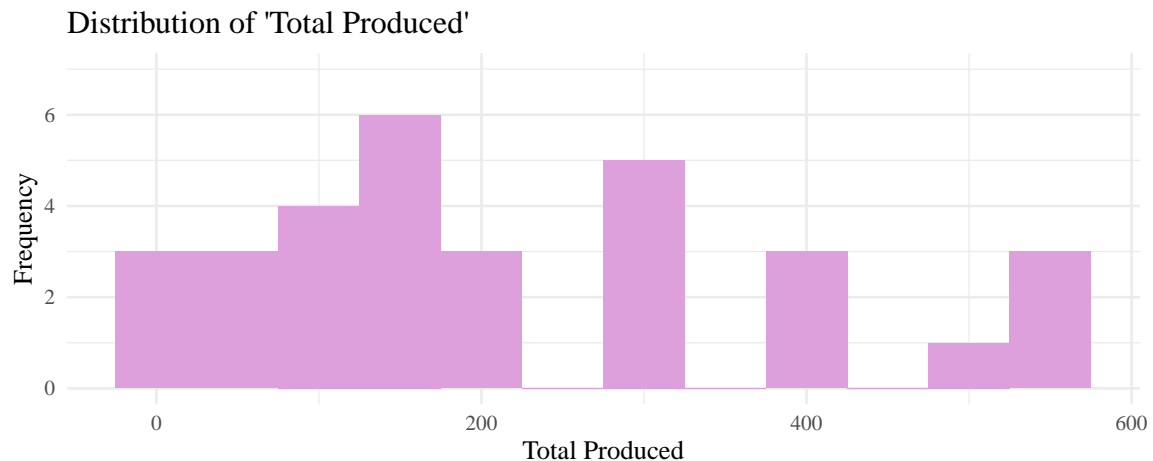
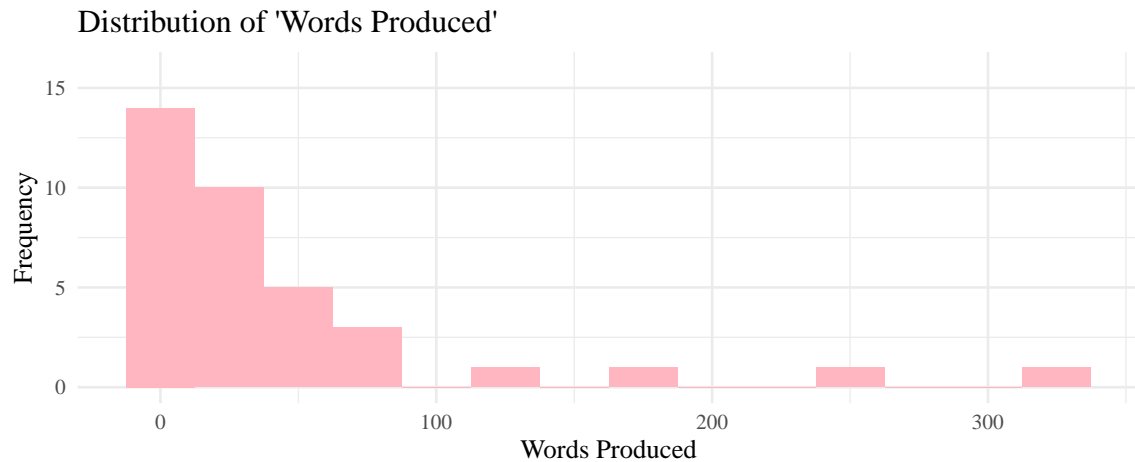


