

NOV/DEC  
2014

American Academy of Audiology  
[www.audiology.org](http://www.audiology.org)

# AUDIOLOGY

TODAY

The magazine of, by, and for audiologists

# TEENS

## AS HEALTH-CARE CONSUMERS

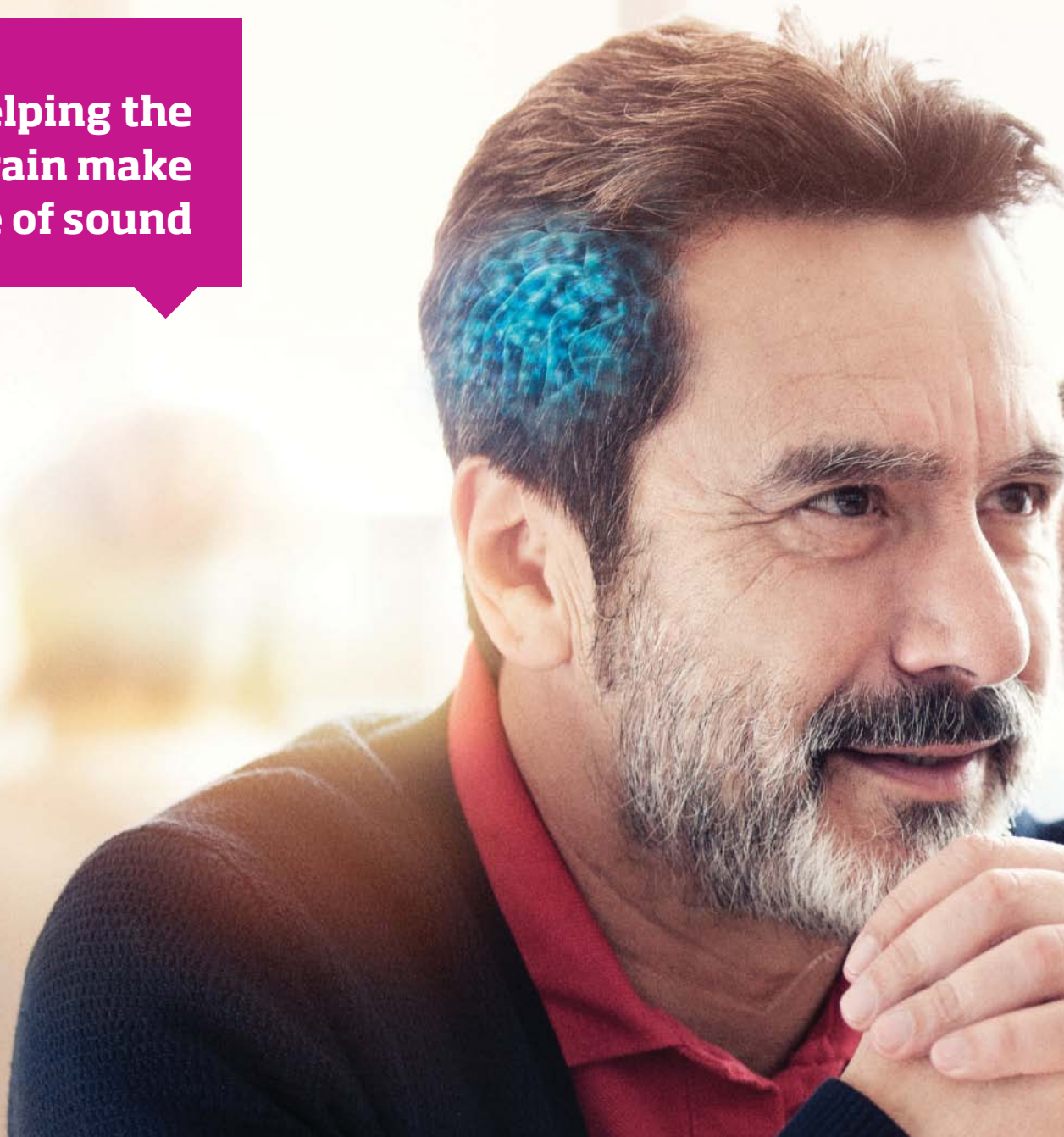
**YOUR PATIENTS ARE NOT AVERAGE**  
Variability Makes Treatments Challenging

**EARLY-ONSET DEAFNESS**  
Functional Speechreading Assessment

**VESTIBULAR AND CONCUSSION ASSESSMENT**  
A Balancing Act

**TINNITUS FUNCTIONAL INDEX**  
Development and Clinical Application

**Helping the brain make sense of sound**



New wireless custom styles

New designRITE style



\*2013 Oticon Alta International Satisfaction Study, overall satisfaction for both new and experienced hearing instrument users.

For more information about Oticon's complete line of BrainHearing™ solutions, call your inside sales representative at **1-800-526-3921** or visit us online at [www.pro.oticonusa.com](http://www.pro.oticonusa.com).



**Delivers better hearing with less effort**

### One incredible platform, three extraordinary families

The Oticon Performance Line is powered by Inium, the first sound processing platform that truly supports the brain's entire process of making sense of sound. As part of our commitment to bring the benefits of BrainHearing™ to every patient, Alta, Nera and Ria are now available in the ultra-compact designRITE and discreet wireless CIC and IIC styles. Find your next discreet hearing solution with Oticon.



**oticon**  
PEOPLE FIRST

See what they say®

HamiltonCapTel.com

# Talk about options

## Hamilton CapTel® 840i



## Hamilton CapTel® 2400i



Join the Hamilton CapTel Hearing Healthcare Program and extend the value of your patient relationships with a Hamilton CapTel phone – at no-cost.\*

Both the Hamilton CapTel 840i and 2400i ensure amazingly clear phone conversations for your patients, each powered by the same proven technology that has made over 41 million captioned telephone conversations possible for individuals with hearing loss.

Find out more about the Hamilton CapTel Hearing Healthcare Program today!

Call: 800-826-7111

Visit: [HamiltonCapTel.com/hhc](http://HamiltonCapTel.com/hhc)

See what they say®

**HAMILTON**  
capTel®

\* Independent third-party professional certification required.

The Hamilton CapTel phone requires telephone service and high-speed Internet access. WiFi Capable.



Nov/Dec 2014  
Volume 26 No 6

- 14

**Teens as Health-Care Consumers: Planned Transition and Empowerment** Transition planning prepares teens for adult health care; however, there is also an additional benefit for audiologists. Transition planning is the epitome of patient-centered conversation, and is a natural progression in care for pediatric audiologists.  
By Emily Pajevic and Kris English
- 20

**Your Patients Are Not Average** Variability among our patients makes the treatment of hearing loss a dynamic and uniquely challenging prospect. However, without some form of outcomes assessment, it's difficult to understand if a patient is at, above, or below average.  
By Jason Galster
- 24

**Early-Onset Deafness: Functional Speechreading Assessment** A study supporting use of conversational analysis in the clinic as a pragmatic measure of spoken-language communication competence for deaf adults with early-onset deafness and the teaching of top-down processing as used by proficient speechreaders.  
By Linda G. Gottermeier and Carol De Filippo
- 34

**Research, Mentoring, and Vestibular and Concussion Assessment: A Balancing Act** Joscelyn Martin, AuD, former Foundation Board trustee, recently spoke with Julie Honaker, PhD, research award winner, to find out how the AAA Foundation's support impacted her research and her career, and why she feels it's important to share her passion for research with her students.  
By Joscelyn Martin
- 40

**Tinnitus Functional Index (TFI): Development and Clinical Application** The TFI is the first tinnitus questionnaire documented for responsiveness, and has the potential to become the new standard for evaluating the effects of intervention for tinnitus, with clinical patients and in research studies.  
By James A. Henry, Barbara J. Stewart, Harvey B. Abrams, Craig W. Newman, Susan Griest, William H. Martin, Paula J. Myers, and Grant Searchfield

CONTENTS



|                     |                            |   |
|---------------------|----------------------------|---|
| <b>8</b>            | <b>PRESIDENT'S MESSAGE</b> | Understanding Academy Governance By Erin Miller   |
| <b>10</b>           | <b>KNOW-HOW</b>            | How to Market Your Practice with an E-mail Newsletter<br>By Kayce Bramble   |
| <b>13</b>           | <b>CALENDAR</b>            | Academy and Other Audiology-Related Events and Deadlines  |
| <b>13</b>           | <b>THE WEB PAGE</b>        | What's New on Social Media  |
| <b>50</b>           | <b>CSI: AUDIOLOGY</b>      | Mild Hearing Loss? Says Who? By Katherine Kerns and<br>Gail M. Whitelaw   |
| <b>56</b>           | <b>RESEARCH TO REALITY</b> | Statistics 101 By Jeffrey Weihing   |
| <b>60</b>           | <b>COMPLIANCE</b>          | Rampant: Workplace Theft and Embezzlement By Terri E. Ives  |
| <b>64</b>           | <b>FOUNDATION UPDATE</b>   | Hearing Healthcare Recruiters Partners with Foundation to<br>Support SAA   Member Assistance Program                                  |
| <b>66</b>           | <b>SAA SPOTLIGHT</b>       | Meet the SAA 2014–2015 Board of Directors   |
| <b>69</b>           | <b>ABA</b>                 | Audiologists Say ABA Certification Raises Credibility<br>By Torryn P. Brazell   |
| <b>70</b>           | <b>ACAE CORNER</b>         | 2014: A Year of Challenge and Gratitude; 2015: A Year of<br>Promise for the Future of Audiology By Lisa L. Hunter and<br>Doris Gordon |
| <b>Academy News</b> |                            |   |
| <b>74</b>           | <b>AUDIOLOGY ADVOCATE</b>  | Making Sense of the Mid-Term Elections By Kate Thomas   |
| <b>75</b>           | <b>JUST JOINED</b>         | Welcome New Members of the Academy  |

**EDITORIAL MISSION**

The American Academy of Audiology publishes *Audiology Today* (AT) as a means of communicating information among its members about all aspects of audiology and related topics.

AT provides comprehensive reporting on topics relevant to audiology, including clinical activities and hearing research, current events, news items, professional issues, individual-institutional-organizational announcements, and other areas within the scope of practice of audiology.

Send article ideas, submissions, questions, and concerns to [amiedema@audiology.org](mailto:amiedema@audiology.org).

Information and statements published in *Audiology Today* are not official policy of the American Academy of Audiology unless so indicated.

**COPYRIGHT AND PERMISSIONS**

Materials may not be reproduced or translated without written permission. To order reprints or e-prints, or for permission to copy or republish *Audiology Today* material, go to [www.audiology.org/resources/permissions](http://www.audiology.org/resources/permissions).

© Copyright 2014 by the American Academy of Audiology. All rights reserved.



Actual size.  
Neckloop and  
phone plug  
not shown.

# UNI-DEX.

## MADE FOR ANY PHONE.



The **UNI-DEX** is compatible with mobile phones from a wide range of manufacturers.

- Simple and easy to use
- Connects to any mobile phone, computer, or tablet with a 3.5mm jack output
- Use hearing aids as a headset/hands-free solution
- Wireless, high-quality audio streaming with WidexLink™
- Room Off function
- Automatic start of streaming
- Long battery life, 40 hours streaming/4 months standby
- Fully charges in only 1 hour

For more information, please call 1-800-221-0188 or visit [www.widexpro.com](http://www.widexpro.com).



**DEX™**  
A WIRELESS WORLD

# AUDIOLGY TODAY

The American Academy of Audiology promotes quality hearing and balance care by advancing the profession of audiology through leadership, advocacy, education, public awareness, and support of research.

**Content Editor**

David Fabry, PhD | [dfabry@audiology.org](mailto:dfabry@audiology.org)

**Editorial Advisors**

Mindy Brudereck, AuD  
Hillary Snapp, AuD  
Christopher Spankovich, PhD

**Editor Emeritus**

Jerry Northern, PhD

**Executive Editor**

Amy Miedema, CAE | [amiedema@audiology.org](mailto:amiedema@audiology.org)

**Managing Editor**

Joyanna Mills, CAE

**Art Direction**

Suzi van der Sterre

**Marketing Manager**

Angela Chandler

**Editorial Assistant**

Kevin Willmann

**Web Manager**

Marco Bovo

**Advertising Sales**

Brittany Shoul | [bshoul@networkmediapartners.com](mailto:bshoul@networkmediapartners.com) | 410-316-9850  
Dan Senecal | [dsenecal@networkmediapartners.com](mailto:dsenecal@networkmediapartners.com) | 410-316-9851

**AMERICAN ACADEMY OF AUDIOLOGY OFFICES**

**Main Office**

11480 Commerce Park Drive, Suite 220  
Reston, VA 20191  
Phone: 800-AAA-2336 | Fax: 703-790-8631

**Capitol Hill Office**

312 Massachusetts Avenue, NE  
Washington, DC 20002  
Phone: 202-544-9334

**AMERICAN ACADEMY OF AUDIOLOGY MANAGEMENT**

**Executive Director** Tanya Tolpegin, MBA, CAE | [ttolpegin@audiology.org](mailto:ttolpegin@audiology.org)

**Senior Director of Finance and Administration** Amy Benham, CPA | [abenham@audiology.org](mailto:abenham@audiology.org)

**Senior Director of Communications** Amy Miedema, CAE | [amiedema@audiology.org](mailto:amiedema@audiology.org)

**Director of Industry Services** Shannon Kelley, CMP, CEM | [skelley@audiology.org](mailto:skelley@audiology.org)

**Director of Professional Advancement** Meggan Olek | [molek@audiology.org](mailto:molek@audiology.org)

**Director of Membership and SAA Operations** Sarah Sebastian, CAE | [ssebastian@audiology.org](mailto:ssebastian@audiology.org)

**American Academy of Audiology Foundation Director of Operations and Development** Kathleen Devlin Culver, MPA, CFRE | [kculver@audiology.org](mailto:kculver@audiology.org)

**American Board of Audiology Managing Director** Torryn P. Brazell, MS, CAE | [tbrazell@audiology.org](mailto:tbrazell@audiology.org)

**BOARD OF DIRECTORS**

**PRESIDENT**

Erin L. Miller, AuD  
University of Akron  
[auderin@zoominternet.net](mailto:auderin@zoominternet.net)

**PRESIDENT-ELECT**

Lawrence M. Eng, AuD  
Maui Medical Group  
[larryaud@gmail.com](mailto:larryaud@gmail.com)

**PAST PRESIDENT**

Bettie Borton, AuD  
Audigy Group, LLC  
[bchampion1@aol.com](mailto:bchampion1@aol.com)

**MEMBERS-AT-LARGE**

Shilpi Banerjee, PhD  
[shilpi\\_banerjee@hotmail.com](mailto:shilpi_banerjee@hotmail.com)

Lisa Christensen, AuD  
Cook Children's Hospital  
[lisavchristensen@gmail.com](mailto:lisavchristensen@gmail.com)

Jackie Clark, PhD  
University of Texas Dallas Callier Center  
[jclark@utdallas.edu](mailto:jclark@utdallas.edu)

Carol G. Cokely, PhD  
University of Texas Dallas  
[cokely@ut.dallas.edu](mailto:cokely@ut.dallas.edu)

Patricia A. Gaffney, AuD  
Nova Southeastern University  
[patricia.gaffney@yahoo.com](mailto:patricia.gaffney@yahoo.com)

Antony Joseph, AuD, PhD  
Illinois State University  
[earsafety@yahoo.com](mailto:earsafety@yahoo.com)

Dan Ostergren, AuD  
Advanced Hearing Services  
[dostergren@mac.com](mailto:dostergren@mac.com)

Todd Ricketts, PhD  
Vanderbilt University Medical Center  
[todd.a.ricketts@vanderbilt.edu](mailto:todd.a.ricketts@vanderbilt.edu)

Richard A. Roberts, PhD  
Alabama Hearing and Balance Associates, Inc.  
[rroberts@hearingandbalance.net](mailto:rroberts@hearingandbalance.net)

**EX OFFICIOS**

Tanya Tolpegin, MBA, CAE  
Executive Director  
American Academy of Audiology  
[ttolpegin@audiology.org](mailto:ttolpegin@audiology.org)

Laura Chenier  
President, Student Academy of Audiology  
[laurachenier.saa@gmail.com](mailto:laurachenier.saa@gmail.com)

*Audiology Today* (ISSN 1535-2609) is published bimonthly by the American Academy of Audiology, 11480 Commerce Park Drive, Suite 220, Reston, VA 20191; Phone: 703-790-8466. Periodicals postage paid at Herndon, VA, and additional mailing offices.

**Postmaster:** Please send postal address changes to *Audiology Today*, c/o Membership Department, American Academy of Audiology, 11480 Commerce Park Drive, Suite 220, Reston, VA 20191.

**Members and Subscribers:** Please send address changes to [membership@audiology.org](mailto:membership@audiology.org).

The annual print subscription price is \$126 for US institutions (\$151 outside the US) and \$61 for US individuals (\$114 outside the US). Single copies are \$15 for US individuals (\$20 outside the US) and \$25 for US institutions (\$30 outside the US). For subscription inquiries, telephone 703-790-8466 or 800-AAA-2336. Claims for undelivered copies must be made within four (4) months of publication.

Full text of *Audiology Today* is available on the following access platforms: EBSCO and Ovid.

Publication of an advertisement or article in *Audiology Today* does not constitute a guarantee or endorsement of the quality, safety, value, or effectiveness of the products or services described therein or of any of the representations or claims made by the advertisers or authors with respect to such products and services.

To the extent permissible under applicable laws, no responsibility is assumed by the American Academy of Audiology and its officers, directors, employees, or agents for any injury and/or damage to persons or property arising from any use or operation of any products, services, ideas, instructions, procedures, or methods contained within this publication.



# The world's smartest hearing aids are a perfect fit.



Smart Audiology



Smart Connectivity



Smart Design



Smart Apps

With new options that allow you to fit the entire spectrum of hearing loss, and designs that are as reliable as they are discreet, ReSound gives you a new way to fit – and satisfy – all of your patients. Featuring our revolutionary Surround Sound by ReSound technology, your patients will experience the very best in sound quality. And, with more options that are designed to connect directly to an iPhone®, iPad® or iPod touch®, hearing life has never been easier.

For more information on our complete line of products, visit [ReSound.com](http://ReSound.com).



ReSound LINX™  
RIE 61

ReSound LINX™  
BTE 77

ReSound LINX™  
BTE 88

ReSound ENZO™  
Super Power BTE

## ReSound

rediscover hearing



The trademarks listed are owned and used by The GN ReSound Group and its related affiliates. © 2014. Apple, the Apple logo, iPhone, iPad and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries.

PRESIDENT'S MESSAGE

# Understanding Academy Governance

## With the elections for the

Academy's next president-elect and members-at-large just around the corner, I thought this might be an opportune time to review the Academy governance structure. The governing body of the Academy—the board of directors—provides leadership and strategic direction, establishes policies, and monitors proper implementation. While the term governance refers to “board matters,” there must be a good working relationship with the board and the executive management to ensure effective governance of the association.

The newly elected members of the board will join the existing board members to make decisions on all matters related to Academy policy. Your board members serve as the stewards of the organization. We must ensure legal and ethical integrity, ongoing revenue generation and financial viability, and compliance with the association bylaws.

