SPOG Lab
Speech & Cognitive Development Lab

Q: Does using Total Communication (often a combination of spoken and signed language) with a child impact children's spoken articulatory development?

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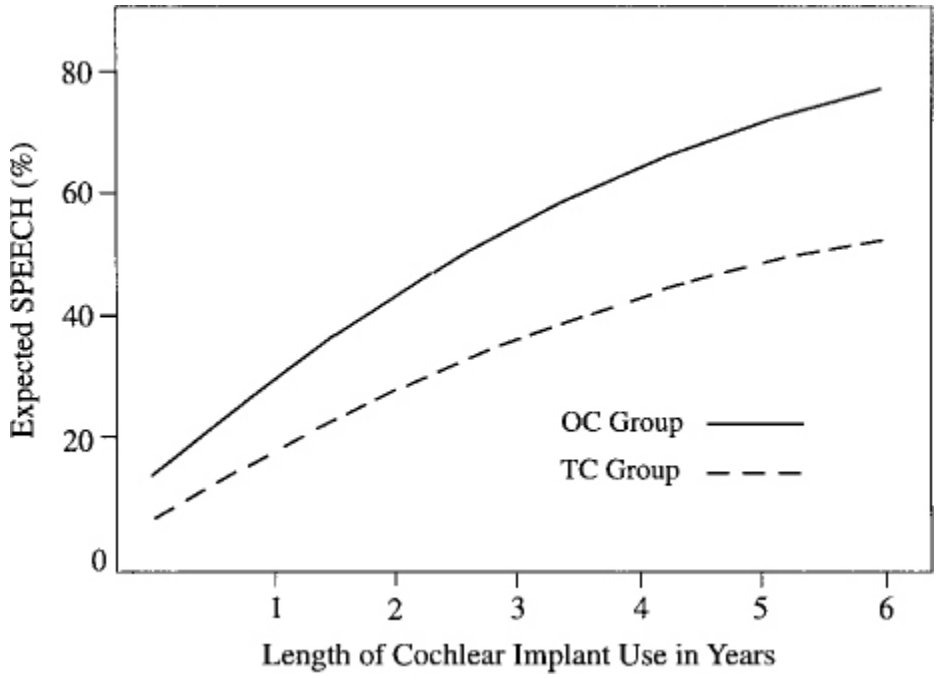
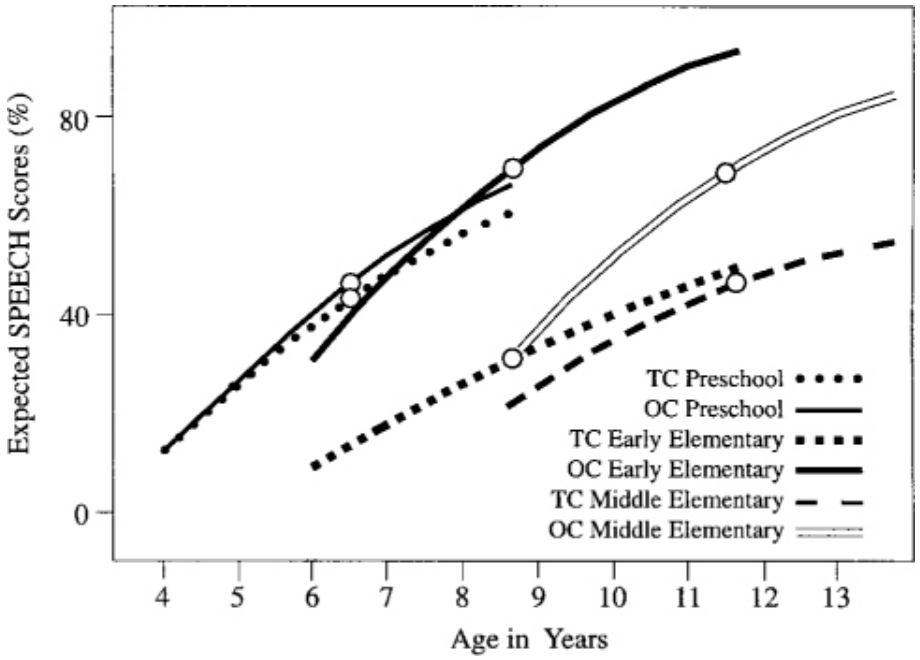
There is not much direct research to answer this question, but some recent studies looking at different communication methods for children who are DHH seemingly point to the advantages of LSL (listening and spoken language) over a bimodal method when it comes to developing articulation skills.

