

Beyond the Family: Turning to Teachers for Reports of Hearing Aid Use and Management

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INTRODUCTION

Audiologists routinely recommend that children with hearing loss wear their hearing aids during all waking hours. Several studies have shown that hearing aid use time increases during the first seven years of life^{1,2}. However, findings from a recent study of school-age children with hearing loss suggest that daily hearing aid use time might reach maximal levels around age nine or ten years and then decreases for some children as they enter adolescence³. In addition to reductions in hearing aid use time, the use of remote microphone systems in classrooms has also been found to decrease as children mature⁴.

Because school-age children spend a majority of their day in classrooms away from their parents, teacher reports of hearing aid and remote microphone use might provide additional information to improve our understanding of hearing aid and remote microphone use as well as parent/data logging agreement in children.

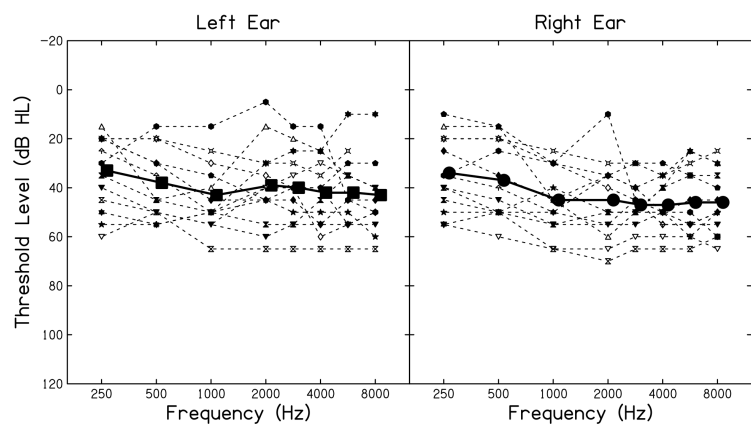
PURPOSE

The purpose of this study was to examine device use in young school-age children with hearing loss to enhance understanding of:

- parent-reported hearing aid use as compared to data logging records;
- parent and teacher agreement of hearing aid and remote microphone use in the classroom as well as the child's ability to manage his or her hearing aids; and
- differences between hearing aid use on school days and non-school days.

PARTICIPANTS

Figure 1. Audiometric thresholds of child participants.



Children (n=13):

- Monolingual English speakers
- Spent at least two hours per day in a general education classroom
- No diagnosis of cognitive impairment, autism, or other developmental disorders

Parents (n=13):

- Mothers of children

Teachers (n=10):

- Primary/Homeroom teacher

Table 1: Demographics of child participants.

Child	Age (years)	Gender	PPVT Standard Score	Better-Ear PTA (dB HL)	Age of Diagnosis (years)	Age of Hearing Aid Fitting (years)	Grade Level
HL1	7.27	F	91	11.67	Birth	5.00	K
HL2	7.31	F	95	26.67	6.00	6.58	1st
HL3	7.58	M	112	25.00	5.00	6.33	1st
HL4	7.58	F	66	50.00	6.75	7.00	1st
HL5	8.38	M	87	45.00	3.00	4.00	2nd
HL6	8.39	F	96	38.33	4.00	4.33	2nd
HL7	8.63	F	85	48.33	5.33	5.33	3rd
HL8	9.29	M	96	41.67	3.00	3.33	3rd
HL9	9.47	F	69	46.67	5.00	5.00	3rd
HL10	9.57	M	99	28.33	Birth	2.00	3rd
HL11	9.68	M	97	60.00	5.33	5.50	3rd
HL12	9.70	F	86	51.67	5.00	5.00	4th
HL13	10.61	F	129	33.33	5.00	5.00	5th

NOTE: PPVT: Peabody Picture Vocabulary Test – 4th Edition. PTA: Pure-tone average (500, 1000, 2000 Hz).

METHODS

Data logs were read from the child's hearing aids using the hearing aid manufacturer's software. Information recorded was average number of hours per day each hearing aid was turned on.

