Language Outcomes across 12 States: Strengths, Limitations, and Predictors of Success

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Today's Topics

- Describe NECAP, a CDC-supported national outcomes database project
- Summarize characteristics of sample obtained to date
- Present language outcome data
- Identify characteristics of children with more successful language outcomes

NECAP Project Overview

- CDC-supported project to collect language outcome data on deaf and hard-of-hearing children birth to 4 across the United States
  - Establish individual state databases
  - Establish national database
  - Explore feasibility of interfacing with existing EHDI databases

Assessment Components

- Demographic form
- Release of audiologic information
- Minnesota Child Development Inventory
- MacArthur-Bates Communicative Development Inventories
- Additional assessments on request (e.g., play, listening skills, speech intelligibility, etc.)

States Represented in Results

- Arizona
- California
- Colorado
- Idaho
- Indiana
- Maine
- Minnesota
- New Mexico
- Oregon
- Texas
- Utah
- Wisconsin
- Wyoming

Assessments Completed

- 1,077 assessments completed (not including Colorado)
- 649 children assessed 1 to 6 times each
- Colorado: 300 assessments per year

Participant Characteristics (excluding Colorado)

- Bilateral loss = 80%
- Auditory Neuropathy = 5%
- English-speaking home = 85%
- No additional disabilities = 79%
- Boys = 56%

Participant Criteria for Language Outcomes Analysis

- Bilateral hearing loss
- English-speaking home
- No other disabilities that would affect speech or language development

Language Outcomes Analysis: Number of Assessments

- Number of Children = 359

- Minnesota Child Development Inventory = 370 assessments
- MacArthur-Bates Communicative Development Inventory = 560 assessments

Language Outcomes Analysis: Participant Characteristics

- Chronological age
  - Range = 6 to 60 months
  - Mean = 24 months
  - 94% of sample: 6 to 36 months of age
- Boys = 55%; Girls = 45%

Language Outcomes Analysis: Participant Characteristics

Age at…	Median (mos)	Range (mos)
Identification	2.3*	.25 to 48
Amplification	5	1 to 48
Intervention	5*	.25 to 44

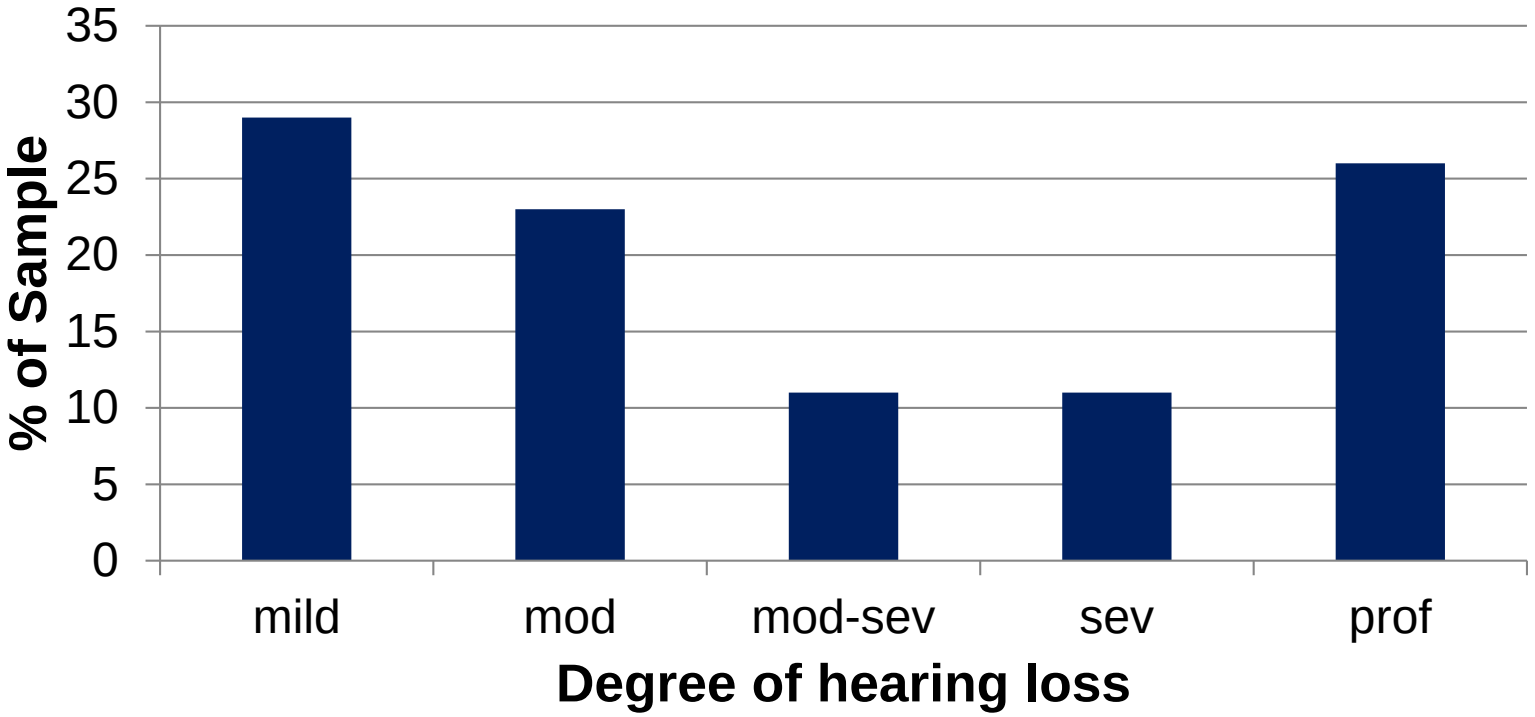
*67% of children were identified by 3 months of age

