The production of negation in parents' and children's speech

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Abstract

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The production of negation in parents' and children's speech

Introduction

Study 1 Questions

- What is the overall trajectory of negative forms in child production?
  - Does the development of negation follow a no > not > nt cline? (Cameron-faulkner et al)
- Do positive variants of the negative constructions exist too?
  - Are early "can't" and "don't" examples unanalyzed wholes? (Klima & Bellugi 1966; Bloom 1970) Do children produce "can't" and "don't" before using "do" and "can"?
- Proportion of no vs. not vs. nt broken down by mean length of utterance
  - instead of age, put mean length of utterance on the x axis?

Study 2 Questions:

- What are early constructions in parents' and children's speech?
- Do children's early negative utterances differ so much from those used by adults? (Thornton & Tesan 2013)
  - How common are ungrammatical non-adult like combinations?
    - How many pre-sentential negation? (NEG + Subject + Predicate)
      - How many sentence internal? (Subj + NEG + Predicate)

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* Is negation external at the beginning? (appear before subjects) Does a NEG + S schema mark the beginning of negation? (McNeill & McNeill)

* How many are optional infinitive: it not fit in here, it don't fit in here?

- control MLU: which forms are common among 1/2/3/... word utterances?

- exclude single "no" (as well as anaphoric no) utterances from "no + more words"

- What is anaphoric negation negating?

- How productive are early forms of negation?

  - average neg + #WORD per child as measure of productivity

Previous Studies

Formal and functional development of negation

1. Klima & Bellugi. 1966. Syntactic regularities in the speech of children. In Psycholinguistic papers, ed. J. Lyons and R. Wales, 183-208. Edinburgh: Edinburgh University Press.

2. Bellugi (1967). The acquisition of negation. Doctoral dissertation, Harvard University, Cambridge, Mass.

3. McNeill & McNeill 1968: Japanese

4. Bloom, L. (1970). Language development: Form and function in emerging grammars. Cambridge, MA: MIT Press.

5. Lord (1974): Variations in the pattern of acquisition of negation

DRAFT

6. Wode, H. (1977). Four early stages in the development of L1 negation. Journal of Child Language 4, 87–102.

7. Pea (1978): the development of negation in early child language. dissertation

8. De Villiers, P., and J. G. De Villiers (1979) "Form and function in the development of sentence negation", Papers and Reports on Child Language Development, 17, 57- 64.

9. Pea Dissertation

10. Clahsen, Harald. 1983. Some remarks on the acquisition of German negation. Journal of Child Language 10:465-469.

11. Choi, S. (1988). The semantic development of negation: A cross-linguistic longitudinal study. Journal of Child Language, 15, 517–531.

12. Weissenborn, Juirgen, and Monica Verrips. 1989. Negation as a window to the structure of early child language. Ms., Max Planck Institut fur Psycholinguistik, Nijmegen.

13. Deprez, Viviane and Amy Pierce. 1993. Negation and Functional Projections in Early Grammar. Linguistic Inquiry 24, no. 1: 25-67.

14. Stromswold, K. (1997) The Acquisition of Inversion and Negation in English: A Reply to Deprez and Pierce', ms. Rutgers.

15. Drozd (1995): Child English pre-sentential negation as metalinguistic exclamatory sentence negation. JCL

16. Hamann 2000

17. Cameron-Faulkner, T., Lieven, E., & Theakston, A. (2007). What part of no do children not understand? A usage-based account of multiword negation. Journal of

DRAFT

Child Language, 34, 251–282.