Parents completed a custom survey designed to assess patterns of device use in various situations. Topic areas of items included:

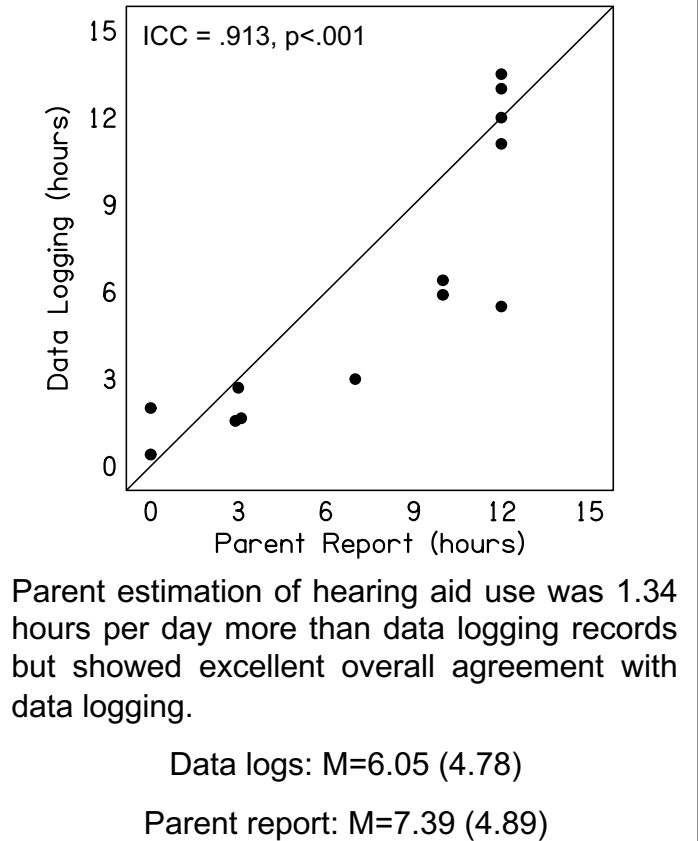
- Does your child use a remote microphone system at school?
- How many total hours does your child wear his/her hearing aids on a typical school day?
- Does your child wear his/her hearing aids during activities outside of school?
- Does your child express a desire to remove his/her hearing aids?
- Is your child responsible for his/her own hearing aid management (e.g., replacing batteries, cleaning device if needed, putting them away at night)?
- During which activities does your child wear his or her hearing aids on a typical school day and a typical non-school day?

Teachers were mailed a custom survey developed to parallel the parent survey. Topic areas of items included:

- What percentage of the time spent with you is this student wearing his/her hearing aids?
- Does this student ever express a desire to remove his/her hearing aids?
- Is this student responsible for his/her own hearing aid management?
- During what activities does this student wear his/her hearing aids?
- Does this student use a remote microphone system at school?

USE TIME

Figure 2. Daily hearing aid use time from data logging and parent reports.



REPORTS FROM PARENTS AND TEACHERS

Child	Transition to school in morning		School Instruction		Lunch		Transition from school in afternoon	
	Leaves Home	Arrives at School	Parent	Teacher	Parent	Teacher	Leaves School	Arrives at Home
HL1	Yes	Yes	Yes	Yes	No	No	Yes	No
HL2	Yes	Yes	Yes	Yes	No	No	Yes	No
HL3	Yes	Yes	No	Yes	No	Yes	Yes	Yes
HL4	No	No	Yes	Yes	Yes	Yes	No	No
HL6	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HL7	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HL8	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HL11	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HL12	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HL13	No	No	No	No	No	No	No	No

Remote Mic Use	All Classes	Some Classes	Never	Not Sure
Parent	4	1	6	2
Teacher	2	3	5	0

Seven parent-teacher pairs (70%) were in agreement when reporting at least part-time use or non-use of a remote mic system.

Five children (50%) were reported to use remote mic systems in the classrooms by their teachers.