As president of the Academy, I serve as the representative of the board of directors. An executive committee, consisting of the president, president-elect, immediate past president, and executive director, meets weekly to manage scheduling issues, complete routine tasks, and vet issues brought to the committee. The executive committee determines what additional information and materials may be needed by our board colleagues to make informed decisions regarding these matters. The committee and

staff work to gather those materials and make them available for the board, with adequate review time, prior to our monthly board meeting. No one member of the board of directors, or the executive committee, makes decisions for the Academy. The bylaws do not provide decision-making authority to the executive committee. Within the Academy governance structure, only the board can make decisions for the association.

The executive director's role is to manage and lead our talented association staff in the day-to-day implementation of our strategy. This is referred to as the “operations” of the organization. Tanya Tolpegin, MBA, CAE, our newly hired executive director, has the education, knowledge, and past experience to expertly lead Academy operations. Under her direction, the Academy staff is responsible for running the regular business of the organization, maintaining profitability targets, and ensuring consistency. In short, the operations side of the association is responsible for getting the work done and the board's role is too oversee that it happens!

While the 10-month transition to our new leadership for Academy operations has had challenges, the transition allowed us to emerge even more focused on the vision and preferred future for the profession of audiology. I want to take this opportunity to thank my colleagues on the board for their additional work during this transition, and also



extend thanks to our senior management team and the entire Academy staff for keeping projects moving forward and for your dedication to the Academy, and our profession. **AT**

Erin Miller, AuD  
President  
American Academy of Audiology

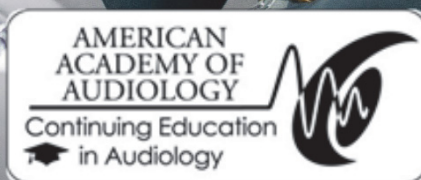
# Discover Tomorrow's You: A Highly Skilled Tinnitus & Hyperacusis Specialist

**Tinnitus & Hyperacusis Therapy Masterclass**  
**London, UK 16-20 March 2015**

This specialist training course is designed for those who wish to pursue a career as an advanced practitioner in providing specialized care for patients experiencing troublesome tinnitus and hyperacusis.

[hashir.aazh@tinnitustherapy.org.uk](mailto:hashir.aazh@tinnitustherapy.org.uk) <http://tinnitustherapy.org.uk/>

The program is worth a maximum of **3.0 CEUs**. Academy approval of this continuing education activity does not imply endorsement of course content, specific products, or clinical procedures. Any views that are presented are those of the presenter/CE Provider and not necessarily of the American Academy of Audiology.



## 2<sup>nd</sup> International Conference on Hyperacusis

Dates: 9-10 July 2015 Venue: Birkbeck College, University of London, UK



Email: [admin@hyperacusisresearch.co.uk](mailto:admin@hyperacusisresearch.co.uk) Website: <http://hyperacusisresearch.co.uk/>

**Abstract submission deadline: 15<sup>th</sup> January 2015**



KNOW-HOW

# How to Market Your Practice with an E-mail Newsletter

By Kayce Bramble

**E**-mail marketing is a very effective and efficient way to get the word out to your prospects and patients. An e-mail newsletter is used to keep in touch with existing patients. Put simply, it is relevant content sent (via e-mail) to subscribers on a regular schedule (monthly, quarterly, etc.). E-mail provides the most direct line of communication. It is also very flexible. These two points make it a very powerful platform. E-mail newsletters offer an ongoing, continuous conversation with your patients and prospective patients in a very cost-effective and measurable format. E-newsletters can demonstrate value and also positively change perceptions of your readers;

they are very commonly employed but you want to do them correctly. List creation, distribution options, and content writing are all integral components to e-mail newsletter success.

## Creating a Mailing List

You cannot start sending out your e-mail newsletter to just everyone. You need to ask permission first. This process is called “opting-in.” If you already have a list of e-mail addresses for patients that you have been doing business with for years, you cannot suddenly blast them your e-mail newsletter. Instead, you want to start by asking them for permission. E-mail a very brief and

straightforward letter announcing your newsletter, asking them if they would like to receive it.

You want to do everything possible to avoid having recipients mark your e-mail as spam. If the e-mail is marked as spam, then the recipient’s ISP (Internet service provider) will start watching you, because you’ve aroused their suspicions. Once enough people on their network report your e-mail as spam to them, they’ll block all future e-mails from you. ISPs all have different thresholds, but 0.01 percent is the number that is most often referred to by people in the e-mail deliverability business (Campaign Monitor, 2014).

A few other tips:

- Never send e-mail marketing to a purchased list.
- Do not send e-mail to a list of people you just assume would want to hear from you.
- When people sign up for your e-mail list, use the double opt-in method.
- Throughout your opt-in confirmation process, ask subscribers to add your e-mail address to their contacts list or address book.
- Know your spam rules. Read up on the CAN-SPAM Act (GPO, 2003) to avoid any trouble.

### Selecting Distribution Options

You have two basic options for distributing your e-mail newsletter. You can buy software to manage your e-mail newsletters and the list of recipients you've built, or you can join a subscription format service with a Web-based application, often known as an e-mail service provider.

Software that allows you to import and export data would be ideal. The software is installed on your own server or a shared server. One negative to consider when going this route is that you may be restricted in the amount of mail you can send out at once due to your Internet connection and ISP provider limits. There is also a higher risk of your newsletter being labeled as spam or junk e-mail. This is because many junk e-mail filters look at the software that is used to send the e-mail. Be sure to thoroughly investigate the reputation of any e-mail software you're considering.

A second option is to use a free or paid e-mail management service. These services typically allow you to track your subscribers, donors,

supporters, and clients in one single database. An e-mail management system will help automate the entire process of building subscriber lists, designing and delivering messages, and measuring the success of campaigns. These services can have a range of monthly costs that might quickly escalate as your needs increase.

### Developing Patient-Focused Content

If you want your e-mail to stand a chance in a bustling inbox, you have to get your audience's attention quickly via the subject line. In many ways, your e-mail subject line is more important than the e-mail newsletter itself. Keep your subject line short and sweet, limited to 50 characters or less. Once you have your readers' attention, it is time to deliver quality content.

It helps to have a standard format where you can easily and quickly copy and paste in your latest content. The header and general sections should remain the same from one issue to the next.

Here are some tips for writing newsletter articles.

- **Problems and solutions:** Identify common problems your customers face and provide ideas on how to solve them.
- **Top 10 lists and steps:** Provide actionable lists and tips with titles such as "Seven Steps to..." or "The Top Five Ways to..."
- **New technology:** Let your patients know how they can take advantage of recent technological developments.
- **Hearing industry news:** Write about new developments in your industry.

- **Testimonials:** Include patient success stories or even letters sent by patients (with their permission, of course).
- **Keep it short:** Use between 500 and 750 words of text. One of the biggest problems with e-mail newsletters is that they are often cluttered and unfocused because they are supporting every aspect of your business.

### Generating Calls to Action


Even though the focus of your e-mail newsletter is to educate patients and prospective patients, this is a great opportunity to present them with relevant offers to generate appointments and sales, or even encourage Web site visits. Try using the 80/20 rule. The newsletter should be 80 percent educational and 20 percent promotional. The majority of the e-mail newsletter should be useful educational information, while the sidebar is presenting your readers with an attractive offer that is relevant to the article content.

### Measuring Your Success

You should measure success to see how well you performed in the past and also to help improve your results going forward. An e-mail newsletter management system will likely have access to several reports. These reports typically allow you to track the key metrics to measure the success of your e-mail marketing campaign. Some basic statistics you will want to track include open rate, click-through rate, bounce rate, list-growth rate, sharing rate, and spam-complaint rate. Another way to find out how your e-newsletter is performing is to simply ask your readers for feedback. Many times, your own patients can be remarkably candid and helpful.

KNOW-HOW

**Conclusion**

A newsletter is a useful tool for educating patients when they choose to be educated. If the newsletter is focused and well targeted, it can make a huge difference to practice-marketing efforts. Newsletters can be useful in getting attention from potential patients, but their primary importance is in maintaining ongoing connections with existing patients. 

Kayce Bramble, AuD, is a clinical audiologist with Ress ENT in Boca Raton, Florida. She is the chair of the Academy's Business Enhancement Strategies and Techniques (BEST) Committee.

Illustration by Johanna van der Sterre.

**References**

Campaign Monitor. What happens if I get too many spam complaints? <http://help.campaignmonitor.com/topic.aspx?t=143>. Accessed August 15, 2014.

U.S. Government Publishing Office (GPO). (2003) CAN-SPAM Act of 2003. [www.gpo.gov/fdsys/pkg/PLAW-108publ187/pdf/PLAW-108publ187.pdf](http://www.gpo.gov/fdsys/pkg/PLAW-108publ187/pdf/PLAW-108publ187.pdf). Accessed August 15, 2014.

ALSO OF INTEREST

**eAudiology On-Demand Web Seminar by Kayce Bramble**

How to Create a Successful E-mail Newsletter

[www.eAudiology.org](http://www.eAudiology.org)



*The Annual SAA Conference Is Back!*

SAA Conference Registration Opens November 3

[www.audiologynow.org](http://www.audiologynow.org)

*Gain insights* using clinical case studies.

*Dive into* problem-solving discussions.

*Prepare* for externships and future clinical practice.

*Network* with current and future audiologists.

This event is open to all AuD students.





SAN ANTONIO, TX

*March 25-28, 2015*

THE WEB PAGE

CALENDAR

November 3

**Meeting**

AudiologyNOW! 2015 registration opens for members.

[www.audiologynow.org](http://www.audiologynow.org)

November 5

**eAudiology Web Seminar**

Induction, Induction What's Your Function? Telecoils Revisited (.1 CEUs)

[www.eaudiology.org](http://www.eaudiology.org)

November 14–15

**Meeting**

Steve Ackley's Legacy: Works of his students and colleagues  
Gallaudet University, Washington, DC  
[chizuko.tamaki@gallaudet.edu](mailto:chizuko.tamaki@gallaudet.edu)

November 18

**eAudiology Web Seminar**

Forensic Audiology (.2 CEUs)

[www.eaudiology.org](http://www.eaudiology.org)

November 20–21

**Meeting**

British Academy of Audiology 2014 Annual Conference  
Bournemouth, United Kingdom  
[www.baaudiology.org](http://www.baaudiology.org)

December 1

**Meeting**

AudiologyNOW! 2015 registration opens for everyone.

[www.audiologynow.org](http://www.audiologynow.org)

December 3

**Meeting**

AudiologyNOW! 2015 call for presentations deadline  
[www.audiology.org/conferences/audiologynow/presenters/presenter-deadlines](http://www.audiology.org/conferences/audiologynow/presenters/presenter-deadlines)

December 3

**eAudiology Web Seminar**

Otoacoustic Emissions Across the Lifespan (.15 CEUs)

[www.eaudiology.org](http://www.eaudiology.org)

We asked. You answered.

Social Media Responses from the Audiology Community...

What is your biggest fear?

Otoscopy...Who knows what you will find!  
— A. Finger

Never paying off student loans.  
— A. Rominger

The fate of man's hearing, I fear, is in the hands of hearing aid manufacturers.  
— D. Palilis

If you could bring one character to life from your favorite book, who would it be?

Winnie the Pooh!  
— J. Lambert

Minerva McGonagall  
— L. Ramanovich

6,230 FOLLOWERS

6,650 LIKES

4,921 CONTACTS



[twitter.com/AcademyofAuD](https://twitter.com/AcademyofAuD)



[facebook.com/audiology](https://facebook.com/audiology)



[www.linkedin.com](http://www.linkedin.com)



# TEENS

## AS HEALTH-CARE CONSUMERS

### PLANNED TRANSITION & EMPOWERMENT

BY EMILY PAJEVIC AND KRIS ENGLISH



TRANSITION PLANNING PREPARES TEENS FOR ADULT HEALTH CARE; HOWEVER, THERE IS ALSO AN ADDITIONAL BENEFIT FOR AUDIOLOGISTS. TRANSITION PLANNING IS THE EPITOME OF PATIENT-CENTERED CONVERSATION, AND IS A NATURAL PROGRESSION IN CARE FOR PEDIATRIC AUDIOLOGISTS.

**T**een-aged patients with hearing loss present several challenges to audiologists, not the least of which is our limited understanding of their unique experiences and needs (Neria, 2009). We are well aware that, in general, adolescence is a time of change, instability, and insecurity (Park et al, 2011; Robins et al, 2002), and yet we can still be caught off guard when previously friendly relationships become strained. Teens may withdraw during appointment interactions, convey disinterest in discussions, and choose not to adhere to our recommendations (Pajevic, 2013). Such lack of engagement may not be merely a transitory phase. Pai and Ostendorf (2011) found that appointment attendance in younger teens (i.e., when parents handle scheduling and transportation) was 98 percent, but dropped to 61 percent two years following transition to adult care.

Even if apparently uninterested, when directly asked what they would like to occur during health appointments, teens have expressed some clear preferences, listed in TABLE 1 (Britto et al, 2004; van Staa et al, 2011a, b), and parents indicate parallel interests (TABLE 2) (van Staa et al, 2011a). These reports indicate that both teens and families see the need for a planned transition from pediatric to adult health care, and many health-care professions have already developed these kinds of plans in the management of diabetes, cystic fibrosis, juvenile rheumatoid arthritis, and other chronic health conditions (Manganello, 2008; National Alliance to Advance Adolescent Health, 2014).

Teens on Individualized Education Plans (IEPs) receive support as they transition from high school to college or work settings, but, by definition, an IEP does not typically include the life skills required of a health-care consumer. Additionally, many teens with hearing loss are not on an IEP at all. Rather than leave the transition from pediatric to adult care to chance, we propose that

audiology adopt health-care transition planning as a standard of care for pediatric patients.

**Planning with the Destination in Mind**

Teens and their families may not be aware of the changes that take place once patients are discharged from pediatric services. Compared to child- and family-centered appointments, adult-level audiologic care includes shorter appointments that involve higher levels of language and terminology. Some of the advanced skills expected of adult patients include being able to:

- provide accurate and complete information for a case history;
- manage insurance forms and appointments, prescription dosages and refills; and
- communicate effectively with the health-care provider (i.e., explain symptoms clearly, ask relevant questions, understand explanations and instructions).

A transition plan develops these skills over time, “starting early” as both teens and their parents recommend. Transition planning appears to be an efficacious practice. Health-care professionals in the Netherlands, for example, found that, when they consistently used transition plans, their pediatric patients were more likely to adhere to recommendations, understand the patient-professional relationship, and take a more active role in their health as consumers in the adult-care system (van Staa et. al., 2011a). The time and effort involved were deemed a positive “return on investment.”

**A Proposed Transition Plan**

We have adapted a transition model developed by the Royal College of Nursing (2004). Our model (FIGURE 1)

Teens as Health-Care Consumers: Planned Transition and Empowerment

includes three stages, each one fully respecting the goals and values of every family. It is duly noted that many families value interdependence more than the Western-based value of independence depicted here (L. Wiley, personal communication, March 2014).

The following is a “walk-through” depicting transition planning. The goals mentioned in this example are drawn from TABLE 3, and would be individualized for every patient.

**Stage 1, or the Early Stage**, would begin around age 13–14. During this beginning phase, we introduce the concept of transition, describe the rationale and general goals, and provide written support materials for home reading (TABLE 4). We emphasize the collaborative nature of a transition plan, wherein the family and teen take the lead and the audiologist provides support. If the patient and family agree, we draft an initial plan, subject to revision at each appointment.

**TABLE 1.** What Do Teen Patients Want from Health-Care Providers?

| Honesty                                      | Confidentiality                        |
|--|--|
| Co-decision making                           | Answer my questions                    |
| Use language I understand                    | Focus on me, rather than parents       |
| Take interest in me as whole person          | Treat me like an adult, most times     |
| Start transitioning me earlier               | Allow more time, more choices          |
| Explain differences in pediatric, adult care | Help with smooth, organized transition |

Britto et al, 2004; van Staa et al, 2011a, b.

**TABLE 2.** What Do Parents Want from Their Teens’ Health-Care Providers?

| Start earlier                            | Involve parents                            |
|--|--|
| Provide more information                 | Include other life transitions             |
| Appoint someone to coordinate transition | Help teens become responsible, accountable |

van Staa et al, 2011a.

At this stage, we should determine our patients’ knowledge of their hearing loss and their ability to describe it to others. Does the teen need practice, information, clarification? We can also inquire about the patient’s participation in school, friendships, sports, and other activities. Throughout, we listen for any concerns that would warrant a referral to counseling or social work.

**TABLE 3.** Sample Health Goals (Knowledge and Skills)

- Explain degree and nature of hearing loss
- Explain functional impact of hearing loss
- Describe and apply assistive technologies and communication repair strategies
- Case history information:
  - Etiology of hearing loss
  - Family history (hearing loss and other health concerns)
  - Blood type
  - History of injuries, illnesses, surgeries, and additional health concerns
  - Current and past medications
  - Names, contact information of health-care providers, insurance, emergency contact information
- Fill out intake, self-assessments
- Maintain health records
- Keep health information and other private data (Social Security number, etc.) secure
- Know basic health terminology (diagnosis, nausea, prescription, antibiotic, etc.)(see Davis et al, 2006)
- Schedule and keep track of appointments
- Explain legal rights and accommodations relative to health care
- Explain confidentiality and the patient–health care provider relationship
- Describe patient autonomy and patient rights
- Explain location, intensity, frequency of pain, and other symptoms
- Understand explanations, instructions, options, and recommendations

Finally, we ask families to consider *gradually* withdrawing from future appointments. Our role during this stage is to “plant the transition seed,” help the family consider some initial goals, and provide educational materials and other resources.

**Stage 2, the Middle Stage**, may begin around age 14–15. During this stage, we address any new concerns and developments (general health, school, friendships, part-time work, etc.). We may start describing how the adult health-care system differs from pediatric care and, depending on patient maturity, we may ask the patient to start keeping track of appointments. We should evaluate the patient’s level of responsibility in managing hearing aids or implants. When families are willing, they could yield five minutes at the end of the appointment for one-on-one conversations with the patient. During these five minutes, we can clarify the concept of confidentiality and give the teen an opportunity to ask questions.

**Stage 3, the Late Stage**, begins around age 16–18. As before, the plan and goals are adjusted as the patient continues to mature. We may now encourage the patient to demonstrate expertise in addressing communication

needs and self-advocacy. Developing a personal health file could be an age-appropriate goal (e.g., family and medical history, inoculation records, emergency and other contacts, insurance information). The topic of health records gives us the opportunity to address the importance of keeping health and personal information secure. The patient might practice conveying case-history information, completing intake forms, and scheduling appointments. We continue to provide relevant educational materials, discuss rights and accommodations, and share advanced information on communication strategies and support groups. The one-on-one consultation could be expanded to 10–15 minutes, continuing to encourage participation and communication skill development.

### Preliminary Endorsement of Transition Planning

Recently, the topic of transition planning in health care was shared at a conference attended by parents and teachers (English, 2014). Attendees were asked to review TABLE 1 and share their thoughts and concerns. The following comments were conveyed:

#### From parents:

- This (transition plan concept) would be useful for ALL my children, not just my child with hearing loss. No one has mentioned this life skill before.
- Families see their audiologists as trusted advisors, and if we had this conversation, I would trust the situation and work with it.
- I just happened to ask our audiologist if she also served college students, and that opened up a whole new world of information for us. She might have brought up the future eventually, maybe she was waiting for the right time. (Q: How old is your child? She’s a sophomore in high school; it’s not like we have lots of time ahead.)
- The overall idea is brilliant and I like how it is gradual.

