Field Study News

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Teens and technology

Use and disuse of remote microphones explored in survey of students

The use of remote microphones has proven benefits for children in classroom environments. However, there is a steady decline in use of these systems as children approach high school. To understand the reasons for use and disuse of these systems, a survey was administered to 83 students aged 13 to 18. Findings showed that students who continue to use remote microphone (RM) systems acknowledged the benefit in classroom situations and take responsibility for using the systems, showing strong self-advocacy skills. Non-users conversely reported less perceived benefit, dislike for the cosmetics of the system and an aversion to handing the microphone to the teacher. These responses highlight the potential to increase remote microphone use in teens by improving performance with additional use cases and improving designs with inconspicuous products and less obtrusive handling.

Introduction

It is often reported by educational audiologists that children start to reject the use of hearing aids and wireless systems as they hit adolescence. Educators worry about this trend because it occurs at a time when the curriculum is becoming more challenging. Additionally, peer to peer learning and group work, which can pose additional listening challenges for people with hearing loss, have been shown to occupy a substantial amount of teenagers' typical school day (Feilner, Rich & Jones, 2016). Findings by Feilner revealed that group work was identified as very challenging by students with hearing loss. In spite of the growing difficulty in the acoustic content and environment, teens often reject the use of amplification and assistive technologies. This survey was developed to explore reasons for use and disuse in this population.

Methodology

83 adolescents between the ages of 13 and 18 (mean age = 15) completed a written survey that included eleven questions. Figure 1 shows the distribution of ages of all respondents. 63% of respondents (52) were male.

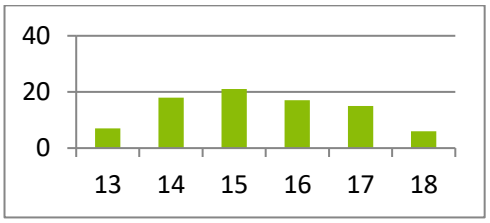

Figure 1. The distribution of ages of students who completed the survey

Each student's audiogram was provided with the completed survey and all student respondents were deemed candidates for a remote microphone (RM) system by their educational audiologist. 5 students had normal hearing but were diagnosed with central auditory processing disorder, 25 had unilateral loss and 53 had bilateral sensorineural hearing loss. The hearing status of all respondents can be seen in Figure 2.

64% of the students reported that they used hearing aids and 5% used one or more cochlear implants. 70% of the students had used a RM system in the past and planned to use one in the coming school year. 24% had used a RM system in the past but did not plan to use one this year. 6% of the respondents reported that they had never used a RM system and did not plan to use one this year. In total 70% were current users and
30% were non-users.

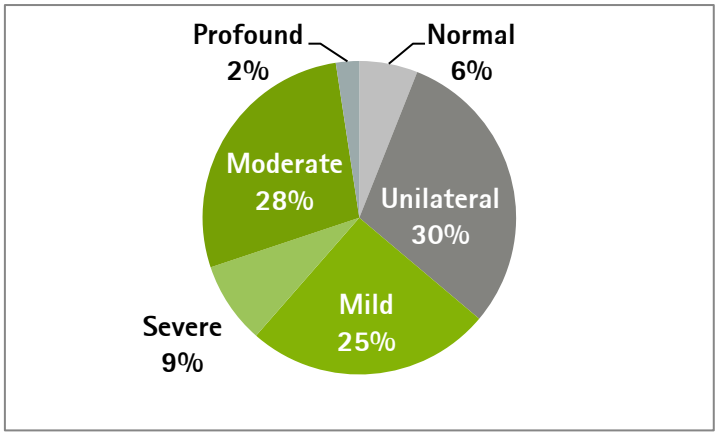

Figure 2. Survey respondents by degree of hearing loss.

