

Royal Arch CAPD/Neuroaudiology Newsletter

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Research Award Recognition!

Dr. Frank Musiek, Professor at the University of Arizona and long-term recipient of the Royal Arch Research Assistance (RARA) grant, recently received the highest honor from the Royal Arch Masons, the Royal Arch gold medal. This medal was in recognition of Dr. Musiek's research on central auditory processing. The RARA has supported CAPD research along with student tuition, travel, and work study for many Neuroaudiology lab members

AUDIOLOGY TRIVIA

ANSWERS ON THE LAST PAGE

1) Who is generally given credit for describing the electrophysiologic contingent negative variation (CNV)?

a) Hallowell Davis, b) Grey Walter, c) S.R. Sutton, d) Howard Streeton

2) Spoenclin's most famous research in the late 1960s and early 70s was on the what?

a) efferent system, b) auditory nerve, c) cochlear microphonic, d) pitch discrimination

over the years. This gold medal is given to only one individual each year for "outstanding national or international achievement in arts, sciences, public service, business, and learned professions." The RARA has supported hearing research since the 1970s in addition to Autism research, the Hearing Health Foundation, as well as selected programs in audiology. They have always had an "ear" for those doing central auditory research. Congratulations, Dr. Musiek, this is a well-deserved award, and we thank you for your important contributions to the field of audiology.



Recently Published Article

An original research article was recently published and well worth the read:

Title: Experiences of Patients with Auditory Processing Disorder in Getting Support in Health, Education, and Work Settings: Findings from an Online Survey

Journal: *Frontiers in Neurology*

Authors: Deepashri Agrawal, Giorgos Dritsakis, Merle Mahon, Alyson Mountjoy, and Doris Bamio

This article provides insight into the views and experiences of individuals with Auditory Processing Disorders in addition to their families through a cross-sectional random sample survey. The survey specifically addresses their perspectives on getting support from services and ways to improve these services. The authors recruited 156 participants to be a part of this 16-item survey. The survey included questions on negative and positive experiences for referral for diagnosis, funding for FM systems, and overall support for APD. The conclusions drawn from the survey are reported by the authors, “Individuals and families of individuals with APD overwhelmingly report a lack of awareness of APD across health, education, and work sectors, and difficulties in getting access to diagnosis and support.”

These results are eye-opening and highlight the need of health care professionals to provide more patient-centered APD support and policy makers to provide more coverage for clinical services for APD. This study includes informative results that can help navigate research priorities and influence longer-term public health decisions.



ORIGINAL RESEARCH
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Experiences of Patients With Auditory Processing Disorder in Getting Support in Health, Education, and Work Settings: Findings From an Online Survey

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Recently Accepted (in-press) Article

Keep an eye out for this recently accepted article combining the disciplines of auditory processing and hearing aids:

Title: Investigating the Role of Auditory Processing Abilities in Long-Term Self-Reported Hearing Aid Outcomes Among Adults Age 60+ Years

Journal: Journal of the American Academy of Audiology

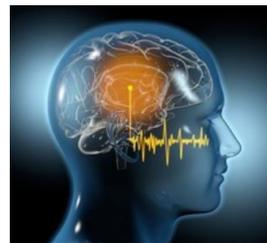
Authors: Alyssa Davidson, Frank Musiek, Julia Fisher, Nicole Marrone

This article evaluates self-reported hearing aid outcomes among older adults in order to determine how auditory processing abilities are related to these outcomes. Outcomes of satisfaction and benefit are considered. Auditory processing abilities were measured using the Gaps-in-Noise Test, the Listening in Spatialized Noise Sentence Test, and the Dichotic Digits Test. Other non-auditory processing abilities such as self-efficacy, personality, self-report of disability, hearing aid use, and aided audibility were also considered.

Results were the first of its kind, showing that temporal processing, as measured by the Gaps in Noise Test was a significant predictive factor of hearing aid satisfaction. That is, those who had poorer temporal processing abilities had poorer hearing aid satisfaction scores.

These results and the conclusions drawn from the current study provide the rationale for evaluating auditory processing abilities in the hearing aid decision-making process.

CENTRAL AUDITORY PROCESSING DISORDERS CORNER



Topic: Auditory Training of Frequency Discrimination

One of the most fundamental processes in human hearing is frequency discrimination. It is critical to our abilities to understand speech, appreciate music, heed warning sounds and more. Yet surprisingly, audiology doesn't have a clinically useable test of frequency discrimination, though there has been some faithful work started in this area. "Frequency discrimination is typically measured by comparing a stimulus tone to a reference tone in order to determine the minimum difference in Hz that the listener requires to differentiate the two tones" (Nagle, 2009). Interestingly, there is a fair amount of data indicating that frequency discrimination can be readily improved by practicing on frequency discrimination tasks. Both human and animal studies have demonstrated that by using adaptive training techniques along with consistent, well planned practice, frequency discrimination can be improved. By employing paired tonal, multi-stimuli, or frequency modulation techniques in training, frequency discrimination can be enhanced.

Tasking directives can be multi-dimensional but probably the most common is to ask the participant to judge whether the stimuli are the same or different in pitch. Judgements can also be made on which of two tones is higher or lower in pitch and adaptively altering the difference in frequency of the stimuli. Of special clinical interest are two pediatric populations that may suffer from impaired frequency discrimination. One of these groups are those with language learning impairments. Multiple reports have shown that these children have increased difference limens for simple frequency discrimination tasks which makes one consider the basis of their language problem. The other group are those children having difficulty learning vowels. Vowel discrimination is a challenging task for children and is relevant to reading skill.

CAPD Corner Cont....

In our clinical experience, often training on basic frequency discrimination tasks can ameliorate the problem.

Audiology needs to advance to developing tests of auditory discrimination and integrate auditory training protocols for those with poor auditory discrimination abilities. There are certainly populations (especially pediatric) that would profit from improved frequency discrimination – not only in a learning environment but also in their daily lives. It should also be remembered that frequency discrimination training tasks can be set up quite easily by utilizing contemporary auditory software – much of it available online.

References and Suggested Readings:

- Delhommeau, et al. (2005). Generalization of frequency discrimination learning across frequencies and ears: Implications for underlying neural mechanism in humans.
- Halliday & Bishop (2006). Auditory frequency discrimination in children with dyslexia.
- Kleindienst & Musiek (2011). Do frequency discrimination deficits lead to specific language impairments?
- McArthur & Bishop (2004). Frequency discrimination deficits in people with specific language impairment: Reliability, validity, and linguistic correlates.
- Abramson & Lloyd (2016). Development of a pitch discrimination screening test for preschool children.

Interesting Reads on Neuroaudiology and CAPD

- Matos Silva, C., Fernandes, C., Rocha, C., et al. (2020). Study of acute and sub-acute effects of auditory training on the central auditory processing in older adults with hearing loss-A pilot study. *Int J Enviro Res and Public Health*, 17(14), 4944-4957.
- O'Brien, J., Lister, J., Fausto, B. et al. (2021). Are auditory processing and cognitive performance assessments overlapping or distinct? Parsing the auditory behavior of older adults. *Int J Audiol*, 60(2), 123-132.

AUDIOLOGY TRIVIA ANSWERS 1) Grey Walter (B) is generally given credit for describing the CNV.
2) Spoendlin's most famous research was on (B) the auditory nerve.