Examining the Language Environment of Children Who Are Deaf-Blind With Cochlear Implants

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A Federal Project: Influencing Outcomes for Children Who Are Deaf-Blind With Cochlear Implants

Study A – Focus on Outcomes & Predictive Factors Across Time

Study B – Focus on Communication & Language Environments

Steppingstones of Technology Innovation

Office of Special Education Programs (#H327A0800045)

Project Partners

- The Teaching Research Institute (Western Oregon University)
- Cincinnati Children's Hospital Medical Center
- East Carolina University
- In collaboration – University of Kansas – LSI

  Parsons

Study A

- Multi-center study
- Enrolled deaf-blind children, 12 months to <8 years who have or will receive a cochlear implant
- Evaluated language trajectories
- Assessed language, development, auditory skills
  - Communication and Symbolic Behavior Scales
  - MacArthur-Bates Communication Scale
  - Rynell-Zinkin (developmental assessment for DB)
  - ITMAIS-MAIS

Examine Individualization & Variability of the Children's Progress

- Age at Implant
- Degree of Vision Impairment
- Additional Disabilities
- Duration of "time in sound"
- Type, frequency and intensity of intervention
- Parent communication, language and speech interactions in the natural environment

Characteristic/Demographics	Percentage N=84
Gender = boys	59%
Gender = girls	41%
Ethnicity	
Caucasian	72%
Latino	9%
African American	5%
Asian	1%
Other	13%
Other issues	
Physical challenges	65.1%
Cognitive challenges	39.5%
Behavior challenges	16.3%
Complex health care needs	54.7%