18. Guidetti (2000): Pragmatic study of agreement and refusal messages in young French children. Journal of Pragmatics

19. Guidetti (2005): Yes or no? How young French children combinegestures and speech to agree and refuse. JCL

20. Schutze (2010) The Status of Nonagreeing Don't and Theories of Root Infinitives

21. Dimroth (2010): The Acquisition of Negation

22. Thornton & Tesan (2013): sentential negation in early child English

23. Nordmeyer & Frank (2014): Individual variation in children's early production of negation

Current Study

Acquisition of negation should concern itself with two notions: 1. negative morpheme 2. compositional complexity. By negative morpheme, we mean the kinds of morphemes that at each stage of acquisition are mapped to negative meanings. English has adverbal and adnominal mophemes that encode the concept of negation. We can look at how each form-meaning mapping emerges in children's development. Second by compositional complexity, we mean the types of elements that each morphemes succesfully negates at each stage of development. Under stuch analysis negation may have been successfully acquired to operate on locative elements but not identity relations. Compositional complexity of negation at each stage also helps us understand how quickly children generalize the function of negation beyond specific arguments it takes in the child's input.

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Study 1: Large-scale metrics

Methods

For samples of parents' and children's speech, we used the online database childes-db and its associated R programming package `childesr` (Sanchez et al., 2018). Childes-db is an online interface to the child language components of TalkBank, namely CHILDES (MacWhinney, 2000) and PhonBank. Two collections of corpora were selected: English-North America and English-UK.

Procedure. All word tokens were tagged for the following information: 1. The speaker role (parent vs. child), 2. the age of the child when the word was produced, 3. the type of the utterance the word appeared in (declarative, question, imperative, other)[1], 4. whether the word was positive or negative, and 5. the type of negative word produced. For this study we considerd the following classes of negative morphemes in English: the forms *no* and *not*, all possible negative clitic auxiliary forms with *n't* (i.e. *ain't*, *isn't*, *amn't*, *aren't*, *wasn't*, *weren't*, *don't*, *doesn't*, *didn't*, *won't*, *shan't*, *hasn't*, *havn't*, *hadn't*, *shouldn't*, *can't*, *couldn't*, *may'nt*, *might'nt*, *would'nt*, and *mustn't*) as well as their positive forms without *n't* as controls, negative pronouns (*nothing*, *nobody*, *no-one*, *nowhere*) and their positive existential and universal variants (*something*, *everything*, *somebody*, *everybody*, *someone*,

[1]This study grouped utterance types into four main categories: "declarative", "question", "imperative", and "other". Utterance type categorization followed the convention used in the TalkBank manual. The utterance types are similar to sentence types (declarative, interrogative, imperative) with one exception: the category "question" consists of interrogatives as well as rising declaratives (i.e. declaratives with rising question intonation). In the transcripts, declaratives are marked with a period, questions with a question mark, and imperatives with an exclamation mark. It is important to note that the manual also provides terminators for special-type utterances. Among the special type utterances, this study included the following in the category "questions": trailing off of a question, question with exclamation, interruption of a question, and self-interrupted question. The category imperatives also included "emphatic imperatives". The rest of the special type utterances such as "interruptions" and "trailing off" were included in the category "other".

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everyone, *somewhere*, *everywhere*), negative quantifier *none* and its existential and universal variants (*some*, *all*), the negative adverb of frequency *never* and its existential and universal variants (*sometimes*, *always*), and finally derivational negative forms with morphemes *un-* (e.g. unhappy), *in-* (e.g. invisible), *dis-*(e.g. disappear), *de-* (e.g. defrost), *non-* (e.g. nonsense), and *-less* (e.g. careless).

Exclusion Criteria. First, unintelligible tokens were excluded (N = 379,549). Second, tokens that had missing information on children's age were excluded (N = 1,060,766). Third, tokens outside the age range of 1 to 6 years were excluded (N = 658,207). The collection contained the speech of 570 children and their parents after the exclusions.