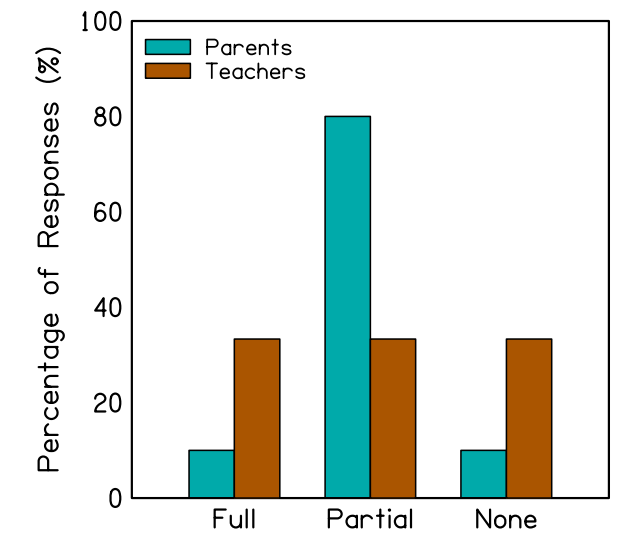
One parent was unaware their child was not using a remote mic system in the classroom.

Figure 3. Percent of parents and teachers indicating the child's level of responsibility in the hearing aid management process.

Three parent-teacher pairs (33%) reported consistent levels of responsibility of the child in the management process.

Four teachers (44%) reported the child to be more responsible for hearing aid management than the child's parent.

Two teachers (22%) reported the child to be less responsible for hearing aid management than the parent.



SCHOOL VS NON-SCHOOL DAYS

Table 4. Parent reports of their child's use of hearing aids on typical weekend/non-school (W) and school (S) days. Colored cells indicate the parent reported typical use during this time.

Overall, parents reported minimal differences of typical hearing aid use or non-use across school and non-school days.

Child	Wake-Up		Breakfast		In the car/bus		Homework		Social activities		Sports		Dinner		Evening	
	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
HL1				X	X	X										X
HL2						X										
HL3															X	
HL4			X	X	X	X	X	X	X	X	X	X	X	X	X	X
HL5						X										
HL6			X	X	X	X	X	X	X	X				X		X
HL7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HL8	X	X	X	X	X	X	X	X	X	X			X	X	X	X
HL9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HL10	X	X	X	X	X	X	X	X					X	X		
HL11	X	X	X	X	X	X	X	X	X	X			X	X	X	X
HL12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HL13																

SUMMARY & CONCLUSIONS

In this study, parents of 7-10 year old children with mild-to-moderate hearing loss showed excellent agreement with data logging when reporting daily hearing aid use time. Furthermore, **they reported that the day of the week (i.e., school or non-school day) and type of activity in which their children were involved did not impact their estimated hearing aid use time.**

Although parents and teachers showed good agreement regarding device use at school, our findings show poor agreement between parents and teachers concerning a child's management of hearing aids at school. These inconsistent reports reveals an area of care potentially under-addressed by audiologists and other providers. Teacher reports of the child's ability to manage the hearing aids independently could be useful in identifying which children require additional support in the area of maintenance and troubleshooting.

Fifty percent of teachers reported that the children with hearing loss in this study did not use a remote microphone system in the classroom. Although consistent with previous research⁴, it is unknown if the use of a remote microphone system was recommended for children in this study. Considering the wide-spread recommendation for use of remote microphone systems by children with hearing loss in classrooms, documenting the consistency of use of prescribed remote microphone systems with a large sample size is an important area for future research.

KEY REFERENCES

- Muñoz, K., Preston, E., & Hicken, S. (2014). Pediatric hearing aid use: How can audiologists support parents to increase consistency? *Journal of the American Academy of Audiology*, 25(4), 380–387.
- Walker, E. A., Spratford, M., Moeller, M. P., Oleson, J., Ou, H., Roush, P., & Jacobs, S. (2013). Predictors of hearing aid use time in children with mild-to-severe hearing loss. *Language, Speech, and Hearing Services in Schools*, 44(1), 73–88.
- Gustafson, S., Davis, H., Hornsby, B. W., & Bess, F. H. (2015). Factors Influencing Hearing Aid Use in the Classroom: A Pilot Study. *American Journal of Audiology*, 24(4), 563–568.
- Brackett, D., & Maxon, A. B. (1986). Service delivery alternatives for the mainstreamed hearing-impaired child. *Language, Speech, and Hearing Services in Schools*, 17(2), 115–125.

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