*66% of children were in intervention by 6 months of age

Language Outcomes Analysis: Participant Characteristics

Highest degree completed	% of primary caregivers
Less than HS	8%
High school diploma	46%
Vocational or Associates	16%
Bachelor’s degree	18%
Graduate degree	12%

Degree of Hearing Loss (available for 256 children)



Assessment 1: Minnesota Child Development Inventory (1992)

- 8 areas of development assessed
  - Language, Motor, Social, Self Help, Pre-Literacy
- Parent report
  - Parents respond “yes” or “no” to a variety of statements about their child
  - Example: “Has a vocabulary of 20 or more words”
- Scales adapted to reflect abilities in both spoken and sign language

Assessment 2: MacArthur-Bates Communicative Dev. Inventories

- Assesses spoken and sign vocabulary
  - Expressive and receptive for younger children
  - Expressive vocabulary for older children
- Parent-report instrument

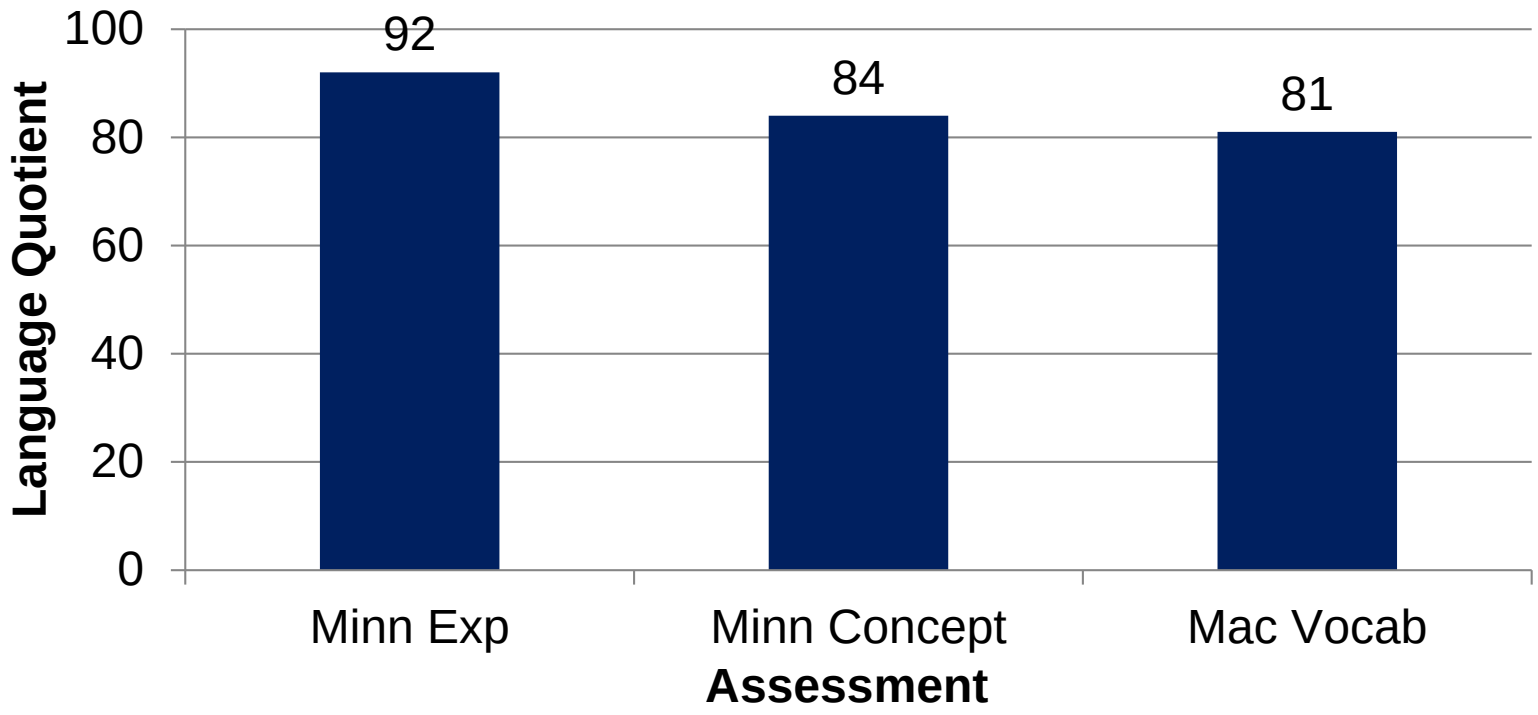
Determining Language Quotient

Language Age/Chronological Age x 100

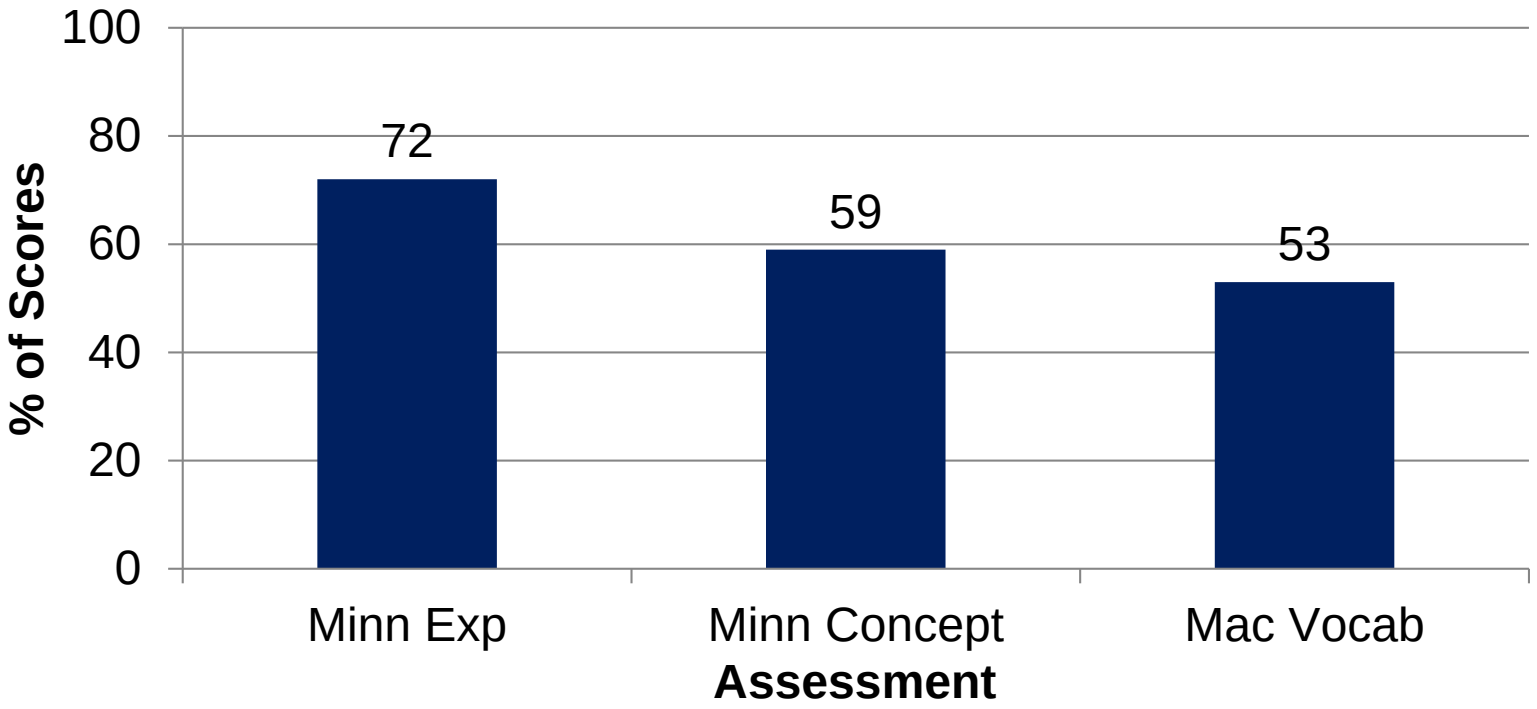
- If LQ = 100, Language Age = CA
- If LQ < 100, Language Age < CA
- If LQ > 100, Language Age > CA

