

# Diversity in Educational Audiology Research including works from Deaf Learner/Researchers

Joy Rosenberg, Programme Leader; Imran Mulla, Module Leader; Robin Askew, Principal/CEO

Mary Hare with University of Hertfordshire

Courses@maryhare.org.uk

## Introduction

Action research, usually conducted by practitioners in their own settings, is a 'powerful strategy for being active partners in school improvement', i.e., for determining implications for practice (Efron and Ravid, 2019). The Educational Audiology cohorts at Mary Hare/University of Hertfordshire produce timely relevant research projects. A selection of recent MSc Educational Audiology dissertations is included here. QR links to the full dissertation are provided for each.

## Acoustics

Karen Wright and Imran Mulla explored the impact of classroom acoustic measurements, and follow-up adaptations, on learners and staff in the classroom.

Email: karenwright@warwickshire.gov.uk

**Aims:** With the majority of deaf learners in the UK educated in mainstream schools, optimal listening conditions are needed. This study explored the impact of an acoustic adaptation programme of

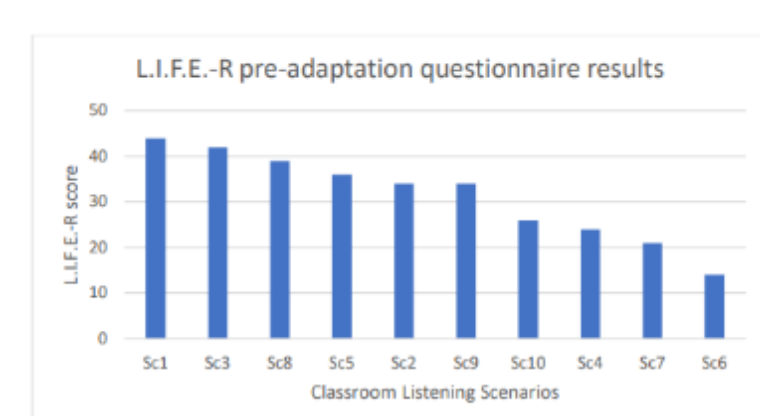


Figure 4 Total L.I.F.E.-R score for 5 pupils in ten different listening conditions in order of ease of listening pre-acoustic classroom adaptation

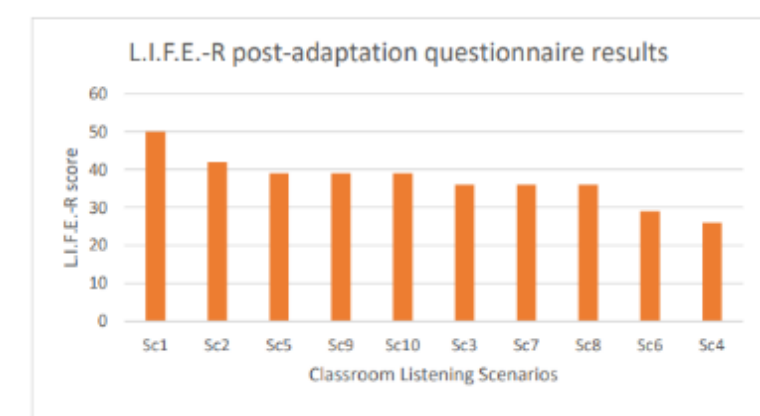


Figure 5 Total L.I.F.E.-R score for 5 pupils in ten different listening conditions in order of ease of listening post-acoustic classroom adaptation

works, which aimed to reduce the Tmf to  $\leq 0.4$  by installing acoustic panels. **Method:** Classroom reverberation times, Deaf pupil's perceptions of listening (via LIFE-R), and class teachers' perceptions were compared, before and after the acoustic modifications. **Results:** The installation of acoustic panels successfully reduced the Tmf in each classroom to  $\leq 0.4$  seconds. Deaf primary pupils indicated this improved listening and understanding. However, even in optimal acoustic conditions, with well-fitted personal and assistive listening devices, deaf pupils still reported difficulty listening to their peers demonstrating challenges even with reasonable adjustments. Class teachers reported improved listening conditions for all, increased peer learning interactions, positive behaviour changes

for noise-sensitive pupils, improved access for deaf students and reduced vocal effort for teachers. This acoustic adaptation study showed benefits for all learners and staff in the classroom and the positive contribution of the Educational Audiologist to the acoustic programme of works.