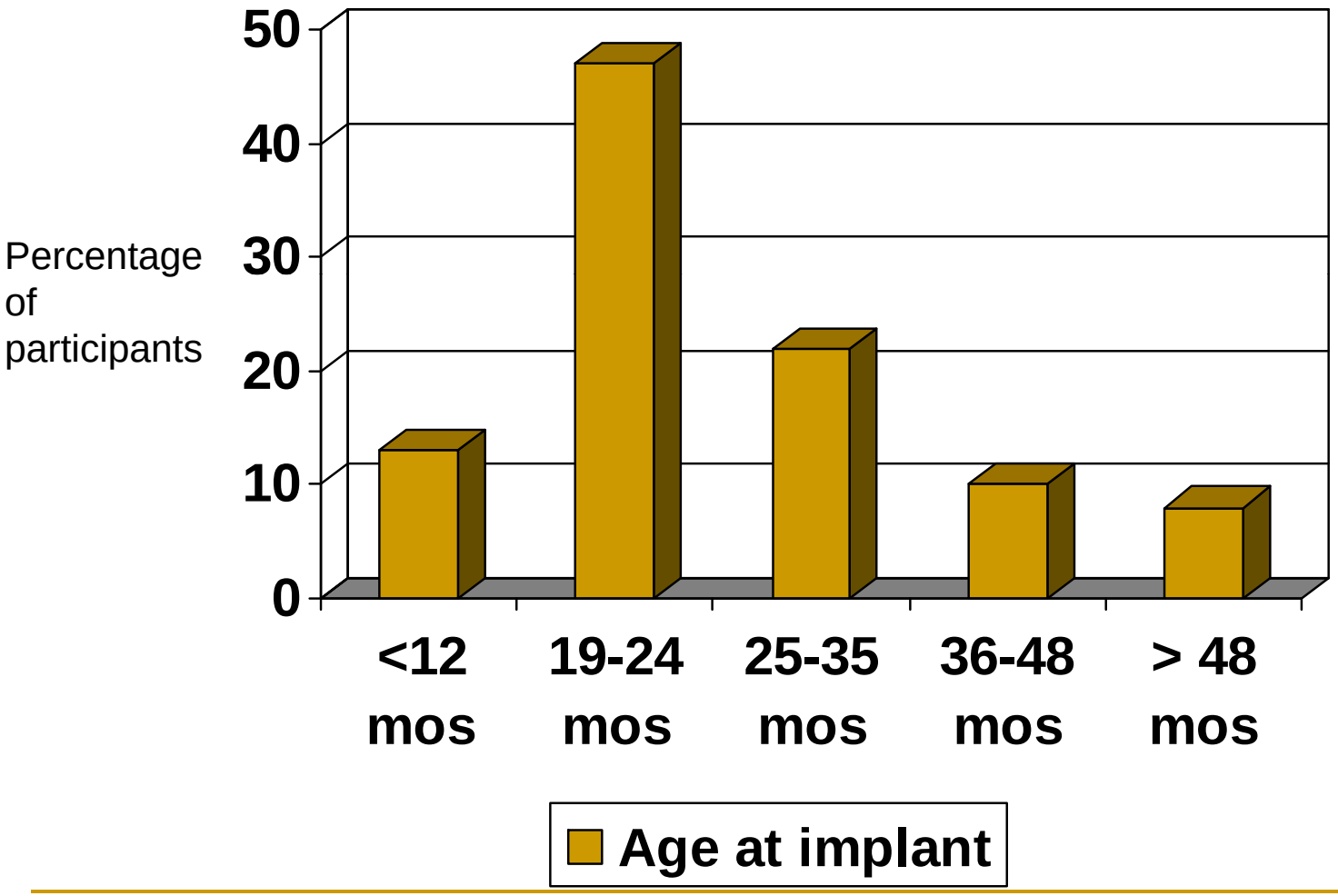
Participant Demographics n=84

Etiology	Percentage	Etiology	Percentage
Complications of Prematurity	25.9%	Klippel-Feil sequence	1.2%
CHARGE	25.9%	Leber congenital amaurosis	1.2%
CMV (Cytomeglovirus)	10.6%	Usher I syndrome	1.2%
Other	9.4%	Usher II syndrome	1.2%
Unknown	12.9%	Congenital Rubella	1.25
Meningitis	2.4%	Asphyxia	1.2%
Refsum syndrome (MSP I-S)	2.4%	Encephalitis	1.2%
		Microcephaly	1.2%

Participant Demographics: Vision

Vision Impairment	Participants
Low Vision (<20/200)	22%
Legally Blind	20%
Light perception only	5%
Blind	7%
CVI	23%
Diagnosed progressive loss	1%
Other	22%

