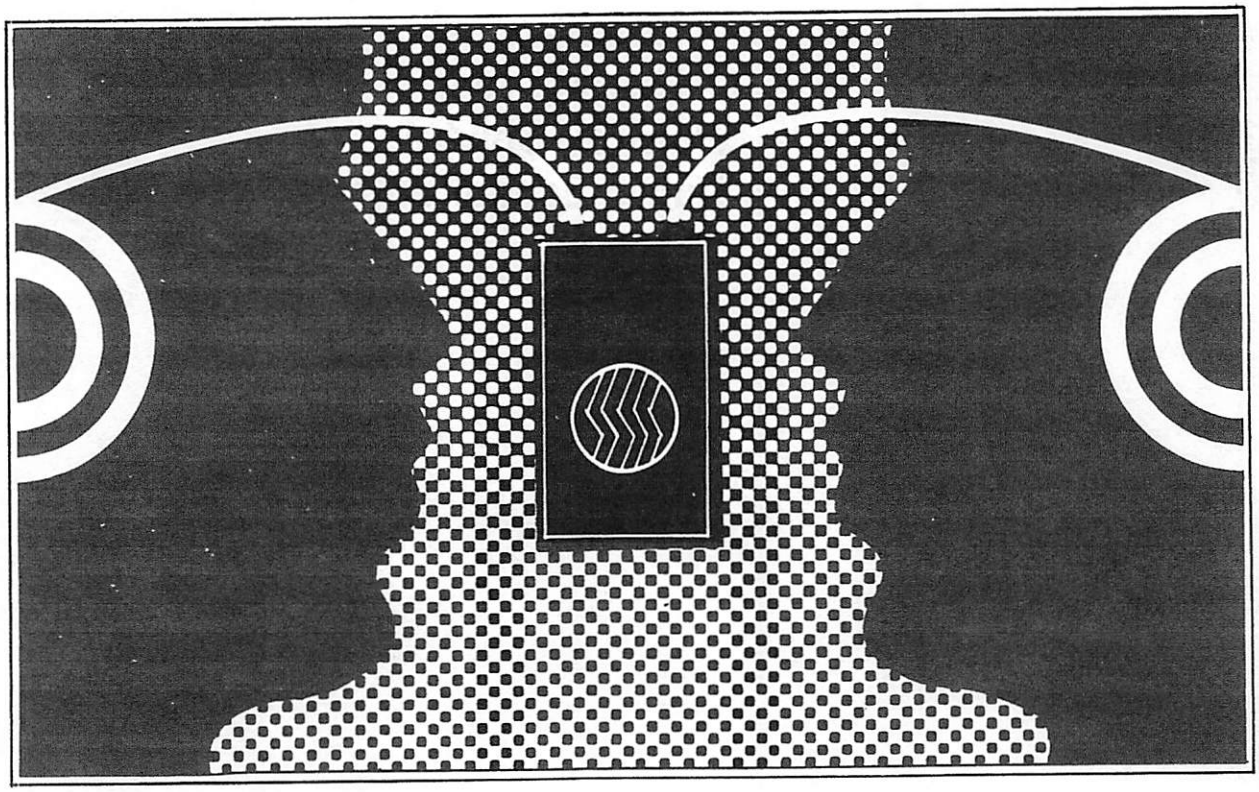
The Condition of Hearing Aids Worn by Children in a Public School Program



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Joseph A. Califano, Jr., *Secretary*
Mary F. Berry, *Assistant Secretary for Education*
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Ernest L. Boyer, *Commissioner*

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Condition of Hearing Aids Worn by Children in a Public School Setting

Fred H. Bess, Ph.D.
Area of Communication Disorders
Hearing Clinics
Central Michigan University
Mt. Pleasant, Mich. 48859

hearing aid user employs a gain of 1 dB. In this investigation many children wore the volume control at gain settings which were less than one-half the amount of hearing impairment. For example, in a sample of 20 children with profound hearing losses ($\geq$90 dB) 45 percent used gain settings of 35 dB or less.