Results

Following Cameron-Faulkner, Lieven, and Theakston (2007), we first look at the proportions of different categories of negation in parents' and children's speech between the ages of 1-6 years. As the right panel on Figure 1 shows, of all negative froms parents produce, the majority are the contracted auxiliary negation *n't*, followed by *no* and then *not* respectively. Other forms of negation like negative quantification pronouns (e.g. *nothing*) or negative adverbs of frequency (e.g. *never*) are much less frequent. In children's productions and between the ages of 12-18 months, almost all negative forms are instances of *no*, with some contracted auxiliary negatives like *don't* and *can't*. As children grow older, the proportions of *not* and its contracted form *n't* increase while the proportion of *no* decreases. Similar to Cameron-Faulkner et al. (2007) we find that children start productions of *no* earlier than other forms. However, we do not find the full form *not* to be produced before its contracted form *n't*. The results in Figure 1 suggest that children start producing *not* and *n't* around the same time, if not slightly earlier for *n't*.

Figure 2 shows the relative frequency of the morphemes *no*, *not* and *n't* per thousand

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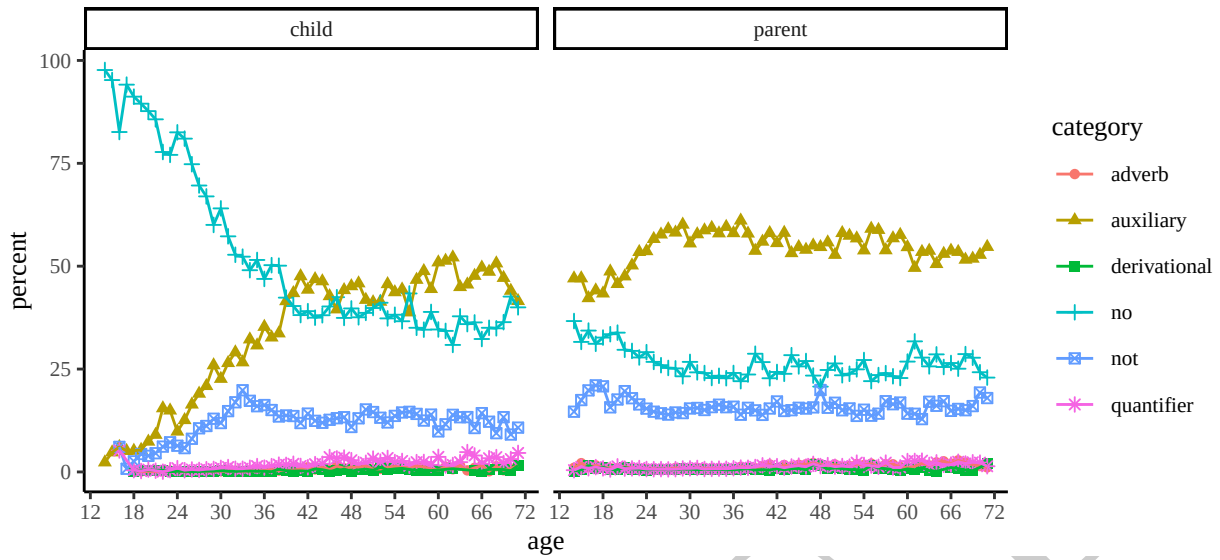

Figure 1. Proportion of different categories of negation in parents' and children's speech between 1 to 6 years of age.

words in the speech of parents and children. Children start producing *no* between 12-18 months and they immediately surpass their parents' rate of production for this morpheme. Betwen 18-42 months children produce two to three times more instance of *no* than their parents. This rapid incrase and high frequency of *no* may be partly because parents ask many yes/no questions from children in this age range. After 42 months the frequency of *no* reduces substantially and gets closer to parents' level of 10 per thousand. For the negative morpheme *not*, children start their productions between 12-24 months and by 30 months of age, they are producing *not* at the same rate as their parents (5 per thousand). After 36 months children's rate of *not* productions stay similar to their parents. Finally for the contracted form *n't*, children's productions start between 12-18 months and by 24 months they reach a rate of 5 instances per thousand words. They keep increasing this rate until they reach their parents' rate of 15 instances per thousand at age 36 months. It is important to note that for all these negative forms, children have reached a substantial level of production by 30 months of age.