Results

RM users were asked to rank the importance of various reasons for their continued use of a RM system. Their responses can be seen in Figure 3. The reasons that were given the highest importance were *improved ability to hear the teacher*, *understanding in noise*, and *improved confidence*. These answers were followed in ranking by *improved focus and attention* and *better grades*. It is also interesting to note the reasons that were given the lowest importance relative to students' continued RM use. The factors rated as "not important" by the most respondents included that *parents, audiologist or teachers made them use it* and that *RM systems made them less tired*. In general these answers indicate that the students who continued RM use during the teen years were a group of students who accurately understood and experienced the benefit of such systems and showed great self-determination in their choice to use them.

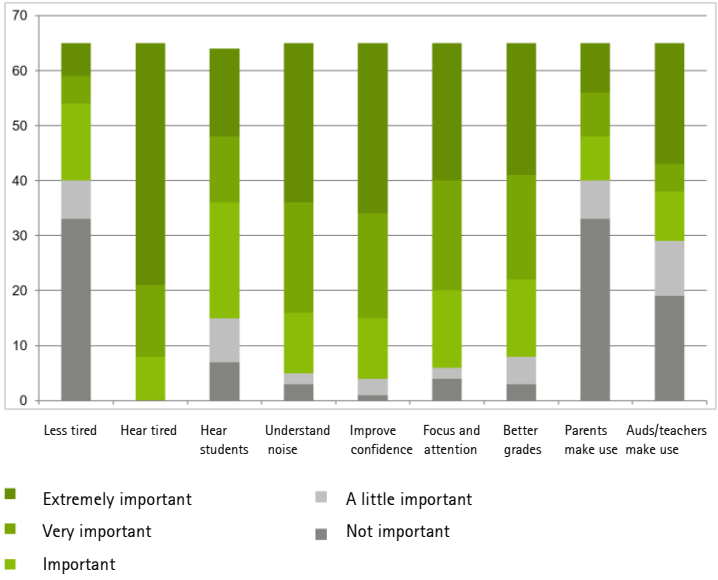

Figure 3. Rankings of reasons for continued RM use by teens.

In addition to their reasons for use, teenagers also reported the amount of perceived RM benefit in certain situations. The results can be seen in Figure 4. In general, the results show that students are only using the systems in traditional classroom situations. More than half reported never having used RM systems for applications outside of the classroom. Understanding the classroom teacher, understanding peers, and listening to media were identified as the situations in which the most benefit was perceived.

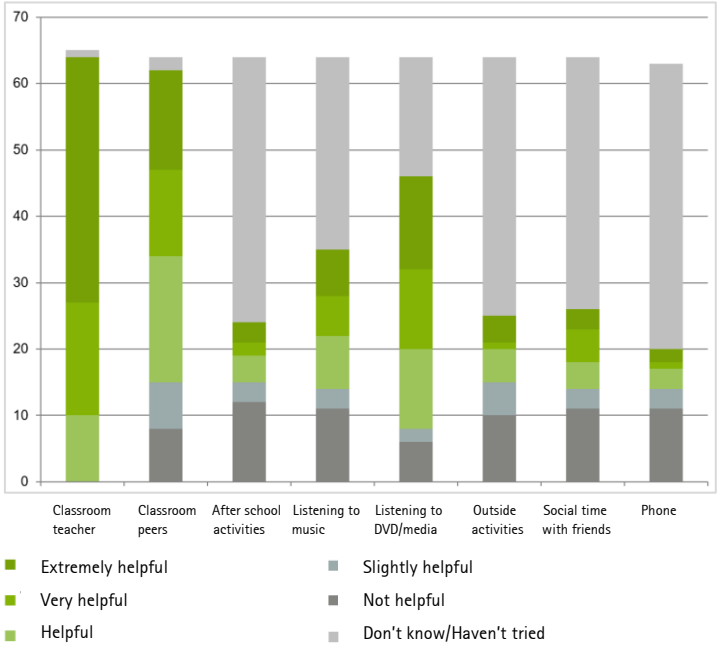

Figure 4. Rating of benefit provided by a remote microphone system in listening situations.