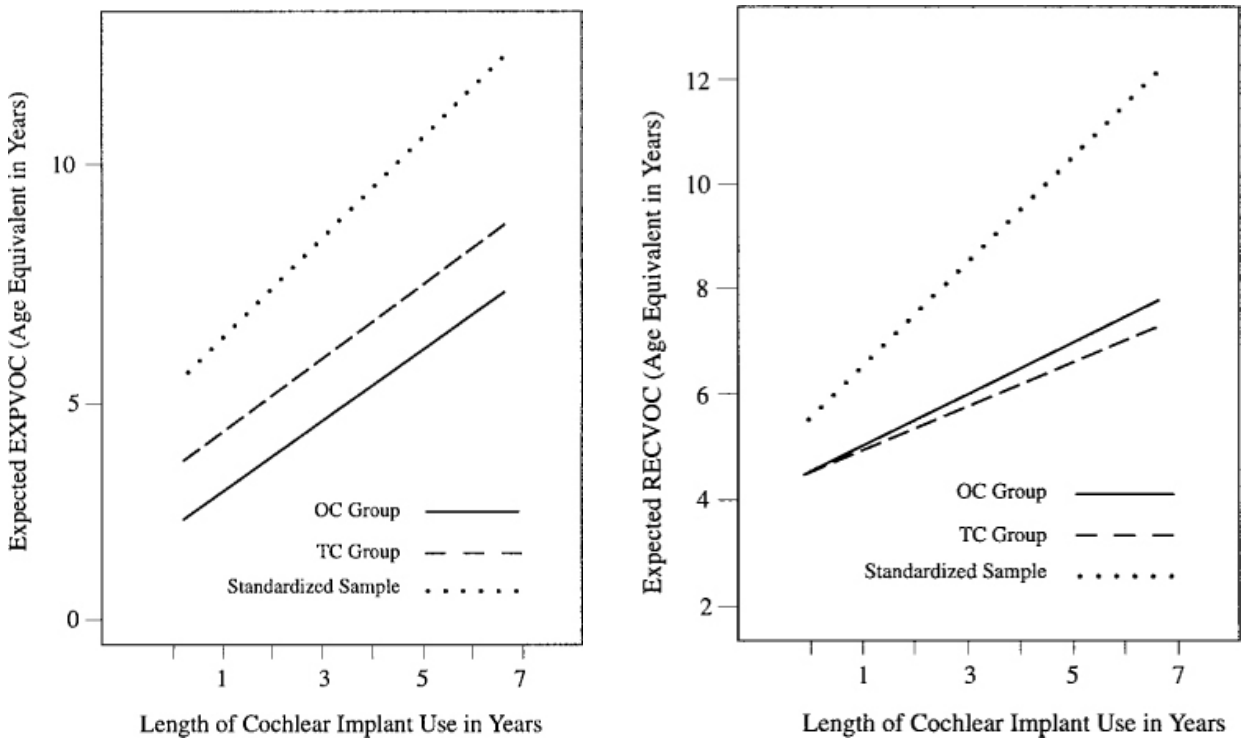
Looking into the past, one study from the University of Michigan in 2000 (Connor et al., 2000) studied children aged 6 months to 10 years with cochlear implants. They were in school programs that used either an oral communication (OC) teaching method (focusing on the development of spoken language) or a Total Communication (TC) approach (using both spoken and signed language). This study found that, on average, children in OC programs had better consonant production accuracy scores and improved faster than the children in TC programs. The figure below shows that children in OC programs had higher consonant production accuracy (SPEECH) scores than children in TC programs, and the difference increased over time. The mean age of implantation for the children in these groups was at 5.58 years old.