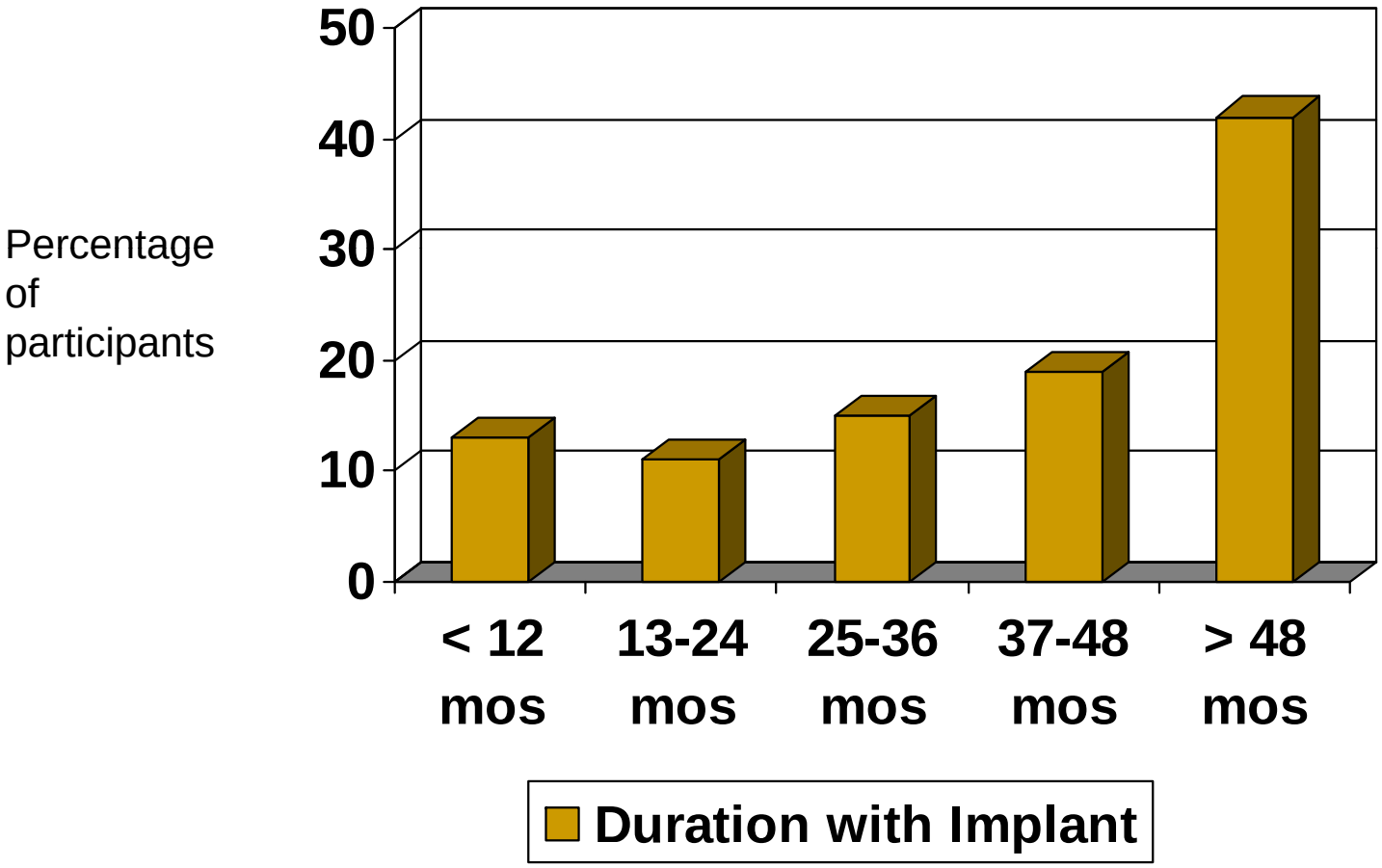
Participants age at implant



Range of implant ages: 7 months to 5 years, 2 months

Participants Duration with Implant

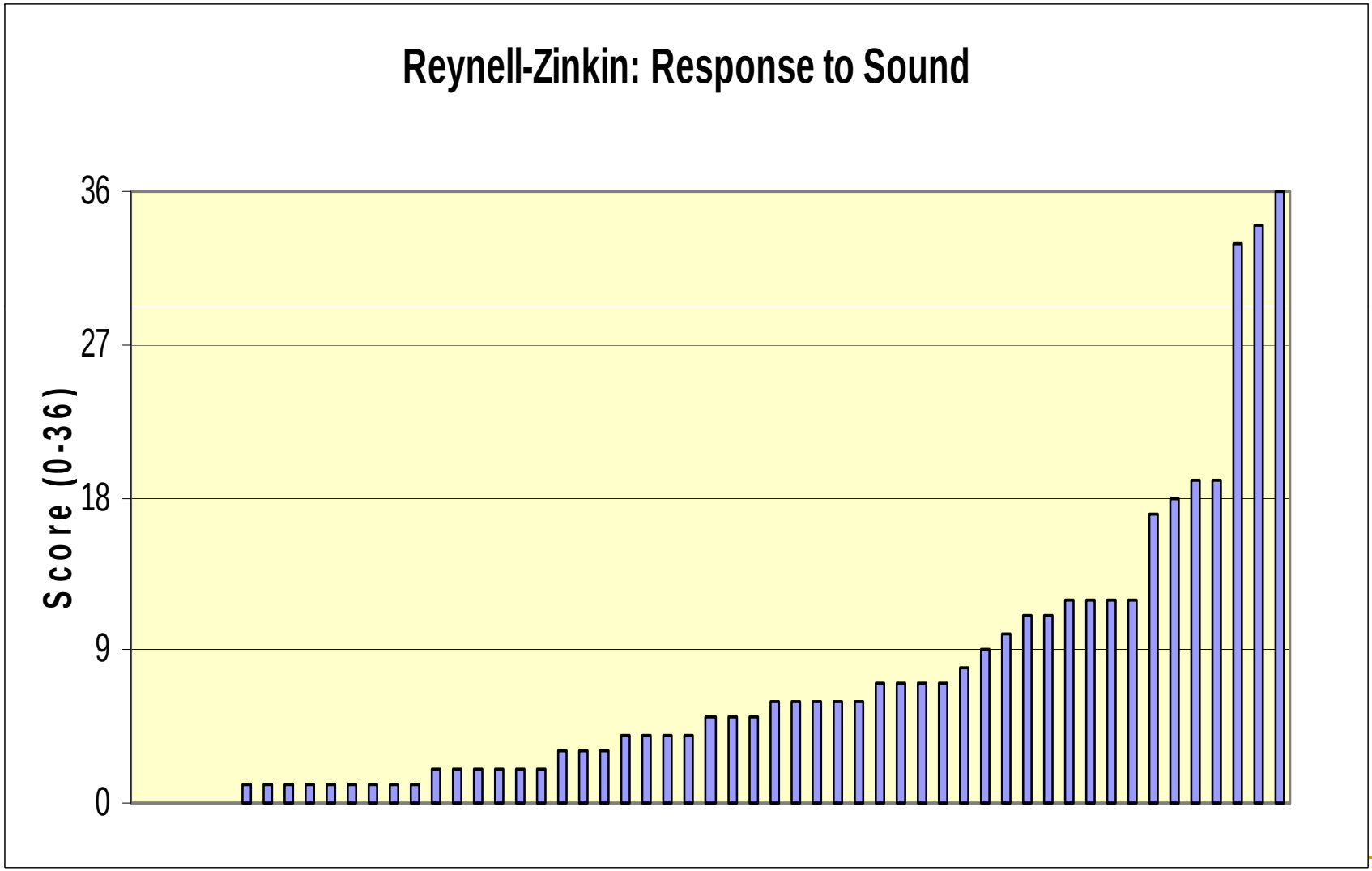
(as of 2/15/10)