#### From a teacher:

- The list of words [from health-literacy screening tool] (Davis et al, 2006) would be very useful for language development in the context of self-advocacy as a patient. No one has ever talked about building up this particular vocabulary set, but the need is obvious. I am looking forward to using this.

**TABLE 4.** Online Resources on Health-Care Transition

**Adolescent Health Transition Project**  
<https://depts.washington.edu/healthtr>

**Centers for Disease Control and Prevention National Health Education Standards**  
[www.cdc.gov/healthyyouth/sher/standards](http://www.cdc.gov/healthyyouth/sher/standards)

**GAP/Guide to Access Planning**  
[www.phonakpro.com/us/b2b/en/pediatric/gap.html](http://www.phonakpro.com/us/b2b/en/pediatric/gap.html)

**Got Transition? Center for Health-Care Transition Improvement**  
[www.gottransition.org](http://www.gottransition.org)

**Stepping Up Transition Information**  
<http://steppingup.ie>

**Transition Health-Care Checklist: Preparing for Life as an Adult**  
[www.waisman.wisc.edu/cedd/pdfs/products/health/thcl.pdf](http://www.waisman.wisc.edu/cedd/pdfs/products/health/thcl.pdf)

**Transition to Adult Health Care: A Training Guide in Three Parts**  
[www.waisman.wisc.edu/cedd/pdfs/products/health/tahc.pdf](http://www.waisman.wisc.edu/cedd/pdfs/products/health/tahc.pdf)

Teens as Health-Care Consumers: Planned Transition and Empowerment

**Implementing a Transition Plan**

As with every aspect of pediatric audiology, transition planning is a team effort. Our role is to help the family look ahead, identify age-appropriate goals, and provide education and materials relevant to audiology and general health care. Ongoing support to families could include a list of health-related life skills (TABLE 3) and transition Web sites (TABLE 4). The initial conversation would take a few minutes, and once a plan has been initiated, subsequent conversations also would require only a few extra minutes each visit in order to check on progress and address new concerns.

**Everyone Wins**

Transition planning prepares teens for adult health care; however, there is also an additional benefit for audiologists. Anecdotally, many audiologists report often feeling uncomfortable trying to talk with uncommunicative teen patients (“How are things going, Joni?” “Fine”), and resort to directing the conversation to their parents instead. We can work through this awkward stage by using transition planning as a conversational springboard. By focusing on meaningful life skills, and providing support to acquire those skills, we now have much to talk about: what the teen knows, doesn’t know, wants to learn, wants to do, worries about, is ready for. Transition planning is the epitome of patient-centered conversation, and is a natural progression in care for pediatric audiologists. **AT**

Emily Pajevic is an AuD student at the University of Akron/NOAC and is completing her fourth-year externship at Cleveland Clinic. Kris English, PhD, is a professor and interim school director at the University of Akron.

**References**

Britto MT, DeVellis RF, Hornung RW, DeFries GH, Atherton HD, Slap GB. (2004) Health care preferences and priorities of adolescents with chronic illnesses. *Pediatrics* 114(5):1272–1280.

Davis T, Wolf MS, Arnold CL, Byrd RS, Long SW, Springer T, Kennen E, Bocchini JA. (2006) Development and validation of the Rapid Estimate of Adolescent Literacy in Medicine (REALM-Teen): A tool to screen adolescents for below-grade reading in health care settings. *Pediatrics* 118:1707–1714.

English K. (2014, June) Health literacy: Asking the right questions. Presentation at campUS program for teens with hearing loss, Columbus, Ohio State University.

Manganello JA. (2008) Health literacy and adolescents: A framework and agenda for future research. *Health Education Research* 23(5):840–847.

National Alliance to Advance Adolescent Health. (2014) “Got Transition?” Six core elements of health-care transition 2.0. Transitioning youth to an adult health-care provider. Available: [GotTransition.org](http://GotTransition.org).

Neria C. (2009) Where are the voices of adolescents? An examination of adolescent cochlear implant users’ socio-emotional development. *Perspectives on School-Based Issues* 10:123–126.

Pai ALH, Ostendorf HM. (2011) Treatment adherence in adolescents and young adults affected by chronic illness during the health care transition from pediatric to adult health care: A literature review. *Children’s Health Care* 40(1):16–33.

Pajevic E. (2013, April 15) Counseling adolescents: How to manage the transition from child to young adult? Available: <http://advancingaudcounseling.com/?p=287>.

Park MJ, Adams SH, Charles CE. (2011) Health care services and the transition to adulthood: Challenges and opportunities. *Academic Pediatrics* 11(2):115–122.

Robins RW, Trzesniewski KH, Tracy JL, Gosling SD, Potter J. (2002) Global self-esteem across the life span. *Psychology and Aging* 17(3):423–434.

Royal College of Nursing. (2004) *Adolescent transition care: Guidance for nursing staff*. Available: <https://www.bspar.org.uk/DocStore/FileLibrary/PDFs/RCNGuidanceAdolescentTransitionalCare.pdf>

van Staa A, Jedeloo S, van der Stege H. (2011a) “What we want”: Chronically ill adolescents’ preferences and priorities for improving health care. *Patient Preference and Adherence* 5:291–305.

van Staa A, Jedeloo S, van Meeteren J, Latour JM. (2011b) Crossing the transition chasm: Experiences and recommendations for improving transitional care of young adults, parents, and providers. *Child: Care, Health, and Development* 37(6):821–832.

*For Excessive Ear Wax Build Up...*

# Debrox®

**#1 OTC Brand**  
for safe, comfortable,  
in-home **Ear Wax**  
**removal**

- #1 Doctor & Pharmacist recommended brand**

- Safe, Gentle, Non-Irritating**  
microfoam  
cleansing action

[www.debrox.com](http://www.debrox.com)

Use as directed.  
©2013 Medtech Products Inc.





# YOUR PATIENTS





FEATURED SESSION AT  
**AUDIOLOGYNOW!® 2015**  
 IN SAN ANTONIO, TX!

# ARE NOT AVERAGE

BY JASON GALSTER

Variability among our patients makes the treatment of hearing loss a dynamic and uniquely challenging prospect. However, without some form of outcomes assessment, it's difficult to understand if a patient is at, above, or below average.

A few years ago, while contributing to the development of guidelines for clinical best practice, I found it interesting that our recommendations were often developed from studies that drew conclusions from average data and the resulting statistical analysis. This is certainly the correct approach for the development of best practice guidelines, but the process isn't one that can easily address the variability among individuals that is an inherent consideration in the development of a personalized rehabilitation plan.

Hearing aid outcomes are highly variable; to suggest that patients will conform to the average would be misleading. For illustrative purposes, this article will focus on the dilemma of speech understanding in noise and the use of hearing aids in noisy environments. Directional microphones have the potential to provide great benefit for hearing aid wearers in noisy environments, but audiologists know from experience that patients' reported experiences with directional microphone hearing aids do not always align with laboratory data and established expectations.

Your Patients are Not Average

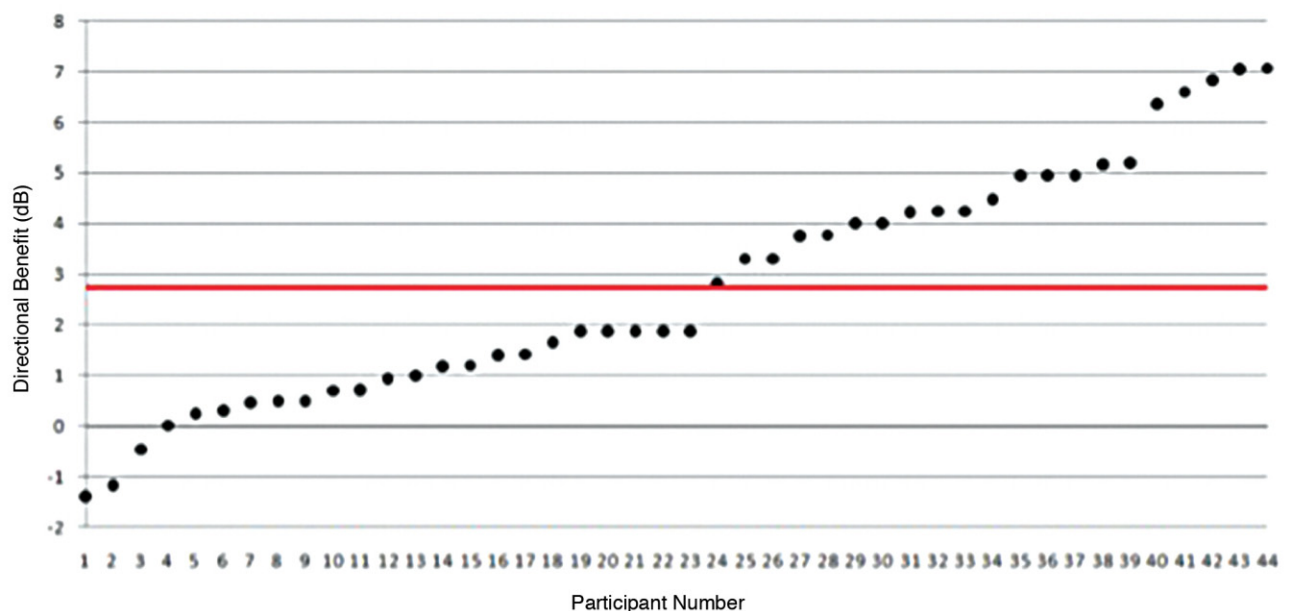
Take FIGURE 1 as an example: here we have data from 44 research participants who have completed the Hearing in Noise Test (HINT) (Nilsson et al, 1994). Each data point shows directional benefit for one patient (the difference between speech recognition in noise using omnidirectional and directional microphones). The data have been rank-ordered, ranging from the least to the most directional benefit, and the red line shows average performance. A question regarding FIGURE 1: How many participants in this sample have average performance? The answer is one participant. One participant's performance is equivalent to the group's average performance, a clear reminder that most patients are not average. In the case that a patient is not average and shows less than desired outcomes, an adjustment in the treatment plan or revision to counseling strategies is warranted. The challenge for the audiologist lies in the fact that variability originating from cognitive factors or physiologic factors cannot be explicitly controlled. There are, however, factors relating to the hearing aid and (to some extent) the patient's behavior that can be controlled or modified.

Continuing with the example of directional microphones, many audiologists have experienced this same variability, with the occasional patient reporting poorer-than-expected benefits when listening in noisy conditions. In cases where a patient reports a

poorer-than-expected experience, there are several opportunities to improve outcomes and attempt to constrain some of that individual's variability. A first point of consideration is the fitting configuration; it is an acoustic expectation that the effective directivity of directional microphones will be reduced as the ear-coupling configuration becomes progressively more open. A patient who requires more from directional microphones may benefit from a more occluding earmold that improves audibility for the amplified (i.e., processed) signal pathway (Magnusson et al, 2013).

With regard to behavioral modification, directed counseling on the utility of visual cues can be an impactful focus that greatly improves speech recognition in noise (Wu and Bentler, 2010). Of course, counseling on access to visual cues is a routine topic, but in the context of the noise-challenged patient, a counseling strategy more focused on accessing and maintaining visual cues may be of value to the patient.

The purpose of these examples is to demonstrate the utility of establishing a range of expectations for patient outcomes. In the laboratory, we establish these ranges through behavioral assessment and subjective outcome assessment. In a clinical setting, the options are slightly more limited, but the best option for subjective outcomes assessment remains questionnaires. For those interested




**FIGURE 1.** Directional microphone benefit in dB (the difference between directional and omnidirectional test conditions) is shown for each of 44 research participants who completed the Hearing in Noise Test. The red line shows group average directional benefit.



in freely available and well-validated outcome measures, the Web site [www.harlmemphis.org](http://www.harlmemphis.org) includes downloads for a number of useful tools, including the Abbreviated Profile of Hearing Aid Benefit (APHAB; Johnson et al, 2010) and the International Outcome Inventory for Hearing Aids (IOI-HA; Cox et al, 2003).

Patients who fall within the range of expected outcomes might receive one embodiment of a treatment plan, while those falling outside of a defined range of outcomes will be better served with a modification to that treatment plan. Abrams and Chisolm (2013) describe the intentional tiering of treatments as Progressive Audiologic Rehabilitation (PAR). Each patient enters the rehabilitation plan at a lower tier, in which counseling and treatment strategies may be less directed, leaving more control to the patient. In the case where the patient experiences less success, the treatment plan is modified and more direct actions are taken. These adjustments may include modification of hearing aid characteristics, directive counseling, inclusion of accessory devices (i.e., remote microphones), and/or prescription of auditory rehabilitation and training.

Variability among our patients makes the treatment of hearing loss a dynamic and uniquely challenging prospect. However, without some form of outcomes assessment, it's difficult to understand if a patient is at, above, or below average. Once the individual's outcomes are understood, a set of progressive treatment strategies can be formed. Several examples were provided here to address the needs of a noise-intolerant patient. Whether addressing comfort, audibility, or noise tolerance, the development of a progressive treatment plan can assist in managing individual variability by starting patients out with a rehabilitative strategy that becomes more personalized as the requirements for successful treatment increase. 

Jason Galster, PhD, is a senior manager of audiological research with Starkey Hearing Technologies in Minneapolis, MN. He is also the Featured Sessions chair of AudiologyNOW!® 2015.

## References

Abrams H, Chisolm T. (2013) Will my patient benefit from audiologic rehabilitation? The role of individual differences in outcomes. *Sem Hear* 34(2):128–140.

Cox R, Alexander G, Beyer C. (2003) Norms for the international outcome inventory for hearing aids *J Amer Acad Audiol* 14(8):403–413.

Johnson J, Cox R, Alexander G. (2010) APHAB norms for WDRC hearing aids. *Ear Hear* 31(1):47–55.

Nilsson M, Soli S, Sullivan J. (1994) Development of the hearing in noise test for the measurement of speech reception thresholds in quiet and in noise. *J Acous Soc Amer* 95:1085–1099.

Magnusson L, Claesson A, Persson M, Tengstrand T. (2013) Speech recognition in noise using bilateral open-fit hearing aids: the limited benefit of directional microphones and noise reduction. *Inter J Audiol* 52(1):29–36.

Wu YH, Bentler RA. (2010) Impact of visual cues on directional benefit and preference: part I—laboratory tests. *Ear Hear* 31(1):22–34.

## ENJOY THIS ARTICLE?

This topic will be a featured session at AudiologyNOW!® 2015, Saturday, March 28, 10:30 am–12:00 pm. View more featured sessions, events, and activities at [www.audiologynow.org](http://www.audiologynow.org).



# EARLY-ONSET DEAFNESS

## Functional Speechreading Assessment

BY LINDA G. GOTTERMEIER AND CAROL DE FILIPPO





**A**udiologists have few resources to assess functional communication skills in individuals who have severe-to-profound early-onset sensorineural hearing loss. In the real world, spoken language communication between those individuals who are deaf and those who have normal hearing typically occurs using both auditory and visual information; thus, a communication assessment task should incorporate some measure of speechreading (with acoustic speech cues) and lipreading (without acoustic cues).

Speechreading/lipreading tests often consist of unrelated words or sentences that the speechreader tries to identify in a write-down task (Sims, 1975). Attempts to adapt approaches previously used for auditory-only performance fall short as visual spoken language assessments, compared to those that tap lexical processing and other cognitive skills in deaf speechreaders (Mohammed et al, 2006; Nohara et al, 1995; Schow, 2001; Tye-Murray et al, 1995). Such tools also may fail to reveal strategies that augment successful communication. Multiple factors enter into the deaf speechreader's performance and no single factor in isolation adequately predicts speechreading outcomes (Mohammed et al, 2005).

A study supporting use of conversational analysis in the clinic as a pragmatic measure of spoken-language communication competence for deaf adults with early-onset deafness and the teaching of top-down processing as used by proficient speechreaders.

Early-Onset Deafness: Functional Speechreading Assessment

An assessment geared toward establishing an instructional plan would incorporate the pragmatics of communication in an interactive procedure that necessitates communication strategies, and thus better reflects real-world functioning. One example of such an assessment was developed by the U.S. Foreign Service. The agency developed an interview protocol and rating scale based on degree of accommodation needed to maintain a conversation in a foreign language, such as slower speech or repetition (Jones, 1975).

Another example is the Sign Language Proficiency Interview of Caccamise and Newell (1983, 2007). Their rating of Novice, for example, means “able to provide a single sign and some short phrase/sentence responses to basic questions signed at a slow-to-moderate rate with frequent repetition and rephrasing,” and a Superior rating indicates “able to have a fully-shared conversation, with in-depth elaboration for both social and work topics.”

In Erber’s TOPICON procedure, there is an overall rating, from low to high, of fluency and 15 related pragmatic factors (Erber, 1988). With DYALOG, Erber’s automated method to analyze conversation, a clinician records information by pressing the spacebar on a keyboard, yielding mean length of speaking turn and time spent in communication breakdowns (Erber, 1998).

Gustafson and Dobkowski (1995), in their conversational speech model for deaf-hearing partners, noted that the partner with normal hearing influences the flow of the dialogue, a variable also emphasized by Erber (1988). Other factors to be considered for assessment that they observed to affect functional communication were the deaf person’s self-confidence and assertiveness, and facility with speech, pronunciation, listening, speechreading, English language, and nonverbal cues. Conversational behaviors of deaf individuals can also include an apparent lack of assertiveness indicated by failure to request clarification of misunderstood messages (Caissie and Rockwell, 1993), or withdrawal, avoidance, or pretending to understand (Trychin, 1987).

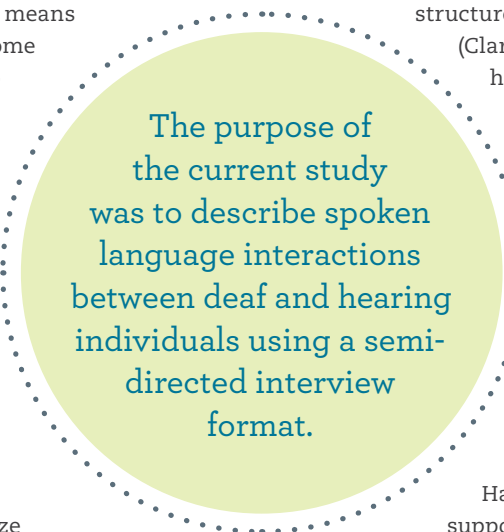
Erber (1988) observed that the person with hearing loss might dominate the conversation, avoid or shift

topics, interrupt or end the communication, or engage in nonverbal cues and meta-communication. Tye-Murray et al (1995) related that some individuals become so controlling that they alienate their communication partners. Controlling behaviors could serve to reduce the amount of speechreading, lipreading, or listening in a conversation, and thus preclude communication breakdowns and misunderstandings (Caissie et al, 1998).

Conversational style, whether assertive or reserved, is learned as part of basic linguistic knowledge (Tannen, 1984). Children develop social knowledge and stylistic features of the language as they learn the language structure, beginning as early as age two (Clark, 2009). This raises a question about how and when deaf children who are learning a spoken language acquire the nuances of conversational style, and whether styles need to be assessed and deliberately taught.