# Multilevel Analysis and Visualizations

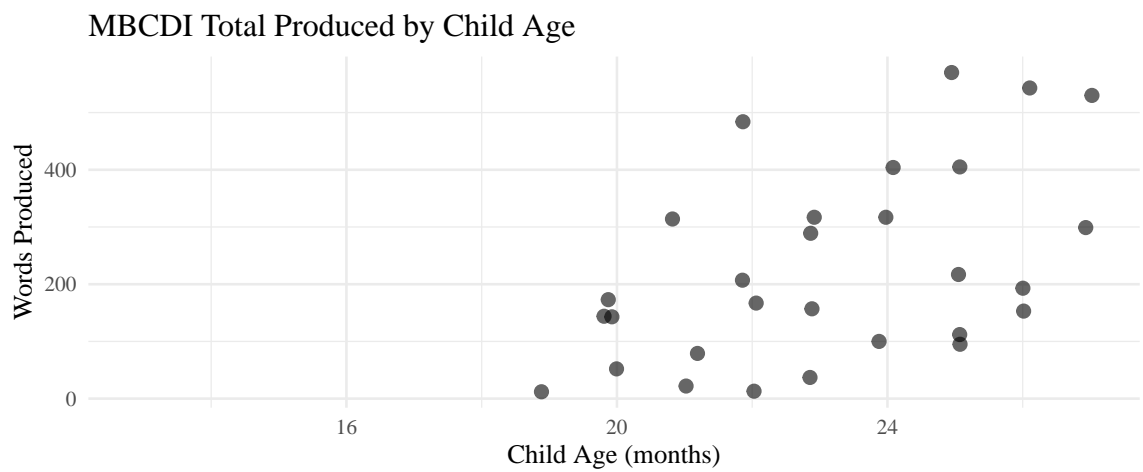
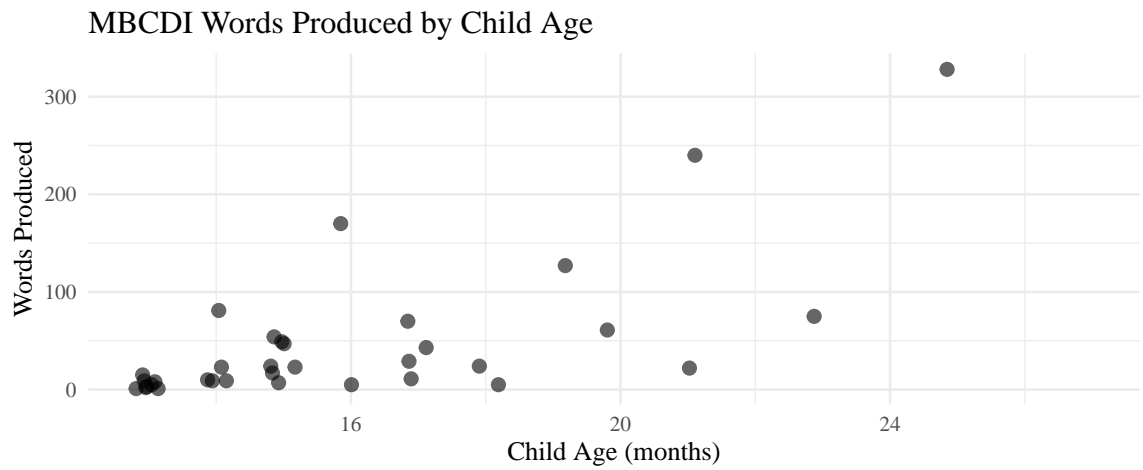
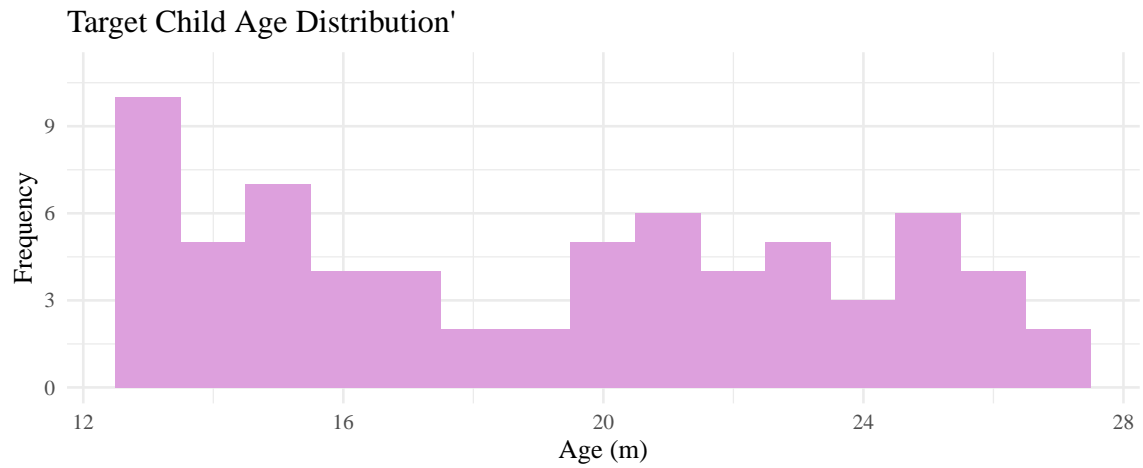
## Visualization of the Data

### MacArthur-Bates Communicative Development Inventory

Parents who consented to participation were sent questionnaires asking about their reading beliefs, habits, household details, and more. Of those questionnaires was the MB-CDI. Depending on age, different versions were deployed — WG for children <19 months and WS for children >19 months. Parents who answered the WG version fall under the “Words Produced” graph while parents who answered the WS version fall under the “Total Produced” graph. These are the variables that will be used in the multilevel analysis.