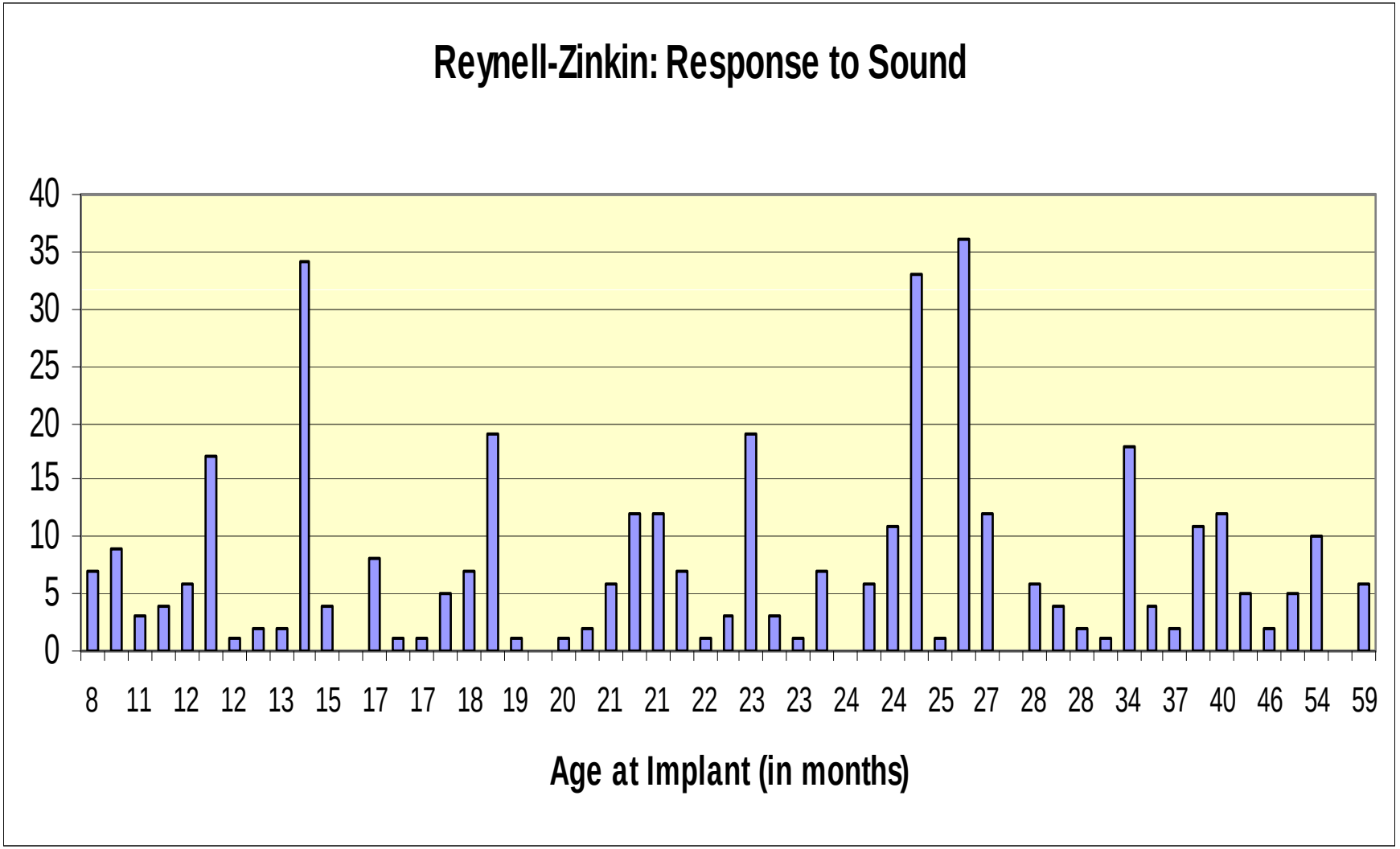
Range of duration is 1 month to 7 years, 2 months

