

# Assessing Spoken Language in Infants and Toddlers who are Deaf or Hard of Hearing using the LENA Developmental Snapshot



Monika-Maria Oster, Kimberly Peters

## Background

Regular language assessment and monitoring is essential for supporting the development of age-appropriate language skills in infants and toddlers who are deaf or hard of hearing (DHH). The LENA Developmental Snapshot is a newer spoken language assessment that has been validated in children age 0 – 36 months with typical hearing and development (Gilkerson et al., 2017). The LENA Developmental Snapshot is completed by caregivers online and scored automatically. It can be administered as frequently as once a month. These characteristics make the LENA Developmental Snapshot useful for providers working with infants and toddlers who are DHH, since it can be used for frequent language monitoring regardless of the early intervention setting. To date, no published studies have assessed the LENA Developmental Snapshot in this population. The current research was designed to partially address this gap by evaluating the utility of the LENA Developmental Snapshot for language monitoring in DHH infants and toddlers with bilateral hearing loss who use listening and spoken language.

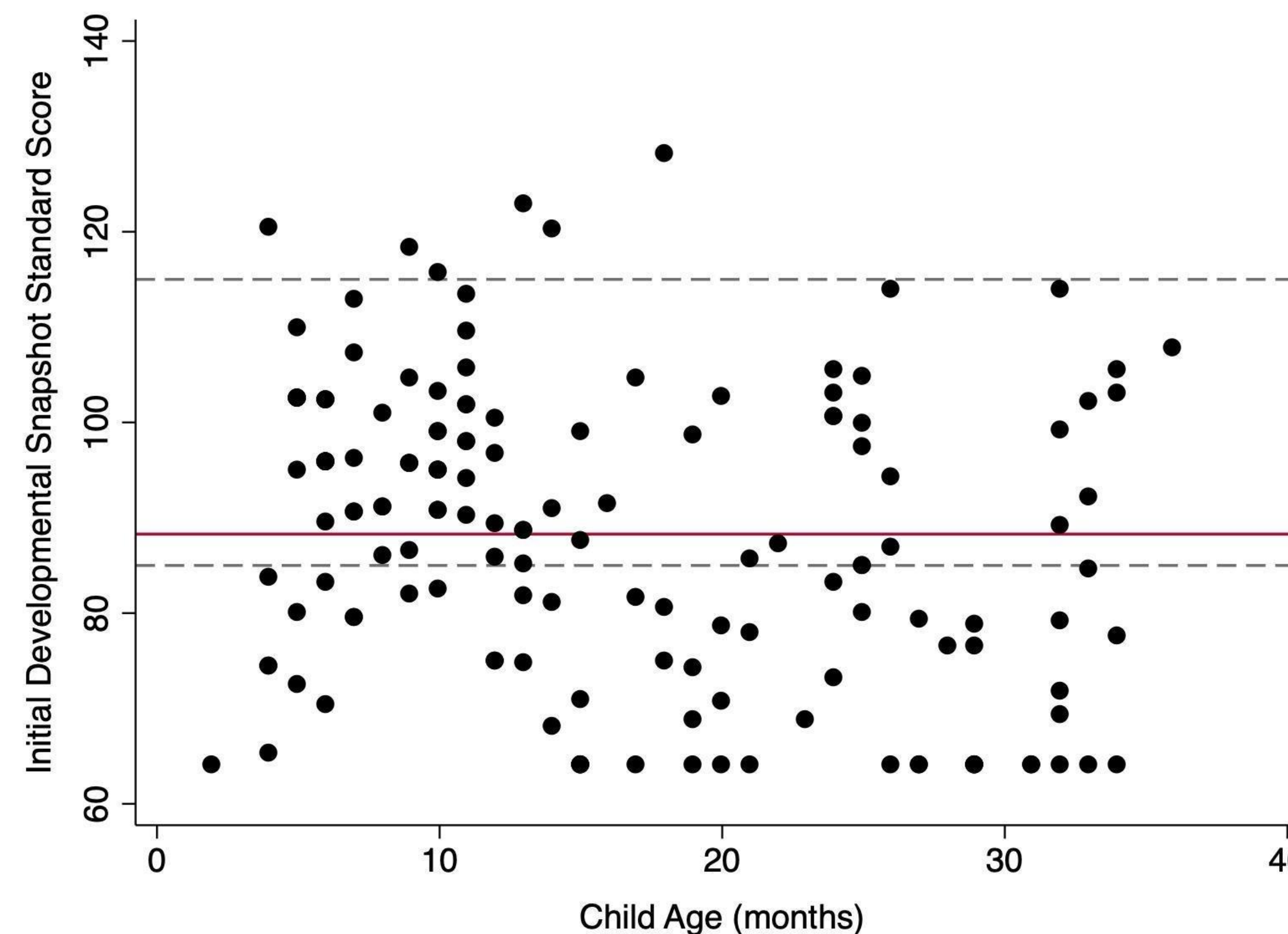
## Methods

For this retrospective analysis, data were obtained from the educational and clinical records of 147 DHH children with bilateral hearing loss aged 2 to 36 months who had at least one LENA Developmental Snapshot score. The primary language of all children was spoken English.

- The initial LENA Developmental Snapshot score was used to describe group performance
- Changes in scores obtained 1 month, 2 months and 3 months apart were used to evaluate the utility of the LENA Developmental Snapshot for frequent language monitoring.
- When available, scores from other commonly used standardized language assessments were obtained to evaluate correlations with the LENA Developmental Snapshot. Scores were available from the:
  - Preschool Language Scales – 5<sup>th</sup> Edition (PLS-5, Zimmerman et al., 2012)
  - MacArthur Bates Communicative Inventories: Short forms (CDI, Fenson et al., 2012)
  - Developmental Assessment of Young Children – Second Edition (DAYC-2, Voress & Maddox, 2013)

## Results

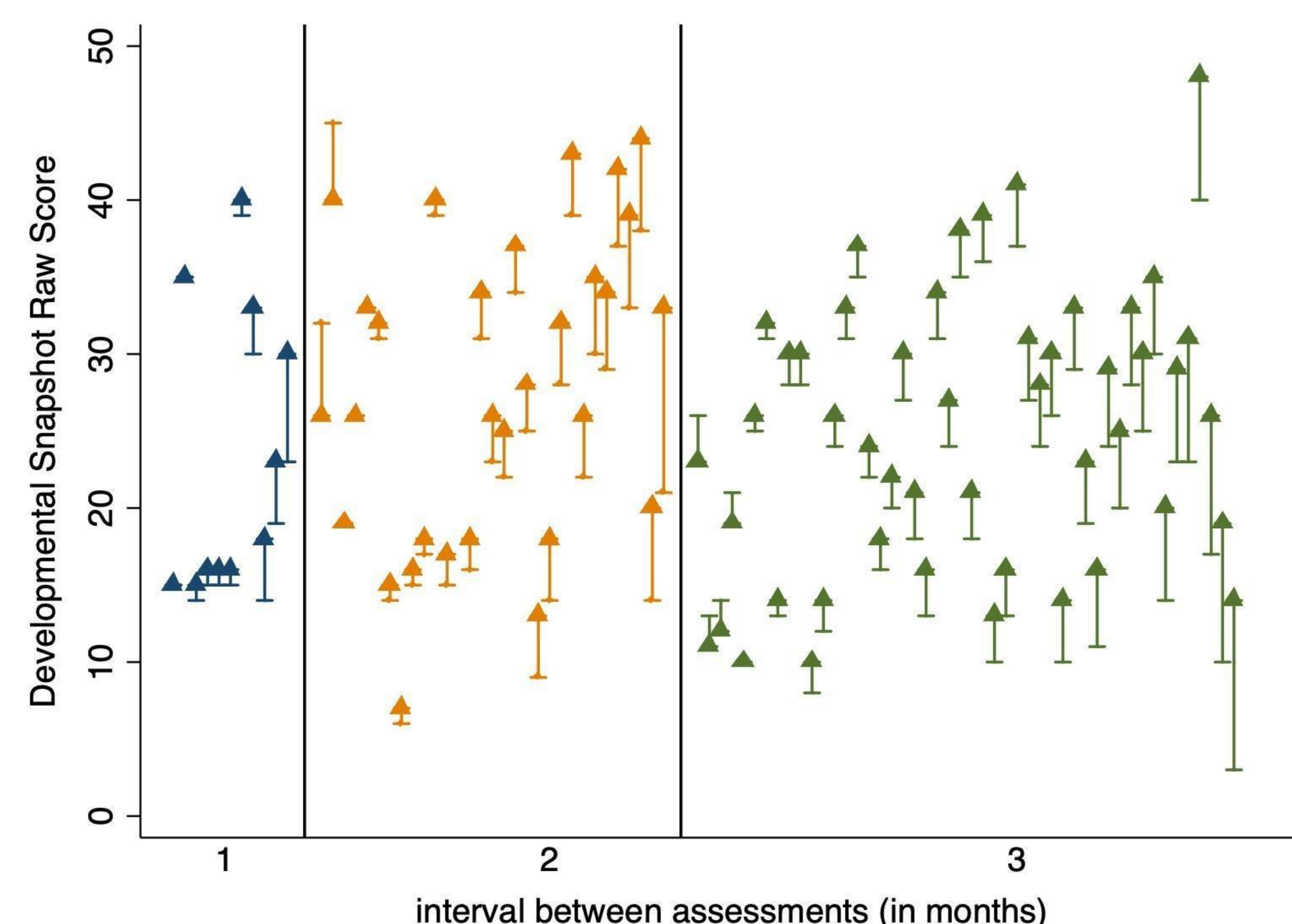
The mean initial LENA Developmental Snapshot standard score (red line) was 88.29 (SD = 15.58), which falls in the low average normative range (dashed lines).



