Bicycling Habits of Children with Hearing Loss

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Outcomes of School Age Children who are Hard of Hearing

Background

- Hearing aids (HAs) and cochlear implants (CIs) support auditory access, increase safety, and promote communication skills.
- Childhood hearing loss (HL) and devices such as HAs and CIs may limit participation in age-appropriate activities, such as bicycling, due to safety concerns or lack of accommodating safety equipment.
- This study investigated whether children with HL who use HAs or CIs are restricted from bike riding, if they wear helmets less, and if there are more parental safety concerns in this population. This study was done in collaboration with Universiteit Leiden in the Netherlands to explore cultural differences in biking behavior and parental attitudes between American and Dutch parents of children with HL.
- The present study aims to bring awareness to the need for audiologists to advocate for improved accommodations to enhance quality of life and safety, and alleviate participation restrictions for children with hearing loss.

Research Questions

- Do children with HL ride bicycles less often than children with normal hearing (NH)?
- Do children with HL wear helmets less often than children with NH?
- Do children with HL begin bicycling without training wheels at a later age than children with NH?
- Are parents of children with HL less confident in their child's bicycling skills than parents of children with NH?

Participants and Methods

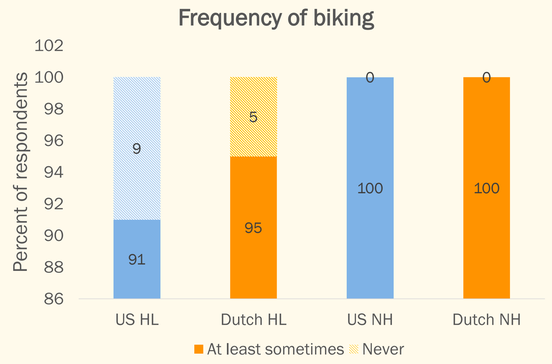
- A Qualtrics questionnaire was sent out to parents of children with HL and children with NH.
- The questionnaire featured 15 questions (e.g., Likert scale, multiple choice, short answer).
- One hundred two American parents of children with HL and 59 parents of children with NH responded to the survey. Some questions were directed only towards the parents of children with HL. As a result, each question yielded a different number of responses. One hundred ninety-four Dutch parents completed the survey (108 NH, 86 HL)

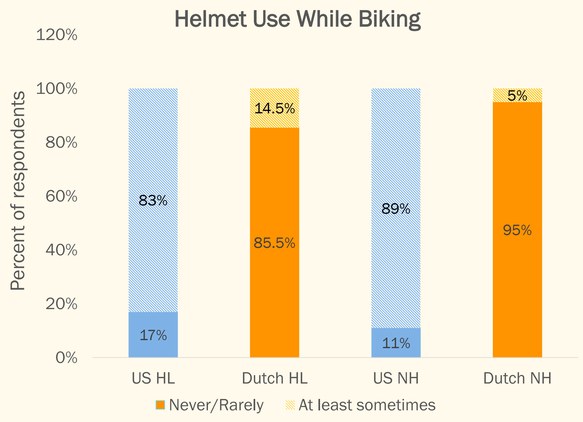
Group	Mean Age	Standard Dev.
US NH	10;8	1;2
US HL	10;7	1;6
DUTCH NH	10;2	1;4
DUTCH HL	10;4	1;3

Results

Do children with HL ride bicycles less often than children with NH?

US and Dutch children with HL were significantly more likely to never ride a bicycle than children with NH ($\chi^2(1) = 4.3$, $p = .04$, $\chi^2(1) = 5.18$; $p = .02$, respectively).



