

An explanation of the decisive role of function words in driving syntactic development

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English vocabulary consists of two kinds of words:

Content words (CWs) and function words (FWs).

CWs are verbs, nouns, adjectives and adverbs.

For example **eat, hand, pretty, fast.**

FWs are determiners, prepositions, auxiliaries, pronouns, coordinators and subordinators.

For example **this, of, will, she, and, if.**

We ask: Why are content words lesser predictors of syntactic development?

We wanted to understand the advantage of the early mastery of FWs over CWs for syntactic development (e.g., Le Normand et al., 2013).

We tested the hypothesis that the learning of FWs necessarily involves **learning their syntax**, but not the learning of CWs (despite the popular “syntactic bootstrapping” theory).

The proposed explanation:

FWs such as determiners are defined by their syntax, therefore learning them **requires cracking the code of syntax in multiword expressions.**

By contrast, learning CWs merely requires that the words are matched to their meaning in the non-linguistic context, but may not necessarily need an understanding of their syntactic behaviour (Ninio, 2016).

Hypothesis:

Contrasting two-word sentences as the minimal multiword types with single-word utterances that lack syntax:

We hypothesize that **FWs** will be learned from at least **two-word long input sentences**, with their syntax,

whereas

CWs will be equally learned from **single-word utterances** without mastering their syntax.

Method: Samples

English-language parental and child samples were taken from the CHILDES archive, **N=350**.

Parental corpus

Parents produced **22,595** single-word utterances and **23,143** 2-word long sentences.

Interjections were excluded from the corpus and also interrupted utterances.

Child corpus

The children were at the beginning of multiword combinations, mean age **2;0.18** (SD =0;4.8).

They produced **24,444** single-word utterances and **11,642** two-word long syntactically structured sentences.

Only spontaneous utterances were included in the study.

All words in the corpus were tagged for part of speech (POS) category:

POS	examples:
noun	ball, bear, baby
verb	jump, hear, tickle
adjective	big, good, red
adverb	again, quickly, here
pronoun	I, me, you
determiner	the, that, mine
preposition	on, in, to
conjunction	and, but, or
auxiliary verb (incl. copula)	can, do, is

Two-word sentences were analyzed for syntactic structure, their **head-words** taken as targets of analysis.

I write. (head is a verb)

Large bag. (head is a noun)

That box. (head is a determiner)

Too cold. (head is an adjective)

For you. (head is a preposition)

