A Comparison Of The Classroom & Home Audio Environments Among Siblings

Danielle Jeglie, MA, Courtney Palma, MA, Abbie McCauley, PhD, Mike Esposito, MA, SLP/CCC, & M. David Gothard, MS
Family Child Learning Center, Akron Children's Hospital & Kent State University

Introduction:

- Previous research has emphasized the importance of parental language input and adult-child conversations to the language development of typically developing (TD) children (Zimmerman et al., 2009).
- Given that children with autism often show delays in language development and communication skills (Mitchell et al., 2006), the role of adult language input and aspects of the home environment may be even more critical for their language development.

Purpose:

- Examine classroom and home LENA recordings from three sets of siblings who attended the Family Child Learning Center (FCLC)'s Integrated Preschool for Children with Autism.
- Identify the influence of variables, such as gender and diagnosis, on children's language.

Subjects:

- Three sibling sets (N=6) from the FCLC Integrated Preschool for Children with Autism.

Table 1: Demographics of Sibling Sets

Sibling Set 1	*Sibling Set 2*	*Sibling Set 3*
Child 1	**Child 1**	**Child 1**
Male	Male	Male
Typically Developing	Autism	Typically Developing
1st Year Class	1st Year Class	1st Year Class
Child 2	**Child 2**	**Child 2**
Male	Female	Female
Autism	Typically Developing	Typically Developing
2nd Year Class	2nd Year Class	2nd Year Class

Methods:

- Home and classroom LENA recordings were collected over a seven-month period (October 2011-April 2012).
- A total of approximately 250 home recording hours and 150 classroom recording hours were collected.
- Rates (per hour) were calculated for Adult Word Count, Conversational Turn Count, Child Vocalization Count, and for measures of the Audio Environment (Meaningful, Distant, Silence, Noise, TV/Media).

Question #1: *What are the differences in the classroom audio environments of children with autism and their TD siblings?*

Results:

- No significant differences were found in the classroom audio environment of children with autism and their TD siblings (p_s>0.05) (i.e., children with autism and their TD siblings were exposed to similar amounts of meaningful speech in the classroom). *(see Charts 1 & 2)*

Chart 1: Classroom Audio Environment for Children with Autism

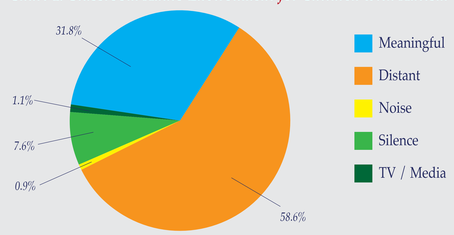
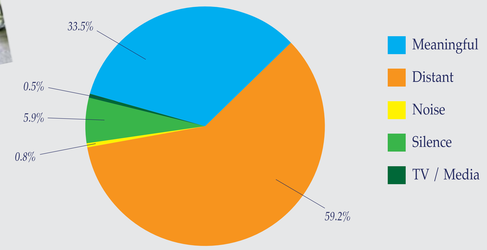


Chart 2: Classroom Audio Environment for their TD Siblings

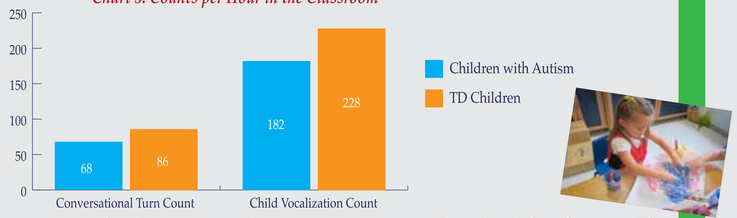


Question #2: *What are the differences in vocal output and conversational turns between children with autism and their TD siblings?*

Results:

- A significant difference was found for Conversational Turn Count (p=0.001) and for Child Vocalization Count (p=0.006) (i.e., in the classroom, children with autism had significantly lower CTC and CVC compared to their TD siblings). *(see Chart 3)*
- No significant difference was found in Adult Word Count (AWC) for children with autism and their TD siblings (i.e., in the classroom, children with autism and their TD siblings heard similar amounts of adult words).

Chart 3: Counts per Hour in the Classroom



It is striking how similar the classroom audio environments were for all of the children. The decreased conversational turn counts and child vocalization counts can be easily explained by the communication deficits inherent in children with autism. We have the unique situation of having three sibling sets of preschool age participating in the same program, with the opportunity to collect LENA recordings from each sibling simultaneously in their home environments.

Question #3: *What are the differences in the home audio environments of children with autism and their TD siblings?*

Results:

- There was significantly more silence and less meaningful speech (p_s<0.05) found in the homes with a child with autism (Sibling Sets 1 & 2) compared to homes without a child with autism (Sibling Set 3). *(see Charts 4 & 5)*

Chart 4: Home Environment of Children with Autism (Sibling Sets 1 &2)

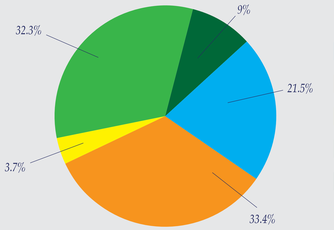
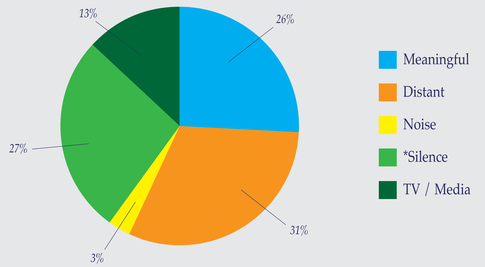
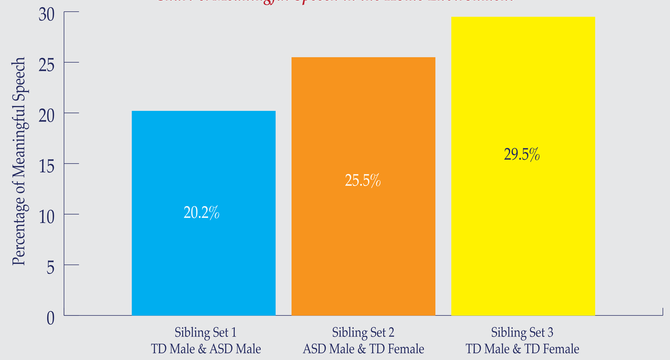


Chart 5: Home Environment of TD Siblings (Sibling Set 3)



Looking at each sibling set individually, the most significant difference was found in the percentage of meaningful speech. *(see Chart 6)*

Chart 6: Meaningful Speech in the Home Environment



We further examined each sibling set to see what demographics might account for these differences in meaningful speech.

Does having a diagnosis of autism influence the amount of meaningful speech in the home?

- In Sibling Set 3, we see the largest percentage of meaningful speech in the home (29.5%).
- In Sibling Set 2, we see a significant decrease in the amount of meaningful speech (29.5% ➜ 25.5%). This reduction suggests that having a child with autism in the home negatively impacts the amount of meaningful speech.
- Sibling Set 1 shows the lowest percentage of meaningful speech of the sibling sets (29.5% ➜ 25.5% ➜ 20.2%). This home has a child with autism. However, the TD sibling is male. This suggests that gender may influence the amount of meaningful speech.

Conclusions:

- Findings from ANOVA further suggested that there is a combined negative effect of 1) having autism and 2) being male (seen in Sibling Set 1) on the meaningful speech heard in the home audio environment.
- Exploratory analyses suggested that gender had a greater effect than having a diagnosis of autism on several of the language measures. Future studies should further examine these relationships.