LQs of 80+ are within the normal range compared to hearing children

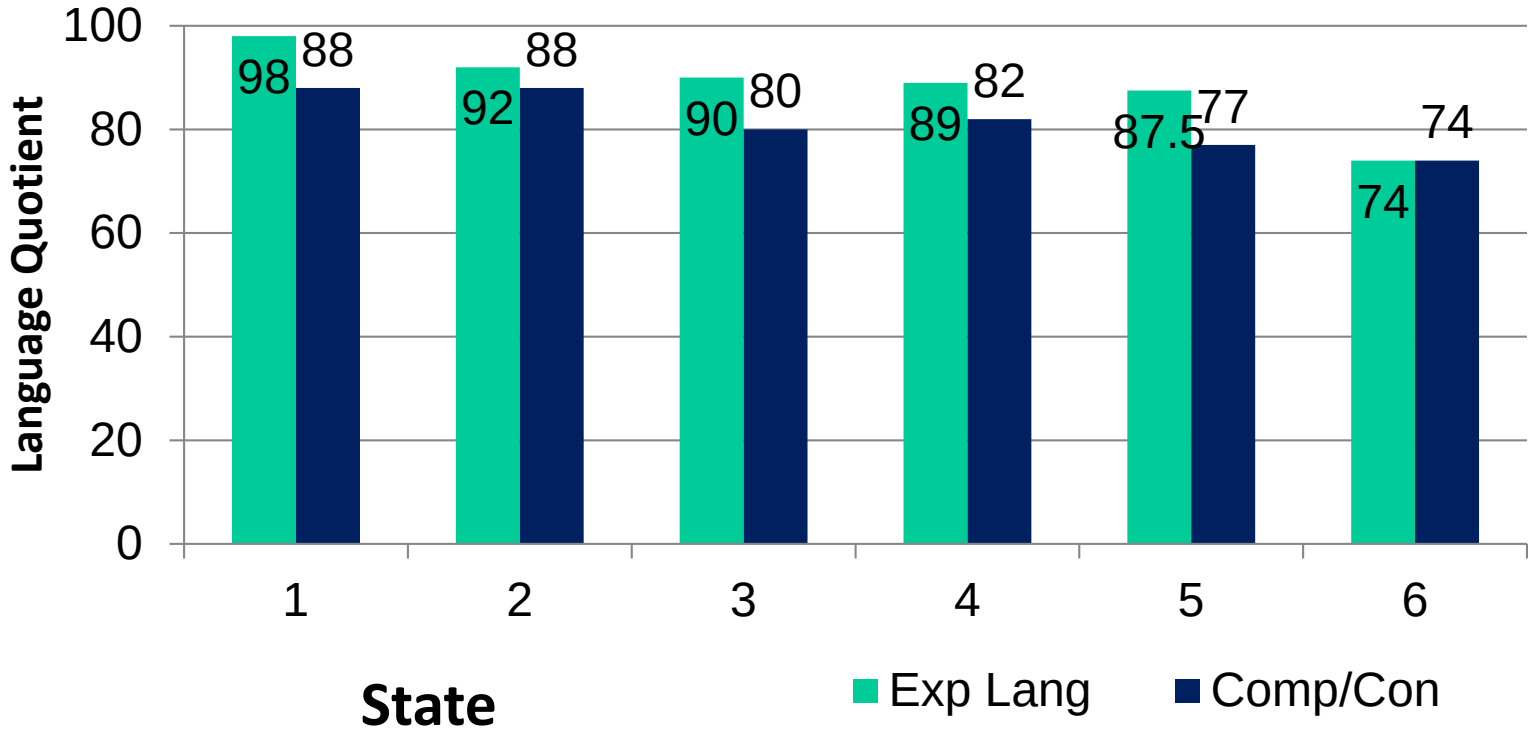
Median Language Quotients



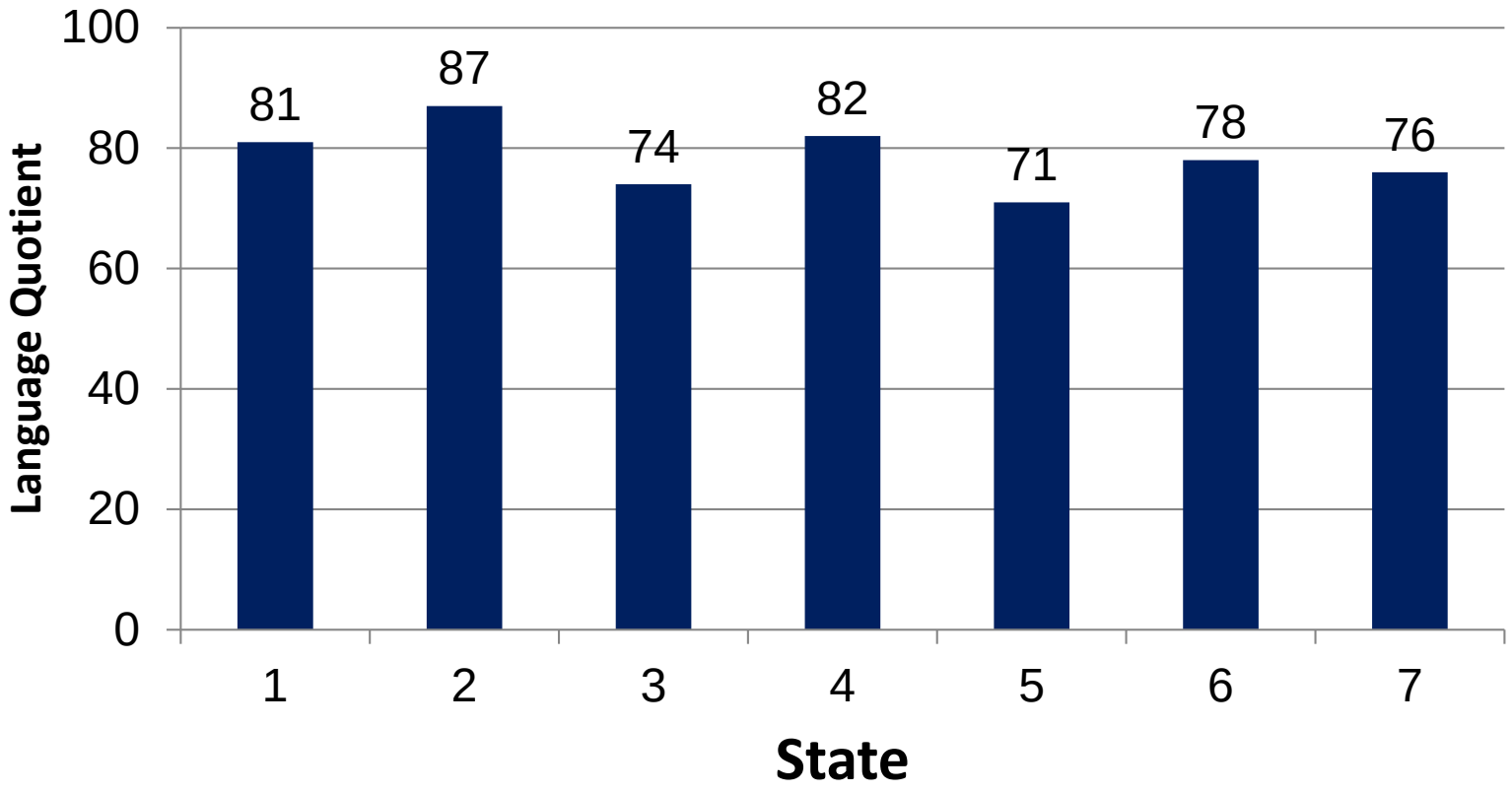
Percent of Scores in the Average Range (LQ = 80+)



Minnesota CDI: Median Language Quotients (n = 370)



MacArthur: Median Vocab Prod. Quotients (n = 560)



Bates-MacArthur Exp Vocabulary: Sub-Group Comparisons

- Language of the home, presence of additional disabilities, unilateral vs. bilateral examined with most recent assessment from all participants (n = 384 to 594)
- Other comparisons made with most recent assessment from children with bilateral loss and no additional disabilities from homes where English is the primary language (n = 142 to 325)

Sub-Group Comparisons

- No significant difference ($p > .05$) between:
  - Boys vs. girls
  - Mild vs. moderate hearing loss
  - Mod-sev vs.severe, vs. profound hearing loss

