INTRODUCTION

- Children who are deaf and implanted with a cochlear implant (CI) can develop language skills that enable them to communicate verbally and to function in mainstream environments.
- Recently, it has become common for children to receive bilateral cochlear implants (BICIs) in an effort to promote the development of spatial hearing skills and in the hope that the ability of these children to function in complex auditory environments will be greater than that of unilaterally implanted listeners.
- Growing evidence suggests that sound localization and speech understanding in noise improve when BICIs are used compared with unilateral CIs.
- It is unclear whether non-auditory abilities such as expressive and receptive language are also promoted through the use of a second CI.

Purpose:
- To evaluate cognitive and linguistic abilities of children with bilateral cochlear implants (BICIs).
- To determine which variables (Hearing Age, Chronological Age at CI1, Length of Bilateral Experience, and Interval between CI1 and CI2) play a role in predicting cognitive and linguistic development. (See section on right for definitions of variables)

VARIABLES

- Hearing Age (at time of testing)
- Amount of time listener has been exposed to speech
- Chronological Age at CI1 (CA at CI1)
- Age at CI1 activation
- Length of Bilateral Experience (at time of testing)
- Amount of time listener has been exposed to sound
- Interval between CI1 and CI2
- Length of time between the activation of CI1 and the activation of CI2

STANDARDIZED MEASURES

- Leter-R (Roid & Miller, 1997)
  - BRIEF-IQ Composite: 4 “Visualization and Reasoning” subtests, administered completely non-verbally
- Memory Screen Composite: 2 “Attention and Memory” subtests, administered completely non-verbally
- Test of Language Development-Primary, 4th ed. (TOLD-P4; Newcomer & Hammill, 2008)
  - Core Language Composite-6 (Expressive and Receptive) subtests
- Receptive Language (Listening) Composite-2 subtests
- Expressive Language (Speaking) Composite-2 subtests

LANGUARDIANSHIP BETWEEN AUDITORY AND NON-AUDITORY MEASURES

<table>
<thead>
<tr>
<th>BRIEF-IQ</th>
<th>Memory Screen</th>
<th>Core Language</th>
<th>Listening Composite</th>
<th>Speech Composites</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>p</td>
<td>R²</td>
<td>p</td>
<td>R²</td>
</tr>
</tbody>
</table>

- Hearing Age
  - R² = 0.439, p = 0.014, 346, 343, 011
- Bilateral Experience
  - R² = 0.9, 0.59, 0.38, 0.19, 0.18
  - Interval btw CI1 & CI2
    - R² = 0.24, 0.437, 0.29, 0.20
  - a 0.2, 0.256, 0.17, 0.125

- No significant age of implantation effects were found, but there is a trend towards improved performance for children who received their first implant before 18 months.

PARTICIPANTS

- Mean = 111.36 (SD = 12.59)
- Range = 87-143
- 5;8: Age
- 40: Min
- 91: Max
- Std.Dev.: 14

- Table 1: Demographic characteristics of 45 BCI children at their first visit.