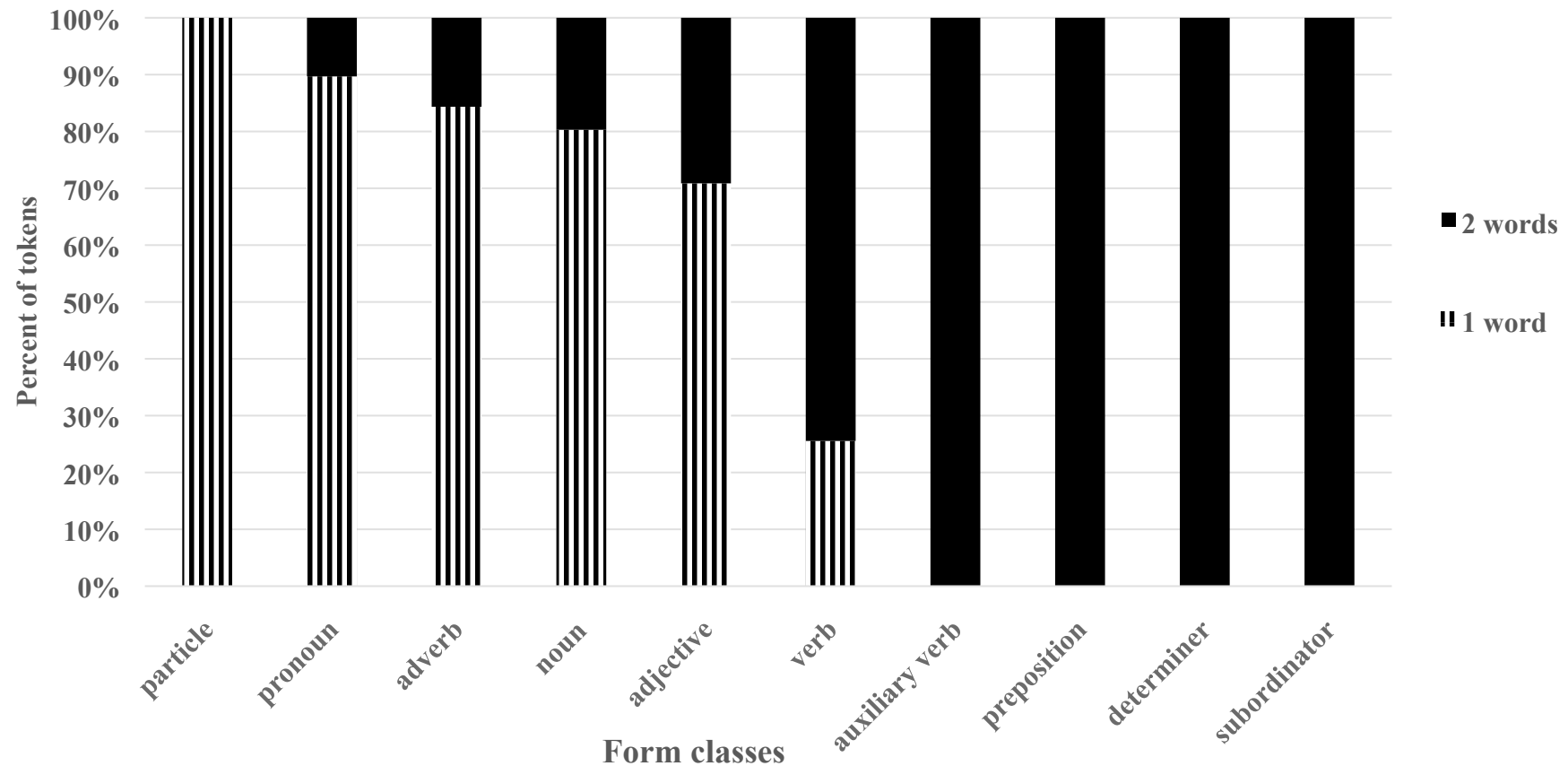
I can. (head is an auxiliary verb)

Hypothesis testing on the input

The hypothesis was first tested by comparing the production of CWs and FWs in parents' single word speech and as heads of their two-word long sentences.

We predicted that FWs occur mostly as heads of 2-word long sentences, but CWs also as 1-word utterances.

Parents' Use of Words by Form-Class and Length of Sentence



Results:

In four categories of function words, namely subordinator, determiner, preposition and auxiliary verb, there were **almost no single-word utterances** produced by parents.

The hypothesis of requiring a syntactic combination **for minimal expression** was supported for function words serving as **heads of combinations**, not for pronouns and particles that only serve as dependents.