Klima and Bellugi (1966) reported that in their sample, children did not produce the

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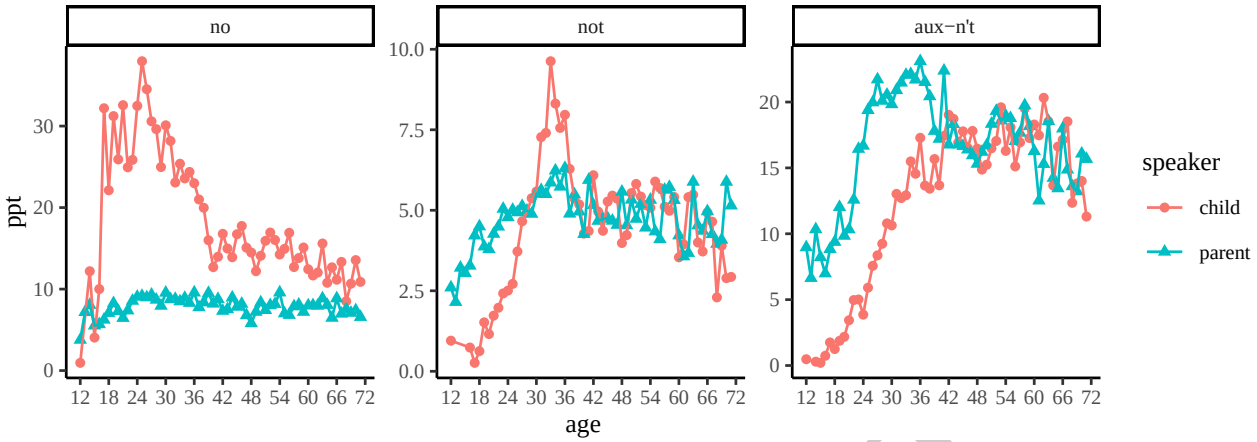

Figure 2. Relative frequency of the response particle *no*, verb phrase negation *not*, and its contracted form *n't*

positive auxiliary forms like *can* or *do* even though they were already producing the negative variants like *can't* and *don't*. Based on this, they hypothesized that the negative auxiliaries are learned as unanalyzed chunks. Choi (1988) concurred and added *won't* to the list of early unanalyzed negative chunks. Figure 3 shows the relative frequency of positive and negative auxiliary forms in the speech of children and their parents. Our results show that overall, children start producing the positive and negative auxiliary forms around the same time and they always produce the positive forms at a higher rate than negative ones. Therefore, the claim that negative auxiliary forms are learned before the positive ones is not supported by our data.

The auxiliary category in our previous figures lump together a wide variety of auxiliary verbs that develop at different rates. Figure 4 shows the production of common negative auxiliary verbs in the speech of children and parents, sorted from top-left to bottom-right based on frequency. The most frequent negative auxiliary form in child-directed speech is *don't* and it is also the earliest and most frequent auxiliary form in children's speech. Children start producing it between 12-24 months and they quickly reach the parents' rate at 36 months. Perhaps the fastest development occurs with the auxiliary *can't*. Children start producing it between 18-24 months and very quickly surpass their parents' rate.

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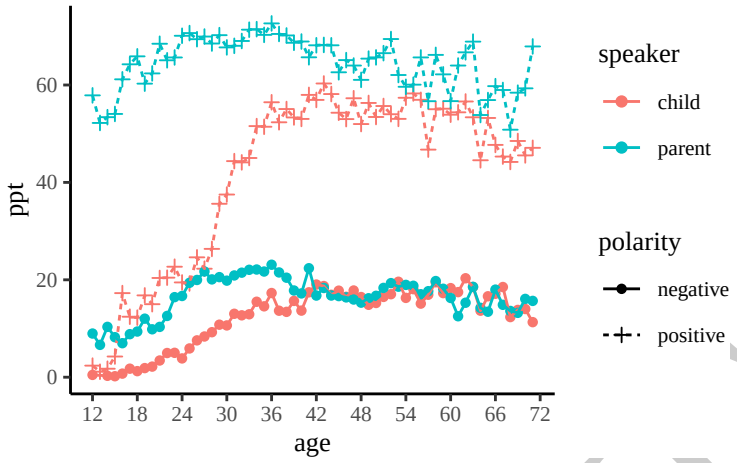

Figure 3. Relative frequency (per thousand words) of positive auxiliary forms such as *do*, *are*, and *can* as well as their contracted negatives in the speech of parents and children.

