

Exploring the LENA Adult Word Count Measure: What Researchers and Clinicians Should Know

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OVERVIEW

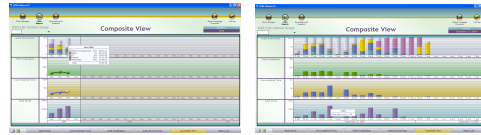
Application of LENA system to a parent-focused intervention

- LENA
 - New research tool
 - Automatic analyses of naturalistic language
- It Takes Two to Talk: Hanen Program for Parents* (Adapted)
- Pilot study
- Interpreting LENA

WHAT IS LENA?



- A small, wireless digital recorder that a child wears for up to 16 hours per day
- Automated LENA measures:
 - Adult Word Count (AWC)**: total number of words said to child
 - Child Vocalizations (CV)**: total number of vocalizations (words and phrases) said by the child
 - Conversational Turns (CT)**: child vocalizes & adult responds or adult speaks & child responds



It Takes Two To Talk: Hanen Program for Parents (ITTTT), 4-Week Adapted Program

- Early exposure to a language rich environment promotes later academic success (Hart & Risley, 1995)
- Parent-based interventions and traditional SLP-implemented therapy are equally effective (Law, Garret, & Nye, 2004)
- Focuses on teaching parents techniques to build language skills during child-lead interactions.
- Covers the core content of the traditional 11-week ITTTT program
- Two 2-hour parent-education sessions
- Two 30-minute individual videotaped feedback coaching sessions
- Parents also receive a *It Takes Two to Talk* handbook (Pepper & Weitzman, 2004)

RESEARCH QUESTIONS

- Will parents show and increase in language input to their late-talking toddlers after the intervention?
 - Hypothesis: Yes, AWC and CT values: post tx > pre tx*
- After the intervention, will late-talking children demonstrate improved language skills based on (a) parent report and (b) naturalistic child vocalization output?
 - Hypothesis: Yes, MBCDI and CV values: post tx > pre tx*

METHOD

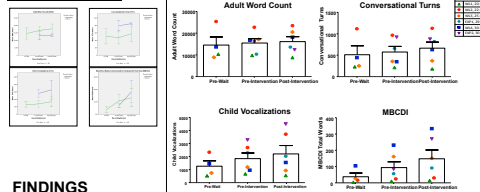
PARTICIPANTS

- Eight participants were recruited
 - 1 lost to technical error & 1 lost to attrition
- Results from 6 participants reported (ages 20 to 30 months at start)
- Mono-lingual English speaking
- All children were late-talkers:
 - expressive and/or expressive-receptive mixed language deficit
 - below the 10th percentile for total productive vocabulary on the MacArthur-Bates Communicative Development Inventory
 - normal oral and speech motor abilities
 - normal hearing ability
 - no frank neurological, gross-motor, or cognitive impairments.

DESIGN

- Quasi-experimental
 - 4 families in experimental group (2 families lost)
 - 4 families in wait-list control group
 - Pre-and post-tx data on 6 families
- Pilot Study

GROUP DATA



FINDINGS

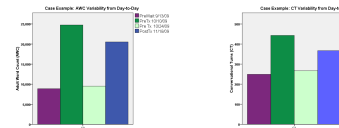
- Given a small sample size, we cannot make definitive conclusions about the effectiveness of the adapted *It Takes Two to Talk: Hanen Program for Parents*
- For individual participants
 - LENA measures (AWC, CT, and CV) tended to remain stable or increase after intervention
 - Expressive Vocabulary (MBCDI) measures tended to remain stable or increase after intervention

INTERPRETING LENA

- What factors may impact LENA's ability to detect changes?
- What do we need to know when interpreting LENA's automated output?

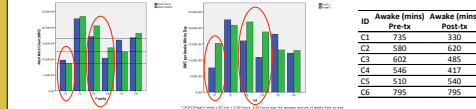
LARGE COEFFICIENT OF VARIATION

- AWC coefficient of variation was 52.5%, in LENA normative study (N = 314).
 - A family can vary their AWC by more than 50% of the average amount
- CT coefficient of variation was 53% for a family with a 24-month-old, in LENA normative study.
 - Average CT of 520 turns per day for a 24-month-old
 - On any given day CT could be as few as 250 and as many as 800.



AMOUNT OF AWAKE TIME

- AWC influenced by child awake time (AWC/awake mins * 60 * 9.6)
- If total AWC (graph left) was higher/similar post tx, and child had less awake time post tx. (see table), AWC values increased more dramatically when data was normalized for awake time (graph right).



QUANTITY vs. QUALITY

- Consider goals of intervention program
- Do LENA's automated measures reflect the goals of the intervention?
 - E.g., ITTTT aims to teach parents to follow their child's lead which may decrease overall AWC if child has low language
- Advanced LENA analyses may capture more qualitative information

ACKNOWLEDGMENTS

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