## Age Breakdown



## Children and Parent Scores

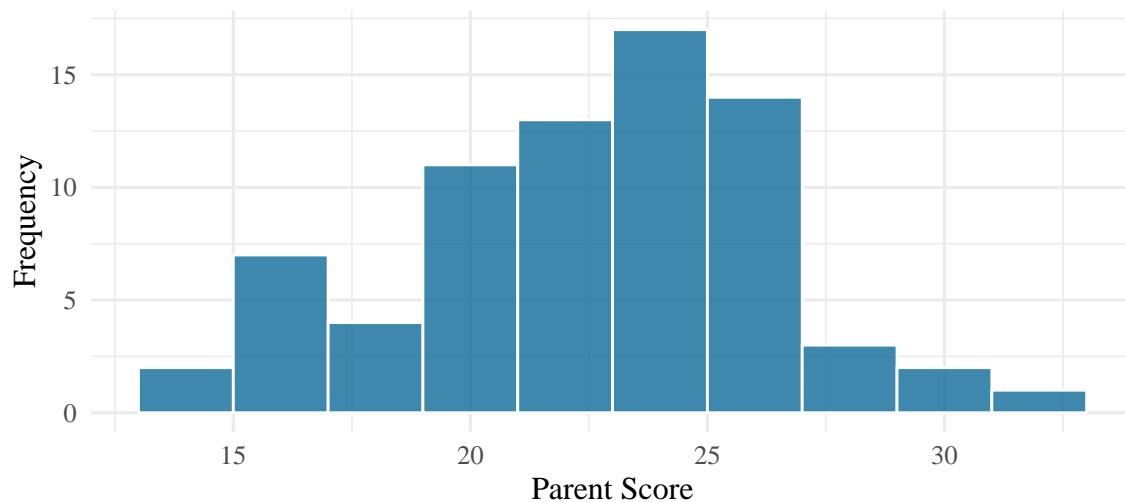
Specific questions were used to calculate respective parent and child scores. Each score takes into account 5 questions.

### Parent Score

Scores are out of 40 and the questions used to calculate the parent score are as followed:

1. When you read to your child to what extent does your child quietly listen to the story, or is reading an interactive activity?
2. When you read to your child, how often do you read the text on the page exactly as it appears?
3. When you read to your child, how often do you make up your own story and talk about the pictures on the page?
4. When you read to your child, how often do you name objects or actions in the pictures?
5. When you read to your child, how often do you ask your child questions about the objects or events in the story or in the pictures?