Figure 5 shows the development of negative and positive indefinite pronouns: *everything*, *nothing*, *something*. Children start producing these words quite early as well, with *nothing* reaching the parent level of production at 30 months.

Adverbs of frequency

Conclusions

Essentially the answers to these questions:

- What is the overall trajectory of negative forms in child production?
  - Does the development of negation follow a no > not > nt cline? (Cameron-faulkner et al)
  - How many children are found to produce no/not/nt at each age?
- Do positive variants of the negative constructions exist too?
  - Are early "can't" and "don't" examples unanalyzed wholes? (Klima & Bellugi 1966; Bloom 1970) Do children produce "can't" and "don't" before using "do" and "can"?

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- Proportion of no vs. not vs. nt broken down by mean length of utterance
  - instead of age, put mean length of utterance on the x axis?

Study 2: Early Productions

Participants

Material

Procedure

Data analysis

Results

Discussion

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192 **References**

193 Cameron-Faulkner, T., Lieven, E., & Theakston, A. (2007). What part of no do
194 children not understand? A usage-based account of multiword negation. *Journal of Child*
195 *Language*, *34*(2), 251–282.

196 Choi, S. (1988). The semantic development of negation: A cross-linguistic longitudinal
197 study. *Journal of Child Language*, *15*(3), 517–531.

198 Klima, E. S., & Bellugi, U. (1966). Syntactic regularities in the speech of children. In
199 *Psycholinguistics papers* (pp. 183–207). Edinburgh University Press.

200 MacWhinney, B. (2000). *The CHILDES project: The database* (Vol. 2). Mahwah, NJ:
201 Erlbaum.

202 Sanchez, A., Meylan, S., Braginsky, M., MacDonald, K., Yurovsky, D., & Frank, M. C.
203 (2018). Childes-db: A flexible and reproducible interface to the child language data exchange
204 system. PsyArXiv. Retrieved from psyarxiv.com/93mwx

