

ABSTRACT

The purpose of the present study was to compare LENA and SALT data from naturalistic language samples obtained from 12 preschool-aged children with Autism Spectrum Disorders (ASD) for the purpose of determining the nature of the relationship between variables derived by these two language sampling technologies.

The relationships between LENA AWC and SALT adult number of word count and LENA CTC and CVC, and SALT child number of utterance count was calculated for a) all samples, b) home and school environments, c) 1-1 and group environments, and d) verbal and non-verbal participants.

Results of analysis indicate strong positive relationships between LENA and SALT adult word counts as well as between LENA CTC and CVC, and SALT child utterance counts. The strongest relationship between LENA and SALT measures was identified in highly structured 1-1 environments.

Clinical implications and directions for future research based on preliminary study results are discussed.

CONTACT

Sloane Burgess
Kent State University
Email: sburgess8@kent.edu
Phone: 330-672-0610

INTRODUCTION

LENA™ and **SALT** are two important technologies to analyze child language samples.

LENA technology is used to provide quantitative data.

SALT technology is used to provide quantitative and qualitative data.

There is only one study comparing adult and child data obtained via LENA and SALT technologies:

Oetting and colleagues (2009) analyzed data gathered during interactions between young typically developing children and their mothers.

The authors evaluated the relationship between:

1. LENA AWC and SALT adult word counts.
 - Moderate to high correlations were found between LENA and SALT adult word counts.
2. LENA CTC and estimates of number of child turns using SALT turn length data.
 - Weaker relationships were found between LENA and SALT child turn counts.

AIMS

The purpose of the present study is to extend research comparing data obtained via LENA and SALT technology.

In the present study LENA and SALT data are compared for a group of young children with language learning disabilities; Autism Spectrum Disorders (ASD).

Relationships between LENA and SALT variables are compared for samples collected in home and school environments, within group and 1-to-1 contexts, and from verbal and non-verbal children.

PARTICIPANTS

Participants were 12 male preschool aged children with ASD, aged 28-71 months at the beginning of the study

Participants were primarily Caucasian (83%) and from 2-parent families with college educated mothers

Participants demonstrated expressive and receptive language delays based on age equivalency (AE) scores on the Vineland Adaptive Behavior Scales and core language standard scores on the CELF Preschool, 2nd Edition

METHOD

1. Naturalistic language samples were obtained via LENA technology at approximately 3-month intervals for 1 year.
2. Thirty-four samples were obtained within participants' home environments and 29 in their school environments.
3. 15 minute segments of the highest AWC were selected for transcription and SALT analysis.
4. Identified audio files were transcribed using SALT.
5. Transcription reliability was established.
6. Pearson's correlations were calculated to evaluate the relationship between LENA and SALT variables.

STUDY QUESTIONS AND RESULTS

1. What is the relationship between LENA AWC and SALT number of adult words and LENA CTC and CVC and SALT number of child utterances?
 - *Strong positive relationships between LENA AWC and SALT adult word count, and LENA CTC and CVC and SALT child utterance count*

Table 1. Correlations Among Variables for All Samples

	All Samples
AWC and Adult Words	$r = .75^{**}$
CTC and Child Utterances	$r = .65^{**}$
CVC and Child Utterances	$r = .61^{**}$

Notes: N = 63. $^{**}P < .0001$

STUDY QUESTIONS AND RESULTS

2. How does data obtained via LENA and SALT technologies compare in home and school environments?
 - *The relationship between adult variables is stronger in the home environment, the relationship between child variables is stronger in the school environment.*

Table 2. Correlations Between Variables in Home and School Environments

	Home	School
AWC and Adult Words	$r = .74^{**}$	$r = .59^{**}$
CTC and Child Utterances	$r = .57^{**}$	$r = .77^{**}$
CVC and Child Utterances	$r = .55^{**}$	$r = .79^{**}$

Notes: Home N = 30, School N = 26. $^{**}P < .0001$

3. How does data obtained via LENA and SALT technologies compare in group and 1-to-1 context?
 - *The relationship between adult variables is stronger in the 1-to-1 context, the relationship between child variables is stronger in the group context.*

Table 3. Correlations Between Variables in Group and 1-to-1 Contexts

	Group	1-to-1
AWC and Adult Words	$r = .56^{**}$	$r = .82^{**}$
CTC and Child Utterances	$r = .68^{**}$	$r = .60^{**}$
CVC and Child Utterances	$r = .70^{**}$	$r = .53^{**}$

Notes: Group N = 22, 1-to-1 N = 34. $^{**}P < .0001$

4. How does data obtained via LENA and SALT technologies compare for verbal and non-verbal children?
 - *Relationship between adult variables was consistent for verbal and non-verbal children. Strong relationships were identified for child variables for verbal children and between CVC and child utterances for non-verbal children.*

Table 4. Correlations Among Variables for Verbal and Non-verbal Children

	Verbal	Non-Verbal
AWC and Adult Words	$r = .76^{**}$	$r = .77^{**}$
CTC and Child Utterances	$r = .62^{**}$	<i>ns</i>
CVC and Child Utterances	$r = .52^*$	$r = .60^*$

Notes: Verbal N = 37, Non-verbal N = 19. $^{**}P < .0001$. $^*P < .01$

DISCUSSION

LENA and SALT adult word counts were strongly correlated.

The strongest relationship between LENA and SALT adult variables was found in 1-1 contexts.

SALT number of child utterance were strongly correlated to both CTC and CVC with variability within and between environments and contexts, and in relation to child language level.

Variability is not well explained by the present study.

Although aggregate data shows strong relationships it is unknown what relationship between variables is at the individual level.

FUTURE DIRECTIONS

Determining the nature of the relationship between LENA and SALT variables at the individual level.

Compare results of this study to language samples gathered from young typically developing children.

Refining audio sample selection methods to determine which linguistic segments best reflect the child's linguistic abilities and which audio segments reflect the richest language samples.

REFERENCES

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