Individual Differences & Variability

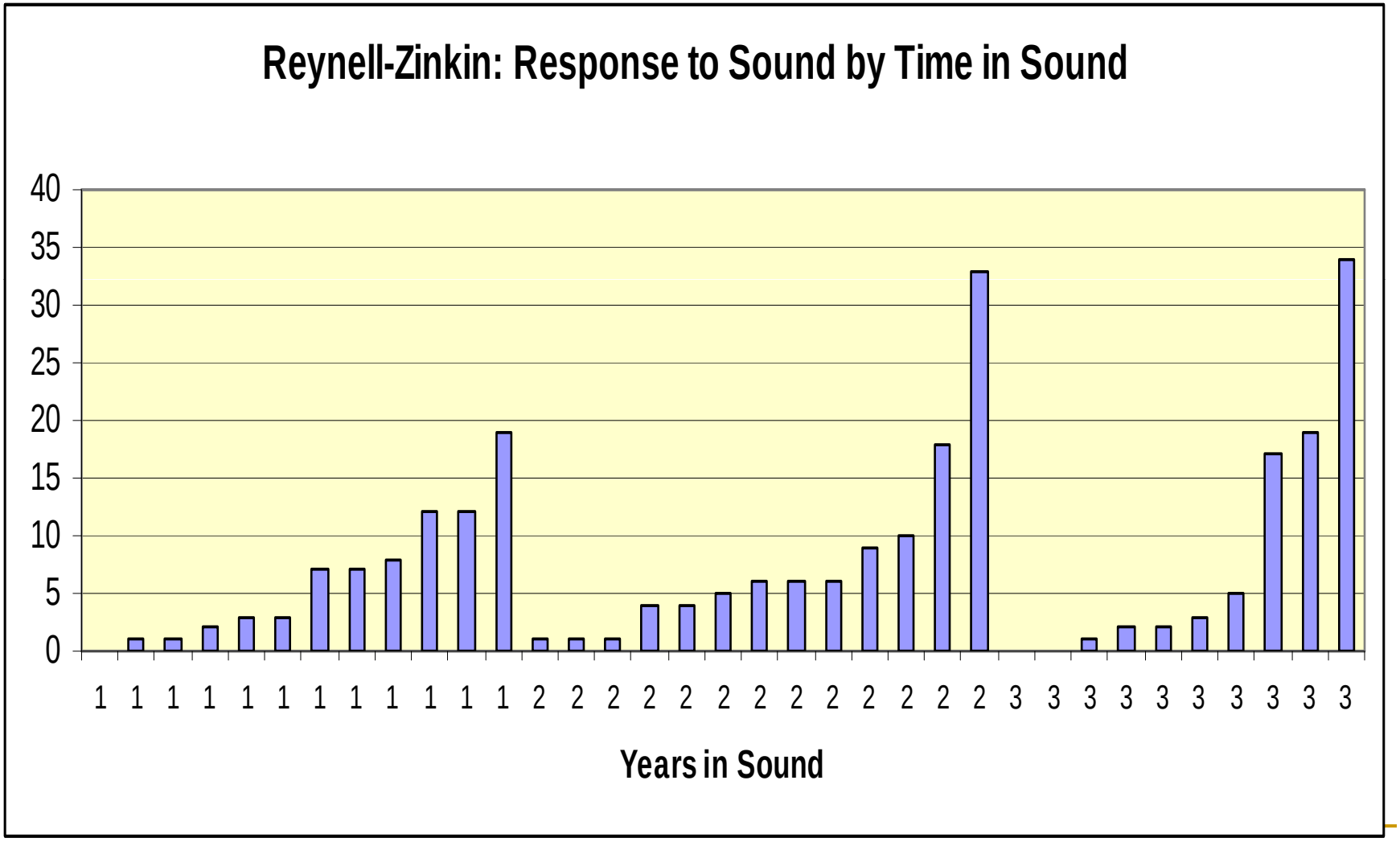
Example Data Analyses: Variability