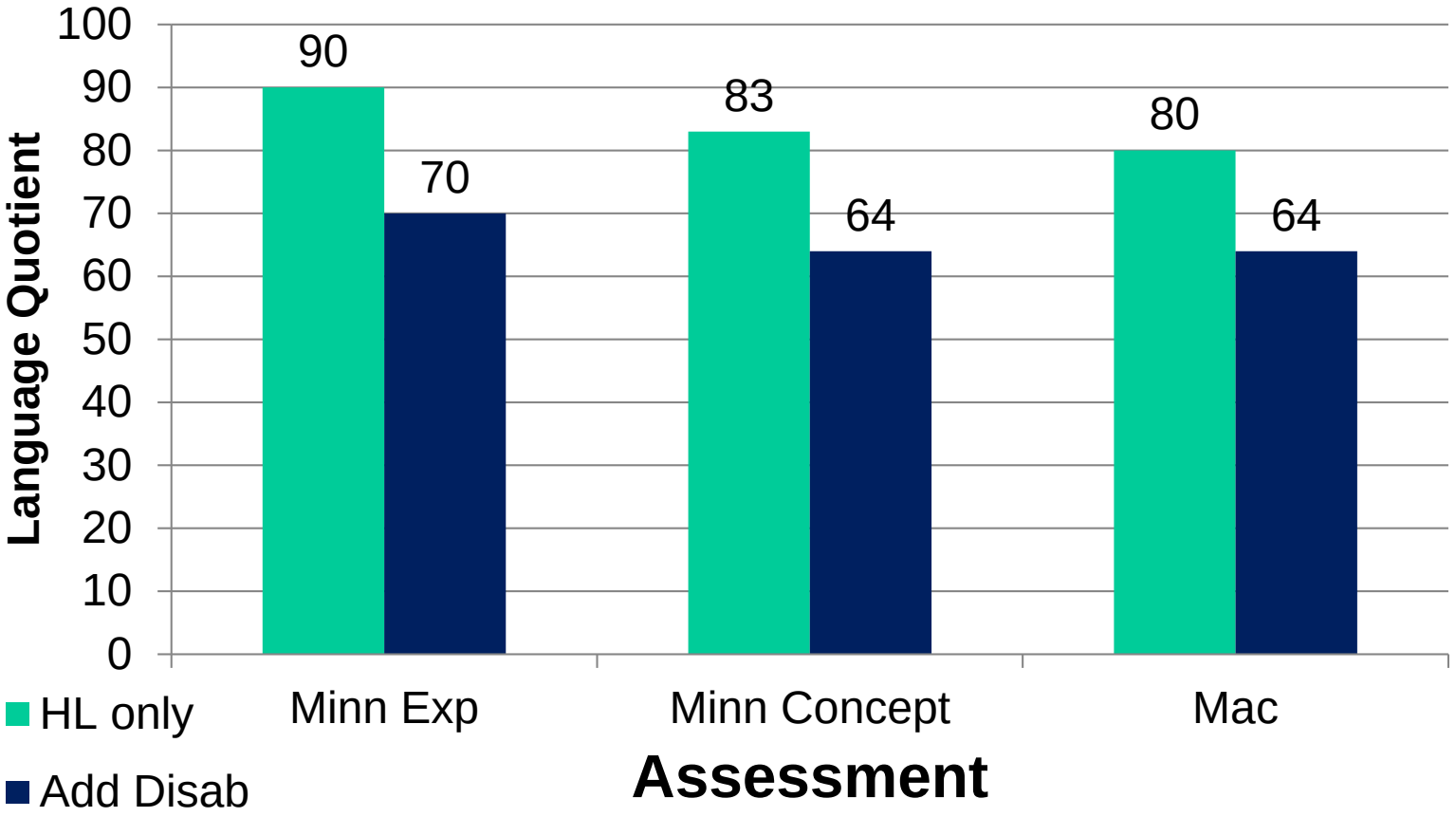
Language Outcomes: Sub-Group Comparisons

- Significant differences ($p < .05$) on all three language quotients:
  - No additional disabilities vs. having additional disabilities
  - Mild/Mod vs. mod-severe to profound hearing loss
  - Early intervention by vs. after 6 months of age
  - Deaf parent(s)

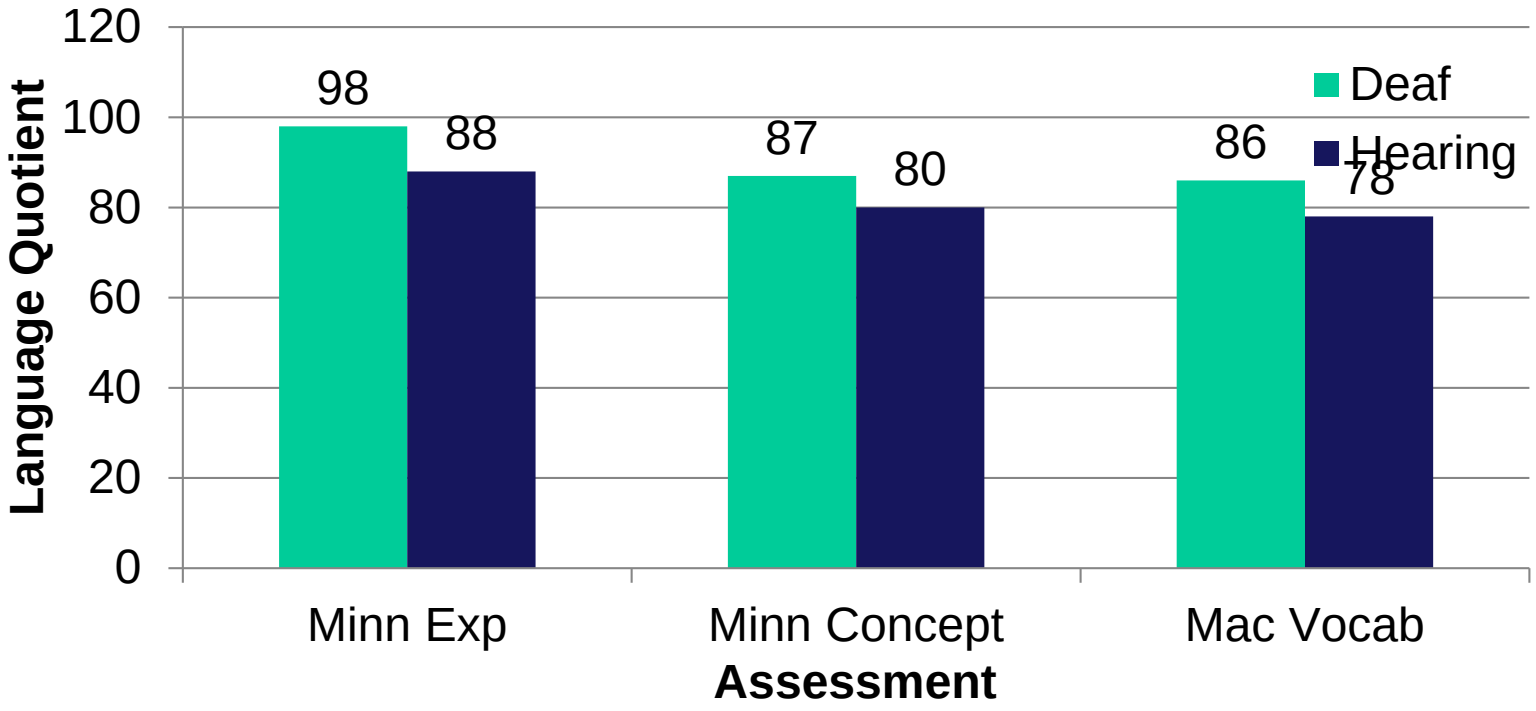
Language Outcomes: Sub-Group Comparisons

