

Parental Communication and Auditory Skill Development: Longitudinal Insights into Early Language Acquisition for Deaf and Hard of Hearing Children

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INTRODUCTION

Purpose of the study: Examine the relationship between auditory skill development and specific parental communication behaviors in supporting language acquisition among deaf or hard of hearing children aged 0-3 years.

Positive parent-child interactions play a crucial role in language development, as parents serve as the primary source of social and linguistic input (Curtin et al., 2021). Through prompts, responses to gestures, and vocalizations, parents help strengthen communication skills, with these interactions directly linked to vocabulary growth (Humphries et al., 2022). While hearing aids and cochlear implants enhance auditory input, deaf children may still face delays in language development due to the limitations in auditory access (Curtin et al., 2021). The quality and frequency of parental engagement are essential in shaping a child's language outcomes, particularly when parents must adapt their communication methods to meet their child's needs (Humphries et al., 2022). For hearing parents of deaf children, strategies such as gaining attention before speaking and using a mix of visual and auditory cues are important for fostering effective engagement and supporting language acquisition.

METHODS

Research Questions:

- 1.) What is the relationship between auditory skill development and parental communication behaviors in facilitating language acquisition for deaf or hard of hearing children?
- 2.) How do pre- and post-cochlear implantation effects influence parental communication behaviors and language development in deaf or hard of hearing children?

Participants:

The study focused on a single deaf infant, with data collected at two time points: at 8 months old (prior to cochlear implantation) and at 16 months old (post-cochlear implantation). The infant's parents, both hearing, participated in the study, providing insight into their communication strategies and their perceptions of the child's auditory and communication development.

Procedure:

The parents completed three questionnaires to provide self-reported data on their child's auditory skills and communication behaviors.

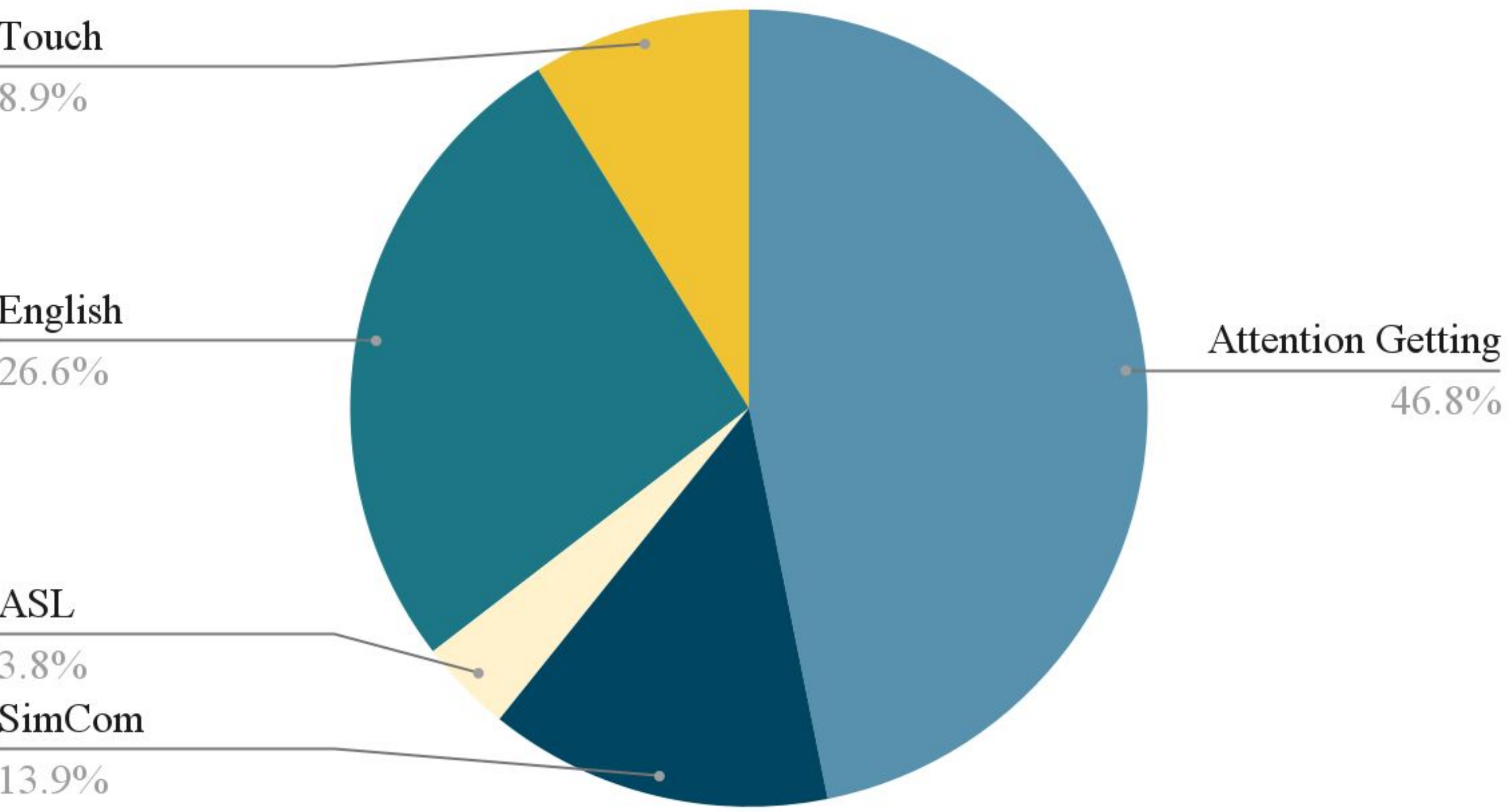
Two naturalistic play sessions were recorded to observe the child's interaction with their parents. During both sessions, the child interacted with the mother, and communication behaviors were recorded to capture the strategies used by the mother in engaging with the child.