In the event of a breakdown in real-world spoken language interactions, what do experienced deaf speechreaders do to avoid or recover from misunderstandings? In a survey of 212 members of Self Help for the Hard of Hearing (SHHH), a now-defunct support group for people with hearing loss, most respondents said they would ask a person to repeat rather than simplify, restructure, or elaborate (Tye-Murray et al, 1992). In contrast, Gagné and Wyllie (1989) found that paraphrasing and providing a synonym were more helpful than repeating a lipread word. At the level of the conversation, Caissie (2000) documented that fewer breakdowns occur when a topic is maintained or expanded, or there is clear initiation of a new topic. Breakdowns become more likely with topic shading, when the content of a new topic is derived from the immediately preceding topic.

The purpose of the current study was to describe spoken language interactions between deaf and hearing individuals using a semi-directed interview format. A secondary objective was to test the prospects of using conversation analysis in developing a spoken communication development plan for clients who are deaf. Specifically, we focused on turn-taking, strategies to avoid and repair communication breakdowns, and evidence of bottom-up and top-down processing strategies.



## Method

### Participants

We sought four professional working adults with long-standing deafness who showed ease in use of spoken English. Characteristics of the selected participants are shown in TABLE 1. There were three males and one female, ages 21 to 36, college educated, employed in professional positions, and experienced communicating with individuals who had normal hearing. They had been deaf since birth or by time of entry to school, and had attended either an oral school for the deaf or a public school with no support services. All used hearing aids continuously since early childhood, but differed widely in auditory-only speech perception skill. Their lipreading scores with or without sound were good to excellent, and their speech was highly intelligible, with scores of 90 percent or higher (Subtelny, 1977). In addition to being competent with spoken English, these individuals were proficient in American Sign Language and shifted modes depending on their conversational partner.

We also selected four adults with normal hearing, two male and two female, to serve as conversation partners for the deaf participants. They were college-educated professionals, had little to no experience interacting with deaf individuals, and were judged to have engaging personalities and communication styles.

### Procedure

The deaf and hearing participants were randomly paired and videotaped in a conversational interaction. Partners sat facing each other about one-and-a-half meters apart in a quiet room with overhead lighting. Two cameras and a split-screen mixer provided color images of both partners

from the top of the head to the lap. To increase the participants' comfort level, there was no monitor visible and the investigators left the room during each conversation.

Written instructions informed the participants that the purpose was to learn more about how deaf and hearing people converse so as to improve approaches to assessment and instruction. The deaf participants were told that their hearing partner did not know sign language. Each pair was given five minutes to get to know each other, and then 20–30 minutes to explore the answers to a printed list of questions, different for each participant, about family, work, and current affairs. For example, "Is your partner in favor of more public transportation? Would your partner ride a bus or van to work? Why or why not?" During the first half of the session, the deaf participants used their hearing aids. For the last half, they continued with hearing aids off. All four teams followed the same sequence, the audiovisual condition (AV) followed by lipreading only (LR). Counterbalancing was not used, because our primary objective was to observe under typical AV circumstances, without what would have been the disruptive influence of the more difficult LR condition, had it occurred first.

**Transcription of verbal and nonverbal events.** All spoken words and nonverbal behaviors were extracted from the videotapes independently by the authors and verified by student assistants. Nonverbal behaviors were movements such as gestures, head nods, facial expressions, and eye gaze that all judges agreed were part of the communication interaction. Timing of nonverbal behaviors relative to the speech stream was marked on the transcripts.

**Episodes.** Change of topic was recorded on the transcripts to denote the bounds of conversational episodes

**TABLE 1.** Characteristics of Experienced Speechreaders

| Team | Etiology    | Three-frequency PTA (dB HL) | WORD RECOGNITION (% CORRECT) * |                 |                       |
|------|-------------|-----------------------------|--------------------------------|-----------------|-----------------------|
|      |             |                             | Auditory-only                  | Lipreading-only | Lipreading-with-sound |
| A    | Unknown     | 97                          | 24                             | 58              | 78                    |
| B    | Unknown     | 98                          | 0                              | 96              | 84                    |
| C    | Prematurity | 72                          | 100                            | 45              | 70                    |
| D    | Unknown     | 97                          | 46                             | 100             | 100                   |

\* Central Institute for the Deaf (CID) Everyday Sentences, percent-correct keyword recognition

Early-Onset Deafness: Functional Speechreading Assessment

as described by Tannen (1984). Episodes contained a sequence of questions and answers and/or questions and explanations (Tannen’s “adjacency pairs”).

**Length of speaking turn.** Mean length of speaking turn (MLT) was the amount of time that each partner held the floor, calculated as the average number of words uttered in the first 50 consecutive turns in each condition, not including verbal fillers or false starts. For example, “It was, was for, uh, the...” counted as four words. MLT controls for difference in speaking rate among talkers and is a more valid reflection of talking time than actual time expired (Caissie and Rockwell, 1993).

**Conversational strategies.** Each speaking turn and nonverbal behavior was coded for function, including maintenance strategies that sustained the flow of the conversation and repair strategies that aided recovery. Our categories, derived from the work of Erber (1988), Tye-Murray (1995), Tye-Murray et al (1992), and Caissie and Rockwell (1993), were the following:

- **Echo behavior:** Repeating a keyword or ending the partner’s sentence.
- **Nonspecific request:** Verbal or nonverbal cue to disambiguate a potential confusion.
- **Question:** Requesting information.
- **Answer:** Providing information requested in a previous question of the conversational partner.
- **Informational utterance:** Providing a fact or detail, not in response to a question.
- **Expansion:** Providing a fact or detail related to the current topic, but beyond the bounds initially established.
- **Crosstalk:** Verbal or nonverbal behavior while the other person holds the floor, signaling attentiveness and acknowledgment that the partner’s turn is not yet finished (e.g., Uh-huh. Yeah. Right. Head nodding).
- **Repair strategy:** Attempt to clarify or repair a communication breakdown by focusing on individual phonemes and/or visemes (bottom-up strategy) or focusing on words or context, including repetition and echo questions (top-down strategy).

One of our aims was to document how top-down versus bottom-up strategies were used in deaf-hearing conversations.

**Topic manipulation and related communication breakdowns.** Topic changes were analyzed in order to indicate how each episode emerged, whether as topic initiation, topic maintenance, topic shading, or topic expansion.

**Results**

**Episodes and Mean Length of Turn**

During the first half of the interactions, in the AV condition, two teams had many episodes (Teams B and D: 11–12 episodes); the other two had few episodes (Teams A and C: 4–5 episodes). In the second half, under the LR condition, all conversations leveled off at 5–6 episodes. Paradoxically, the reduction was associated with the two deaf participants (B and D) whom we did not expect to be sensitive to sound on versus sound off, based on their lipreading-only word recognition scores.

Mean length of turn (MLT) was examined as one indicator of reciprocity in the conversations (SEE FIGURE 1). In the AV condition, MLTs were not significantly different within teams, suggesting a balanced conversation. It also was noted that the deaf partners in Teams B and D, in addition to having many episodes in the AV condition, had the lowest MLTs, about five words per turn. This would result in a pattern of shorter and quicker interchanges, compared to Teams A and C, who took longer turns, with MLTs of 8–12 words.

MLTs in the LR condition reflected a different pattern, with all deaf participants exceeding the turn lengths of their hearing partners, reaching statistical significance for all but Team A. Both partners changed: Three of the hearing participants took shorter turns compared to the AV condition, and all deaf participants took longer turns.

**Conversational Maintenance and Repair Strategies**

One of our aims was to document how top-down versus bottom-up strategies were used in deaf-hearing conversations. We observed scant use of bottom-up strategies, primarily during the warm-up period for name clarification, constituting too few instances for meaningful analysis. The following is an examination of top-down strategy use.

Early-Onset Deafness: Functional Speechreading Assessment

**Echo behaviors.** Each of our deaf participants used echo behaviors in the AV condition (8–17 instances) and the LR condition (8–16 instances). Tannen (1984) described “echo questions” as backchannel feedback. In speechreading, this behavior is called a confirmation strategy (Kaplan et al, 1985; Tye-Murray, 2015). It verifies that the person is on track and prevents disruptions to the flow of the conversation by using context, rather than an analytic approach.

The following is one example of echo behavior to maintain the flow between deaf (D) and hearing (H) partners:

- H: “Um, I like to work in a college environment.”
- D: “College environment. Yeah. (Head nod.)”
- H: “I was working in business before and it was, was very stressful, and...”
- D: “Stressful?”

An example that prevented a breakdown by catching a perceptual error, is this exchange:

- H: “I’m finishing my tenth year.”
- D: “Your second year?”
- H: “10 years.”
- D: “Oh, 10 years. Uh huh.”

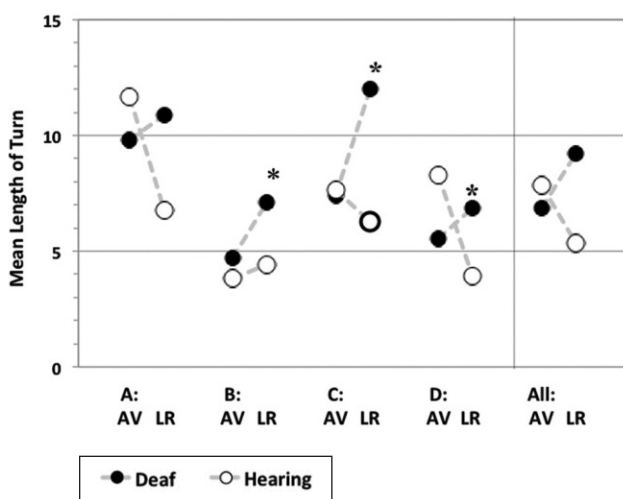
No pattern of echo behaviors related to perceptual characteristics was noted among the deaf participants. Echo was occasionally used by the hearing participants

(up to six times per condition), especially in Teams A and B with the deaf participants who had the poorest auditory-only skill, which can affect speech intelligibility.

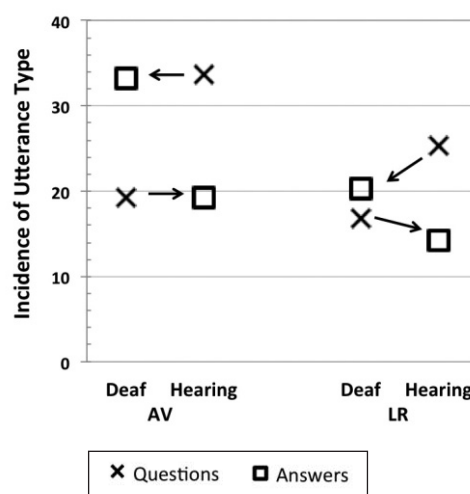
**Nonspecific requests.** Our deaf participants used nonspecific verbal requests such as “Excuse me,” “I’m sorry,” and “You’ll have to repeat that;” and nonverbal requests such as leaning forward, raising their eyebrows, or using a quizzical look. Nonverbal requests, in particular, were an unobtrusive strategy to obtain additional information that might disambiguate the message without stopping the hearing partner. Nonspecific requests appeared in both conditions (AV: 0–6 instances; LR: 1–9 instances) and were used most often by the deaf participant in Team B.

**Questions and answers.** Question/answer patterns are another indicator of balance in a conversation and are shown averaged over all four teams in FIGURE 2. In the AV condition, a question/answer pattern emerged (Tannen’s “adjacency pairs”) in which the number of questions asked by one partner (more often, the hearing participant) matched the number of answers given by the other (primarily the deaf partner in the role of respondent). This pattern continued in the LR condition for Team C and Team D (with our best lipreader), but was less clear for Teams A and B where there were fewer answers than there were questions posed, by either partner.

**Informational utterances and expansions.** Unique conversational styles were reflected in the wide range



**FIGURE 1.** Mean length of turn for the Deaf and Hearing partner in Teams A–D in an AV condition (hearing aid on) and LR condition (hearing aid off); and the average over all teams. Asterisks indicate a statistically significant difference between partners during HA off ( $p < .05$ ).



**FIGURE 2.** Incidence of questions and answers averaged for the Deaf partners and the Hearing partners in an AV condition (hearing aid on) and LR condition (hearing aid off). Arrows connect reciprocal Q/A events.

Early-Onset Deafness: Functional Speechreading Assessment

of informational and expansion utterances produced by the four teams (diamond symbols in FIGURE 3). In the AV condition, the deaf participants in Teams B and D produced more of these types of utterances than their hearing partners. During LR, the deaf partner in Team B experienced a dramatic reversal of that pattern, again reflecting the overall difficulty of the LR condition for this deaf participant.

Another strong dynamic between deaf and hearing partners was apparent in the parallel use of crosstalk (plus symbols in FIGURE 3). Crosstalk occurred with nearly every informational/expansion utterance, regardless of team or condition. For example, with hearing aid (HA) on, the deaf participant in Team B produced 166 expansions or informational utterances, while his partner interjected crosstalk 164 times. With HA off, this deaf individual's expansions and informational utterances decreased to 38 while his hearing partner's crosstalk decreased to 43. A reciprocal relationship between expansions/informational utterances and crosstalk indicates that utterance type can exert a powerful influence on the roles of participants in the conversational flow.

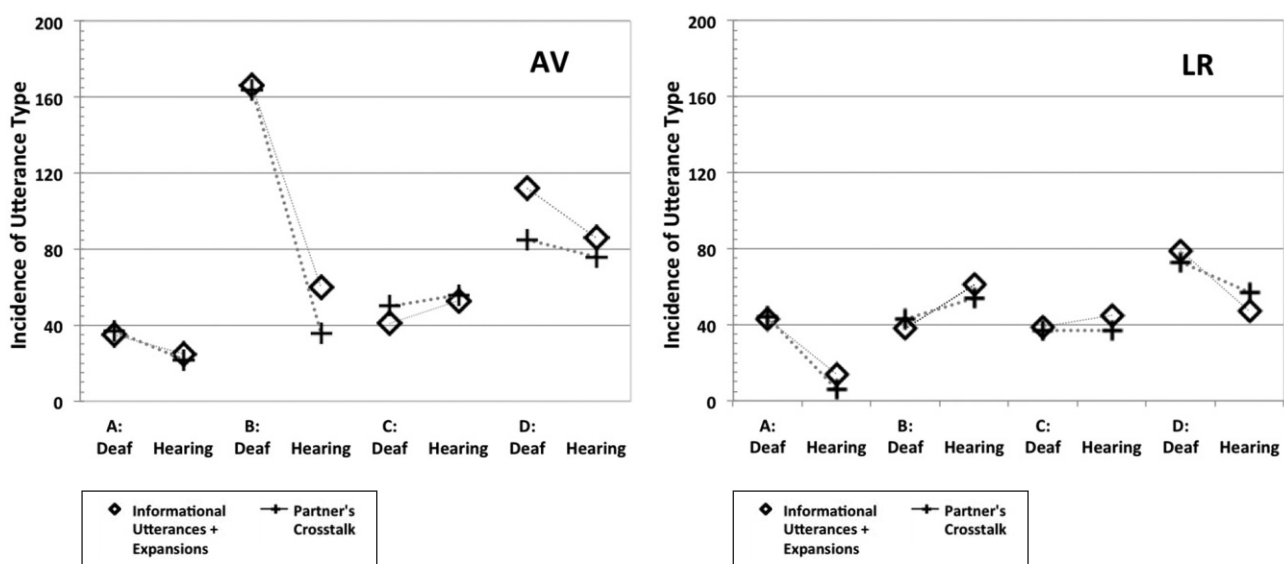
**Repair strategies.** Use of repair strategies varied across teams, deaf/hearing participants, and conditions. Team A increased strategy use dramatically from the AV condition (Deaf: 14 instances; Hearing: 8) to the LR condition (Deaf: 60 instances; Hearing: 52). Both members of Team B

decreased strategy use from an average of 40 during AV to 23 during LR. This was the team in which the hearing participant took longer turns when his deaf partner turned off his HA. Team C also used fewer strategies in the LR condition (average=5) compared to the AV condition (average=13). In this instance, the deaf participant took longer turns with his HA off. Team D, with the strongest lipreader, showed little change across conditions.

**Topic Manipulation and Related Communication Breakdowns**

Topic initiation was associated with few communication breakdowns (0–2 instances over teams and conditions), perhaps because the participants often marked topic change by a pause or glance downward to select a new question. Caissie (2000) has shown that such cues help individuals with hearing loss to anticipate new content and, hence, they may make extra effort to concentrate, avoiding breakdowns. Topic maintenance was associated with 0–3 breakdowns, and Topic expansion, no breakdowns. Both functions were low-incidence events, each occurring only 0–3 times across teams and conditions.

In contrast, Topic shading highlighted stark team differences. Shading occurred 1–6 times per team/condition, resulting in 0–5 breakdowns for Teams B, C, and D; but 17 breakdowns for Team A in the AV condition and 44 in the LR condition. The deaf participant on this



**FIGURE 3.** Incidence of informational utterances and expansions by the Deaf and Hearing partner in Teams A–D in an AV condition (hearing aid on) and LR condition (hearing aid off), and amount of crosstalk produced by the partner.



team achieved a maximum score of only 78 percent on tests of word recognition, in spite of a high level of success in real-world interactions. Mentis (1994) suggested that topic shading requires more sophisticated linguistic skills because pausing or other visible marking cues are not obvious.

## Discussion

A semi-directed interview format yielded a rich body of information about the functional spoken-language communication of deaf-adult speechreaders in conversations with normal-hearing partners. With this method, behaviors common to all teams, as well as unique styles, could be observed. Most striking was the nearly total absence of bottom-up strategies in any of the conversations, consistent with the expectation of Mohammed et al (2006) for deaf speechreaders. Instead, when our participants sought clarification, it was in a top-down fashion, using both verbal and nonverbal maintenance strategies that included echo behaviors. A pattern emerged consisting of numerous informational utterances and expansions matched by a similar amount of crosstalk inserted by the partner. A second pattern was question-answer, with the deaf speechreader more often in the role of respondent.

The LR condition highlighted individual perceptual differences among the deaf participants. For example, the deaf participant in Team A had the most communication breakdowns and increased strategy use without sound, which might be expected with a lipreading score of 58 percent. The deaf partner in Team B, who struggled the most overall with his hearing partner, had a dramatic decrease in informational and expansion utterances during LR. In Team C, we observed a large increase in the deaf participant's length of turn, in line with his relatively poor word recognition without sound. Team D was exceptional and experienced no breakdowns with any type of topic maintenance in either condition.

When they encountered difficulties, these experienced communicators often "tread water," letting the conversation continue to take full advantage of the redundancy of the language, or used their turns to recapture the context, indirectly provoking assistance

("Say that again.") or asking for verification of topic. They seemed confident that later information would help interpret earlier trouble spots. Contrary to Erber (1988) and others, in the most typical AV condition, no evidence of deliberately dominating the conversation appeared in the present study. Both the hearing and the deaf partner adjusted turn length and utterance function in a balanced fashion to maintain conversational fluency.

Toward the purpose of assessing a conversational interview as a functional communication tool, we found that our interactive technique generated complex language (as in Schick, 1989) and multiple opportunities to use real-world behaviors for achieving comprehension with fluency. Wilson et al (1998) recommended provoking communication breakdowns during conversation in the clinic as an efficient assessment of strategy use for

Written instructions informed the participants that the purpose was to learn more about how deaf and hearing people converse so as to improve approaches to assessment and instruction.

individuals with mild-to-moderate hearing loss. The current study found success with that concept in cases of early-onset deafness. A descriptive analysis of behaviors in such a conversation could then form the basis of an instructional plan for improvement, implementing synthetic exercises as in training guides by Kaplan et al (1985) and Tye-Murray and Witt (2008), for example.

