Critical Review:

Results

Brackett and Zara (1998) evaluated the communicative performance of children who received cochlear implants before five years of age and the effects of age of implantation on language acquisition. Thirty-three children were grouped according to their age of cochlear implantation; two to three years old (n=17) and three to five years old (n=16), respectively. Receptive vocabulary was tested using the Peabody Picture Vocabulary Test (PPVT) pre-implantation and consecutively for three years post-implant.

The authors provided descriptive statistics of the different trends noted for growth over time. These descriptive results indicated that children implanted before the age of five continuously showed a delay in their receptive vocabulary development, but this delay did not widen over time, which has been seen previously with children who are deaf, wearing traditional amplification. Furthermore, when comparing the younger to older groups of children, it was observed that children in the younger group were able to make consistently larger gains over the three years, whereas the older children made less vocabulary growth. Although both groups exhibited a language delay post-implantation, the older group
Despite these trends, an appropriate mixed repeated measures analysis of variance showed that no significant differences were found between the two groups in any language domain, including receptive vocabulary for either group. Overall, the authors suggested that children who are implanted by the age of five will show increased receptive vocabulary development. It was also suggested that children implanted by two to three years old may show a slightly greater receptive vocabulary growth.

Upon analysis of the Brackett and Zara (1998) study, apparent methodological limitations were noted. Study procedures, including who tested the subjects, as well as testing times and locations were not mentioned, which would affect any replication of this study. The participant group had little exclusion criteria and was therefore a heterogeneous population. As well, a small sample size may have reduced the power of the study to detect significant results. Although statistical analysis did not support the original descriptive findings, important trends of growth patterns and variability were noted over time and therefore should not be discredited. Overall, Brackett and Zara (1998) provided suggestive evidence that younger implantation may have larger positive receptive vocabulary development.

Hayes, Geers, Treiman and Moog (2009) evaluated whether the age and year of cochlear implantation would affect receptive vocabulary skills and growth rates. A group of sixty-five children who were deaf were included in the study. At the time of testing, participants

that both age groups showed a persistent delay in receptive vocabulary throughout the study. The older group had significantly poorer results than the younger group at the initial time of testing, but improved significantly more in their vocabulary development than the younger group. Individual variation was also studied, indicating that some of the highest scorers came from both groups. Poorer performance levels at the initial time of testing, as judged by individual variation, did not predict a more rapid vocabulary growth rate. Additional results that did not hold a direct link to the current study were also reported. Results of phonological testing indicated that younger children were more likely to fall within normal limits and have significantly larger growth rates. Significant differences between the two groups were found in word reading as well. Overall, it was suggested that children implanted at a later age may make more receptive language gains over time, but there was still a wide range of variation between and within the two groups that may not be accounted for solely by age of implantation.

Although the authors incorporated descriptive statistics and used t-tests to compare the two groups, overall statistical analysis was weak. By using multiple t-tests, the authors increased their chances of having a type I error. As well, statistical power may be low due to the small sample size, leading to a reduced ability to detect a significant difference. Despite these limitations, this study provides fairly compelling evidence to suggest that younger children may

authors indicated that children who were implanted before the age of 2.5 would see greater development and a burst of speech and receptive vocabulary that would diminish with later ages of implantation.

Analysis of this research paper indicated that the study was well designed. The study was longitudinal and had a relatively large sample size considering the small size of the intended population. It would be assumed that statistical power would be adequate, therefore increasing the likelihood of correctly identifying statistical significance. Finally, participant criteria and methodology were well described and could be replicated in further studies. As well, participant variability was taken into account by using appropriate statistical analysis.

of communication. Researchers have begun to answer the latter question by studying total versus oral communication. Both Connor, Hieber, Arts and Zwolan (2000) and Kirk, Miyamoto, Ying, Perdew and Zuganelis (2000) indicated that communication mode did not effect rate of language development, whereas Kirk, Miyamoto, Lento and Ying (2002) indicated that children who used oral communication saw more gains in language. Further research in this area is warranted.

Conclusion

The literature reviewed in this critical analysis yielded important first steps in deciphering an appropriate age-of-implant to improve receptive vocabulary development. Trends towards early implantation emerged, indicating that children may present with more than average receptive vocabulary gains after early implantation. Some research did indicate, however, that older children may see more long-term benefit in receptive vocabulary development. This would suggest that children, regardless of age, would benefit from cochlear implantation.

Clinical Implications

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