However, among children who were implanted before age 5, there was no longer a significant difference in the scores between the two programs. This indicates that age of implantation has a much stronger effect on articulation skills than the method of communication used in school. Perhaps kids in TC programs who are implanted early enough are better able to interpret spoken language and can rely less on signed language because they have had extra time to develop articulation/phonological skills from spoken language. The figure below (reprinted with permission from Connor et al., 2000) shows the lack of difference in SPEECH scores between children in OC programs and TC programs when implanted in preschool but the significant difference in articulation ability when implanted later on in early or middle elementary.



Additionally, Connor et al. (2000) showed that as long as children in TC programs received their CI(s) before third grade, they had higher expressive language scores (both spoken and signed) than children in the OC programs . Even back when the study was conducted, TC seemed to enhance some aspects of language development in the classroom even if speech development lagged behind. The figures below show higher expressive vocabulary (EXPVOC) scores (left) and only slightly lower receptive vocabulary (RECVOC) scores (right) for children in TC programs compared to children in OC programs. These are compared to a standardized sample of children with typical hearing.



Notably, that study did not differentiate between the auditory-oral approach (using lipreading to aid development of spoken language) and the auditory-verbal approach (not using lipreading and focusing only on learning to listen). Both teaching methods focus on spoken language, but they use lipreading to a different degree. The study mentioned (Connor et al., 2000) could have looked at children who used either approach. A more recent study from the University of Michigan (Thomas & Zwolan, 2019) differentiates between the two teaching methods and found that young cochlear implant recipients (implanted before age 5) had better speech, language, and literacy outcomes when taught using the auditory-verbal approach over both auditory-oral and TC.

I wanted to look mainly at recent research (after 2018), but it was very limited in direct answers (likely due to the pandemic). One 2019 study from Georgia State University (Lederberg et al., 2019) compared the speech, language and literacy skills of children who are DHH and who were in classroom environments that were either spoken language only, signed language only, and bimodal (both spoken and signed). They didn't define the bimodal environments as 'total communication,' but most students in the classroom used both spoken and signed language (74%), 14% preferred only speaking, and 14% preferred only signing. The majority of these classrooms used ASL as the primary language of instruction (62%), but some used both signed English and ASL (27%) and a few used only signed English (11%).

In Lederberg et al. (2019), almost 100% of the students in spoken or bimodal classrooms could consistently identify words from spoken language. However, the levels of spoken language articulation impairment were higher in bimodal classrooms than in spoken language classrooms (Lederberg et al., 2019). These bimodal classrooms had more children with moderate-severe articulation impairments while most kids in the spoken language only classrooms had no articulation impairment or a mild one. These data suggest that a TC approach may indeed lead to worse articulation outcomes for children who are DHH. However, the children in this study had varied auditory access despite being "bimodal," and as we've seen with previous studies (Connor et al., 2000; Thomas & Zwolan, 2019), children with CIs who are implanted early (before age 5) may have good enough auditory access that these potential drawbacks to a TC classroom may not apply. In that sense, recent technology allowing earlier identification and implantation does help improve articulation for children with CIs by improving their access to spoken language.

Another related question to articulation deficits with TC concerns literacy deficits in TC classrooms/programs. One 2020 study built upon the data from Lederberg et al., (2019) and looked at how children who are DHH in bimodal classrooms could improve their markedly lower literacy scores without losing the benefits of TC in the classroom. One element that the researchers looked at was using fingerspelling to develop phonological awareness in bimodal classrooms. For children in sign-only and bimodal classrooms, there is a strong relationship between fingerspelling phonological processing and reading, suggesting that fingerspelling could be a useful tool in TC classrooms to teach English phonological awareness (Antia et al., 2020). Phonological awareness is the ability to break up words into their component sounds and use those sounds to make new words. It is an essential skill for children learning how to read. Children with auditory access develop this skill with spoken phonological awareness (hearing component sounds and isolating them). Fingerspelling may serve as a functional alternative to spoken phonological awareness in children learning to read, as it can serve as a way to break up words into visual components. However, these two approaches–finger spelling and spoken phonological awareness– may also work in tandem for children who are bimodal. That relationship is yet to be explored!

Overall, the research points to the benefits of auditory access for children developing articulation skills rather than any deleterious effects that TC classrooms may have on developing articulation. Total Communication seems to have a positive effect on improving access to language, and any delay in articulation development would result from children not having sufficient auditory access of spoken language (not them ignoring it in favor of signing).

References

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