Lind (2009) and Lind et al (2010) described conversation therapy that analyzes "talk" (speech units beyond the syllable, word, or sentence), with a focus on interaction rather than speech reception.

Success is judged in terms of lessened participation restriction (World Health Organization, 2001; Rangasayee et al, 2010). Lind (2013) also has argued the "ecological validity" of conversational analysis for assessing intervention outcomes.


Attempts to demonstrate the efficacy of speechreading training often have resulted in modest findings, perhaps because the field has not widely adopted the pragmatic World Health Organization (WHO) criteria for assessment. Although communication-strategies training has a long history (see Tye-Murray, 2015), there have been shifts toward bottom-up perception-oriented instruction with the emergence of new technologies (Pichora-Fuller and Levitt, 2012). This trend has been influenced by the growing need to assist congenitally deaf clients who obtain a cochlear implant as an adult and by research

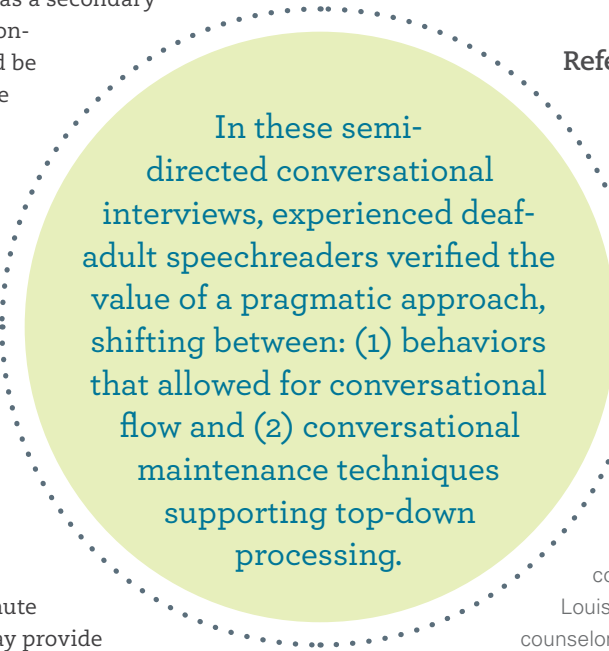
Early-Onset Deafness: Functional Speechreading Assessment

findings that have identified enhanced phonetic perception as a major contributor to successful lipreading performance in early-onset deafness (Auer and Bernstein, 2007; Auer, 2010).

From a functional perspective, top-down-processing strategy training may be a more effective route to success in later adulthood compared to an analytic approach, and more readily addressed within the time and cost parameters that clinicians and clients can afford. Whether implemented as a secondary or primary focus, a conversation-based training approach would be accompanied by some measure of performance, including baseline and interim progress.

A semi-directed interview technique has had success in assessing communication competence in a nonnative language, including American Sign Language. Building on previous work to automate and implement conversation analysis (as with Erber's DYALOG; Heydebrand et al, 2005), and with innovations in speech-recognition software, a 10-minute interaction with a clinician may provide an adequate sample for analysis. A write-down task may be quicker, but cannot demonstrate the functional skills of the speechreader, which should also reflect his or her typical communication setting, whether school, work, or home. A conversational interaction also can show significant others the frustrations and successes of various communication strategies with the deaf partner.

In these semi-directed conversational interviews, experienced deaf-adult speechreaders verified the value of a pragmatic approach, shifting between: (1) behaviors that allowed for conversational flow and (2) conversational maintenance techniques supporting top-down processing. Further study is needed to determine how methods such as conversation therapy transfer from cases of acquired hearing loss to adults with early-onset deafness for training of specific behaviors, such as echo questions and topic confirmation, toward improving functional speechreading. 



In these semi-directed conversational interviews, experienced deaf-adult speechreaders verified the value of a pragmatic approach, shifting between: (1) behaviors that allowed for conversational flow and (2) conversational maintenance techniques supporting top-down processing.

Linda G. Gottermeier, AuD, is an associate professor of audiology in the Department of Communication Studies and Services at the National Technical Institute for the Deaf, Rochester Institute of Technology, Rochester, NY.

Carol L. De Filippo, PhD, is a professor of audiology in the Master of Science Program in Secondary Education of Students who are Deaf or Hard of Hearing at the National Technical Institute for the Deaf, Rochester Institute of Technology.

References

Auer ET. (2010) Investigating speechreading and deafness. *J Am Acad Audiol* 21:163-168.

Auer E, Bernstein L. (2007) Enhanced visual speech perception in individuals with early onset hearing impairment. *J Speech Lang Hear Res* 50:1157-1165.

Caccamise F, Newell W. (1983) Use of sign language proficiency interview for assessing the sign communication competence of Louisiana School for the Deaf dormitory counselor applicants. *J Acad Rehabil Audiol* 16:283-304.

Caccamise F, Newell W. (2007) *SLPI-SCPI-SLPI History*. 8th ed. Rochester, NY: National Technical Institute for the Deaf.

Caissie R. (2000) Conversational topic shifting and its effect on communication breakdowns for individuals with hearing loss. *Volta Rev* 102(2):45-56.

Caissie R, Dawe AL, Donovan C, Brooks H, MacDonald S. (1998) Conversational performance of adults with a hearing loss. *J Acad Rehabil Audiol* 31(1):45-67.

Caissie R, Rockwell E. (1993) A videotape analysis procedure for assessing conversational fluency in hearing-impaired adults. *Ear Hear* 14(3):202-209.

Clark EV. (2009) Lexical meaning. In: Bavin EL, ed. *The Cambridge Handbook of Child Language*. New York: Cambridge University Press, 283-300.

Early-Onset Deafness: Functional Speechreading Assessment

Erber NP. (1988) *Communication therapy for hearing-impaired adults*. Abbotsford, Victoria, Australia: Clavis Publishing.

Erber NP. (1998) DYALOG: A computer-based measure of conversational performance. *J Acad Rehabil Audiol* 31:69–76.

Gagné JP, Wyllie KM. (1989) Relative effectiveness of three repair strategies on the visual identification of misperceived words. *Ear Hear* (10):368–374.

Gustafson MS, Dobkowski KD. (1995) Improving your conversations: A course for deaf and hard of hearing young adults. *Volta Rev* 97(1):5367.

Heydebrand G, Mauze, E, Tye-Murray N, Binzer S, Skinner, M. (2005) The efficacy of a structured group therapy intervention in improving communication and coping skills for adult cochlear implant recipients. *Int J Audiol* 44(5):272–280.

Jones RL. (1975) *The FSI Oral Interview*. Provo, Utah: Brigham Young University.

Kaplan H, Bally S, Garretson C. (1985) *Speechreading: A Way to Improve Understanding*. 2nd ed. Washington, DC: Gallaudet University Press.

Lind C. (2009) Conversation therapy: Interaction as intervention. In *Hearing Care for Adults*. Phonak, pp. 103–110. Online at <http://tinyurl.com/k2hjv8pl>.

Lind C. (2013) Conversation repair: Ecological validity of outcome measures in acquired hearing impairment. *Cochlear Implants Int* 14(S4):S48–S51.

Lind C, Hickson, L, Erber, N. (2010) Who said what? Sampling conversation repair behavior involving adults with acquired hearing impairment. *Semin Hear* 31:104–115.

Mentis M. (1994) Topic management in discourse: Assessment and intervention. *Top Lang Disord* 14:29–54.

Mohammed T, Campbell R, MacSweeney M, et al (2005) Speechreading skill and visual movement sensitivity are related in deaf speechreaders. *Perception* 34:206–216.

Mohammed T, Campbell R, MacSweeney M, et al (2006) Speech reading and its association with reading among deaf, hearing and dyslexic individuals. *Clin Linguist Phon* 20:621–630.

Nohara M, MacKay S, Trehub S. (1995) Analyzing conversations between mothers and their hearing and deaf adolescents. *Volta Rev* 97:123–134.

Pichora-Fuller M, Levitt H. (2012) Speech comprehension training and auditory and cognitive processing in older adults. *Am J Audiol* 21:351–357.

Rangasayee R, Mukundan G, Dalvi U, Nandurkar A, Kant A. (2010) The International Classification of Functioning, Disability and Health (ICF) for audiologists and speech-language pathologists. *JISHA* 24(1):1–23.

Schick B. (1989) *Using the language proficiency interview to elicit complex language*. Presentation at the convention of the American Speech-Language-Hearing Association, St. Louis, MO.

Schow R. (2001) A standardized AR battery for dispensers is proposed. *Hear J* 54(8):10–20.

Sims D. (1975) The validation of the CID Everyday Sentence Test for use with the severely hearing impaired. *J Acad Rehabil Audiol* 8:70–89.

Subtelny JD. (1977) Assessment of speech with implications for training. In: Bess FH, ed. *Childhood deafness: Causation, assessment and management*. New York: Grune and Stratton.

Tannen D. (1984) *Conversational Style: Analyzing Talk Among Friends*. Norwood, NJ: Ablex.

Trychin S. (1987) *Stress Management*. Bethesda, MD: SHHH.

Tye-Murray N. (2015) *Foundations of Aural Rehabilitation: Children, Adults, and Their Family Members*. 4th ed, pp. 240–339. Stamford, CT: Cengage.

Tye-Murray N, Purdy SC, Woodworth G. (1992) The reported use of communication strategies by members of SHHH and its relationship to client, talker and situational variables. *J Speech Hear Res* 35:708–717.

Tye-Murray N, Witt S. (2008) Communication strategies training. *Sem Hrng* 18(2):153–164.

Tye-Murray N, Witt S, and Shum L. (1995) Effects of talker familiarity on communication breakdowns with adult cochlear implant users. *Ear Hear* 16:459–469.

Wilson J, Hickson L, Worrall L. (1998) Use of communication strategies by adults with hearing impairment. *Asia Pacific J Speech Lang Hear* 3(1):29–41.

World Health Organization. (2001) *International Classification of Functioning, Disability and Health*. Geneva, Switzerland.

# RESEARCH, MENTORING, AND VESTIBULAR AND CONCUSSION ASSESSMENT

## A BALANCING ACT

BY JOSCELYN MARTIN

## JOSCELYN MARTIN, AUD, FORMER AAA FOUNDATION BOARD TRUSTEE, RECENTLY SPOKE WITH JULIE HONAKER, PHD, 2008 RESEARCH AWARD RECIPIENT, TO FIND OUT HOW THE AAA FOUNDATION'S SUPPORT AFFECTED HER RESEARCH AND HER CAREER, AND WHY SHE FEELS IT'S IMPORTANT TO SHARE HER PASSION FOR RESEARCH WITH HER STUDENTS.

**T**he American Academy of Audiology Foundation (AAAF) has partnered with the Academy to support the Research Grants in Hearing and Balance program (formerly known as the Academy Research Awards) since 2003. As part of the Foundation's efforts to promote innovative audiology research, *Audiology Today* periodically features interviews with past recipients of Foundation research funding.

Julie Honaker, PhD, was awarded a 2008 New Investigator Research Grant for her project, Gaze Stabilization Testing for Predicting Fall Risk, while receiving a post-doctorate fellowship at Mayo Clinic in Rochester, Minnesota. She is now an assistant professor at the University of Nebraska-Lincoln (UNL), and has since mentored three students who also have received Academy Research Grant funding. Joscelyn Martin, AuD, former Foundation Board Trustee, recently spoke with Honaker to find out how the Foundation's support affected her research and her career, and why she feels it's important to share her passion for research with her students.

**Joscelyn Martin (JM):** It's a pleasure to talk with you, Julie. It has been a few years since we have had a chance to connect, so let's begin with a recap of the post-doctoral research you were working on at Mayo.

**Julie Honaker (JH):** Absolutely. My project was evaluating a functional measure of the vestibular system, the Gaze Stabilization Test. My hypothesis was that this particular functional vestibular measure would be sensitive to identifying individuals with a previous history of falls, and might lead to a new objective tool for falling-risk assessment. Falling-risk assessment is a major focus of my research, since it is a critical component of preventative care.

The Foundation grant was my first major grant, and it helped to launch my career. I started my work at Mayo Clinic and completed the project at the University of Nebraska-Lincoln, where I am currently an assistant professor. I found that the Gaze Stabilization Test is a sensitive measure for identifying individuals with a history of falls. However, if we use this measure in combination with another performance-based tool, specifically the Dynamic Gait Index, it actually has optimal sensitivity and specificity for identifying falling risk. Therefore, it led to the development of a clinical falls-risk protocol for audiologists and physical therapists.

**That's really pretty neat. And I love how you have that preventive umbrella that guides your research. Have you done any follow-up projects on this specific topic?**

One of my students, Choongheon Lee, received the 2012 Vestibular Research Summer Fellowship for his project, Development of a Bedside Gaze Stabilization Test. For his project, we developed a low-cost way to functionally evaluate the vestibular system, with a "bedside" Gaze Stabilization Test. The intention was to develop a screening tool that could be used for fall risk and identification of vestibular dysfunction. Choongheon has a background in electrical engineering, so we worked to develop a low-cost accelerometer that could be used to monitor head velocity and head amplitudes, similar in design to the Gaze Stabilization Test. We tested and piloted it in a normal population. We wanted to first answer questions such as how reliable is it? Is it picking up what we intended it to pick up? We found it was highly reliable and his work on this project was published. Very exciting!

Research, Mentoring, and Vestibular and Concussion Assessment: A Balancing Act

**Do you plan any future work on the same topic?**

Applying the bedside Gaze Stabilization Test to falling risk is ongoing work, but we're also exploring research in another area on head injury and concussion. So we're collaborating with other universities to look at this low-cost alternative to determine if this could be a reliable indicator for concussions and to also monitor vestibular function over time.

**In addition to Choongheon, you mentor several other students who have received funding from the Foundation. Would you like to tell us a little bit about their projects as well?**

I always encourage students at the AuD and PhD level to apply for these grants, and I have helped three other students receive funding from the Grants in Hearing and Balance program. I try to get students to appreciate research early in their careers and to understand the importance of research for our profession. The three students who have received funding are conducting research with student-athletes to answer concussion-related questions.

Robin Criter received the 2013 Vestibular Research Student Investigator grant for her project Characterizing Effects of Anxiety on Postural Sway in Collegiate Athletes. Before I discuss her project, I would like to briefly discuss

the three current recommendations for standard clinical assessment that are recommended following head injury. One is a neuro-cognitive measure, a paper-and-pencil test, or computerized program that can be used for baseline and post-concussion assessment. The second is a checklist for symptoms that the individual may have following head injury. The third component is a postural control measure to monitor body sway, typically with high-technology equipment such as computerized dynamic posturography. There are also lower technology standing-balance tasks for use in assessment, such as standing on a flat surface and standing on a piece of foam, that can document changes in body sway.

Criter is exploring the impact of anxiety on postural control in collegiate athletes. We know that anxiety correlates with changes in postural control in other populations, leading to increased body sway. This can put an individual at increased risk for injury. So Criter is looking at what happens overall for individuals who have a history of anxiety, as anxiety is a leading concern for physicians and clinicians treating student athletes. Specifically, her work is getting a really good snapshot of changes in their overall postural performance across an athletic season (preseason, mid-season, and end-of-season). And, she is trying to answer if this could lead to more specific information about change after a head injury, so her work is looking at these variables. She has validated anxiety measures that she's using to monitor levels of anxiety in these individuals.

**Interesting work! And you have two other students who received funding this year, correct?**

Yes, that's correct. Jessie Patterson received the 2014 Vestibular Research Student Investigator grant for her project, Characterizing Effects of Fatigue Following Physical Exertion on Dynamic Visual Acuity Test in Collegiate Athletes. With current sideline postural control testing, it has been documented that a rest period of upwards of 15 minutes following physical exertion is needed to mitigate the effects of fatigue. Unfortunately, this is not feasible on the sideline, as physicians and athletic trainers need immediate confirmation of potential head injury. This led to her project, where she is looking at the effects of fatigue following physical exertion on a vestibular measure, the Dynamic Visual Acuity Test, to determine its potential inclusion as a sideline concussion measure. Patterson has a control group and a physical exertion group. She's collecting data now on collegiate athletes at UNL. As part of her testing, athletes receive pre-testing dynamic visual acuity and then, immediately following a 20-minute period of either rest for the control



Julie Honaker (seated center) with UNL students who have received an Academy/AAA Foundation grant. Seated: Diana Weissbeck and Jessie Patterson; Standing: Choongheon Lee and Robin Criter.

Research, Mentoring, and Vestibular and Concussion Assessment: A Balancing Act

group or a known protocol for physical exertion, they will have dynamic visual acuity tested again. Then, there is an additional testing period after 10 minutes. She has just started collecting data and I look forward to her results.

The last student researcher I am working with is Diana Weissbeck, who received the 2014 Student Summer Vestibular Research Fellowship for Development of a Head-Shake Postural Control Protocol for Potential Use in Concussion Assessment. She is examining a low-technology head-shake posturography protocol for future incorporation into concussion management. With standing postural control testing for concussion assessment, ceiling and floor effects have been observed on portions of the testing. She hopes that her new protocol will provide a better means of monitoring postural control.

Typically, head-shake posturography is used with computerized dynamic posturography equipment that is very expensive. She has a low-cost alternative, using an inexpensive rate sensor to monitor head movements. She uses a laser pointer to monitor head exertion, and she has athletes perform standing balance tasks on a flat and foam surface with horizontal and vertical head movements. For this study, she is looking at the overall reliability of this new head-shake measure, collecting normative data, and trying to determine if there are any ceiling or floor effects with the addition of the head-movement tasks. Most of our balance measures are in a population who are not experienced athletes. They don't have high performance levels, so we've had to up the ante. With this research, we think about what an athlete is capable of doing and, since they do so well on our typical measures, we're trying to systematically make them more challenging to see if we can pull out abnormalities after head injury.

**I'll look forward to learning what your students are discovering. As a matter of fact, I work with some of your former students, and they talk about how mentoring is very important to you. Tell me about your role as a mentor to these student researchers and why it's so important.**

I've benefitted so much from my mentor experiences with Drs. Neil Shepard and Jeffrey Staab at the Mayo Clinic. Having them guide me through the research process, from the conceptualization of a research question and the overall design, to executing the study and disseminating the findings, has been so rewarding for me. I really enjoy passing this on to my students and helping them appreciate research. The best way to appreciate research is by immersing yourself in the entire process, and that's what I try to do for my students. I want them to become independent, critical thinkers and to truly take ownership



Audiology student Alaina Bassett performs a concussion protocol on a fellow UNL student at the Center for Brain, Biology, and Behavior.

of a research project. I'm here to guide them as they make the project their own. It's rigorous and they know it's time intensive, but it teaches them to appreciate all aspects of the research process.

**Wonderful. Now as a quick side note, when it comes to mentoring the next generation of scientists, I understand that it's a family affair. Your daughter participated in a school science fair as well this year, right? Can you tell us about that?**

Last year, my daughter was in kindergarten, and we worked together on a school science fair project. I went about it the same way I would with any student, I asked her to think about things she was passionate about, which happens to be our three dogs. For her project, she developed a research question and investigated the difference in how loud our dogs' barks were in response to various stimuli, such as the doorbell. It was great fun, and she loved talking to the judges about her project at the science fair.