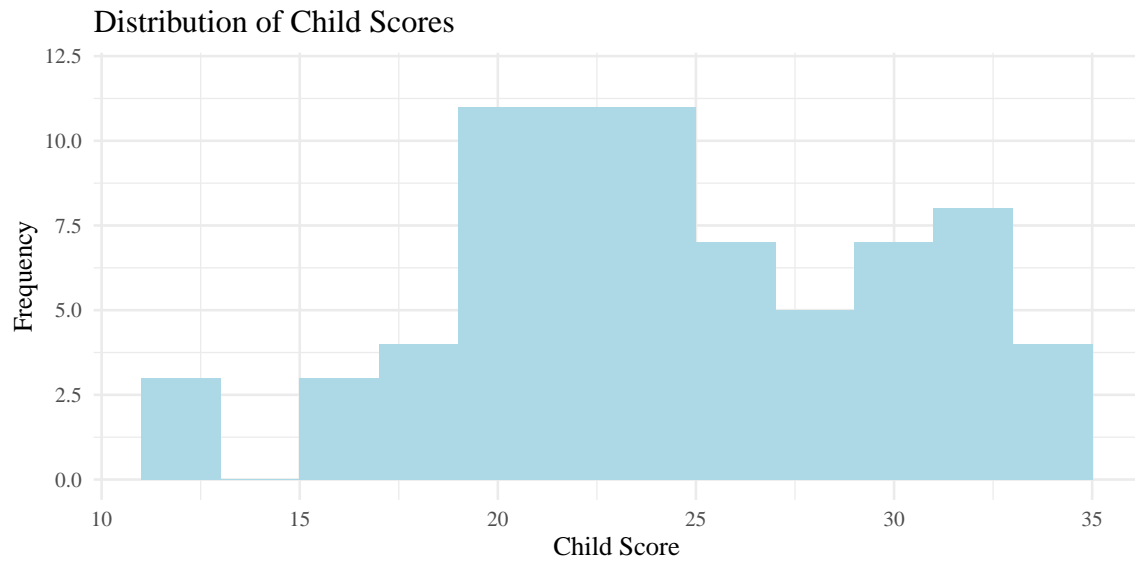
### Distribution of Parent Scores



### Child Score

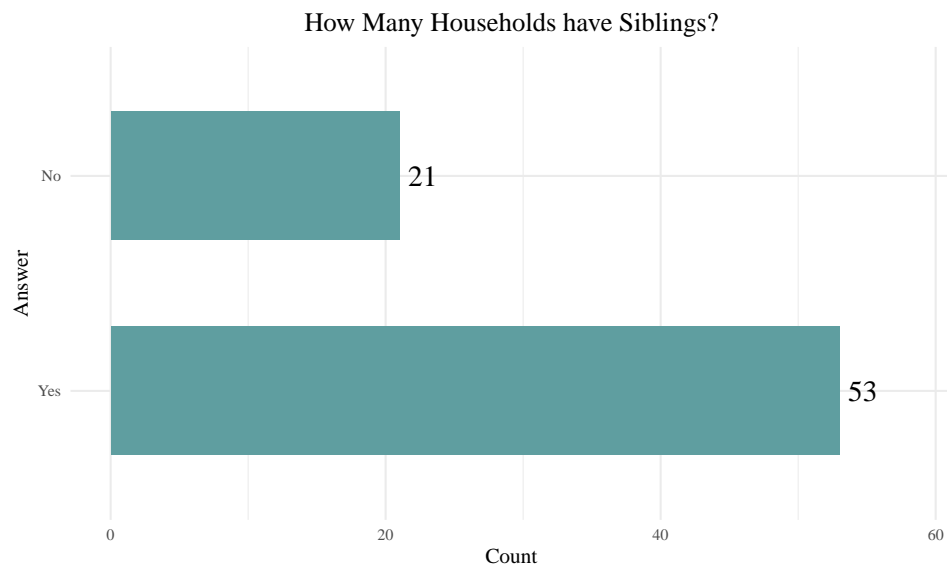
Scores are out of 40 and the questions used to calculate the child score are as followed:

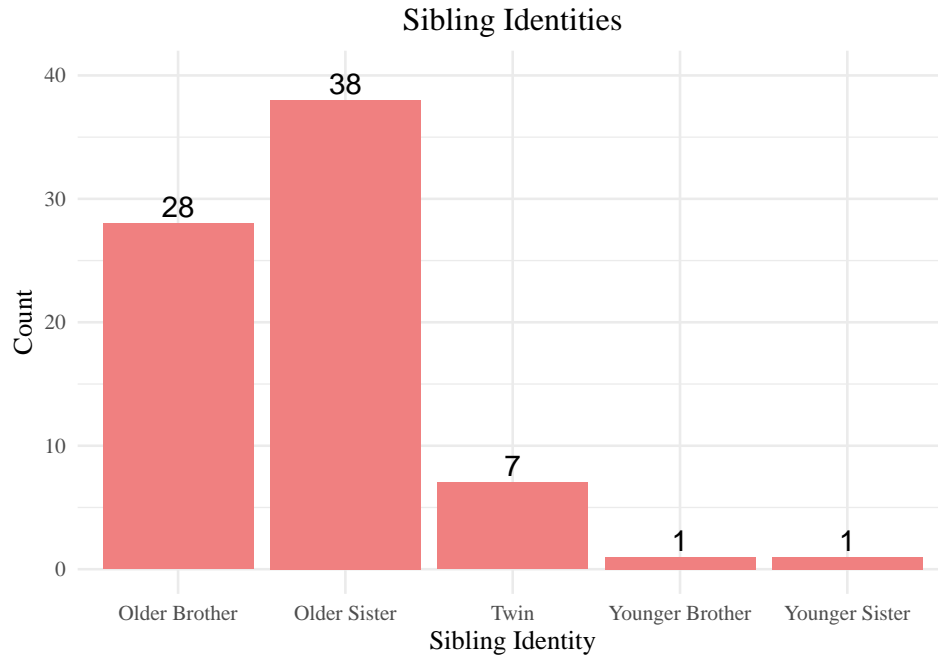
1. When you read to your child, how often does your child touch things on the pages of the book?
2. When you read to your child, how often does your child snuggle and look at items on the page?
3. When you read to your child, how often does your child vocalize or make sounds or say words while you're reading?
4. When you read to your child, how often does your child point to objects on the page?
5. When you read to your child, how often does your child repeat words right after you say them?



