

A Quantitative Look at the Acquisition Order of Functional Morphemes

ENG-3040 First Language Acquisition

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Research Question

1. present participle
- 2./3. in, on
4. regular plural
5. simple past (irregular)
6. possessive -'s/-s'
7. copula 'be' (uncontractible)
8. articles
9. simple past (regular)
10. 3.SG.PRES (regular)
11. 3.SG.PRES (irregular)
12. auxiliary 'be' (uncontractible)
13. copula 'be' (contractible)
14. auxiliary 'be' (contractible)

Brown (1973, pp. 271, 274)

Research Question

	Adam		Sarah
1. present participle			
2./3. in, on		I (2;3)	
4. regular plural			
5. simple past (irregu	Present	II (2;10)	Plural
6. possessive -'s/-s'	progressive		
7. copula 'be' (uncor	<i>in</i>		<i>in, on</i>
8. articles	<i>on, plural</i>		
9. simple past (regul			Present
10. 3.SG.PRES (regula			progressive,
11. 3.SG.PRES (irregu			past irregular
12. auxiliary 'be' (unc		III (3;1)	Possessive
13. copula 'be' (contr	Uncontractible		
14. auxiliary 'be' (con	copula,		Uncontractible
	past irregular		copula
			Articles

Brown (1973, pp. 271, 274)

Research Question: Expectations

- ▶ Does a larger corpus reflect Brown's results?
 - ▶ Expectation: Yes, for the most part
- ▶ Shortcomings of an automated, quantitative analysis?
 - ▶ How to define whether a morpheme has been acquired?
 - ▶ Expectation: Tagging errors

Data

Parent-child interactions (English):

Corpus	Age	N
Braunwald (1971)	1;3–7;0	1
Brown (1973)	1;6–5;2	3
Demetras (1989)	2;0–3;11	1
Henry (1995)	2;0–4;6	8
Kuczaj (1977)	2;4–5;0	1
Sachs (1983)	1;2–4;9	1
Resulting corpus	1;2– 5;0	15

Tagged: morphology, dependencies

Method

Python, modified version of NLTK's corpus reader (Bird et al., 2009)

Method:

- ▶ Define rules for each morpheme, e.g.
 - ▶ 12. auxiliary 'be' (uncontractible): 'be', aux, syntactic position
*CHI: are you making [...]
%mor: **aux|be**&PRES pro:per|you part|make-PRESP [...]

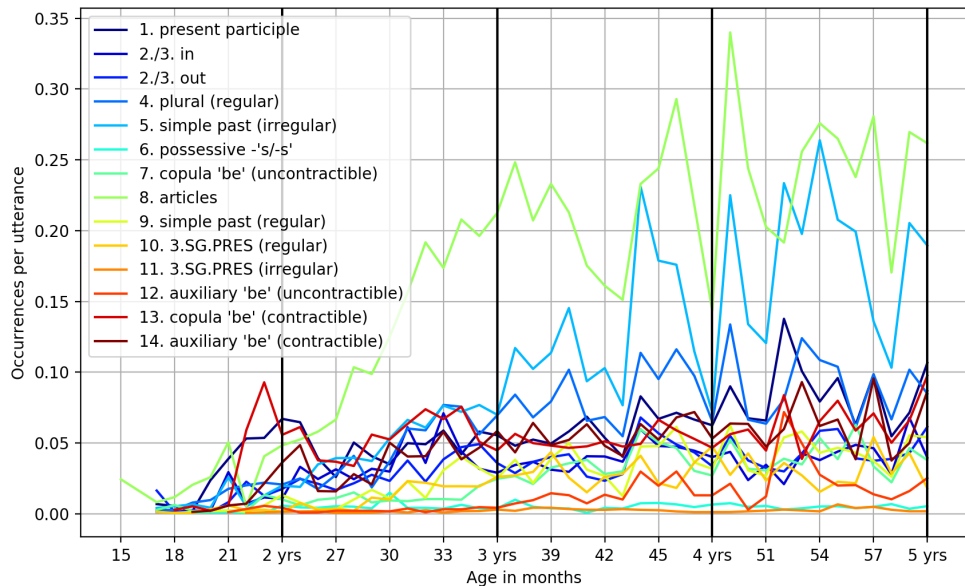
Method

Python, modified version of NLTK's corpus reader (Bird et al., 2009)