**You really can apply the same mentoring principles that you use in your work everywhere!**

Research, Mentoring, and Vestibular and Concussion Assessment: A Balancing Act

**I understand that your lab has moved, and you are now part of the Center for Brain, Biology, and Behavior, right? It sounds like you're fostering an incredible opportunity for new partnerships. Can you tell us about some of the collaborations that you'll be working on with other departments?**

I've been very fortunate. In November 2013, we moved over to the Center for Brain, Biology, and Behavior. We refer to it as CB3, which is a nice little acronym.

**There's always an acronym, isn't there?**

Of course! What's great, particularly for my balance and concussion work, is that my lab is housed in the football stadium. We have prime access to the population we're testing. When I first came to the University, I had to build a lab and find that population. Now that population is right here, which is ideal.

To give you a little background on the stadium, about four years ago, the idea of this research complex was born. They really wanted to have a facility exploring the mechanisms related to concussions, and another portion dedicated to athletic performance. Through this joint collaboration, we're able to integrate these two sides looking at the mechanisms involved in concussions, as well as to promote the long-term health and well-being of the student athletes. I work with researchers within these labs, and actually the director of CB3 is Dr. Dennis Molfese. He brings expertise on brain-recording techniques to study the cognitive functions and interventions for head injury.

Dr. Judy Burnfield is the director of the Nebraska Athletic Performance Lab and she is a physical therapist by background. She really has filled out the team for biomechanics and human performance.

**You definitely have a unique lab with a wide range of equipment and collaborations.**

Indeed. We have close ties with the Department of Athletics, interfacing weekly to monthly. Aside from the research, I can now provide a unique clinical opportunity for doctor of audiology students at UNL. I've worked closely with the head athletics physician, and we now provide clinical audiology services for the student athletes. Looking at the balance and vestibular components in athletes, our students are able to collect baseline information from the athletes and then re-evaluate them after head injury.

**The students must enjoy working with a different type of population, too.**

It's been really fun for the students and me. When I developed a five-year plan years ago, I never would have imagined where I am today. I'm thankful that this opportunity presented itself and that the students are able to be here with me. I'm really grateful. Hopefully, these types of innovative collaborations are a trend for audiology.

## THANK YOU!

In 2009, the AAA Foundation embarked on a partnership with the American Institute of Balance (AIB) Education Foundation, Inc., that has resulted in increased funding for student research on vestibular topics. The Foundation thanks Dr. Richard Gans, AIB CEO, for the grant funding that has supported these student research projects.

### 2010

**Jessica Pierce**  
East Carolina University, Morphological Correlates of Gravity Receptor Functional Aging

### 2011

**Gary Gaines II**  
AuD/PhD candidate, East Carolina University, Neural Generators of Mammalian Vestibular Responses to Linear Head Motion

### 2012

**Choongheon Lee**  
University of Nebraska-Lincoln, Development of a Bedside Gaze Stabilization Test

### 2013

**Robin Criter, AuD**  
University of Nebraska-Lincoln, Characterizing Effects of Anxiety on Postural Sway in Collegiate Athletes

### 2014

**Jessie Patterson**  
AuD/PhD student, University of Nebraska-Lincoln, Characterizing Effects of Fatigue Following Physical Exertion on Dynamic Visual Acuity Test in Collegiate Athletes



**That actually leads to my next question. What other trends do you see for the future of vestibular research?** With the dawn of the video-head impulse test, and knowing what we know about vestibular-evoked myogenic potentials (VEMPs), we really have a unique opportunity to incorporate objective measures to evaluate all of the sensory organs of the vestibular system. I really think it is going to broaden the populations we're able to evaluate, and the clinical research questions that we can answer. I think that the future is very bright for vestibular assessment.

**Do you have any advice for future researchers who are just starting their careers?**

This is my advice for future researchers: "Never, never, never give up." I try to encourage students to integrate research early and often, and never give up. Keep reaching for your dream, whatever that might be. Keep making goals and setting new ones.

**Supporting new investigators and student researchers is an important part of the AAA Foundation's work. Can you talk about what the Foundation's grant has meant to you and your students' research?**

I would say that it's been the foundation in launching my program. I'm forever grateful for the AAA Foundation, not only for funding the work that I did, but also facilitating my students' projects. Even students who have not received the award but have applied have had such a rewarding experience. I highly encourage any student or new investigator to seek out opportunities like this.

**Thank you, Julie, for sharing about the exciting research that you and your students are conducting. And thanks, too, for sharing about how the Foundation had a positive impact on your career. We hope that learning more about your work will inspire others to apply for one of the Foundation-funded grants.**

Thank you for giving me the opportunity to share with AT readers the exciting research my students and I are conducting. 🎧

*Joscelyn Martin, AuD, is a past member of the board of the American Academy of Audiology Foundation and an instructor of audiology at the Mayo Clinic in Rochester, Minnesota.*

For more information on the Academy's Research Grants in Hearing and Balance, visit [www.audiology.org](http://www.audiology.org) and search keyword "research."

**SUCCESS**

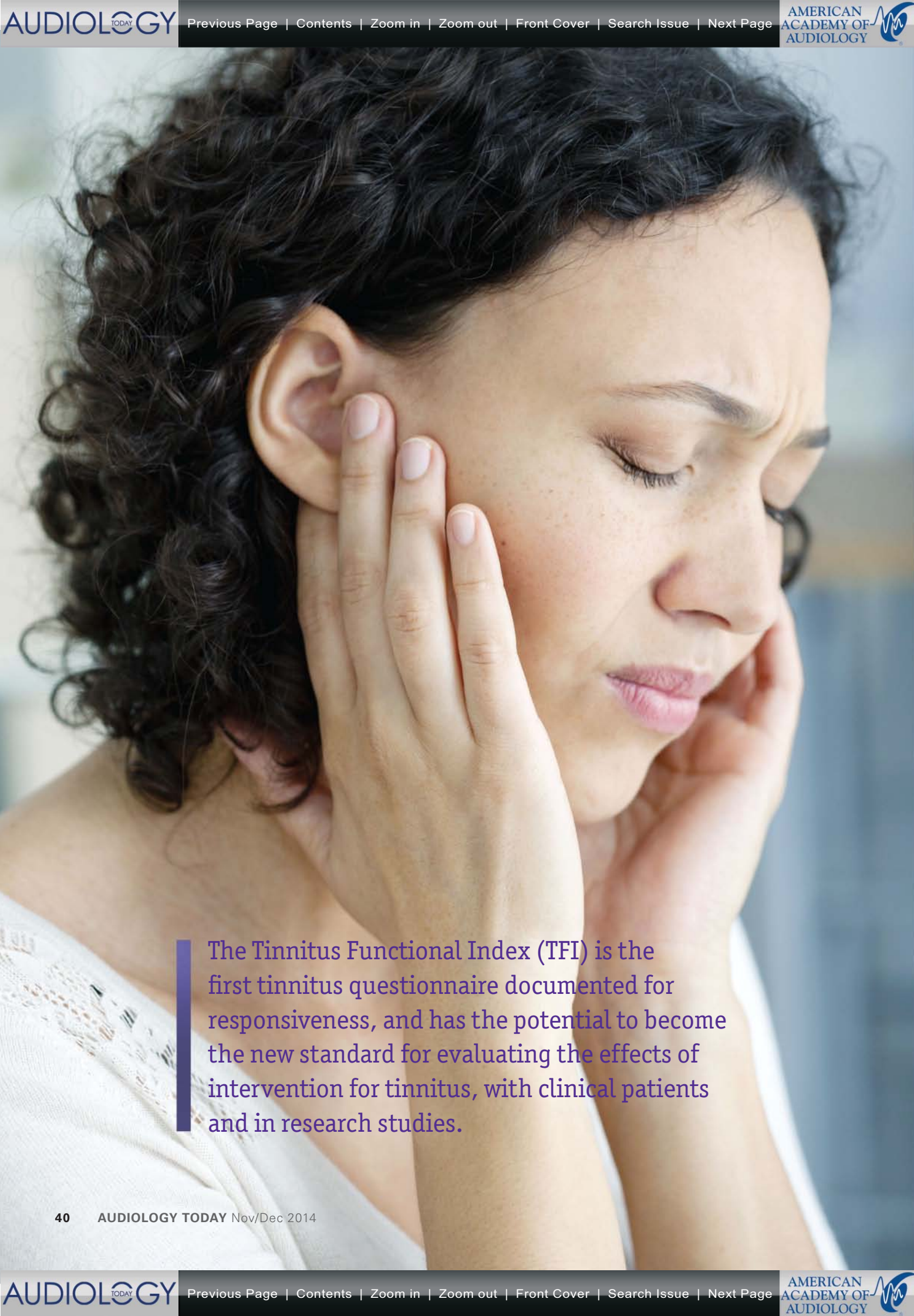
Your Year-Round  
**Audiology  
Employment**  
Resource

**FREE Job  
Posting Days  
for Employers  
Attending  
AudiologyNOW!®**

Starting December 17, with  
purchase of 30-day job posting.

Visit  
[www.HEARcareers.org](http://www.HEARcareers.org)  
for more information.

AMERICAN ACADEMY OF AUDIOLOGY



The Tinnitus Functional Index (TFI) is the first tinnitus questionnaire documented for responsiveness, and has the potential to become the new standard for evaluating the effects of intervention for tinnitus, with clinical patients and in research studies.

# TINNITUS FUNCTIONAL INDEX

## Development and Clinical Application

BY JAMES A. HENRY, BARBARA J. STEWART, HARVEY B. ABRAMS,  
CRAIG W. NEWMAN, SUSAN GRIEST, WILLIAM H. MARTIN,  
PAULA J. MYERS, AND GRANT SEARCHFIELD

### Introduction

**E**pidemiology studies estimate that 10 to 15 percent of the adult population experiences chronic tinnitus (Hoffman and Reed 2004). The condition is the most prevalent service-connected disability for United States military veterans, affecting more than 1.1 million veterans in fiscal year 2013. For many of these individuals, tinnitus is “clinically significant,” causing sleep disturbance, difficulty concentrating, and emotional reactions such as frustration, anxiety, and depression.

There is no cure or drug for tinnitus, and no proven means of permanently reducing its loudness. Patients with clinically significant tinnitus must learn to manage its negative effects, and numerous behavioral methods have been developed to facilitate these efforts. Research is ongoing to evaluate existing methods and to develop new behavioral methods designed to provide tinnitus relief. In addition, research is being conducted to evaluate “treatments” for tinnitus, including drugs, acoustic protocols, and various alternative methods, such as electrical and magnetic stimulation. These treatments are intended primarily to reduce the loudness, or magnitude, of tinnitus.

Effective interventions for tinnitus are urgently needed, but the evaluation of interventions has been hindered due to the lack of a standardized measure validated for both intake and outcome assessment. In 2003, the Tinnitus Research Consortium (TRC) issued a request for proposals to conduct a study to develop a new self-report questionnaire, the Tinnitus Functional Index (TFI). The TRC Advisory Board and Chairman Dr. James Snow stipulated numerous conditions for how the TFI should

be constructed, and that the TFI would have documented validity for scaling the negative impact of tinnitus for use in intake assessment and for measuring intervention-related changes (“responsiveness”) in the functional effects of tinnitus.

Dr. Mary Meikle from the Oregon Hearing Research Center at Oregon Health and Science University (OHSU) submitted an application to develop the TFI. Her application was approved, and the study was funded in 2004. Dr. James Henry from the VA National Center for Rehabilitative Auditory Research (NCRAR) was co-principal investigator. The study was conducted at numerous sites, including the Cleveland Clinic in Cleveland, Ohio; Bay Pines VA Medical Center in Bay Pines, Florida; James A. Haley Veterans’ Hospital in Tampa, Florida; Oregon Health and Science University (OHSU) Tinnitus Clinic in Portland, Oregon; and the Hearing and Speech Institute in Portland, Oregon. The primary collaborators were Drs. Harvey Abrams, Eric Frederick, William Martin, Rachel McArdle, Paula Myers, Craig Newman, Sharon Sandridge, Barbara Stewart, and Susan Griest, MPH.

The OHSU Tinnitus Clinic and Cleveland Clinic had patients with more severe reactions to tinnitus. To evaluate the ability of the TFI to scale tinnitus over the widest possible range, three sites were included that had patients with milder tinnitus conditions: Bay Pines VA Medical Center, James A. Haley Veterans’ Hospital, and the Hearing and Speech Institute. The trade-off was that most of the patients at these latter three sites were males.

At the time of funding, there was a substantial amount of literature concerning self-assessment questionnaires for scaling the negative impact of tinnitus. There were

## Tinnitus Functional Index: Development and Clinical Application

at least nine well-known English-language questionnaires. These questionnaires were statistically validated for intake assessment. None, however, was specifically designed and tested to maximize responsiveness to intervention-related change. Further, no single questionnaire covered all dimensions of tinnitus functional impact, and all differed with respect to format, scaling, and wording of items. Consequently, it was difficult to compare intervention effects obtained in different clinics and in clinical trials. This resulted in a lack of available systematic reviews, which are important for determining the clinical effectiveness of various treatment options (Kamalski et al, 2010).

A logical question might be “why weren’t any of these previous questionnaires validated for responsiveness?” The importance of responsiveness was just being recognized by measurement experts in the 1980s, thus, until the 1990s and later, it was an unfamiliar concept to tinnitus researchers developing these questionnaires. Currently, there is extensive research literature on responsiveness and measurement sensitivity for intervention studies.

Since its original publication, the TFI has garnered considerable interest. The index is already being used in numerous clinical trials evaluating methods of tinnitus intervention, and is being translated into at least 13 languages. The purpose of the present article is to meet the needs of the audiology community by providing a succinct summary describing development of the TFI, and to provide guidelines for its use in the clinic and in clinical research.

### Development of the TFI

There were five stages of TFI development: (1) construct TFI Prototype 1 (item selection and design); (2) test Prototype 1 (43 items); (3) derive TFI Prototype 2 (30 items); (4) test Prototype 2; and (5) derive final 25-item TFI. This work required four years of effort, and the primary TFI report appeared in *Ear and Hearing* in 2012 (Meikle et al, 2012). Details of this project are described in that publication. The following is a condensed description of the five stages of work.

#### Stage 1: Construct TFI Prototype 1

Design considerations for constructing Prototype 1 encompassed (1) responsiveness (include only those items that are demonstrated to have moderate to high sensitivity to treatment-related changes in tinnitus); (2) high construct validity for scaling tinnitus impact (each item should contribute to overall effectiveness of the questionnaire in detecting individual differences in tinnitus

impact); (3) comprehensive coverage (to strengthen content validity, items, when taken together, should address all domains of tinnitus distress that have been represented in the majority of preexisting tinnitus questionnaires); (4) brevity (limit questionnaire to 25 or fewer items if possible, but must be consistent with comprehensiveness requirement); (5) quantitative scaling (Likert-type scales preferred for all items; response options should provide high resolution without being conceptually complex); (6) ease of use for patient (wording of items should minimize reading difficulty and avoid ambiguity); (7) ease of use for examiner (scoring of items and of overall questionnaire should be simple, avoiding scale reversals and complex numerical calculations); and (8) avoidance of overly negative ideation (avoid suggesting overly negative thoughts in questionnaire items, such as suicidal thoughts, feeling victimized, feeling hopeless, feelings of despair, dread, suffering). Note that the last criterion was established by the Tinnitus Research Consortium.

The steps to constructing TFI Prototype 1 were to (1) consult with measurement experts; (2) select items; and (3) create Prototype 1. It was important not to “reinvent the wheel,” therefore the project started with existing questionnaires. The nine extant tinnitus questionnaires provided a valuable pool of questions (items). A total of 175 items were identified as important topics by the developers. There was, of course, considerable overlap among items. The selection of items followed published recommendations: use multiple judges of content validity and quantify judgments using formalized scaling procedures.

Seventeen tinnitus experts agreed to assist with the task of ensuring comprehensiveness. Eight previously had developed tinnitus questionnaires or outcome measures. The task of the Item Selection Panel was to review all 175 items from the nine tinnitus questionnaires and provide judgments about each item. The experts were asked to (1) select the dimension(s) represented by each item; and (2) rate the relevance of each item (low, moderate, high) for responsiveness or sensitivity to intervention-related change.

To rate each of the 175 items, panel experts used a Web site that provided an individual rating page for each item. The pages could be viewed in any order, and review and correction of previous responses was permitted.

For domain identification, the experts were asked to select one or more of 10 dimensions (recommended by the TRC) for which the item in question was considered relevant. If the item addressed a dimension that was not listed, that dimension could be added. For each item, “votes” for each dimension were added across reviewers.

## The index is already being used in numerous clinical trials evaluating methods of tinnitus intervention, and is being translated into at least 13 languages.

There were, therefore, a total of 17 possible votes for each question. Results provided 13 dimensions of tinnitus negative impact: (1) intrusiveness/unpleasantness; (2) persistence; (3) emotional distress; (4) social distress; (5) work interference; (6) leisure interference; (7) disturbance of sleep and rest; (8) disturbance of relaxation; (9) auditory perceptual problems attributed to tinnitus; (10) somatic or physical complaints attributed to tinnitus; (11) cognitive interference; (12) reduced sense of control; and (13) impaired quality of life.

Responses to the rating pages were analyzed, and 70 (of 175) items were judged by the panel to be responsive to treatment effects while addressing all major components or “dimensions” of tinnitus impact. These 70 items were reduced to 35 by eliminating questions that were redundant, referred exclusively to hearing loss, or referred to multiple subtopics within a domain. This item elimination process also used information on item effect sizes obtained during a clinical trial employing four of the nine preexisting questionnaires. A minimum of three to four items for each domain was recommended by the measurement experts. Eight items were added to meet this criterion, thus the 35 items were increased to 43 items.

The 43 initial items were formatted as questions, using a Likert-type response scale (0- to 10-point numeric rating scale). This type of scale provides good resolution for responsiveness, is familiar to many people, and is preferred over other response formats. The scale also used item-specific anchors at the two extremes. A zero to 10 response scale was recommended by the measurement experts, based on the rationale that a rapid increase in reliability is observed going from two to three response choices, three to four, etc. This increase in reliability “tends to level off at about seven, and after about 11 steps there is little gain in reliability from increasing the number of steps” (Nunnally, 1978).

Each block of three to six items used the lead-in phrase “Over the past week...” The choice of a recall interval is an important issue (U.S. Department of Health and Human Services, 2006). A brief recall interval can minimize recall errors. For respondents whose tinnitus varies over time, a brief recall interval helps to minimize response variability.

Overall Stage 1 results indicated that TFI Prototype 1 included 13 content domains, and 43 items were judged most relevant in addressing their domains and most likely to be responsive to intervention-related change. The prototype was tested with 10 patients, and no problems were reported.

### Stage 2: Test TFI Prototype 1

For Stage 2, the goal was to quantitatively evaluate Prototype 1 with “tinnitus patients” for responsiveness, underlying domains (internal structure), and ability to scale tinnitus impact. The best Prototype 1 items would be retained for Prototype 2.