## Household Details and Sibling Identity

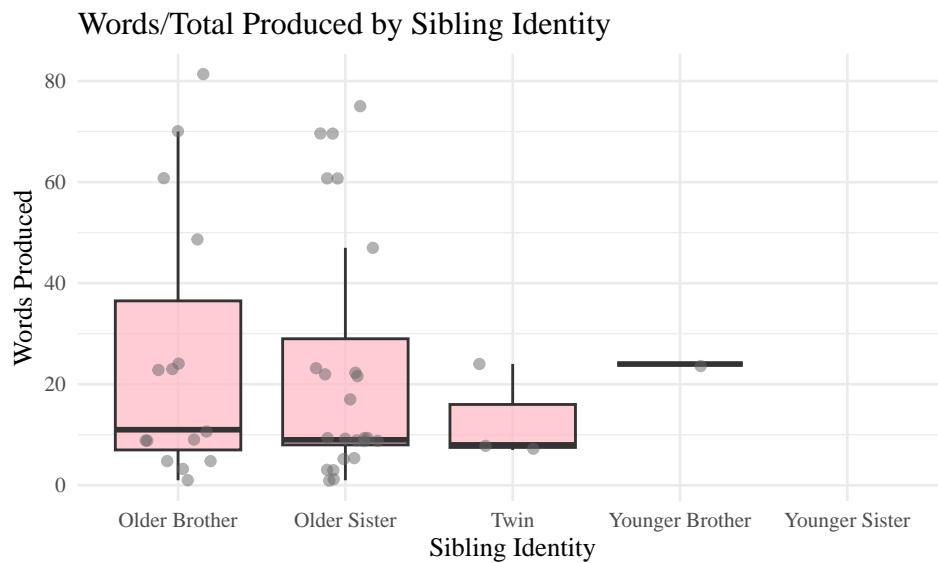
After looking at the parent and child scores, the specific household details, specifically about sibling count and identity was graphed. **Sibling Identity** refers to the sibling's relation to the target child.

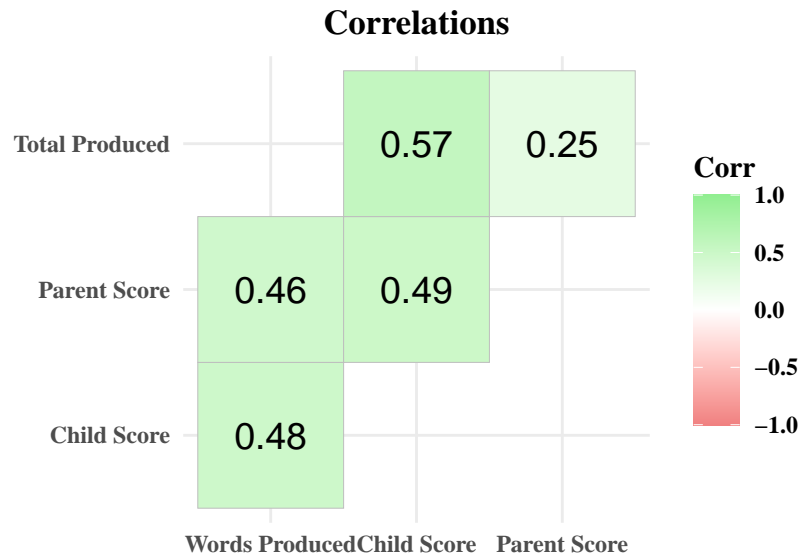




### Production and Correlation by Sibling Identity

Because some sibling data derived from WG questionnaires and some from WS questionnaires, the visualization compiles both the **Total Produced** and **Words Produced** into one visualization categorized by sibling identity.





## Frequentist Analysis of Data

Table 1: Descriptive Stats

Variable	Mean	SD	N
Child Age	19.118	4.586	68
Child Score	24.849	5.507	73
Parent Score	23.123	3.789	73
Words Produced	45.889	69.758	36
Total Produced	228.533	168.695	30