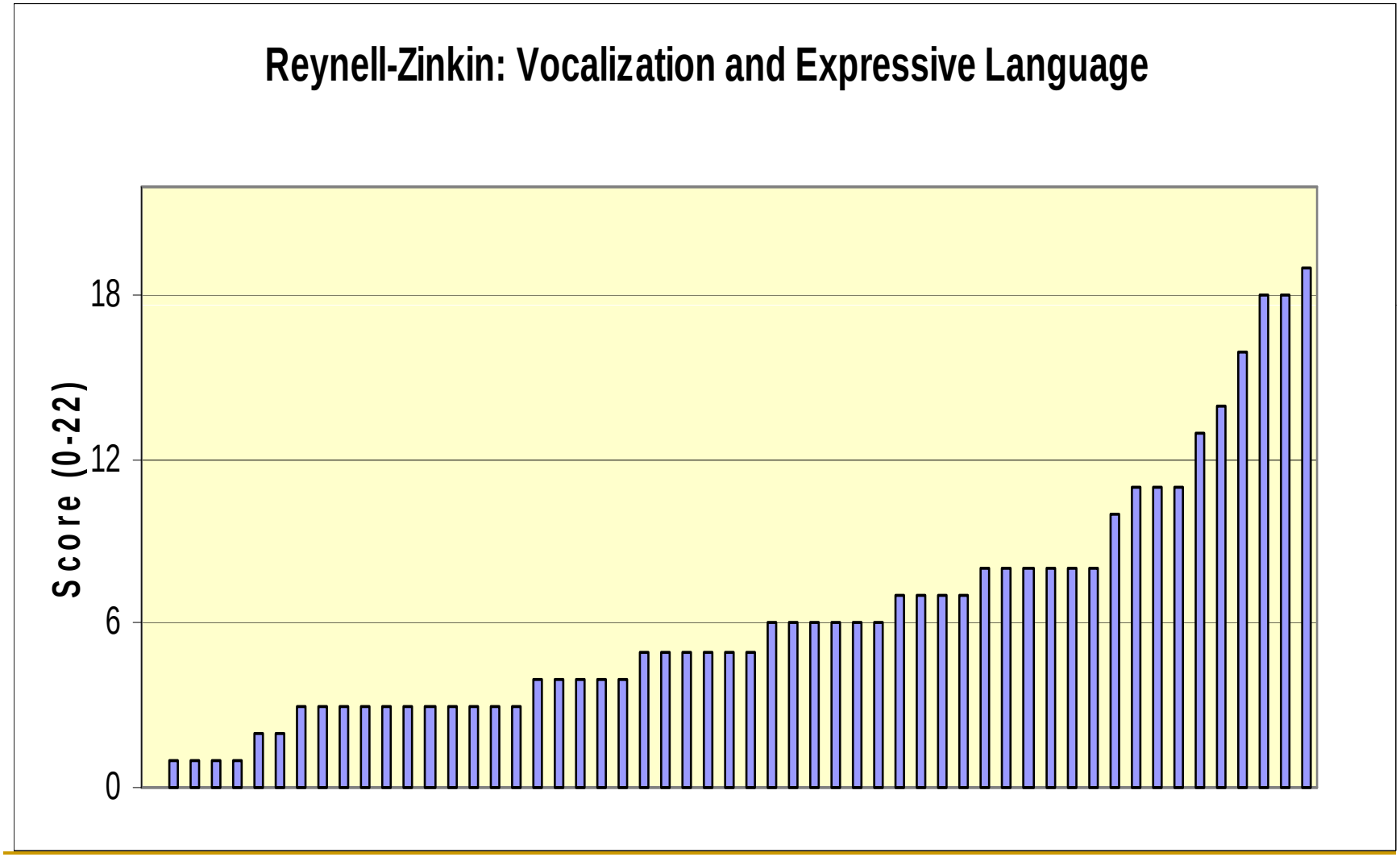
Example Data Analyses



Example Data Analyses



Example Data Analyses