For Stage 2, three classes of data were acquired: (1) Initial (to assess TFI comprehensiveness and validity for scaling tinnitus impact); (2) Retest (to assess TFI test-retest reliability); and (3) Follow-up (to assess TFI responsiveness). Subjects were enrolled from patient populations at the five study sites. For the initial data, questionnaires were mailed to patients prior to their clinic visit, including a brief tinnitus history questionnaire, TFI Prototype 1, the Tinnitus Handicap Inventory (THI), and the Beck Depression Inventory-Primary Care. Patients complaining of tinnitus were asked to complete the forms at home and bring them to the clinic visit. At the visit, they had the option of participating in the study. If they declined, their questionnaires were not used. To obtain retest data, a subset of subjects completed the TFI a second time at the clinic if they had completed the initial TFI at home within the specified retest interval of 7–30 days before their clinic visit.

The follow-up data were collected at three, six, and nine months. However, at nine months there were only 25 cases for Prototype 1 and 27 for Prototype 2, which was not enough for a valid analysis of responsiveness. Therefore, nine-month data were excluded from the analysis. Patients completed the follow-up TFI and also responded to questions about tinnitus interventions received and their perceived effectiveness.

Tinnitus interventions varied widely between study sites. “More intensive” intervention included counseling, ear-level “maskers” and combination instruments, tabletop sound generators, and medications for associated sleep disturbance, anxiety, and depression. “Less intensive” intervention included hearing aids, written tinnitus

## Because of its responsiveness to treatment-related change, as well as its other psychometric properties and comprehensive coverage of the domains of tinnitus impact, the TFI could be used as a standard instrument for both clinical and research settings.

information, and brief counseling. There also were many combinations of interventions.

All told, 327 subjects were enrolled in Stage 2 (82 percent male, 18 percent female). Of these, 326 completed the initial questionnaires, 65 completed three-month follow-up questionnaires, and 43 completed six-month questionnaires. (There were too few follow-ups at six months for adequate statistical evaluation—the return rate for Prototype 2 was improved by increasing subject payment from \$10 to \$20 per follow-up.)

Data analysis for Prototype 1 was conducted as follows. First, data were inspected to look for items with floor and ceiling effects, and items often left unanswered (i.e., ambiguous). Next, effect sizes, commonly computed using the Cohen's *d* statistic, were calculated for the TFI index score, subscales, and for individual items. (The Cohen's *d* "effect size" is a standardized, scale-free measure of the relative size of the effect of an intervention in standard deviation units.) Data collected for Prototype 1 were observational (not experimental), thus effect sizes could not be computed to compare treatment and control groups. Instead, effect sizes were computed for "criterion groups" that were expected to differ from one another to the extent that a treatment and control group would differ.

Criterion groups were derived from subjects' responses at three and six months to the "Global Perception of Change" item, which asked patients: "Since the last time you filled out our questionnaire, how would you describe your overall tinnitus status?" Response choices ranged from 1 (very much improved) to 5 (no change) to 9 (very much worse). Because of the small follow-up sample, response categories were collapsed to create three criterion groups: (1) Improved (response choices 1–4), (2) Unchanged (response choice 5), and (3) Worse (response choices 6–9). This allowed minimally adequate sample sizes for estimating effect sizes (*n*=11 for "Improved"; *n*=45 for "Unchanged"; and *n*=9 for "Worse"). For each of the criterion groups, TFI effect sizes were calculated using the following formula: Initial mean score minus follow-up mean score, divided by the pooled standard deviation for the two scores. Effect sizes (Cohen's *d*) were considered "small" (>0.2), "medium" (>0.5), and "large" (>0.8) (Cohen, 1988).

The effect size for the improved subjects was 0.79, compared to near-zero effect sizes for unchanged and worse. Effect sizes for each of the 43 items were as follows: 14 items had "large" effect sizes ( $\geq 0.80$ ); 20 items had "moderate" effect sizes (0.5–0.79), and seven had "small" effect sizes (<0.30). The two remaining items had negative effect sizes as the effects of tinnitus were worse at three months than at initial intake.

Statistical analysis of Prototype 1 provided the following results:

- Test-retest reliability:  $r=0.92$ ,  $p<.005$
- Internal consistency reliability: coefficient alpha=0.99
- Item-total correlations ranged 0.56–0.91 with 37 correlations  $\geq 0.70$
- Criterion-related validity: High correlation ( $r=0.91$ ) with THI; substantial correlation ( $r=0.73$ ) with Visual Analog Scale (severity of tinnitus) included in Tinnitus Status Questionnaire

An extensive factor analysis was conducted to identify dimensions of tinnitus impact, which included Principal Components Analysis and Principal Axis Factoring. Both models were explored with and without rotation (both orthogonal and oblique). The clearest factor solutions omitted subjects responding "Not a problem" to the question "How much of a problem is your tinnitus?"—leaving 284 subjects who described their tinnitus problem as Small, Moderate, Big, or Very Big. Eight factors accounted for 80 percent of the variance: (1) intrusiveness of tinnitus; (2) emotional effects; (3) interference with thinking; (4) interference with hearing; (5) sleep disturbance; (6) interference with relaxing; (7) reduced sense of control; and (8) reduced quality of life.

Overall Stage 2 results of TFI Prototype 1 were: (1) high test-retest and internal consistency reliability; (2) good criterion-related validity; (3) clear factorial structure in agreement with expert clinical judgment, accounting for more than 80 percent of variance among 43 items; (4)

high responsiveness to treatment-related changes in tinnitus impact (0.79 effect size for overall TFI score). It was concluded that Prototype 1 provided the necessary data to develop a shorter version of the TFI (i.e., Prototype 2).

**Stage 3: Derive TFI Prototype 2**

The number of domains was reduced from 13 to eight as a result of two criteria: (1) Factor analysis—identified groups of questions that correlated, each group measuring different aspects of one general domain; (2) Effect sizes—items were retained that contributed to the main factors identified but they also had to have good effect sizes to be retained. For TFI Prototype 2, 30 items were selected that together encompassed all eight tinnitus dimensions and had maximal effect sizes.

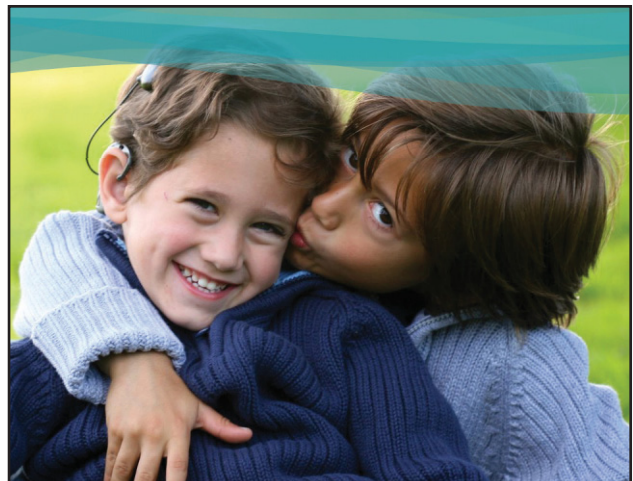
**Stage 4: Test TFI Prototype 2**

Stage 4 involved (1) a new sample of 347 patients at the same participating sites; (2) the same procedures; (3) similar use of factor analytic techniques to check whether the eight-factor structure was confirmed; and (4) similar calculation of effect sizes to evaluate sensitivity of items and subscales (factors). The goal was to use a new sample to evaluate the 30-item Prototype 2 in terms of responsiveness, key domains (internal structure), and scaling of tinnitus impact. The best Prototype 2 items would be retained for the final TFI.

In general, Stage 4 methods and data analysis were the same as for Stage 2. Differences for Stage 4 included: (1) the Hearing and Speech Institute (Portland) discontinued participation; (2) retest data were collected only at OHSU; (3) payment to retest and follow-up subjects was raised to \$20 to increase responses; and (4) subjects with more problematic tinnitus were recruited (they were more compliant with the protocol).

For Stage 4, 347 subjects were enrolled (82 percent male; average age=60 years). Retest data were provided by 37 subjects. Follow-up data were provided by 155 subjects at three months and 85 subjects at six months. Tinnitus severity levels were higher for the Prototype 2 sample than for the Prototype 1 sample.

Despite reduction of the TFI from 43 to 30 items, Prototype 2 performed well by revealing consistent factor structure, high internal consistency reliability, good test-retest reliability, and strong construct validity for scaling tinnitus impact. Moderately high responsiveness was observed at three months, with high responsiveness at six months. We were therefore encouraged to proceed with reducing the TFI length while retaining at least three items per subscale.



# Advance Your Career

The ABA is offering two certification exams on March 29, 2015, in San Antonio, TX.

## Pediatric Audiology Specialty Certification Exam

## Cochlear Implant Specialty Certification Exam

- Demonstrate to colleagues, patients, and employers that you have a high level of knowledge and expertise.
- Add distinction to your career accomplishments.

**Applications due January 29, 2015.**

[www.BoardofAudiology.org](http://www.BoardofAudiology.org)



### Stage 5: Derive Final 25-item TFI

For the final version of the TFI, the best-functioning items were selected, resulting in the removal of five items: (1) discomfort caused by tinnitus; (2) interference of tinnitus with participation in social events; (3) interference of tinnitus with leisure activities; (4) fatigue caused by tinnitus; and (5) amount of time that overall quality of life was reduced by tinnitus. The final TFI included eight subscales: Intrusive, Sense of Control, Cognitive, Sleep, Auditory, Relaxation, Quality of Life, and Emotional. Four items were included in the Quality of Life subscale, and there were three items each for the remaining seven subscales. All analyses used for evaluating Prototype 2 were repeated for the 25-item final TFI, using data obtained with the Prototype 2 sample.

### Use of TFI in the Clinic and Clinical Research

The following is a general guide that can facilitate the interpretation of TFI scores. These beginning estimates were derived from the data collected during development of the TFI. For evaluating tinnitus impact at intake, TFI mean scores can be stratified into five levels:

- Not a problem: M=14 (range: zero–17)
- Small problem: M=21 (range: 18–31)
- Moderate problem: M=42 (range: 32–53)
- Big problem: M=65 (range: 54–72)
- Very big problem: M=78 (range: 73–100)

As another way to interpret TFI scores, preliminary data support the following:

- <25=relatively mild tinnitus (little or no need for intervention)
- 25–50=significant problems with tinnitus (possible need for intervention)
- >50=tinnitus severe enough to qualify for more aggressive intervention

The topic of minimum clinically important change in questionnaire index scores has generated substantial debate among measurement experts. A major issue is the considerable individual differences among patients in regard to what they consider a “meaningful change.”

## REMEMBERING MARY MEIKLE

By James Henry

Mary B. Meikle, PhD, (pronounced *meekle*) lost her battle with amyotrophic lateral sclerosis (ALS, also known as Lou Gehrig’s disease) on February 5, 2011. In 1969, Mary began working for the Kresge Hearing Research Laboratory (renamed the Oregon Hearing Research Center in 1985) at Oregon Health and Science University (OHSU), and made important contributions to the field of tinnitus research.

Mary left behind two grown children, Rick Meikle and Susan Mandell, who were by her side during her final days. Her husband of 35 years, Dr. Jack Vernon, passed away in November 2010. Dr. Vernon was the founder and director of the Oregon Hearing Research Center until he retired in 1995. Both Jack and Mary were well known for their tinnitus research and for their Tinnitus Clinic at OHSU.

Although Mary retired from OHSU in 2000, she remained very active as a researcher. Most notably, she was funded in 2004 with a grant from the Tinnitus Research Consortium (supported by private philanthropy) to develop a new tinnitus self-report questionnaire. This project was her primary research focus through the final days of her life. The project involved 20 investigators around the country who contributed in various ways. Data were collected at five clinical sites from almost 700 patients with tinnitus. This work resulted in the Tinnitus Functional Index (TFI) with documented validity for measuring treatment-related changes in tinnitus (responsiveness) and scaling the severity and negative impact of tinnitus for use in intake assessment. The TFI is the first tinnitus questionnaire that is documented for responsiveness, and has the potential to become the new standard for evaluating effects of tinnitus, with clinical patients and in research studies.

Mary’s journey conducting her TFI research took some noteworthy twists and turns. Anyone who knew Mary knows how meticulous she was in attending to every detail. When she wrote the TFI



Tinnitus Functional Index: Development and Clinical Application

proposal, she wasn't quite satisfied and missed the deadline to deliver the proposal to the FedEx office. For anyone else, that would have been the end of the story, but Mary pressed on—she decided to deliver it herself. She purchased a plane ticket and flew all night, arriving in Maryland the next day. Since she had worked on the proposal on the plane, and needed to print the final documents, she went to a Kinko's to print and assemble the proposal. Then—in a blinding snowstorm—she drove across the Chesapeake Bay Bridge to the home of Dr. James Snow, the Convener of the Tinnitus Research Consortium, where she knocked on his door and handed the proposal to him in person—and on time!

The twists and turns of the TFI project continued. Mary was funded in 2004 for three years to conduct the project (a one-year no-cost extension was granted to complete the work). The Consortium hoped that the project would be published in a prestigious medical journal. Mary wrote the manuscript and submitted it to *JAMA*, which rejected it because the focused topic was considered too specialized for the journal's readers. The manuscript was then sent to the *New England Journal of Medicine*, where it was rejected for a similar reason. A decision was then made to submit the report to *Ear and Hearing*. Mary completed the manuscript and submitted it to *Ear and Hearing* on February 4, 2010. The article was reviewed by four experts, and returned to Mary with 75 comments that all required a response. Needless to say, this was a daunting task, especially since Mary was exhibiting symptoms of ALS, which was formally diagnosed later in April.

Mary worked on the TFI manuscript to the point where her deteriorating health required her colleagues (including myself) to assume primary responsibility. Multiple extensions were granted by *Ear and Hearing*, and the final deadline was February 4, 2011—exactly one year after the initial submission. We completed the manuscript, and Mary contributed up until a few days before the deadline. During the last weeks, Mary's daughter, Susan, was by her side, reading our messages to her, and relaying messages back to us.

On February 4, 2011, we began uploading the revised documents on the *Ear and Hearing* Web site. This process went on until 1:00 the following morning—February 5. I immediately sent an e-mail message informing Mary that the job was finished, which was



Mary B. Meikle, PhD, and Jack A. Vernon, PhD, at their Portland, Oregon, houseboat.

later read to Mary by Susan. At 3:15 in the afternoon, Mary breathed her last breath.

This story highlights several of Mary's unique characteristics—her extreme attention to detail, her tireless dedication to completing projects, her commitment to conducting research to help people with tinnitus, and an attitude that remained consistently positive to the end. At no point did Mary complain about her failing health.

The TFI article received the 2012 *Ear and Hearing* Editor's Award for Outstanding Research in Audiology and Hearing Science. I traveled to Scottsdale, Arizona, to receive the award along with co-author Dr. Harvey Abrams at the Annual Convention of the American Auditory Society.


Mary's contributions will continue to affect clinicians and researchers in the field of tinnitus, as well as the many patients who suffer from tinnitus. She is sorely missed.

Tinnitus Functional Index: Development and Clinical Application

Also, statistical demonstrations of differences among treatment groups are not necessarily indicative of changes that patients consider important or meaningful.

What change in the TFI index score might our subjects consider meaningful? Using the criterion groups approach (described above), mean change scores exhibit an orderly progression from Much or Moderately Improved through Unchanged to Moderately or Much Worse. We interpret these data as suggesting a reduction in TFI scores of ~13 points should be meaningful to patients (there are considerable individual differences among patients in regard to what they consider a “meaningful change”).

The final 25-item TFI has been formally evaluated recently in the United Kingdom (Fackrell et al, 2013) and in New Zealand (Chandra, 2013). These studies suggest high convergent and discriminant validity (Chandra, 2013; Fackrell et al, 2013); and good test-retest reliability with the same factor structure (Chandra, 2013). Although translations of the TFI have yet to be formally evaluated in non-English speaking countries, the results from the United Kingdom and New Zealand suggest that the TFI can be successfully employed in different countries. Efforts are underway to translate the TFI into at least 13 languages.

Because of its responsiveness to treatment-related change, as well as its other psychometric properties and comprehensive coverage of the domains of tinnitus impact, the TFI could be used as a standard instrument for both clinical and research settings. The final 25-item TFI is available online, together with scoring instructions, all of which can be downloaded and printed (permission to use the copyrighted TFI is required from OHSU—there is no cost in most cases) at [www.formstack.com/forms/?1265642-Ir7f92V4rb](http://www.formstack.com/forms/?1265642-Ir7f92V4rb). 

James Henry, PhD, is a research career scientist at the VA National Center for Rehabilitative Auditory Research at the Portland VA Medical Center, and research professor, Department of Otolaryngology–Head and Neck Surgery at Oregon Health and Science University (OHSU). Barbara Stewart, PhD, is a professor emerita at the Oregon Health and Science University. Craig W. Newman, PhD, is section head of audiology in the Head and Neck Institute at the Cleveland Clinic and professor in the Department of Surgery at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University in Cleveland, Ohio. Susan Griest, MPH, is a research investigator for the Oregon Hearing Research Center at Oregon Health and Science University and for the Veterans Administration, National Center for Rehabilitative Auditory Research in Portland, Oregon. William Martin, PhD, is professor at the National University of

Singapore, and maintains an appointment at Oregon Health and Science University as professor of otolaryngology–head and neck surgery, and public health and preventive medicine. Paula Myers is chief of the Audiology Section at the James A. Haley VA Hospital, with expertise in adult development and learning, and blast injury and auditory dysfunction; her research focuses on mild TBI and auditory rehabilitation, and tinnitus self-management. Grant Searchfield, PhD, is a senior lecturer at the University of Auckland, New Zealand, and director of the university’s Hearing and Tinnitus clinic.

References

Chandra N. (2013) New Zealand validation of the Tinnitus Functional Index, Unpublished Dissertation. Bachelor of Health Sciences (Hons), The University of Auckland.

Cohen J. (1988) *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Fackrell K, Hall DA, Hoare D, Barry J. (2013) UK validation of the Tinnitus Functional Index (TFI): convergent and discriminant validity. 7th international Tinnitus Research Initiative Conference. Valencia, Spain.

Hoffman, HJ and Reed, GW (2004) Epidemiology of tinnitus. In: *Tinnitus: Theory and Management*. Lewiston, NY: BC Decker Inc., 16–41.

Kamalski DM, Hoekstra CE, van Zanten BG, Grolman W, Rovers MM. (2010) Measuring disease-specific health-related quality of life to evaluate treatment outcomes in tinnitus patients: a systematic review. *Otolaryngol Head Neck Surg* 143(2):181–185.

Meikle MB, Henry JA, Griest SE, Stewart BJ, Abrams HB, McArdle R, Myers PJ, Newman CW, Sandridge S, Turk DC, Folmer RL, Frederick EJ, House JW, Jacobson GP, Kinney SE, Martin WH, Nagler SM, Reich GE, Searchfield G, Sweetow R, Vernon JA. (2012) The Tinnitus Functional Index: Development of a New Clinical Measure for Chronic, Intrusive Tinnitus. *Ear Hear* 33(2):153–176.

Nunnally JC (1978) Validity. In: *Psychometric Theory*. New York: McGraw-Hill, 86–113.

U.S. Department of Health and Human Services (2006) Guidance for Industry. *Patient-Reported Outcome Measures: Use in Medical Product Development to Support Labeling Claims*. Rockville, MD: Food and Drug Administration.