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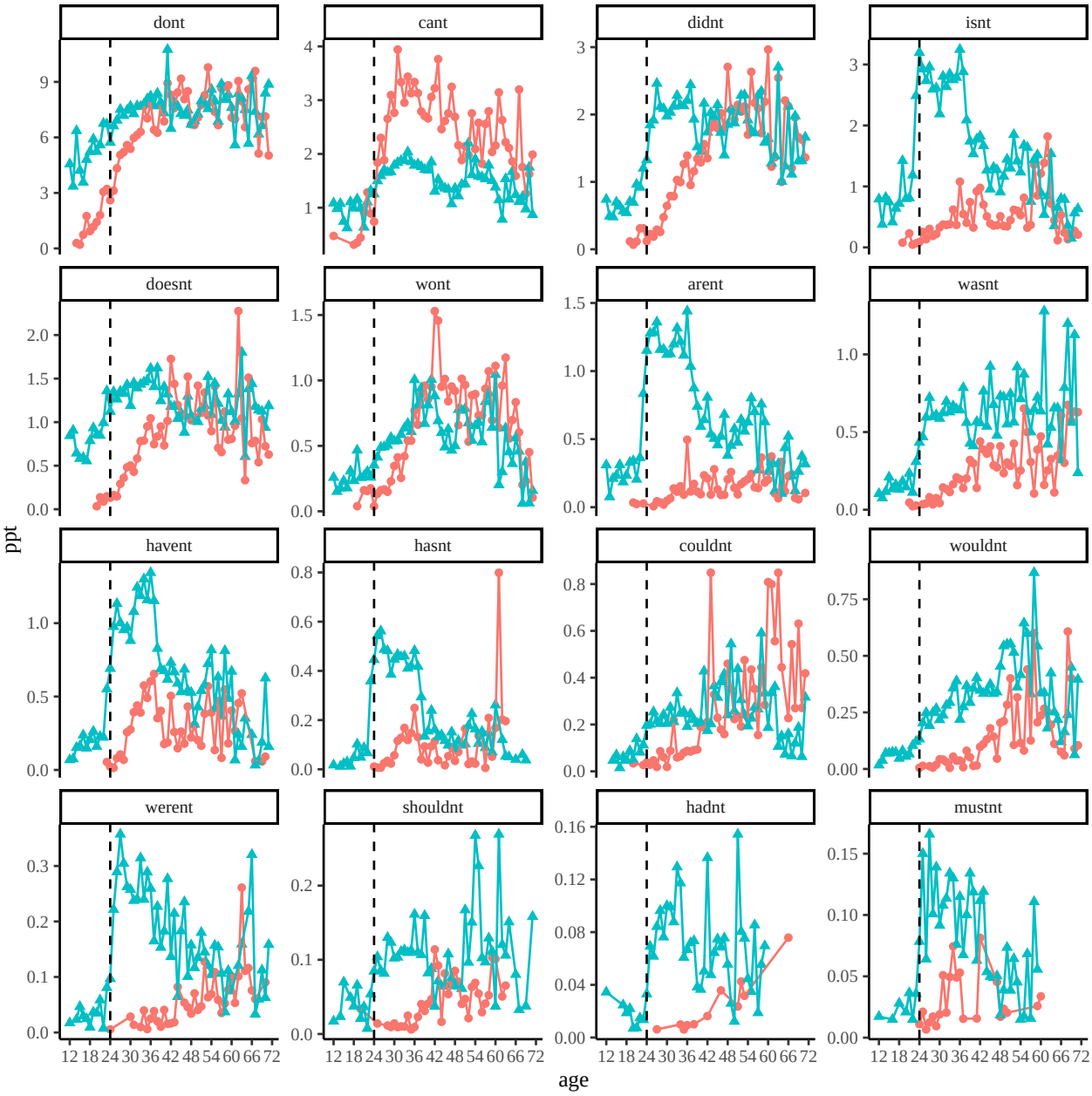

Figure 4. Relative frequency of negated auxiliary verbs in the speech of parents (green triangles) and children (red circles). The dashed line marks 24 months on the x axis.

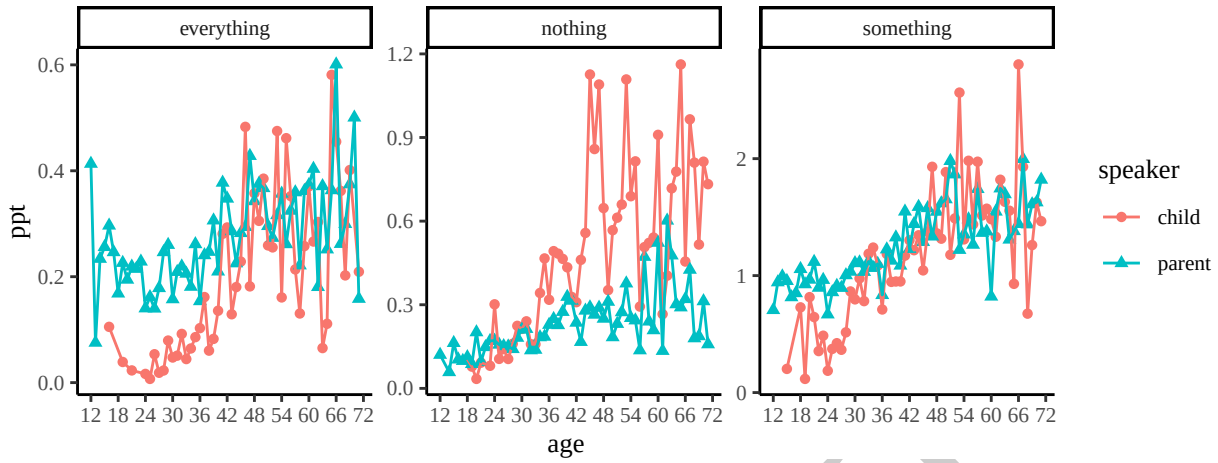

Figure 5. Relative frequency of pronouns *everything*, *something*, and *nothing*