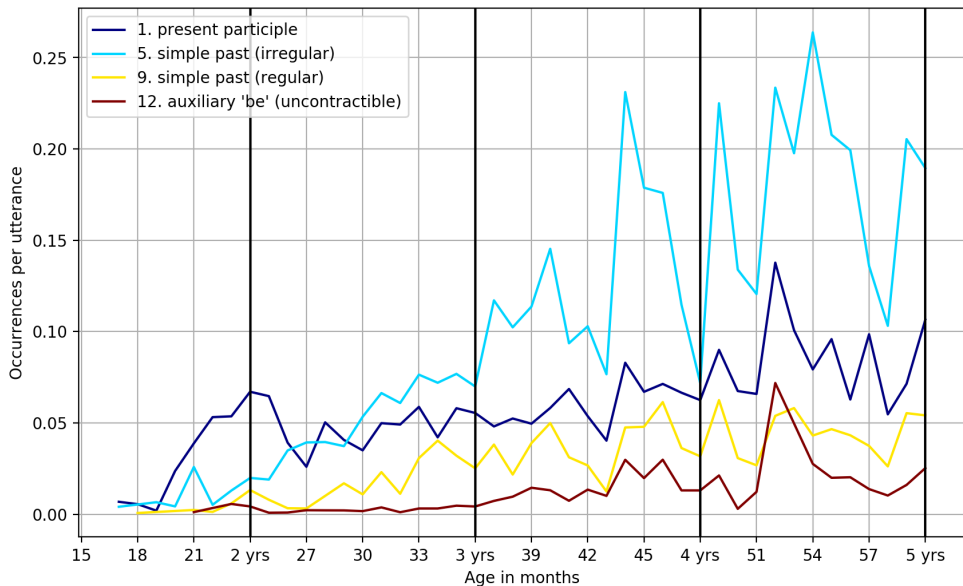
Method:

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*CHI: are you making [...]
%mor: **aux|be**&PRES pro:per|you part|make-PRESP [...]
- ▶ Tally how often each functional morpheme appears (per person, per age).
- ▶ Map the number of each morpheme's occurrences per utterance by month.

Results



Results



Results

- ▶ Does a larger corpus reflect Brown's results?
 - ▶ Partially yes
 - ▶ Partially not, probably also due to...

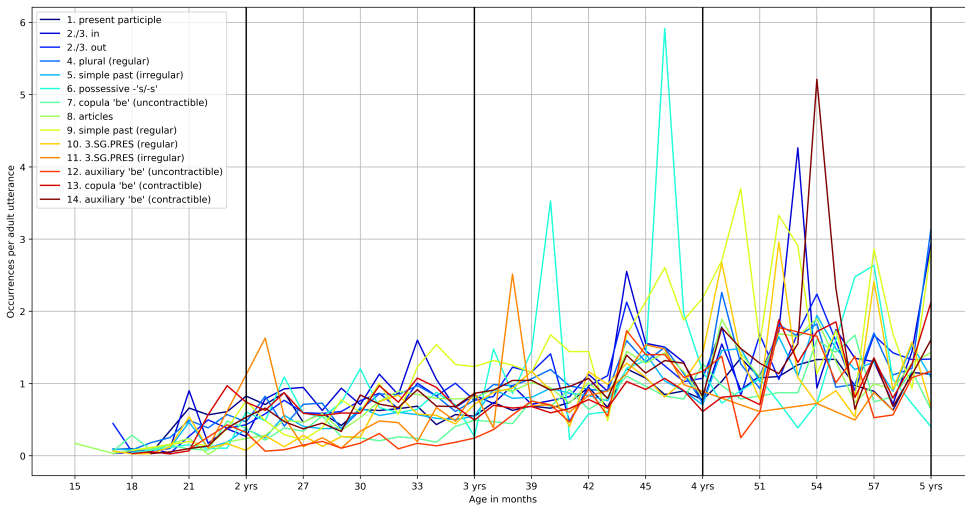
Results

- ▶ Does a larger corpus reflect Brown's results?
 - ▶ Partially yes
 - ▶ Partially not, probably also due to...
- ▶ Shortcomings of an automated, quantitative analysis?
 - ▶ How to define whether a morpheme has been acquired?
 - ▶ Emergence vs. mastering
 - ▶ Tagging errors: worse than expected!
 - ▶ Corpus size still very small

Code:

github.com/verenablaschke/morph-development-children

Appendix I: Additional Graphics



Appendix II: Rules

- ▶ Define rules for each morpheme, e.g.
 - ▶ 1. present participle: suffix, PRESP
*CHI: doing nothing .
%mor: part|do-**PRESP** pro:indef|nothing .
 - ▶ 12. auxiliary 'be' (uncontractible): 'be', aux, syntactic position
*CHI: are you making [...]
%mor: **aux**|**be&PRES** pro:per|you part|make-PRESP [...]

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