *Wh*-Infinitive Generalization (WHIG)** (Sabel 2020: 146):

If a language has *wh*-movement to Spec CP in infinitives, then this language has the option of filling the C-system of this (type of) infinitive with an overt complementizer.

Sabel (2015, 2020) attempts to derive this generalization by assuming that the infinitival left periphery in languages without *wh*-infinitives is “defective”: A defective C-system only projects up to Finite Phrase (FinP) but does not project Force Phrase, Focus Phrase, or Topic Phrase, which as a consequence lacks a position to host a prepositional complementizer. In addition, even though the Specifier of FinP may act as an intermediate landing site for a *wh*-operator or a relative operator, these operators may not remain there, since they need to be in the Specifier of FocP (in the case of a *wh*-operator) or in the Specifier TopP (in the case of a relative operator) in order to be properly interpreted. Thus, a defective C-system allows neither the PC construction nor *wh*-infinitives.

In contrast, in languages that have prepositional infinitival complementizers, the whole left periphery is projected as in (9), and hence the final landing sites for a *wh*-operator and a relative operator are available.²

(9) [ForceP [TopP [FocP [TopP [FinP ...]]]]]

To summarize this section, Sabel (2015, 2020) observes that *wh*-infinitives are permitted only in those languages that allow embedded infinitival clauses introduced by a prepositional complementizer. This cross-linguistic correlation is argued to follow from the parametric variation concerning the structure of the infinitival left periphery: Languages differ as to whether infinitival clauses project the whole left periphery (consisting of ForceP, TopP, FocP, and FinP) or not (i.e. projecting only up to FinP).

3. Prediction for the Acquisition of English

Under Sabel's (2015, 2020) parametric system, the availability of infinitival clauses with a prepositional complementizer (PC construction) constitutes one of the necessary conditions for the possibility of *wh*-infinitives. In terms of acquisition, this means that the language-particular knowledge required for the PC construction is a proper subset of the knowledge required for *wh*-infinitives. Then, it should be predicted that a child learning English should never have a grammar that permits *wh*-infinitives, but disallows the PC construction. This prediction can be restated as in (10).

(10) **Prediction for the Acquisition of English:**

In English, any given child will acquire the PC construction prior to, or at around the same time as, but never significantly later than infinitival *wh*-questions.

4. Transcript Analysis

4.1. Subjects and Method

In order to evaluate the validity of the prediction in (10) from Sabel's (2015, 2020) parametric proposal, I selected 20 longitudinal corpora for English from the CHILDES database (MacWhinney 2000), which provided a total sample of more than 432,000 lines of child speech. The corpora analyzed in this study are listed in the table in (11).

For each child, I located the first clear uses of (i) an infinitival *wh*-question, and (ii) a PC construction with the verb *want*.³ To count as a clear use, the PC construction was required to

² A question would remain as to how to accommodate languages like ME, which allows the PC construction but does not permit *wh*-infinitives.

³ Infinitival relative clauses were not included in the analysis, given that they appear to be extremely rare in children's spontaneous speech.

contain an overt DP subject and an INFL *to* in the CP complement of *want*.⁴ The CLAN program Combo, together with the files of (i) all the *wh*-words in English and (ii) all the relevant forms of *want*, was used to identify potentially relevant child utterances, which were then searched by hand and checked against the original transcripts to exclude imitations, repetitions, and formulaic routines. Following Stromswold (1996) and Snyder (2007), the age of acquisition was taken as the first clear use, followed soon after by additional uses.

(11) Corpora Analyzed

Child	Collected by	Age Span	# Child Utterances
Abe	Kuczaj (1977)	2;04 – 5;00	31,658
Adam	Brown (1973)	2;03 – 5;02	45,575
Anne	Theakston et al. (2001)	1;10 – 3;08	19,897
Aran	Theakston et al. (2001)	1;11 – 2;10	17,114
Becky	Theakston et al. (2001)	1;00 – 2;11	23,295
Carl	Theakston et al. (2001)	1;08 – 2;08	24,952
Dominic	Theakston et al. (2001)	1;10 – 3;00	21,114
Eve	Brown (1973)	1;06 – 2;03	10,856
Gail	Theakston et al. (2001)	1;11 – 3;00	16,958
Joel	Theakston et al. (2001)	1;11 – 2;10	17,870
John	Theakston et al. (2001)	1;11 – 2;10	13,321
Liz	Theakston et al. (2001)	1;11 – 2;10	16,549
Naomi	Sachs (1983)	1;02 – 4;09	15,574
Nicole	Theakston et al. (2001)	2;00 – 3;00	16,937
Nina	Suppes (1974)	1;11 – 3;03	31,333
Peter	Bloom (1970)	1;09 – 3;01	23,958
Ruth	Theakston et al. (2001)	1;11 – 2;11	20,310
Sarah	Brown (1973)	2;03 – 5;01	31,070
Shem	Clark (1982)	2;02 – 3;02	17,510
Warren	Theakston et al. (2001)	1;10 – 2;09	16,578

(years;months)

4.2. Results and Discussion

The results of the transcript analysis are summarized in the table in (12). Among the twenty children, nine of them acquired both the PC construction and *wh*-infinitives by the end of their corpora, and two of the remaining eleven children acquired only the PC construction.