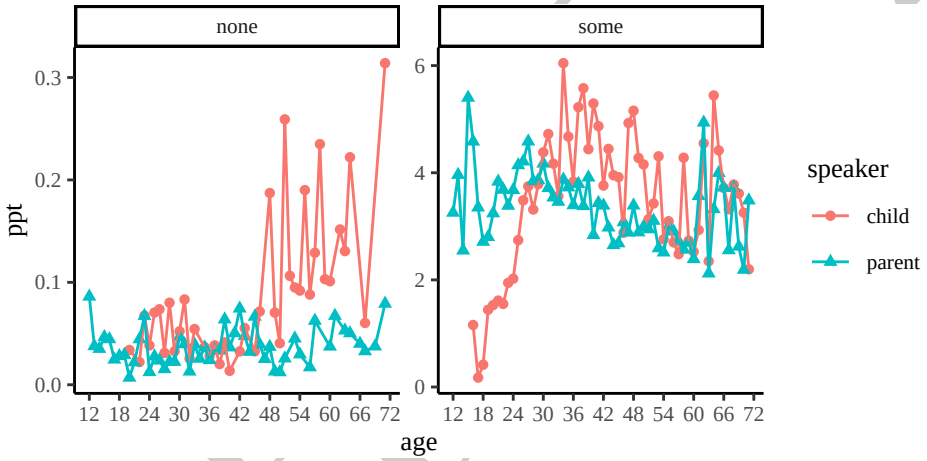

Figure 6. Relative frequency of quantifeirs *none*, *some*, and *all*.

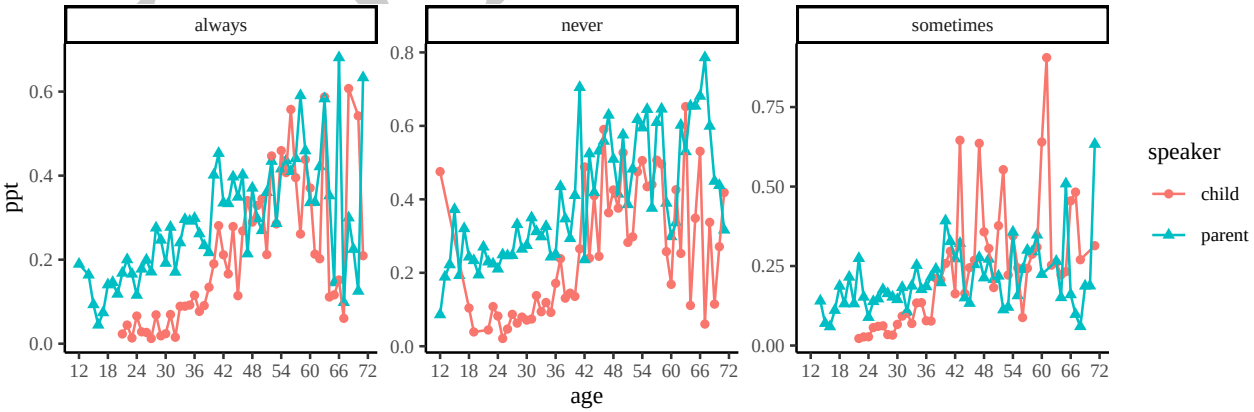

Figure 7. Relative frequency for adverbs of frequency *always*, *never*, and *sometimes* in the speech of parents and children.