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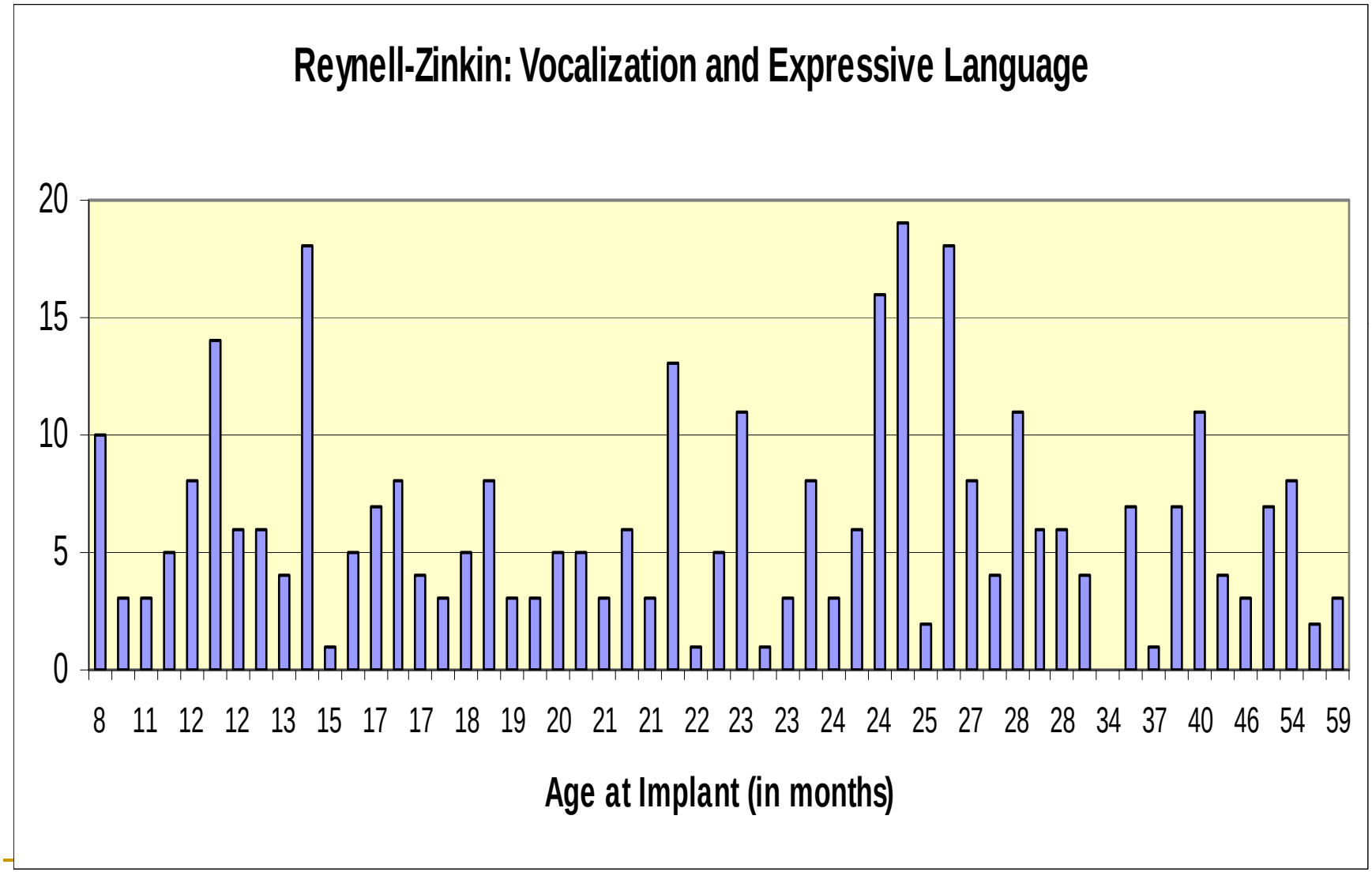
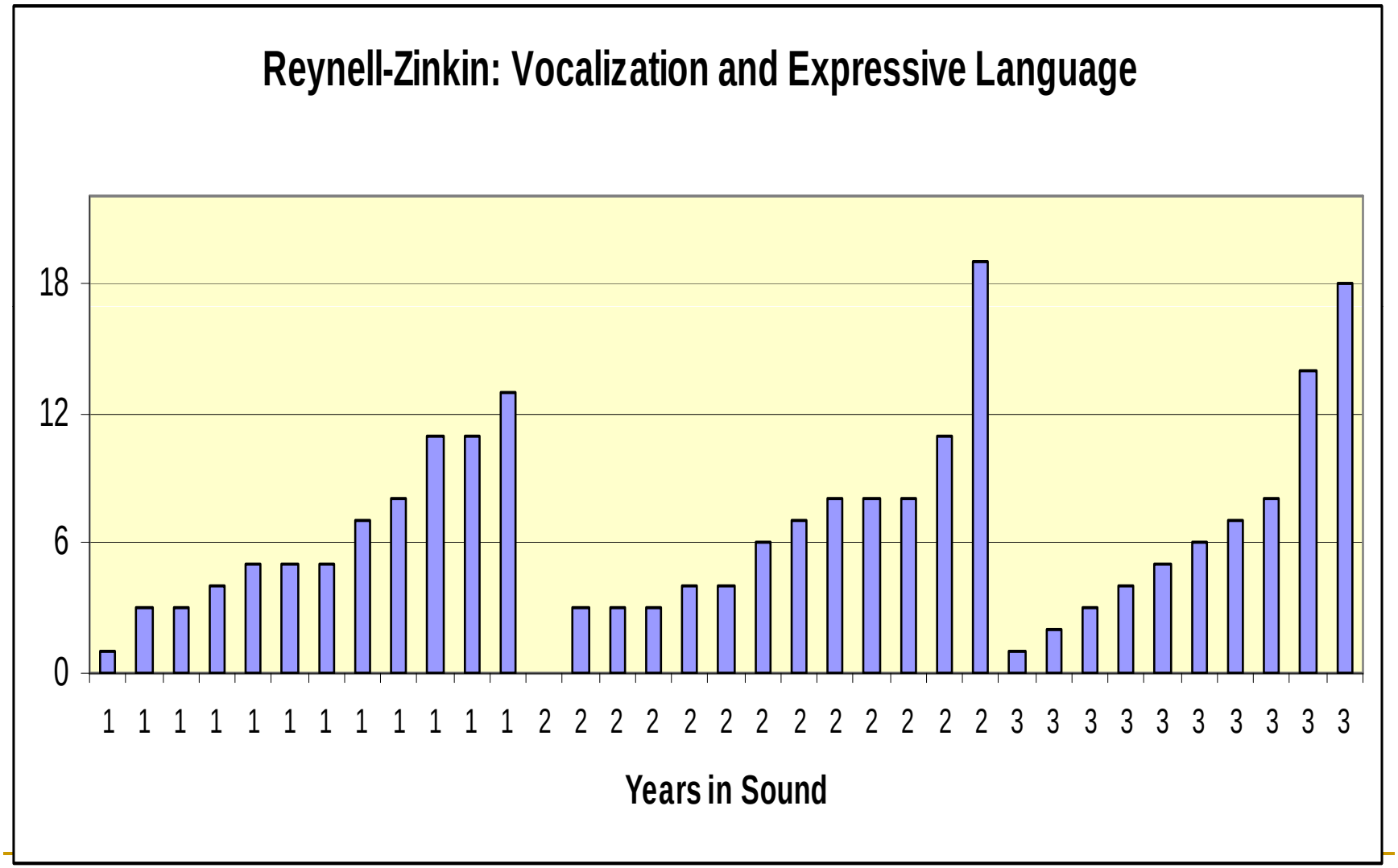