On average, raw scores were significantly higher at the second assessment compared to the first assessment, at all intervals.

|          | n  | Mean raw score change (SD) | Paired-samples sign test |
|----------|----|----------------------------|--------------------------|
| 1 month  | 11 | 2.1 (2.17)                 | $z = 2.845, p = 0.0044$  |
| 2 months | 30 | 2.6 (3.32)                 | $z = 3.684, p = 0.0002$  |
| 3 months | 48 | 3.3 (2.81)                 | $z = 5.476, p < 0.0001$  |

Change in raw scores for individual children at 1-month, 2-month and 3-month intervals are shown below.



## Results

Results from the LENA Developmental Snapshot were strongly correlated with other standardized language assessments.

| Language Assessment          | Mean Age (SD) | Mean Score (SD) | Correlation with Developmental Snapshot |
|------------------------------|---------------|-----------------|-----------------------------------------|
| CDI S-Score (n=67)           | 25 (8.3)      | 20.7 (25.2)     | $r_s = .77, df = 65, p < .001$          |
| LENA Percentile Score        | 25 (8.5)      | 26.4 (27.8)     |                                         |
| PLS-5 Total Language (n=34)  | 19 (10.8)     | 92.9 (19.7)     | $r_s = .76, df = 32, p < .001$          |
| LENA Standard Score          | 20 (9.8)      | 89.6 (16.7)     |                                         |
| DAYC-2 Total Language (n=68) | 14 (10.0)     | 93.1 (13.6)     | $r_s = .63, df = 66, p < .001$          |
| LENA Standard Score          | 16 (8.7)      | 89.5 (15.6)     |                                         |

## Summary and Conclusions

- Initial Developmental Snapshot standard scores fell within the low average range and were characterized by high variability, closely mirroring published research using a variety of language assessments (e.g. Ching et al., 2013; Rudge et al., 2022; Uhler et al., 2022; Yoshinaga-Itano et al., 2017).
- Developmental Snapshot scores in this study were highly correlated with the scores from the CDI, PLS-5, and DAYC-2. These strong positive correlations are consistent with those reported for children with typical hearing (Gilkerson et al., 2017).
- Month-to-month changes in raw scores were larger than those reported by Gilkerson et al., 2017 (mean change = 0.94). However, these results need to be interpreted with caution due to the small sample size.

These results provide preliminary support for using the the LENA Developmental Snapshot to monitor spoken language development in children who are DHH. It provides information about rate of language growth and can signal the need for more in-depth language assessment.

## References & Contact

