

# Children’s Vocabulary Development in American Sign Language\*

Similar Trends between Developing Vocabulary for Sign Language and Speech Language

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## Abstract

This paper investigates the development of American Sign Language in children by observing the relationship between different ages during developmental years and various types of vocabulary terms. Using the data from the open database, Wordbank, we found that children learning to speak a visual language share a similar trend in vocabulary development to those learning auditory languages. This highlights the importance of learning American Sign Language at an early age as it provides the ability for those with hearing impairments or disabilities to participate in society like any other able-bodied individual.

## 1 Introduction

American Sign Language (ASL) allows for communication and interaction with the community of people who are deaf or have hearing disabilities. This makes sign language an essential tool for inclusivity and accessibility. Learning ASL enables those with hearing impairments to participate in society just like any other abled person. The ability to communicate with others through ASL can help diminish communication barriers and help create more inclusive environments for all. And learning languages is best at early stages of life.

In this paper, we investigate the patterns and trends that occur during the early developmental years of childhood in terms of vocabulary in American Sign Language. The estimand that we are trying to estimate is the relationship between children’s developmental ages and their production of vocabulary words in American Sign Language. We aimed to visualize the milestones for children’s vocabulary development in sign language to compare it to the timeline of vocabulary development for speech-language. This paper uses data obtained from the

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\*Code and data are available at: [https://github.com/mxnrm/Children\\_Vocab\\_Development.git](https://github.com/mxnrm/Children_Vocab_Development.git).

open database, Wordbank, which exhibits information on the development of children’s vocabulary in various languages. The dataset, “Full Child-by-Word”, available on this database, provides information on the demographic details of each child when provided as well as the variables presenting their vocabulary assessment.

With our focus on the development of American Sign Language vocabulary, we found that children learning to communicate a visual language share similar trends in vocabulary development to those that are learning a spoken language. We were also interested in how children develop this natural language at an early age and the differences in comprehension and production between different vocabulary terms. The findings in this paper highlight the importance of learning American Sign Language at an early age because it allows those with hearing disabilities to experience a more accessible world. The importance of learning American Sign Language at an early age is emphasized as it provides the ability for those with hearing impairments or disabilities to participate in society like any other able-bodied individual. It acknowledges how the world often caters to able-bodied members of society, making things less accessible for the deaf and hard-of-hearing community. By understanding the cognitive processes involved in learning a visual language, we are better able to support individuals in their language acquisition.

The remainder of this paper is structured as follows: Section 2 introduces the data used for analysis and findings, including visualizations of the variables of interest, Section 3 presents the simple linear regression model to justify and predict the relationship between the developmental ages of children and their production of vocabulary words in ASL, Section 4 displays the interpretations of the model alongside other findings from analyzing the data, and Section 5 provides a discussion on the implications of the findings as well as the weaknesses of this paper and its next steps for further study on this subject.

## 2 Data

### 2.1 Overview of Data

### 2.2 Data Source

### 2.3 Variables of Interest

Discuss.

Discuss.

Discuss.

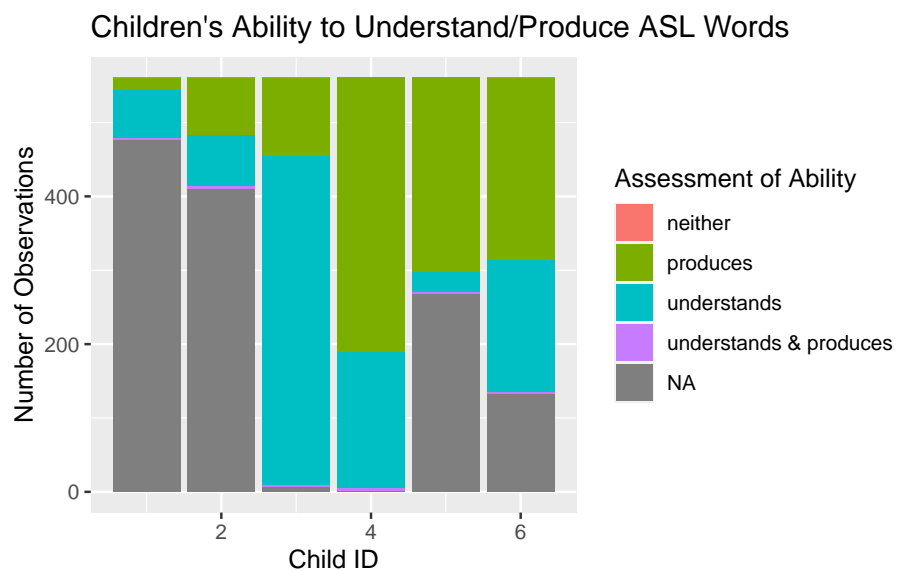


Figure 1: Child's By American Sign Language (ASL) Word Overall Asseessment

		N	%
Production Ability	NO	4	0.1
	YES	2070	61.5
	NA	1292	38.4
Comprehension Ability	NO	1085	32.2
	YES	989	29.4
	NA	1292	38.4