## Assistive Listening Devices

Helen Cromack and Imran Mulla investigated the provision of assistive listening devices for deaf children in mainstream schools.

Email: helen.cromack@hertfordshire.gov.uk

Deaf children across the UK have access to hearing devices from the NHS, with additional assistive listening devices (ALDs), such as radio aids, usually provided by educational services. Previous studies have investigated assistive listening devices for preschoolers, but this study focuses on school aged children. It investigates the barriers to provision and use of systems by staff and students using an online survey to collect both qualitative and quantitative data. The 21 respondents were all Heads of Service, Educational Audiologists or Qualified Teachers of the Deaf who provide peripatetic support for deaf children. The 21 services represented a total of 11,673 deaf children across the UK and employed 151 Qualified Teachers of the Deaf. Responses were analysed thematically. Findings revealed that the provision for early

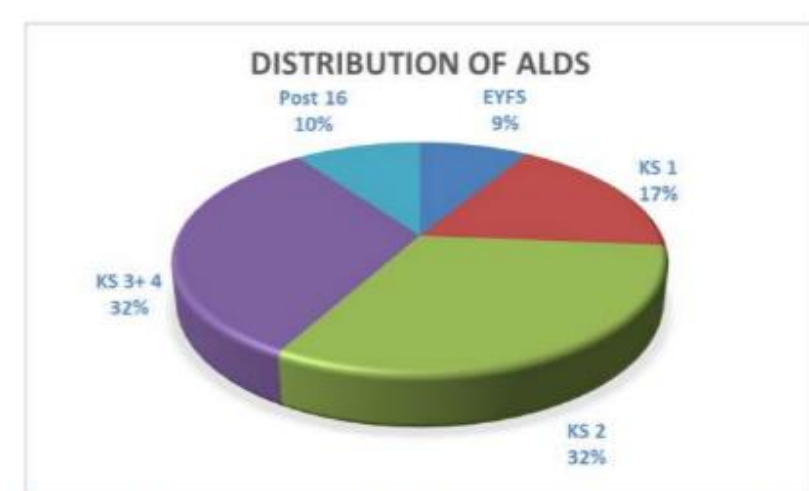


Figure 5: ALD provision across the different ages – Based on 18 respondents

years children has significantly improved. Provision within schools is good, however the demand is sporadic, as the child matures there is a reduction in uptake of use. All continue to face financial challenges. There was a need for more robust secondary staff training in effective use of assistive technology and understanding needs of the deaf child and benefits of ALDs in order to remove barriers for student engagement with technology. The study suggested that there are several different funding streams available across educational services. It is essential that assistive listening systems are used effectively by any person who wears them.

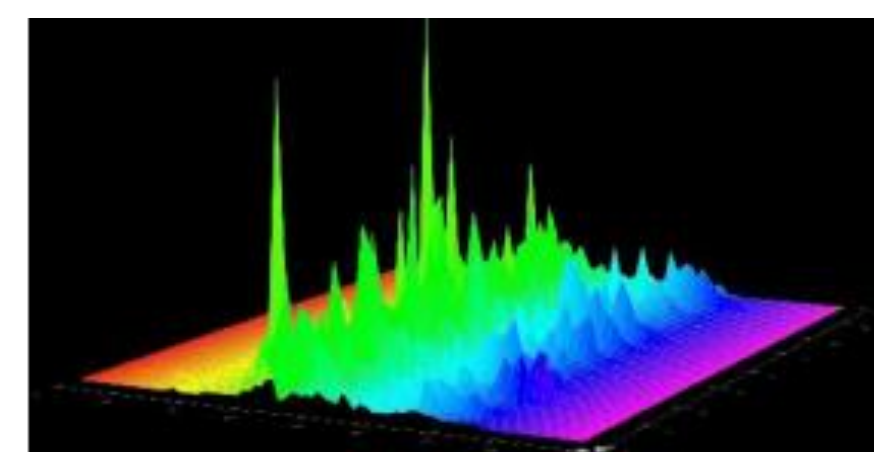


## Speech in Noise Testing

Anne Bailey and Lisa Bull compared two different setups for Speech in Noise testing.