Example Data Analyses



Study B: Examining Communication & Language Environments

- Many of the children with multiple disabilities are dropped from “therapy” if they do not make sufficient progress
- Parents and teachers often do not “talk” to their child any more or any differently “after” the child receives the implant than before
- Many children with multiple disabilities do not demonstrate intentional prelinguistic communication and object use
- Parents and teachers are often not taught effective strategies to use with their children in natural routines and activities
- Part C service providers often teach isolated skills without working as a team to assist the parents to facilitate (1) receptive and expressive communication forms and functions (2) receptive and expressive language forms and functions

Meaningful Differences Pre and Post Implant

- A battery of assessments are given pre-implant and post-implant (CSBS, MacArthur-Bates, Rynell-Zinkin, ITMAIS-MAIS) to determine developmental skills/needs
- Children and caregivers are video-taped in motivating routines and activities
- Language Environmental Analysis (LENA) data are used to examine the frequency & type of caregiver/teacher “talk” across a day (8-12 hours)

Language Environmental Analysis Data

- Auditory Environment
  - Meaningful Talk
  - Distant Talk
  - TV
  - Noise
  - Silence
- Adult Words
- Child Vocalizations
- Conversational Turns
- Estimated Mean Length of Utterance
- Estimated Developmental Age (in months)
- Standard Score
- Percentile

Use of LENA data to individualize a child's intervention in natural environmental routines and activities

- Patterns of child vocalizations pre-implant
- Examining "meaningful" speech in a preschool environment
- Examining type and frequency of "talk" in specific routines in a home environment

Examples of LENA Graphs will be presented but not included here due to size of the visual display & color

- Child A
- Child B
- Child C