Finally, the reasons for discontinuing use among the 24% of former RM users were explored (Figure 5).

The data shown reveal that the number one reason cited by teens is cosmetic. They don't like the way it looks or feels. This is followed by reports that it doesn't help them to hear the teacher and/or peers. These complaints were followed by complaints that there was too much noise or interference through the RM system and that they did not like handing the microphone to the teacher. In light of these reports, it is important to note that 50% of the students surveyed used Roger and 50% still used traditional FM systems. The substantial number of students still using FM transmission may explain the high number of students dealing with interference issues. Since Roger uses 2.4 GHz digital transmission, with point to point pairing, interference is eliminated.

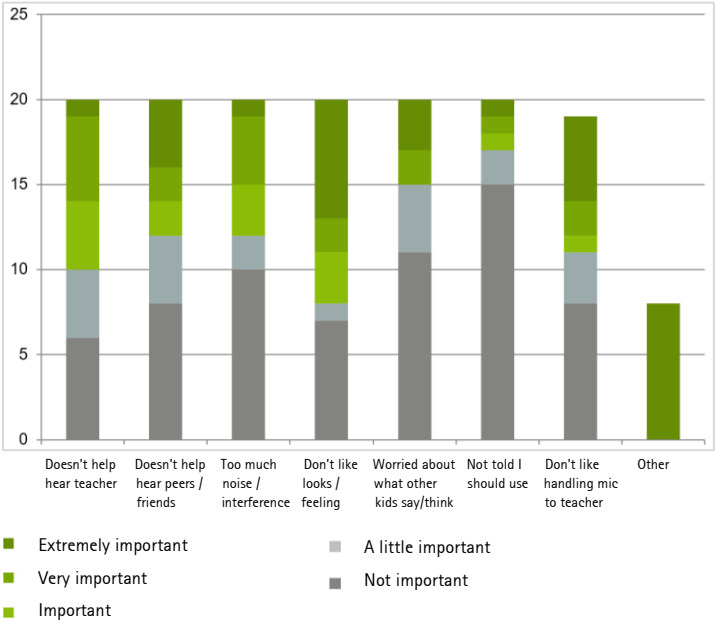

Figure 5. Rankings of reasons for discontinued RM use by teens.

Of the five children who never used a RM, three wrote comments that they did not like the way the system sounded or that they didn't think they needed it.

Conclusion

The results of this survey indicate that a majority of teens in this suburban school district are successful and willing users of RM systems. On the other hand, opportunities continue to exist for the roughly one quarter of high school students who chose to stop using RM systems primarily for cosmetics and poor perceived benefit. All of the primary reasons cited point to the possibility that future RM innovations can better meet the demands of this population. Details pertaining to how cosmetics could be improved were not explored, but presumably smaller ear level devices and transmitters that are beneficial without being handed to the teacher would be appealing. Technologies such as the Roger Touchscreen Mic can adapt microphone behavior to the use case based on the position of the device and effectively broadcast input from peers working together in groups. The applicability of these adaptive behaviors should be further explored for classroom applications. Finally, since it was shown that successful teen RM users do so based on their perceived benefit and of their own volition, continued exploration of the needs and preferences of this group would support future innovation and potentially maintain more teens as RM users.

References

Feilner, M., Rich, S., & Jones, C. (April, 2016) Phonak Insight: Automatic and directional for kids. Scientific background and implementation of pediatric optimized automatic functions. Phonak AG.

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Author

Christine Jones joined Phonak in 2001. She currently serves as the Director of the Phonak Audiology Research Center (PARC) where she manages internal and external clinical research to further our understanding of hearing loss and the opportunities available through treatment. Prior to this role, Christine was responsible for Phonak US Pediatrics and ran pediatric clinical research in PARC. Christine received her Master's degree in Audiology from Vanderbilt University and her Doctorate of Audiology from Central Michigan University.