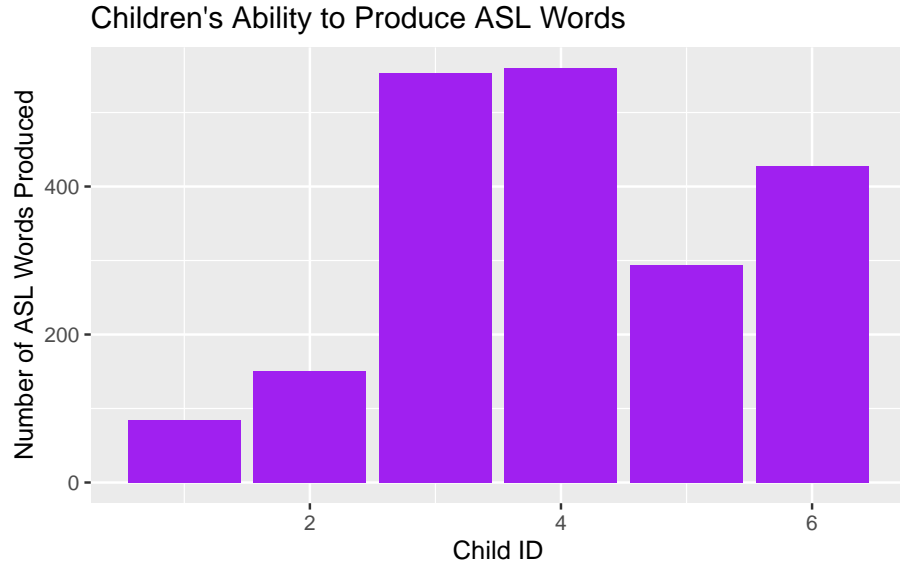


Figure 2: Child's Amount of Produced ASL Words

### 3 Model

We estimate the following model:

$$Y_i = \beta_0 + \beta_1 Age_i (\#eq : 1) \quad (1)$$

In Model @ref(eq:1):

- $Y$  is ...
- $\beta_0$  is ...
- $\beta_1$  is ...

#### 3.1 Model Justification

### 4 Results

Discuss.

Our results are summarized in TABLEX.

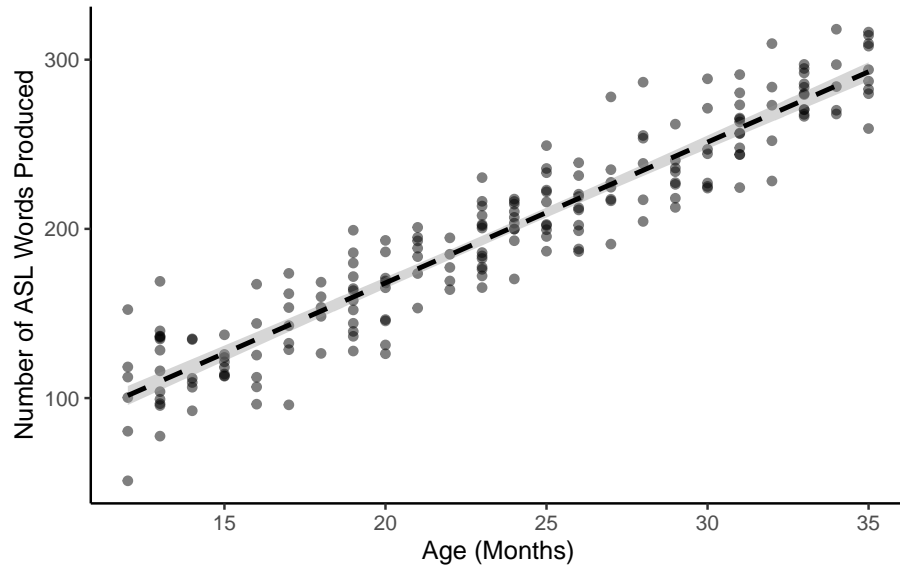


Figure 3: Linear Model of Produced Words by Children Ages

	(1)
(Intercept)	1.695 (5.208)
age_in_months	8.319 (0.213)
Num.Obs.	200
R2	0.886
R2 Adj.	0.885
AIC	1776.6
BIC	1786.5
Log.Lik.	−885.283
RMSE	20.24

## **5 Discussion**

### **5.1 First discussion point**

### **5.2 Second discussion point**

### **5.3 Third discussion point**

### **5.4 Weaknesses & Next Steps**

#### **5.4.1 Weaknesses**

#### **5.4.2 Next Steps**

## Appendix

### A Additional details

## B References