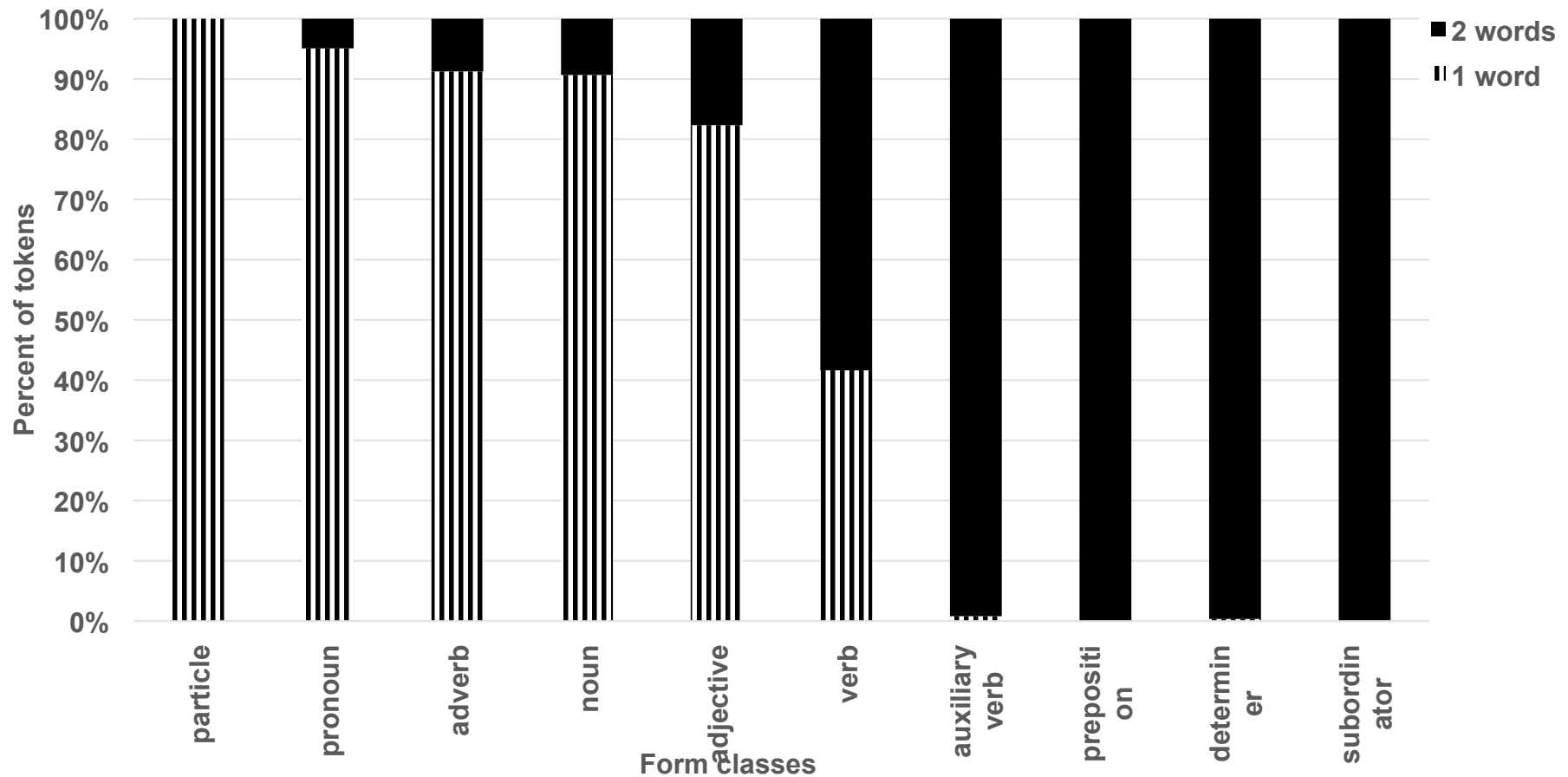
As expected, the four content classes occurred in **a mixture** of single-word and multiword sentences.

Hypothesis testing on child speech

Next, we repeated the analysis on
children's single-word and two-word long
speech.

The results were very similar to those of
parental speech.

Child Use of Words by Form-Class and Length of Sentence



Children's FWs are learned from parents' multiword input

We computed a Pearson correlation coefficient between the proportion of single-word tokens in children's and parents' speech in various form-classes, and found that the correlation is very high: **0.99**.

We may conclude that children **learn FWs only** from multiword parental sentences, hence learning them involves **cracking their syntax**.

This **may explain** the better predictive power of FWs for syntactic development.

References

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Additional references

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<http://micro5.mscc.huji.ac.il/~msninio/>

Thank you!

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