

Maternal Word-Learning Cues to Children with and without Cochlear Implants: A Preliminary Look

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INTRODUCTION

The lexicons of preschool children with hearing loss, despite technological advances, lag behind those of age-matched peers with normal hearing (Connor et al., 2006). In addition to having fewer total words in their lexicons, children with hearing loss, including children with cochlear implants, add words to their lexicons at a slower rate than peers (Nott et al. 2009). Thus, the vocabulary gap between children with and without hearing loss widens across the preschool years.

Maternal input influences a hearing child's rate of vocabulary acquisition. Features of adult input to children support the development of early lexical knowledge. Both infant-directed speech and actions recruit infant attention (Fernald & Simon, 1984; Brand, Baldwin, & Ashburn, 2002). Within the environment, two types of multimodal cues (i.e., auditory and visual cues) are available to children: (a) converging cues in which infant-directed speech and actions overlap temporally and reference the same object and (b) diverging cues in which speech and actions reference different objects (Gogate, Bolzani & Betancourt, 2006). Within a labeling event, synchronous cues provide the most information to infants about a label's referent (as compared to asynchronous or follow-in labels). However, the influence of maternal cues on lexical growth changes across the period of lexical development; older children make better use of diverging cues than young children (Gogate, Bahrack, & Watson, 2000).

Auditory-visual word learning cues to children with cochlear implants may differ from those to children with normal hearing. Children with cochlear implants begin learning spoken language at a later age than normal-hearing peers. FDA-labeled indications do not support cochlear implantation under 12 months. Prior to implantation, many children with cochlear implants exhibit age-appropriate nonverbal skills despite a lack of linguistic knowledge (Geers, Nicholas, & Sedey, 2003). Parents of a child who looks and acts like a three-year-old may find it difficult to use both auditory and visual cues more appropriate for a typically developing, normal hearing 12-month-old (i.e., linguistic level of newly implanted child). Researchers must consider whether converging and diverging maternal input plays a role in the delayed lexical development of children with cochlear implants.

PURPOSE

To report on preliminary findings about word-learning cues provided to children with and without cochlear implants in the early period of lexical development.

PARTICIPANTS

Cochlear Implant Group

CHILD CODE	GENDER	MONTHS OF CI USE	AGE	EXPRESSIVE WORDS	YEARS MATERNAL EDUCATION
MMACK	F	7	19 months	28	18
JCULL	M	4	21 months	0	16
NSUTT	F	4	29 months	10	12

Age-Matched Group

CHILD CODE	GENDER	AGE	EXPRESSIVE WORDS	YEARS MATERNAL EDUCATION
HJONE	M	18 months	72	18
ZTORR	F	23 months	314	17
HINGR	F	30 months	206	16

Vocabulary-Matched Group

CHILD CODE	GENDER	AGE	EXPRESSIVE WORDS	YEARS MATERNAL EDUCATION
LMILL	F	13 months	22	18
MLEWI	F	19 months	11	18

METHOD

Each participant was filmed during two mealtime interactions with their mothers. Novel words used in the interaction were identified and coded for accompanying auditory and visual cues.

Naming events were coded with:

Auditory/visual converging cues:

- Synchronous labeling using hand motion
- Synchronous labeling using eye gaze
- Follow-in labeling

Auditory/visual diverging cues:

- Asynchronous labeling
- Conflicting labeling

Auditory-only cues:

- Static object labeling
- Absent object labeling
- Abstract noun labeling

RESULTS

Figure 1. Cue Types by Group

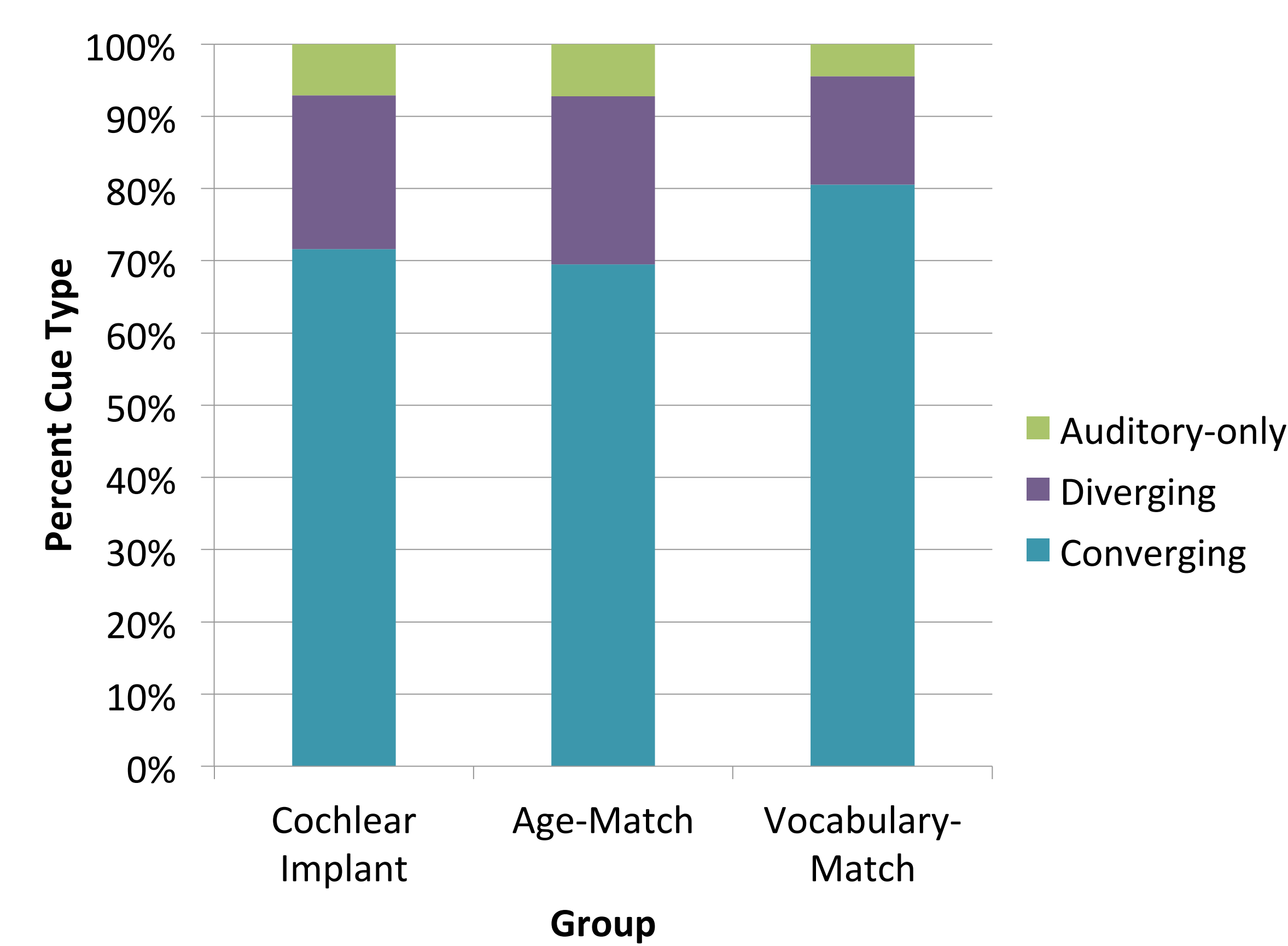
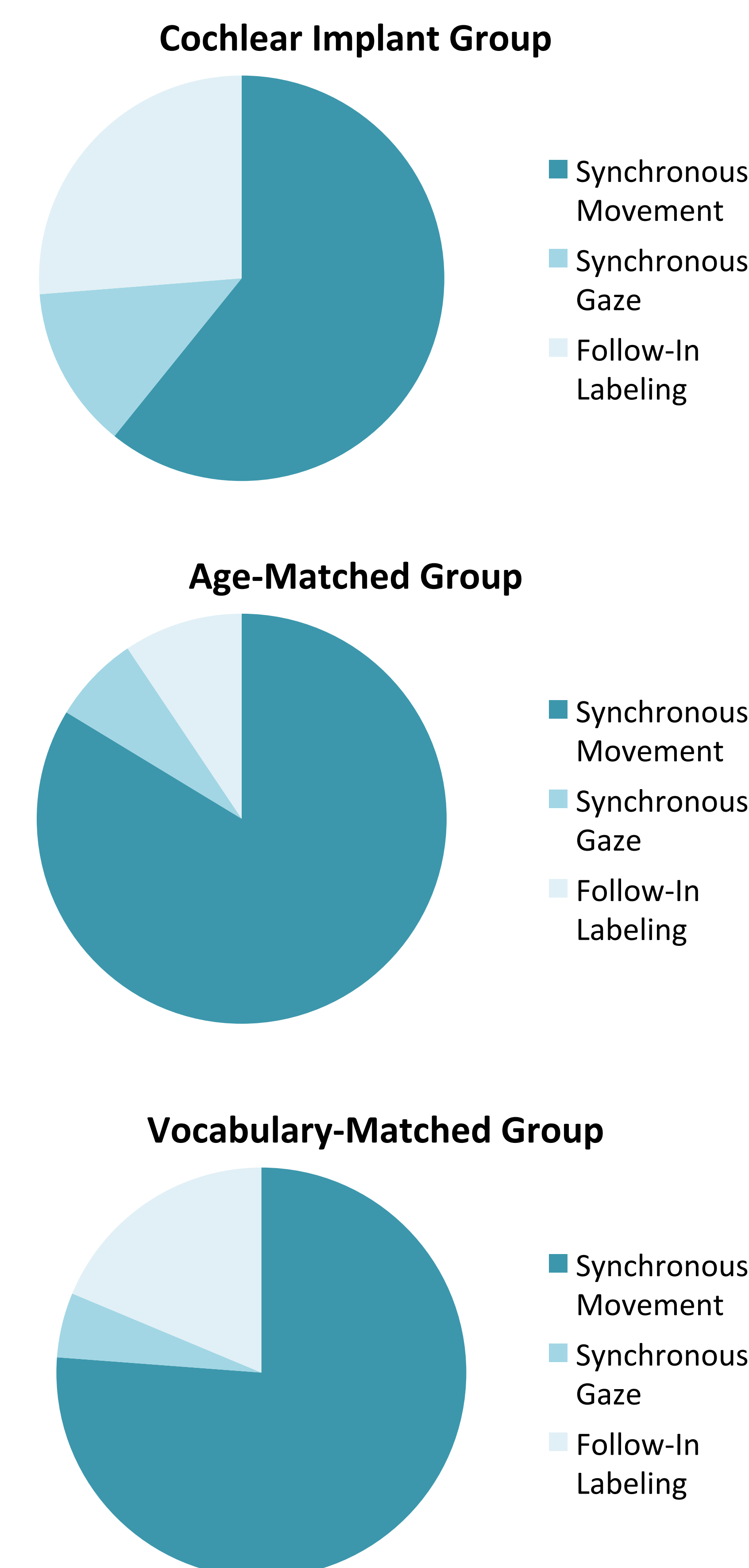
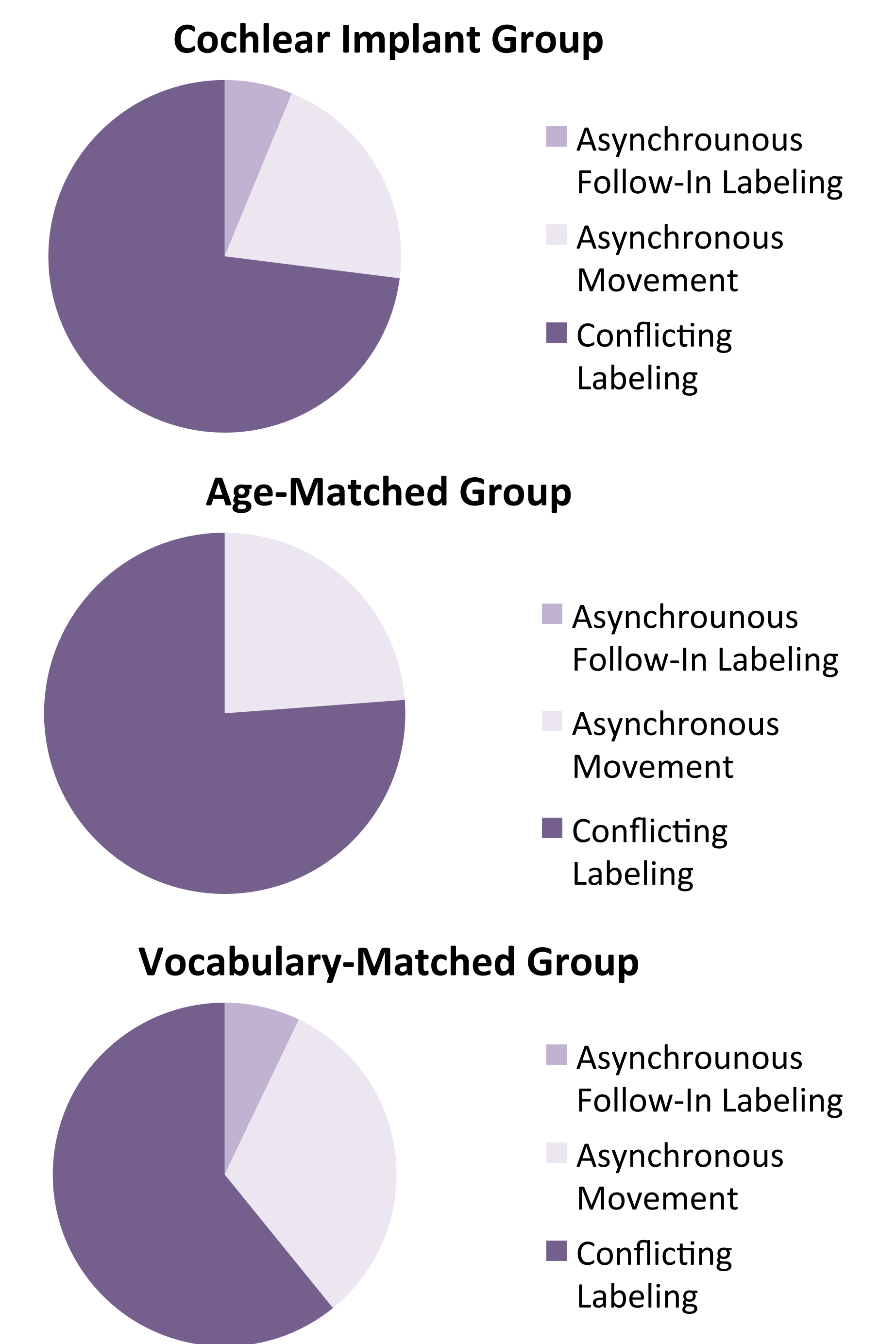


Figure 2. Converging Cues by Group



RESULTS

Figure 3. Diverging Cues by Group



DISCUSSION

This preliminary data suggests that cues provided to children with cochlear implants are more similar to cues provided to age-matched children than to vocabulary-matched children with normal hearing. Current work on this dissertation project involves collecting data across 48 mother-child dyads. Knowledge of environmental differences between children with and without hearing loss will allow investigators to assess how the quantity and quality of environmental input affect children's vocabulary acquisition. Further findings will indicate whether input differences may contribute to the limited vocabulary growth of children with cochlear implants and have implications for the development of intervention.

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References available upon request: language@vanderbilt.edu