When Average Isn't Enough: Morphemic Capacity in Toddlers With Hearing Loss

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ABSTRACT

At age 3, children who are typically developing are observed to have wide variability in expressive language (Novogrodsky et al., 2018). Because of that typical pattern of variability, the gap between "average" and the language skills of a child with hearing loss (HL) is often not yet large enough to qualify for the special education category of hearing impairment based on standardized assessment alone. As initial eligibility decisions are made at age 3, we need to ensure we are selecting valid, sensitive measures to make those first determinations beyond IDEA Part C early intervention.

INTRODUCTION

- Werfel and Douglas (2017) analyzed conversational language samples of preschoolers with and without HL
  - All children performed within 1.5 SDs of the mean on a standardized language assessment
  - Children with HL showed less lexical diversity, shorter MLU, and greater omissions of words and morphemes conversationally
- Werfel (2018) found that preschoolers with HL make different types of morphosyntactic errors conversationally that can be explained by the tense and durational cues
- Koehlinger et al. (2013) reported 38% of 3-year-olds and 63% of the 6-year-olds with HL in their study fell more than 1 SD below the mean on a finite verb morphology composite (FVMC) using language sample analysis compared to control groups
- Novogrodsky et al. (2018) compared the morphosyntactic abilities of toddlers with HL ages 24 - 37 months to typically hearing toddlers using a self-developed Hebrew sentence imitation task
  - Similar total task scores between groups and high variability within groups
  - No children with HL repeated 4-word sentences correctly, but 7 with typical hearing did

The current study builds on extant literature and serves to identify limitations to the sensitivity of standardized assessment practices driving services provision decisions for toddlers at age 3.

PROPOSED RESEARCH DESIGN

The current study proposes to
compare performance on a commonly used standardized language measure with a morphology composite obtained from conversational language sample analysis (LSA) in 15 toddlers with HL and 15 toddlers with typical hearing (TH) ranging in age from 2;6 to 2;11.

Hypotheses
H1. Toddlers with HL will display greater variability of early developing morpheme use in spontaneous language as measured by a morphology composite.
H2. No significant difference in expressive language scores on a commonly used standardized assessment will observed between toddlers with HL and TH.

Participants
- 15 toddlers with HL ages 2;6 to 2;11 who
  - received bilateral cochlear implants or hearing aids binaurally prior to 12 months
  - are enrolled in state early intervention due to hearing loss alone
  - use listening and spoken language
  - speak English in the home
- 15 toddlers with TH ages 2;6 to 2;11 who
  - pass a clinician-administered hearing screening
  - never enrolled in state early intervention
  - speak English in the home
  - have no reported developmental delays

Instruments and Procedures
- Preschool Language Scale – 5 (PLS-5): Expressive Communication SS
- Conversational LSA: 12-min. conversational sample will be elicited using modified Hadley (1998) protocol
- Morphology composite will be generated using the following developmental morphemes (Brown, 1973; Eisenberg & Guo, 2016)

Morphology Composite

1. Regular plural -s
2. Irregular past tense
3. Possessive -s
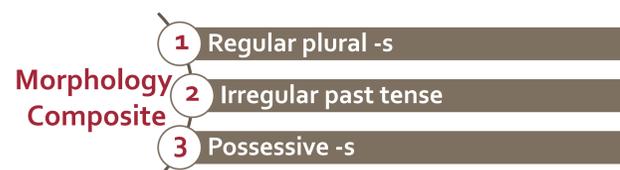
Analyses
Dependent variables: PLS-5 Expressive Communication SS and morphology composite obtained from LSA

Morphology composite = number of correct collective uses of the three target developmental morphemes divided by the total number of obligatory contexts multiplied by 100

$$\text{Morphology Composite} = \frac{\text{\# correct uses of 3 targets}}{\text{total \# obligatory contexts}} \times 100$$

Descriptive statistics will be used to analyze the Expressive Communication scores and morphology composite scores (means and standard deviations).

Inferential statistics and Cohen's d effect sizes will be used to quantify standard score and morphology composite comparisons between groups (independent samples t-tests).

SIGNIFICANCE

The primary assessment practice during transition from Part C to Part B services continues to be the use of standardized measures in the determination of eligibility for hearing impairment. Few, if any, standardized assessments for children ages 2;6 to 2;11 are designed to determine whether a child can meet the language demands of a typical preschool classroom (Wiig et al., 2020). Common standardized measures may lack sensitivity in detecting morphosyntactic delays in children with HL. The current project may provide support for the use of a morphology composite as more sensitive expressive language measure when making initial eligibility decisions for children with HL at age 3.

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