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2017

Using LENA to Examine Associations between Parental Speech and Child Language Skills

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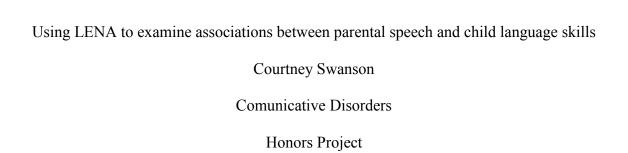*University of Rhode Island*, cswanson@my.uri.edu

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Comunicative Disorders

Honors Project

May 2017

Children are exposed to language starting as soon as they are born. The differences between paternal and maternal speech is an area of study that has an ample amount of inconclusive evidence in its results. Typically, mothers are the primary language source for a child and input from them has been viewed as more influential, as traditional gender roles play a part in the presence of parents. However, it is shown that fathers use more complex syntax, or vocabulary, with their children, while mothers utilize a form a speech known as *motherese.* Motherese is "baby talk," in which intonation patterns are adjusted to higher pitch and elongated syllables accompany simplified words in order to grab a child's attention in a soothing way.

The Bridge Hypothesis (Gleason, 1975) addresses the gap between maternal and paternal speech. It claims that since fathers use less scaffolding of abstract semantics with their children, children acquire the real-world linguistic skills from their fathers, while they acquire comfortable, domestic speech from their mothers. Paternal speech influences skill in talking to strangers, discussing abstract concepts, and reading comprehension. Not only do fathers speak in more complex morphological and phonological ways, but they also typically spend less time verbally interacting with their children, too. Thus, the language from a father to a child is inherently just as valuable because the infrequency accompanied with complexity of the speech is instrumental for a developing child.

Prior to technological advances, transcription of speech was tedious, as it required using the International Phonetic Alphabet (IPA), which uses symbols to represent specific speech sounds. The LENA (Language Environment Analysis) Research Foundation's goal was to accelerate the language development of children from ages 0-5. The foundation is based on the theory that both parents play a crucial part in their child's cognitive, linguistic, social, and emotional development. More specifically, interactive talk is a vital factor in this development,

and each parent plays his or her own respective role in that. LENA created a device that significantly changed the process of analyzing speech data without having to phonetically transcribe. It is essentially a speech recognition technology, which acquires data from a child's natural language environment. It can be placed in a shirt pocket and can store up to sixteen hours of data and record from up to 1.8 meters away. After the data is collected, the recorder synchronizes the data into a computer with software that processes the data and displays a variety of statistical information to the researcher. The statistical information includes data on adult word count, conversational turns, child word count, and percentiles. It also can generate an expressive verbal age based on the child's language performance.

The purpose of this study was to investigate the parental speech patterns and significance between fathers and mothers. Specifically, it addressed these two questions: 1) Are there differences in word count between mothers and fathers? 2) Are mother's and father's word count related to child language skills? In this particular pilot study, each child was given a LENA device to take home and wear. The devices recorded 5 hours of speech input and output that the child experienced. No other requirements were given, so this sample is representative of typical language exposure. The sample included two 5-year-old male participants with no identified language delay or disorder. Both children come from two-parent households.

The results of this study concluded that mothers use more words than fathers. This was expected; however, the differences across parent gender were not significant (t = 1.76, p = .329), which is likely due to a very small sample size. For both families participating in this exploratory study, mothers had a higher frequency of word use than fathers. Interestingly, though, the correlation between fathers' Adult Word Count (AWC) and child language skills was large although not significant (rho = .775, p = .225). For mothers, concurrent correlations were smaller

and also not significant in respect to child language skills (rho = .258, p = .242). This finding requires further exploration in future studies. Results, however, suggest that fathers do play an important role in child's language acquisition and skills.

In the future, it would be fascinating to expand this study to include children of single-parent households, bilingual children, and children who have language delays and disorders, such as autism. This technology has the ability to generate, categorize, and analyze data rapidly, which will enhance the profession of communicative disorders considerably.