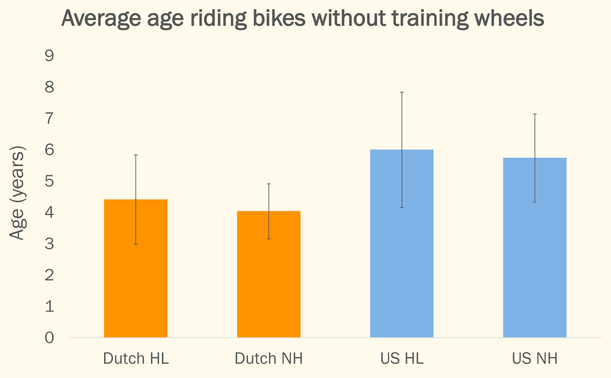


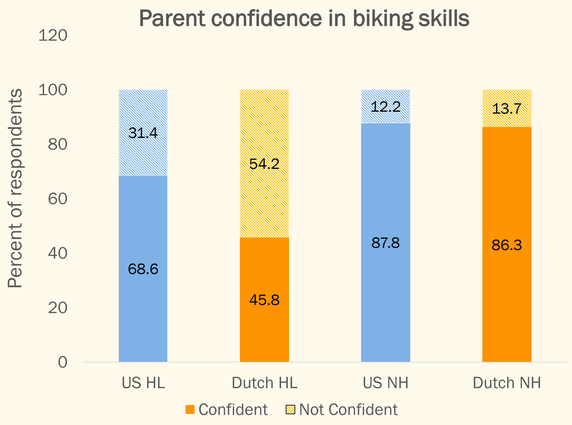
Do children with HL wear helmets less often than children with NH?

Significantly more Dutch children with HL wore a helmet compared to Dutch children with NH, $\chi^2(1) = 4.6$, $p = .03$. There was no statistical difference in the frequency of helmet use in US children with and without HL.

Do children with HL begin bicycling without training wheels at a later age than NH children?

Dutch children with HL began riding bikes without training wheels at significantly older ages, $t(99.2) = 2.05$, $p = .04$. There was no significant difference for US children with and without HL ($p = .38$).



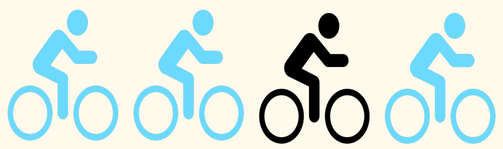


Are parents of children with HL less confident in their child's bicycling skills than parents of children with NH?

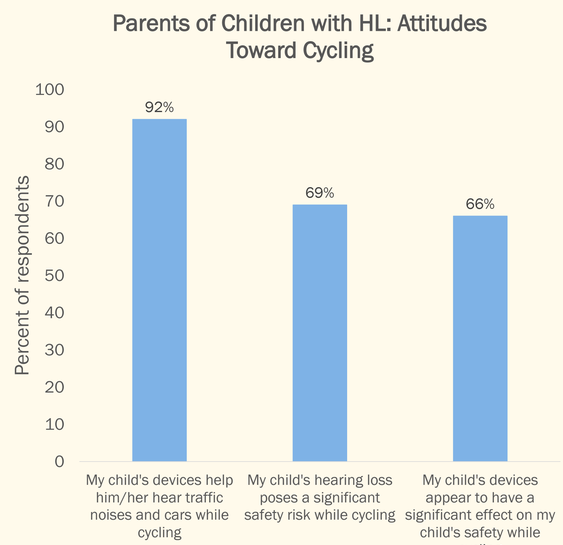
US and Dutch parents of children with HL were significantly less confident in their children's biking skills compared to parents of NH children ($\chi^2(1) = 5.43$, $p = .02$, $\chi^2(1) = 21.21$, $p < .0001$, respectively).

Do children with HL wear their devices while biking?

Three out of four of the US parents of children with HL said their child <u>always</u> wears their hearing device(s) while biking.



Results *(cont.)*



Discussion and Future Directions

- Our survey results indicate that some children with HL may face participation restrictions with biking.
- Dutch children in both groups began bicycling without training wheels at an earlier age. Overall, while certain biking habits may vary between the countries, it appears that parents of children with HL may globally express a lack of confidence in their child's cycling skills.
- It was more common for American children with and without HL to wear bike helmets, relative to Dutch children. This may reflect the success of the American public health movement to encourage helmet use.
- Several parents provided suggestions for accommodations to increase the safety of their child while biking (e.g., installing a "Deaf child" sign alongside the street near their home to increase driver awareness).
- Currently, 83% of counseling provided by audiologists focuses on providing information about medical or device related-issues. An effort to expand audiology-based counseling to address participation restrictions should be considered. Forums where audiologists, families, and individuals with HL can provide solutions to alleviate these restrictions may be beneficial.

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