Data Analysis:

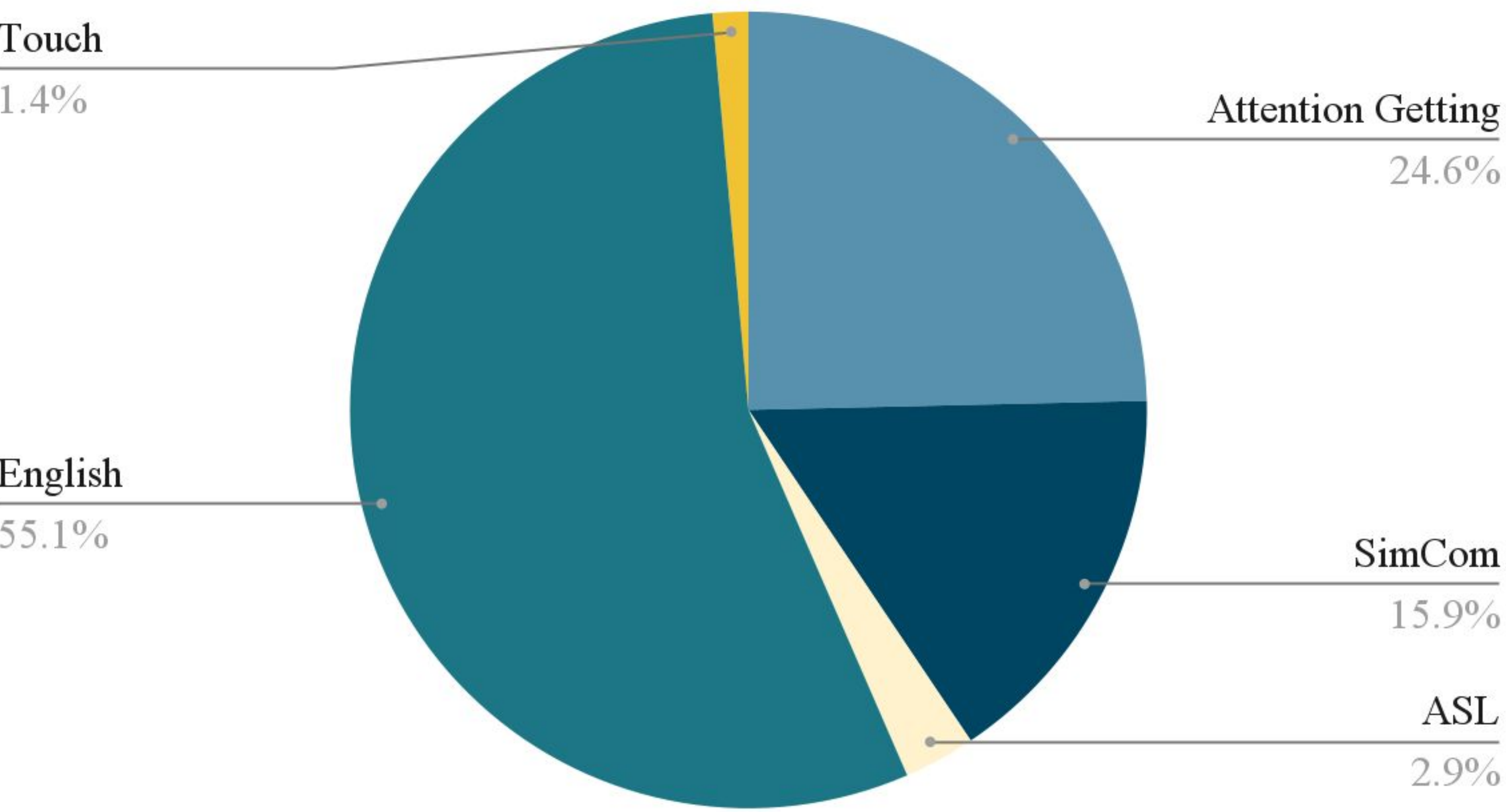
Using Elan computer software, the recorded play sessions were analyzed and coded based on the following parental communication strategies:

- **Attention Getting Behaviors:** Auditory behaviors such as using non-words (e.g. whoo) or clapping. Actions such as moving in the visual field, tapping, waving, or pointing to gain the child's attention.
- **Simultaneous Communication (SimCom):** The use of both American Sign Language (ASL) and spoken English at the same time.
- **American Sign Language (ASL):** Instances where the parents used only ASL.
- **Spoken English:** Instances of verbal communication in English.
- **Touch:** Physical contact strategies, such as hand-over-hand guidance, tickling, or gestures made on the child's body.

Wave I Pre-Implantation Parental Communication Behaviors



Wave 2 Post-Implantation Parental Communication Behaviors



REFERENCES

Curtin, M., Dirks, E., Cruice, M., Herman, R., Newman, L., Rodgers, L., & Morgan, G. (2021). Assessing parent behaviours in parent-child interactions with deaf and hard of hearing infants aged 0–3 years: A systematic review. *Journal of Clinical Medicine*, 10(15), 3345. <https://doi.org/10.3390/jcm10153345>

ELAN (Version 6.8) [Computer software]. (2024). Nijmegen: Max Planck Institute for Psycholinguistics, The Language Archive. Retrieved from <https://archive.mpi.nl/tla/elan>

Humphries, T., Mathur, G., Napoli, D. J., Padden, C., & Rathmann, C. (2022). Deaf children need rich language input from the start: Support in advising parents. *Children*, 9(11), 1609. <https://doi.org/10.3390/children9111609>

PARENT QUESTIONNAIRE SCORES

The parents rated their child on a variety of communication skills using the:

- **Infant and Toddler Meaningful Auditory Integration Scale (IT-MAIS):** An interview-based assessment that evaluates a child's ability to listen to sounds in everyday life
- **Devereux Early Childhood Assessment for Infants (DECA-I):** A standardized assessment tool tracks a child's progress in building healthy relationships, regulating emotions, and showing initiative, while also identifying strengths and protective factors.
- **Developmental Assessment of Young Children (DAYC-2):** A standardized assessment tool used to identify potential developmental delays in children across five key domains: cognition, communication, social-emotional development, physical development, and adaptive behavior

	Wave 1 Scores	Wave 2 Scores
IT-MAIS	0	26
DECA-I	Initiative t-score: 42 Attachment/Relationships t-score: 49 Total Protective Factors t-score: 46	Initiative t-score: 63 Attachment/Relationships t-score: 65 Total Protective Factors t-score: 72
DAYC-2	Receptive Language standard score: 90 Expressive Language standard score: 78 Communication Domain standard score: 84	Receptive Language standard score: 80 Expressive Language standard score: 82 Communication Domain standard score: 81

DISCUSSION

This study explored the relationship between auditory skill development and parental communication behaviors in supporting language acquisition for a deaf child, with a focus on pre- and post-cochlear implantation effects. The data revealed a significant improvement in auditory skills, with the IT-MAIS score increasing from 0 pre-implantation to 26 post-implantation, highlighting the impact of cochlear implantation on auditory development. Parental communication also shifted following the implantation, as parents increasingly used spoken English (from 21 instances to 38) and reduced the use of attention-getting behaviors (from 37 to 17). This suggests that as the child's auditory skills improved, parents adapted their communication strategies to engage the child through spoken language. In early infancy, before the cochlear implant, the child's communication skills were limited, and parents relied on visual and physical cues such as touch and attention-getting behaviors. As the child's auditory input improved with the cochlear implant, the nature of the interactions shifted toward more verbal communication.

The findings also addressed how cochlear implantation influenced both parental communication and language development. Post-implantation, the child's emotional and social development, as measured by the DECA, showed notable progress, with increases in initiative (from 42 to 63), attachment/relationships (from 49 to 65), and protective factors (from 46 to 72). These improvements likely reflect the benefits of present auditory skills and effective parental communication.

LIMITATIONS

This study is limited to a single case study of one deaf infant and their hearing parents, restricting the generalizability of the results to broader populations. The communication behaviors observed may not be representative of all families with deaf or hard of hearing children, as parental interaction styles vary widely. Future research with a larger sample size and longitudinal design would provide a more comprehensive understanding of the relationship between parental communication behaviors and auditory skill development in deaf and hard of hearing children.