⁴ The presence of overt *for* was not required, in light of the syntactic evidence that the infinitival subject is assigned Case not by the matrix verb but by a null prepositional complementizer even when *for* is not overtly present. See Lasnik & Saito (1991: 337) for relevant discussion.

Mean age of acquisition for the PC construction was 2;11, and mean age of acquisition for *wh*-infinitives was 3;01. Thus, the mean age of acquisition for the PC construction was earlier than *wh*-infinitives by about 2 months. Children's first clear uses are presented in the Appendix.

(12) Ages of Acquisition and the Results of the Statistical Analysis

Child	PC Construction	<i>Wh</i> -infinitives	<i>p</i> =
Abe	2;10:30	2;10:07	$p > .10$
Adam	3;02:21	3;02:21	-----
Anne	2;07:27	-----	-----
Aran	2;06:10	-----	-----
Becky	2;08:30	2;10:25	$p > .10$
Gail	2;10:08	2;10:08	-----
Naomi	2;11:18	3;05:07	$p < .05$
Nina	2;10:21	3;00:03	$p > .10$
Peter	2;08:12	2;08:12	-----
Sarah	4;01:11	3;11:09	$p > .10$
Shem	2;11:10	3;00:05	$p > .10$
<i>Mean</i>	2;11	3;01	

(years;months:days)

To evaluate the statistical significance of an observed age-difference between the acquisition of the PC construction and the acquisition of *wh*-infinitives, I counted the number of clear uses of the earlier construction (either the PC construction or *wh*-infinitives) before the first clear use of the later construction. Next I calculated the relative frequency of the two constructions in the child's own speech, starting with the transcript after the first clear use of the later construction, and continuing through the end of the corpus. Finally I performed a binomial test to obtain the probability of sampling the observed number of tokens of the earlier construction simply by chance, before the first clear use of the later construction, under the null hypothesis that both became available concurrently and had the same relative probability of use as in later transcripts.

Results of the statistical analysis are also included in the table in (12). Among the nine children who acquired both the PC construction and *wh*-infinitives, one child (Naomi) acquired the PC construction significantly earlier than *wh*-infinitives, and the other eight children acquired these constructions at around the same time: As for three of these eight children (Adam, Gail, and Peter), the transcript containing his first clear use of the PC construction also contained his first clear use of *wh*-infinitives, and as for the remaining five children (Abe, Becky, Nina, Sarah, and Shem), there was no significant difference, $p > .10$ by binomial test. Crucially, no child in this study acquired *wh*-infinitives significantly earlier than the PC construction. Thus, the results have borne out the prediction in (10) from Sabel's

(2015, 2020) parametric proposal. This finding suggests that the time course of the acquisition of English is consistent with Sabel's view that natural-language grammars permitting *wh*-infinitives are restricted to those permitting the PC construction.

5. Conclusion

In this study, I evaluated the validity of the acquisitional prediction from Sabel's (2015, 2020) analysis of the cross-linguistic variation of *wh*-infinitives, which locates the source of their variation within the lexicon. The results obtained from the transcript analysis of 20 English-speaking children are consistent with Sabel's view that natural-language grammars permitting the infinitival *wh*-questions are a proper subset of those permitting the infinitival clauses with a prepositional complementizer. The findings of this study not only provide acquisitional support for Sabel's (2015, 2020) parametric proposal, but also gives prominence to the possibility of confining parametric variation within the lexicon. A broader implication of this study is that the time course of child language acquisition is potentially an important ground to evaluate theoretical proposals concerning the parameters of variation permitted by human language (e.g. Snyder 2001, Sugisaki 2003).

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Appendix: Children's First Clear Uses

- (13) Abe
- a. *CHI: uhuh I want Edna with red hair to come too yeah. (2;10:30)
 - b. *CHI: I know how to get the top off. (2;10:07)
- (14) Adam
- a. *CHI: you want Mommy to have one? (3;02:21)
 - b. *CHI: I teach him how to walk on dat [:that]. (3;02:21)
- (15) Anne
- *CHI: I want you to [/] to put all these out as well. (2;07:27)
- (16) Aran
- *CHI: I don't want Mummy to help me. (2;06:10)
- (17) Becky
- a. *CHI: I want you to come before. (2;08:30)
 - b. *CHI: I don't know how to do it. (2;10:25)
- (18) Gail
- a. *CHI: I want Caroline to come. (2;10:08)
 - b. *CHI: you know what to do with them? (2;10:08)
- (19) Naomi
- a. *CHI: I want you to read this. (2;11:18)
 - b. *CHI: I'll show you how to do it (.) okay? (3;05:07)

(20) Nina

- a. *CHI: she (.) she wants me to carry her. (2;10:21)
- b. *CHI: he doesn't know how to sit down. (3;00:03)

(21) Peter

- a. *CHI: want em to fall down. (2;08:12)
- b. *CHI: show me how to wear it. (2;08:12)

(22) Sarah

- a. *CHI: want me to comb your hair? (4;01:11)
- b. *CHI: (a)n(d) &-um (.) &-um (.) (a)n(d) then he taught [/] (.) taught me how to swim!
(3;11:09)

(23) Shem

- a. *CHI: you have another (.) I want you to have another one. (2;11:10)
- b. *CHI: it's may [/] it's my tv because I'll [/] I will [/] I'll [/] I know how to turn it on.
(3;00:05)