British Society of Audiology Conference 2010

Uniting basic, translational & clinical research and practice
University of Manchester
Wednesday 8th to Friday 10th September 2010

CALL FOR ABSTRACTS

DEADLINE MONDAY 31ST MAY 2010

For this special event, we are calling for contributions from delegates across the whole range of scientific and clinical disciplines. There will be significant and important time for poster presenters to show and discuss their work with colleagues, as well as a significant number of contributed oral presentations together with the eminent keynote speakers. WE WANT TO SEE YOUR WORK!!

To submit your abstract, please fill out the form on this page and complete your abstract on the following page, using the template as guidance for formatting. Please make sure that your abstract does not exceed the length allotted and ONLY uses the format in the template (just replace the text in the example).

Abstracts will be reviewed and published in the International Journal of Audiology, as well as being available for delegates at the conference. The early deadline is so that we can detail the conference programme in flyers advertising the conference. To assist authors to include recent data, or at the request of reviewers, there will be an opportunity to update your abstract closer to the conference if necessary. You will be notified of the deadline for this.

There will be four poster prizes: one for each of the three categories of research (clinical, translational and basic) and an additional one for best student poster (audiology or PhD student). Poster maximum size is portrait A0 (84 cm wide by 119cm tall).

Title: Principal Components Analysis on Audiograms from a Hearing Aid Clinic	
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Preference (delete one): I would like a poster presentation	
Poster prize category (delete those not applicable) Translational research	
Office use: Abstract #	Category

Please email this form (including your abstract) to Dan Owens by 31st May
daniel.owens@manchester.ac.uk

Principal components analysis on audiograms from a hearing aid clinic

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In this study we describe a Principal Components Analysis (PCA) of 11,462 audiograms recorded at the hearing aid clinic at James Cook University Hospital in Middlesbrough between 1992 and 2001. PCA is a multivariate statistical technique which starts with an n x p matrix in which n subjects are each evaluated on each of p variables (Woods et al, 1986). In our case the n subjects were represented by the 11,462 audiograms, and the p variables were the six air conduction thresholds and five bone conduction thresholds typically obtained in an audiogram. Although the patients were originally tested at 11 thresholds, the principle of PCA is that certain hearing thresholds tend to vary together, and thus can be grouped into a smaller number of underlying variables called principal components (PC). Each PC has a set of coefficients in the range -1 to +1, corresponding to the degree of influence of each of the original thresholds on that PC.

The coefficients of the first PC were all negative and approximately equal. This suggests that the main source of variation between the patients was simply the overall degree of hearing loss. The coefficients of the second PC were negative for frequencies at or below 1000Hz, but positive for higher frequencies, for both air and bone conduction, and thus differentiate patients according to whether they have a predominanty high frequency or low frequency hearing loss. The coefficients of the third PC were negative for air conduction at all frequencies, but positive for bone conduction, showing a contrast between patients with and without an air-bone gap. The fourth component is similar to the second, but corresponds to a sensorineural hearing loss with a sharper dip at 2000 – 4000 Hz rather than a general high frequency hearing loss. No clear patterns were seen for the fifth or subsequent principal components. The percentage of the overall variability in the data explained by the first four principal components respectively was 59.5, 13.4, 9.7, amd 5.2, giving a total of 87.8%. We performed PCA using the MATLAB statistical toolbox.

Acknowledgements

We wish to thank Maurice Hawthorne, Graham Clarke and Martin Sandford at the Ear, Nose and Throat Clinic at James Cook University Hospital in Middlesbrough, England, for making the set of anonymised audiology records available to us.

References

Woods A., Fletcher, P. & Hughes, A. 1986. Statistics in Language Studies. Cambridge, England: Cambridge University Press.

The MATLAB Statistical Toolbox, http://www.mathworks.com/access/helpdesk/help/toolbox/stats/brkgqnt.html