Email: anne.bailey@hants.gov.uk

Speech in noise (SiN) testing demonstrates the effect of noise and distance on speech discrimination and the effectiveness of personal hearing devices and wireless remote microphone systems (WRMS). Currently, there is no UK standard speaker-configuration protocol. This study investigates the difference in speech discrimination scores of children and young people (CYP) using WRMS systems and a 2-speaker setup (used more often) versus 3-speaker setup. The same speech discrimination



b) Hearing aid only 60 dBA with 60 dBA background noise

test was administered to 11 subjects, aged 8-18, using a 2-speaker setup and several months later a 3-speaker setup. Scores for each signal to noise ratio (SNR) tested were compared between the two different speaker setups both with and without WRMS. Results showed that WRMS provided benefit in every SNR for both speaker setups. Taking into account how personal hearing devices and WMRS function and the need to replicate CYP immersion in noise similar to the classroom

listening experience, the 3-speaker setup would appear to be the more effective setup for testing with WRMS up to a SNR of -10 dB. However, it needs a larger floor area, takes longer to set up and is more expensive to purchase. Further testing is needed to validate the results and consider variables. Liaison between SiN test manufacturers and hearing technology companies and a standard test protocol is needed for parity of testing and reliability of results.



## Ling-Madell-Hewitt

Dom Casswell and Joy Rosenberg compared the effectiveness and relevance of using the Ling Sounds or the Ling-Madell-Hewitt Battery for verifying Child's/Young Person's (CYP) speech perception with their hearing devices.

Email: dominiccaswell@gmail.com

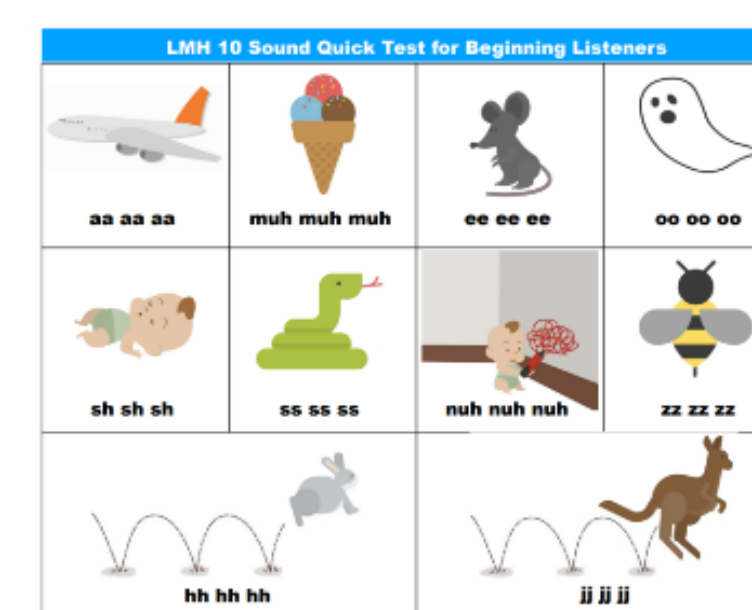


Figure 10: The Ling-Madell-Hewitt Battery Picture Card

Madell and Hewitt (2022) outlined an additional 4 phonemes to complement the widely-used Ling 6 sounds as part of the Ling-Madell-Hewitt (LMH) battery sound check. This study investigates CYPs response to the LMH Battery compared to the Ling Sounds; and current use and application amongst qualified professionals within the UK. Small sample size meant definitive conclusions were not obtained, but there are indicators that the LMH Battery will supplant the Ling Sounds in time. Results show that

the additional 4 phonemes in the LMH Battery are not essential to the majority of CYP in this study as a sound check as the key errors tend to be in the Ling Sounds component of the LMH Battery. Appropriate training of professionals is needed to ensure that either sound check is used consistently; otherwise, the effectiveness and comparability may be compromised. There have been few, if any, peer-reviewed studies validating the Ling Sounds and the LMH Battery and thus further areas of study are identified.



## Conclusion and Reference

Overall findings for these dissertations provide reader/practitioners with valuable relevant practice implications, and possibilities for future research.

**Reference:** Efron SE, Ravid R (2019) *Action research in education: A practical guide*, 2<sup>nd</sup> edition, Guilford Press.