- Significant differences ($p < .05$) on two out of three lang quotients:
  - Unilateral vs. bilateral hearing loss
  - English vs. Spanish as the primary language of the home
  - Primary caregiver has degree beyond high school diploma vs. HS diploma or less

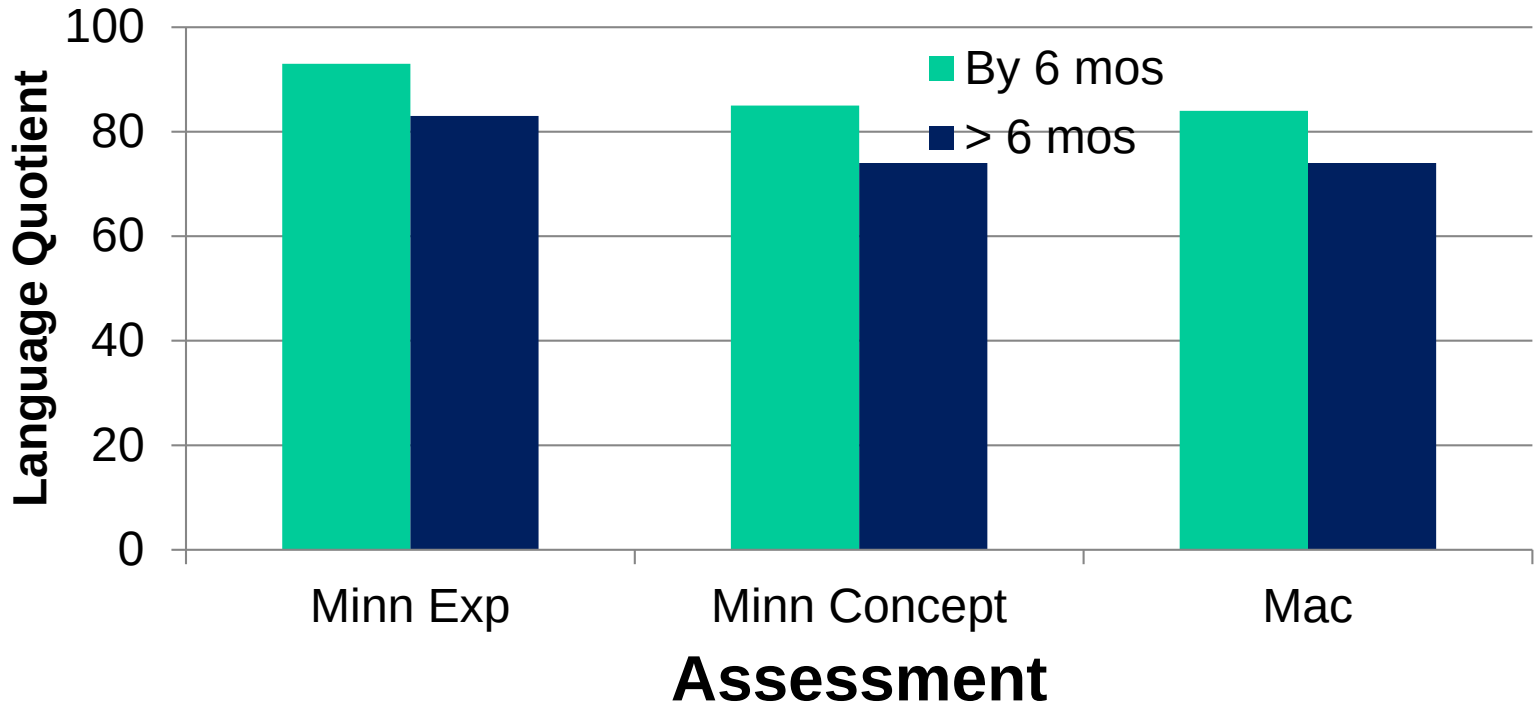
Additional Disabilities vs. Hearing Loss Only