Three possible explanations for this result are proffered. First, the high distortion levels found in the "standard" condition with the control at maximum may have caused many of the children to wear gain settings at a lower level. Another cause may be poor fitting earmolds. Children may have reduced the gain levels in an effort to avoid excessive acoustic feedback. Finally, audiologists and other educational staff may not be training children to wear their hearing aids at appropriate gain levels. It is important that audiologists, teachers, and parents know the recommended gain setting for a specific child and to insure that the child is wearing this aid at the desired level. McCandless (1973) has offered an alternative explanation for low-gain settings. He purports that gain levels are reduced to avoid environmental sounds from exceeding discomfort levels. According to McCandless, discomfort levels seldom surpass 110 dB SPL for subjects with hearing losses up to 65 dB. A 40 dB gain hearing aid, then, can result in amplifying sounds of 75 dB into a discomfort range. The problem of gain-setting requirements among young children needs further study.

From the sample of 35 hearing aids, many failed to agree with the manufacturers' published specifications. Such a result lends additional support to the prevalent view that many children's hearing aids in the public schools are inadequate and are consequently providing minimal benefit to the user.

Finally, while it is apparent that many hearing aids in this study were not satisfactory, it is important to stress that the overall findings appear more promising than the results of previous research. An examination of earlier work (Peck, 1969; Coleman, 1972; Gaeth and Lounsbury, 1966; Zink, 1969) suggests that an average of 40–50 percent of children's hearing aids are malfunctioning. The results in the present study were somewhat better than this. This improvement must be attributed at least in part to the monitoring program of the audiologic staff. Unfortunately, too few public school systems employ educational audiologists.

Conclusions

The major findings of the report include:

1. In 27 percent of the hearing aids, the physical condition of the instrument was rated faulty.
2. Only 15 percent of the hearing aids used weak batteries.
3. For a "standard" measure, 48 percent of the hearing aids produced THD of $\geq$20 percent. In the "as worn" setting, 10 percent of the hearing aids used produced THD $\geq$20 percent.
4. Over 40 percent of the children set their volume controls at levels which produced gain values of $\leq$ 35 dB.
5. A minimum of 25–30 percent of a sample of hearing aids failed to agree with the manufacturers' specifications. Eighty percent of these aids did not meet specifications for a basic frequency response.

Recommendations

In view of the findings described in this report, it appears that public school programs need to intensify their efforts to monitor, trouble-shoot, and maintain the hearing aids of aurally handicapped children. The number of inservice training programs for teachers, speech and language pathologists, and ancillary staff needs to be increased. Teachers must concern themselves with the particular hearing-aid needs of their children. Parents should also continue to be a primary target for these programs. For all inservice training, the value of the educational audiologist, working in conjunction with public school staff, cannot be overemphasized.

The feasibility of training paraprofessionals or aides to monitor hearing aids should be explored. These persons could assist professionals in the intensive daily monitoring of children's hearing aids.

All school programs for the hearing-impaired should have immediate access to hearing aid testing equipment capable of measuring distortion products and frequency response curves. Many of the problems uncovered in this study could be quickly remedied if testing equipment were available. Such a recommendation does not seem unrealistic now that rather simple, inexpensive portable equipment is available.

In large educational programs for the hearing-impaired such as the special education division of Los Angeles, serious consideration should be given to employing a hearing aid repair technician to assist in maintaining children's hearing aids. Additionally, each educational program should have a large supply of components for a variety of types of hearing aids. Programs should also maintain a diversified number of stock hearing aids for the hearing-impaired children.

Finally, there appears to be a need to research hearing aid gain requirements among hearing-impaired children. Information is needed about the relationship between gain and such parameters as degree of hearing loss, audiometric configuration, differences in electroacoustic responses, and discomfort thresholds. The pros and cons of using fixed gain settings should also be explored.