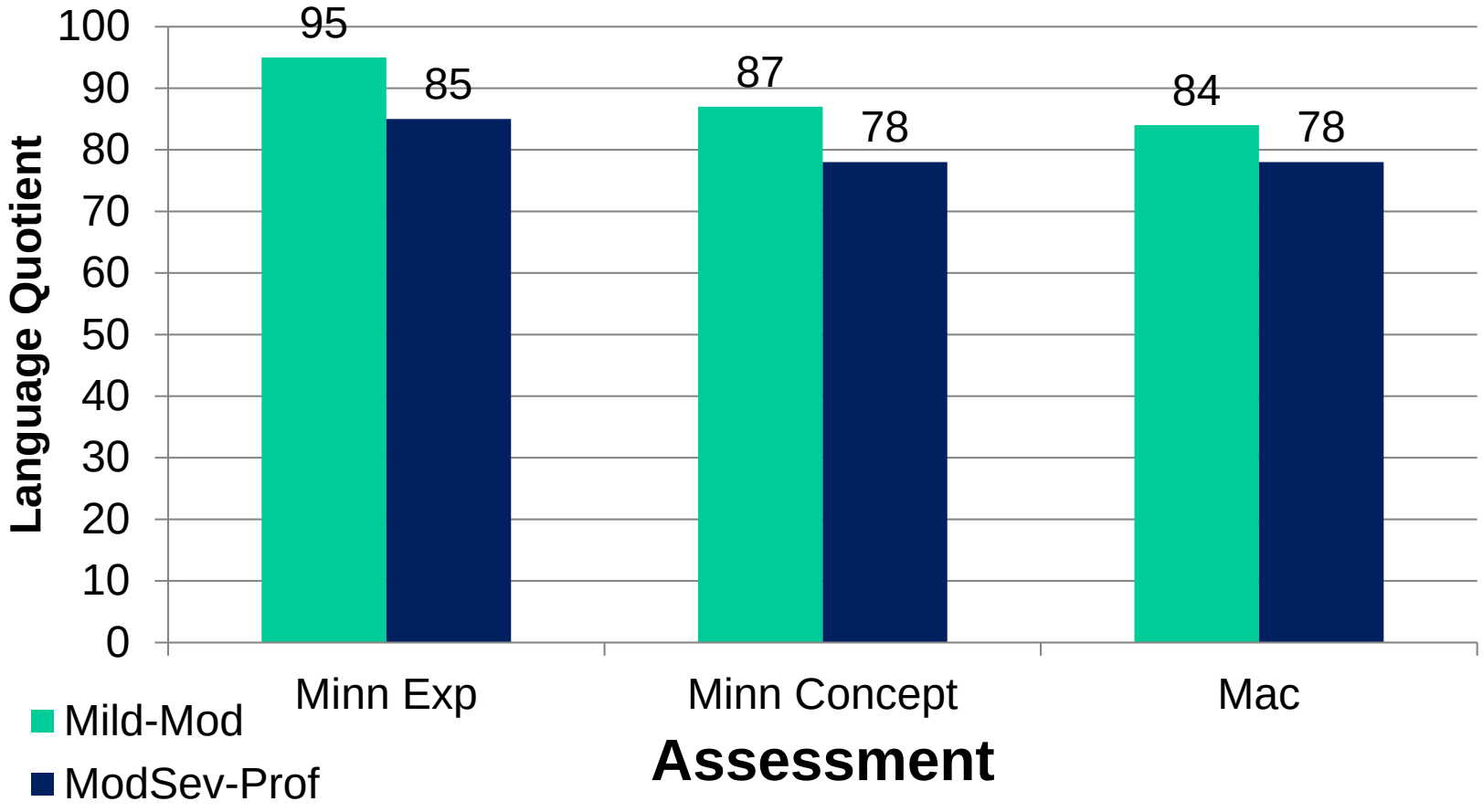
Deaf vs. Hearing Parent(s)



Intervention By 6 Months vs. Later



Mild to Mod Hearing Loss vs. Mod-Sev to Profound Hearing Loss



Conclusions

- Acquiring an age-appropriate lexicon is a challenge for many children with 47% demonstrating significant delays
- Typically children scored more poorly on cognitive-linguistic items compared to more concrete/routine language items

Conclusions

- Typically language quotients were higher (by 7 to 15 points) for children who had:
  - No additional disabilities
  - Intervention by 6 months of age
  - Mild or moderate hearing loss
  - Deaf parent(s)
  - Unilateral hearing loss
  - Parents whose written language was English
  - Mothers with degrees beyond a HS diploma