# MEMBERSHIP RENEWALS NOW OPEN

**Renew Online** by  
**December 31, 2014,**  
and **Receive a**

- Chance to win a free AudiologyNOW!® 2015 registration
- Discount on an eAudiology Web seminar package
- Discount on a learning lab at AudiologyNOW! 2015

Visit [www.audiology.org](http://www.audiology.org) to renew your membership today!

AMERICAN ACADEMY OF AUDIOLOGY 

CSI: AUDIOLOGY

WELCOME BACK to an ongoing series that challenges the audiologist to identify a diagnosis for a case study based on a listing and explanation of the non-audiology and audiology test battery. It is important to recognize that a hearing loss or a vestibular issue may be a manifestation of a systemic illness. Being part of the diagnostic and treatment “team” is a crucial role of the audiologist. Securing the definitive diagnosis is rewarding for the audiologist, and enhances patient hearing and balance health care and, often, quality of life.

—Hillary Snapp, Investigator-in-Chief

**CSI Reference Guide:** Visit [www.audiology.org](http://www.audiology.org) and search keywords “CSI Reference Guide.”



# Mild Hearing Loss? Says Who?

By Katherine Kerns and Gail M. Whitelaw

## Case History

A nine-year-old male was referred to the clinic for an audiologic re-evaluation and auditory processing evaluation. Previous audiologic evaluation performed at an outside facility suggested a mild hearing loss at 8000 Hz in the right ear and at 250 Hz in the left ear. The nature of the hearing loss was unclear, as bone conduction was not performed at that time (FIGURE 1).

Otologic history was positive for longstanding fluctuating conductive hearing loss, secondary to otitis media with pressure equalization tube placement. The patient was born full term, but with low APGAR scores and oxygen deprivation resulting in admission to a neonatal intensive care unit. The patient presented with hypernasality, dysmorphic facial features, and persistent developmental delays in speech and language. Submucous cleft palate was identified and repaired at age six, resulting in improvements in speech production. An interdisciplinary assessment indicated cognitive abilities in the low-average-to-average range of performance. Subsequent genetic testing

revealed chromosome 6 deletion syndrome in both the patient and his father.

The parents reported primary concerns of communication issues and reduced academic performance. Specifically, the patient struggled to comprehend information presented to him verbally, as the complexity of the information increased or when language was inferential. In contrast to the patient’s previous evaluation, a multifactorial evaluation performed by the school district revealed average intellectual abilities, with strengths noted in the area of working memory. Reception and expressive language abilities were determined to be in the average-to-high-average range; however, language-processing skills and literacy skills were not assessed. Performance on achievement testing was below grade level in reading comprehension, reading for main idea, and mechanics of writing. All other achievement testing was consistent with grade-level performance.

The patient did not qualify through the school district for an Individualized Education Plan (IEP) under the Individuals with

Disabilities in Education Act (IDEA) or for a plan under Section 504 of the Rehabilitation Act of 1973. Despite having language-learning and reading issues, the student was judged by his teachers to be performing at his potential and his hearing loss was considered insignificant. His parents provided educational support at home, and his educational needs were considered to be addressed by the school through a Response to Intervention (RtI) approach.

The patient's parents sought out a third assessment privately, which resulted in a diagnosis of mild dyslexia with significant deficits in word finding, literacy, and written language. Deficits in visual motor integration and auditory processing also were suggested.

### Initial Audiologic Evaluation and Auditory-Processing Assessment

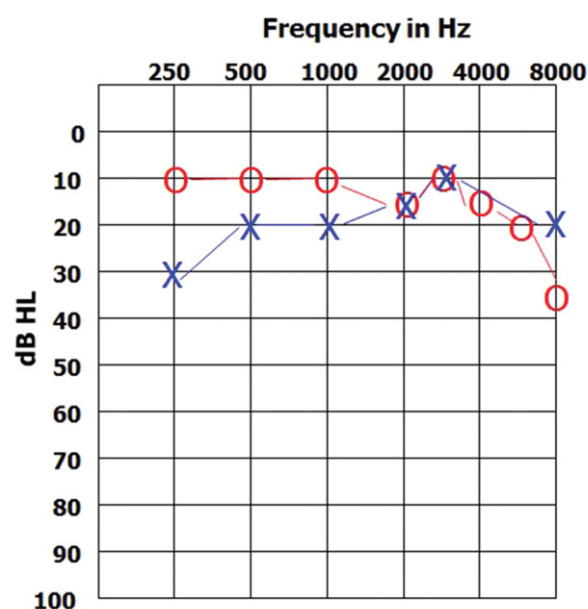
Prior to the evaluation, the teacher and the parents completed the Children's Auditory Processing Performance Scale (CHAPS) (Smoski, Brunt, and Tannahill, 1998), a questionnaire designed to help compare a patient's listening behavior to those of peers across a range of environments and situations. The CHAPS responses placed the patient in the at-risk range for an auditory processing disorder. Audiometric evaluation revealed mild conductive components for the right and left ears, respectively (FIGURE 2).

Considering the reported history, additional testing was performed to assist in the assessment of the patient's complaints that reflected performance in the classroom.

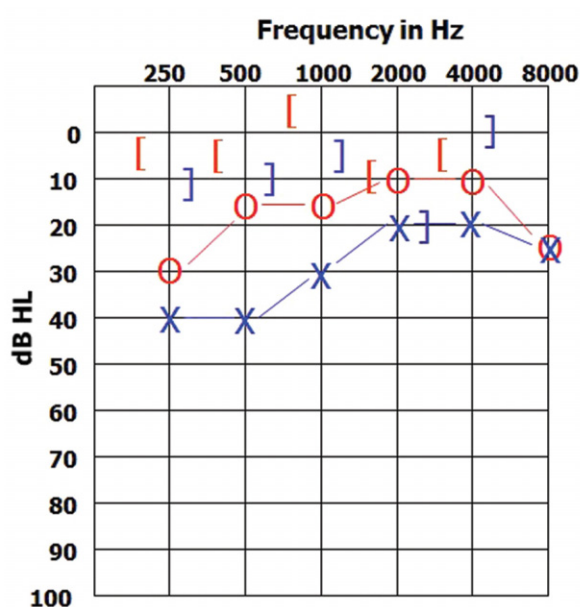
The Bamford-Kowel-Bench Speech in Noise (BKB-SIN) test was used to assess speech-in-noise performance, using the signal-to-noise ratio loss as a measure of real-world listening performance that could not be captured by the audiogram. Results revealed a moderate signal-to-noise hearing loss for a child of his age.

The SCAN-3 for Children: Tests for Auditory Processing Disorders was administered to assess auditory processing skills. The results revealed that the patient demonstrated age-appropriate temporal processing, binaural integration, and binaural separation skills. However, his auditory closure skills and auditory figure-ground skills were in the disordered range for a child of his age.

Auditory closure skills address the ability of the auditory system to fill in missing information, when



**FIGURE 1.** Results from outside audiometric evaluation performed in 2012 suggesting mild to moderate hearing loss bilaterally.



**FIGURE 2.** Pure-tone audiometric results demonstrating mild conductive hearing loss in both ears, left poorer than right.

## CSI: AUDIOLOGY

extrinsic filtering reduces redundancy. Auditory figure-ground skills address the monaural skill of separating a primary signal (speech) from background noise.

Based on the patient's SCAN-3 composite score, it was determined that he demonstrated atypical auditory processing skills, which may be considered consistent with specific-type auditory processing disorder. Additional testing had been planned but, due to the patient's slow speed of response and fatigue from completing the SCAN-3, testing was discontinued.

### Recommendations

The CHAPS results placed the patient in the at-risk category for overall listening, with specific concerns in quiet and in noise situations, auditory memory/sequencing, and auditory attention span.

When asked about the testing, the patient consistently reported that he believed that his hearing was poorer in his left ear than his right ear. The patient reported frustration that his hearing loss was affecting him in every listening environment, including school, home, and when communicating with his coach on the soccer field.

Based on these results, the patient was referred to his otolaryngologist for further medical management of his conductive hearing loss. In addition, an option for a trial of a frequency modulation (FM) system at school was recommended, along with possible consideration for a mild-gain hearing aid. It was explained that use of a hearing aid with such a mild hearing loss might be viewed as controversial or unconventional; however, the recommendation would likely address the communication issues raised by the patient. Both the FM and hearing aid would be options to improve

signal-to-noise ratio issues identified in testing (e.g. BKB-SIN results and asymmetry in auditory closure and auditory figure-ground testing), with a hearing aid providing more flexibility in a wider range of environments outside of school. While open to all options, the family chose to pursue a trial use of an FM system through the school district.

### FM System Trial

Prior to implementing the trial, the teacher completed the Listening Inventory For Education-Revised (L.I.F.E.-R.) Teacher Appraisal of Learning Difficulty (Anderson, Smaldino, and Spangler, 2011). The teacher's responses designated the patient as often or regularly having listening challenges. These results corroborated with the Listening Inventory For Education-Revised (LIFE-R) Student Appraisal of Listening Difficulty: Before-LIFE Questions for Students (Anderson et al, 2011). Both the teacher and student reported positive change in using the FM system. Additionally, post-assessment using the LIFE questionnaire indicated teacher response of rare listening challenges and patient response that listening situations were mostly easy while using the FM system.

Ideally, the FM system at school would have been a strong solution based on feedback from the patient, his teacher, and his parents. However, the FM system required repeated repairs and, each time the system was returned for repair, it appeared the educators became a bit less vested in using it. Monthly checks by the educational audiology consultant indicated that the student was often without his FM system. When questioned, he indicated that he still wanted to use it, but it often was not working or not charged.

The classroom teacher shared her frustrations that the system was not consistently available or functioning the way it should. This led her to revise her view that the student needed the FM, noting that she did not see much difference between him having the system or not having the system.

Without an IEP and with no reported effect on academic performance, the district determined there was no need for FM system use in the classroom.

The importance of ongoing monitoring of children who use hearing technology at school is critical. The initial impression was that the FM was appropriately fit and functioning. However, ongoing educational audiology follow-up identified that the treatment was not successful and provided the opportunity to move on to a more appropriate treatment for this patient.

The patient chose to pursue the option of a hearing aid for his ear with poorer hearing so that he could hear better in school and in other environments, such as when he was playing soccer.

### Hearing Aid Trial

The patient was fitted with an entry-level receiver-in-the-ear (RITE) hearing aid on his left ear for a 30-day period and reported similar benefits on the LIFE-R as observed with the FM system. His classroom teacher noted improved performance with the hearing aid, and his mother reported improved ability to listen and focus at home.

Following a successful trial, he was fitted with an Oticon Sensai RITE hearing aid for the left ear. The patient reported that he felt like a normal kid when he was wearing the hearing aid, as it helped him to "make his ears equal." He used the hearing aid all day and reported he

liked that it worked consistently and he was in control of it. A trial use of an FM audioshoe may be initiated for the upcoming school year.

### Discussion

Our patient had a number of subtle, yet significant, issues that appeared to be factors in his success in school and growth as a student. Let's review:

- Late diagnosis of mild dyslexia
- Long history of speech/language delays
- Multifactorial assessment performed through school failed to identify some key issues that could have helped the patient build learning and communication skills
- Documented hearing loss more often than normal hearing, most notably for the left ear
- Complaints of inability to hear in noisy and reverberant environments, which was supported by speech-in-noise testing, LIFE questionnaire results, and results of the SCAN-3

Is a hearing loss always a hearing loss? Are some hearing losses too minimal to address? In this case, it is likely that the patient's hearing loss, albeit mild and unilateral, contributed to deficits in the processing of auditory information, which would not necessarily be considered an auditory processing disorder but, rather, would reflect asymmetry in peripheral hearing.

The misconception that a mild or unilateral hearing loss is unlikely to result in any significant impairment far too often results in lack of appropriate intervention. The effect is reduced academic, social, and

## The patient reported frustration that his hearing loss was affecting him in every listening environment, including school, home, and when communicating with his coach on the soccer field.

behavioral outcomes, with more than 30 percent of children with mild or unilateral hearing loss failing at least one grade (Bess, Dodd-Murphy, and Parker, 1998; Bess and Tharpe, 1986).

Recent research on children with minimal hearing loss, including those with unilateral losses, reported that the effects are highly variable, but key areas such as attentiveness must be monitored to ensure success in the classroom (Porter et al, 2013; Kuppler et al, 2013).

Porter et al (2013) suggest that future research should focus on the child's self-perceived listening difficulties and achievement. Our patient's self-reported inability to hear and comprehend information in the classroom went unaddressed. While the patient had several other factors that likely contributed to his academic performance, addressing the hearing loss could certainly improve his overall function and well-being in school.

This case demonstrates the importance of listening to a patient's concerns and not being led astray by misleading factors such as a patient's age or minimal degree of hearing loss. Clearly, it is important

to take into account the child's self-perceived effect of a hearing loss. In addition, the use of the term "mild" is misrepresentative of the potential effect the hearing loss can have on academic performance.

Bess and Tharpe (1986) suggested that unilateral hearing loss of any degree could negatively affect the growth and development of a child. The recent meta-analysis on unilateral hearing loss and academic performance by Kuppler, Lewis, and Evans (2013) reported that there is evidence to support that complex cognitive development requires optimal hearing, including restoring bilateral hearing if possible. They suggested that it is time to change the dogma for a minimalist approach to the management of patients with unilateral hearing loss, and that the approach should be modified by current evidence.

This case highlights how even a mild hearing loss can negatively affect a patient. In addition, intervention can result in significant reductions in handicap and increased benefit. The patient indicated that, after getting fitted with his hearing aid, he finally felt normal. Increasing

## CSI: AUDIOLOGY

audibility for this child resulted in increased confidence and motivation, leading to positive changes in social and behavioral outcomes as well.

### Closing Arguments


The risk associated with fitting a hearing aid on the mild-hearing-loss ear was minimal and the reward was great.

It is important to remember that an appropriate fitting protocol includes real ear measures, no matter how minimal the degree of hearing loss.

A trial with a hearing aid and FM is a strong first step for children with a mild hearing loss who are reporting difficulties in school, particularly if they have an associated diagnosis such as a learning disability or dyslexia. A slight improvement in the signal-to-noise ratio (SNR) in listening environments throughout their day might be just what they need to communicate effectively with the people in their world.

Both options offered to this patient addressed improving audibility for him. The key is finding the right option for each patient. Kuk (2011) noted that the noise reduction and directional microphone options provided in hearing aids are proven techniques for enhancing speech understanding in noise. In this case, the audiologist was able to improve the signal-to-noise ratio while optimizing binaural hearing for this patient.

In short, monitoring the child's progress long-term and being flexible with the treatment approach allowed for a successful outcome. Now we know that mild isn't always so mild after all.

Another "case closed" until the next issue of AT! 

*Katherine Kerns is a third-year AuD student at The Ohio State University, with specific interests in electrophysiologic testing, pediatrics, tinnitus, hyperacusis, and humanitarian audiology.*

*Gail M. Whitelaw, PhD, is an audiologist and clinic director in the Department of Speech and Hearing Science at The Ohio State University, and audiology faculty member on the Leadership Education in Neurodevelopmental and Other Disorders (LEND) grant at the Nisonger Center at Ohio State.*

### References

Anderson KL, Smaldino JJ, Spangler C. (2011) Listening Inventory For Education-Revised (LIFE-R) Student Appraisal of Listening Difficulty: Before-LIFE Questions for Students. <http://successforkidswithhearingloss.com/life-r>. Accessed September 29, 2014.

Bess FH and Tharpe AM. (1986) An introduction to unilateral sensorineural hearing loss in children. *Ear Hear* 7(1):3-13.

Bess FH, Dodd-Murphy J, Parker RA. (1998) Children with minimal sensorineural hearing loss: Prevalence educational performance, and functional status. *Ear Hear*, 19(5):339-354.

Kuk F. (2011) Hearing aids for children with auditory processing disorders? *Semin Hear* 32(2):189-195.

Kuppler K, Lewis M, Evans AK. (2013) A review of unilateral hearing loss and academic performance: Is it time to reassess traditional dogmata? *Int J Pediatr Otorhinolaryngol* 77(3):617-622.

McKay S, Gravel JS, Tharpe AM. (2008) Amplification considerations for children with minimal or mild bilateral hearing loss and unilateral hearing loss. *Trends Amplif* 12(1):43-54.

Porter H, Sladen DP, Ampah SB, Rothpletz A, Bess, FH. (2013) Developmental outcomes in early school-age children with minimal hearing loss. *Am J Audiol* 22(12):263-270.

Rare Chromosome Disorder Support Group (2011) 6q deletions from 6q 26 and 6 q 27. [www.rarechromo.org/information/Chromosome6qdeletionsfrom6q0FTNW.pdf](http://www.rarechromo.org/information/Chromosome6qdeletionsfrom6q0FTNW.pdf). Accessed September 29, 2014.

Smith SD, Kelly PM, Askew J, Hoover DM, Deffenbacher KE, Gayan J, Bower AM, Olson RK. (2001) Reading disability and chromosome 6p21.3: Evaluation of MOG as a candidate gene. *J Learn Disabil* 36(6):512-519.

Smoski WJ, Brunt MA, Tannahill JC. (1998) Children's Auditory Performance Scale. Tampa, FL: Educational Audiology Association.

Tharpe AM. (2008) Unilateral and mild bilateral hearing loss in children: past and current perspectives. *Trends Amplif* 12(1):7-15.



# BE AN AUDIOLOGY ADVOCATE



## Challenge yourself to do at least **ONE** of these today.

1. Write to your congressional representatives in support of audiology legislation. Use the Legislative Action Center at <http://capwiz.com/audiology>. This takes less than two minutes!
2. Put letters at your front desk or waiting area for your patients to sign. Patients make great advocates.
3. Give to the Academy's Political Action Committee (PAC).
4. Get involved in both your state and national audiology association.
5. Visit your congressional representatives when they are in their home offices—often a personal visit is more memorable than a letter.

Visit [www.audiology.org](http://www.audiology.org) to get involved.



RESEARCH TO REALITY



# Statistics 101

By Jeffrey Weihing

An understanding of some of the more commonly used statistics is essential for interpreting peer-reviewed research and determining when to apply new findings to clinical practice. Taking a “learning-by-example” approach, this article provides an introduction to several of the more fundamental statistics encountered in the literature.

Each of the statistics defined here is considered within the context of a hypothetical data set (FIGURE 1). This data set includes six participants who were recruited for a speech-in-noise study. Participants ranged in age from seven through 21 years, with an equal number of males and females recruited. During the study, participants were asked to complete a test in which they repeated words heard in the presence of background noise and their percent-correct performance was scored. Each individual face in FIGURE 1 represents a participant, with age plotted on the X-axis, test score on the Y-axis, and gender represented by the circle color (i.e., male participants are blue; female participants are pink).

RESEARCH TO REALITY

**Statistics**

Statistics are performed on data obtained from a sample. A *sample* is composed of participants selected from a population of interest. After statistics have been computed, the resulting statistic value is reported along with a p-value. The *statistic value* reflects the outcome of the mathematics performed on the data. The *p-value* is essentially the probability that your statistic represents a *null finding*. Depending on the research question being addressed, having a null finding might mean that there is *no relationship* between two variables or that two groups do *not differ* on some measure. P-values of .05 or less are generally considered statistically significant, indicating that there is a very small (five percent or less) chance that the statistic value represents a null finding. Statistical significance is affected by many factors, including variability in performance in your data set and your sample size.

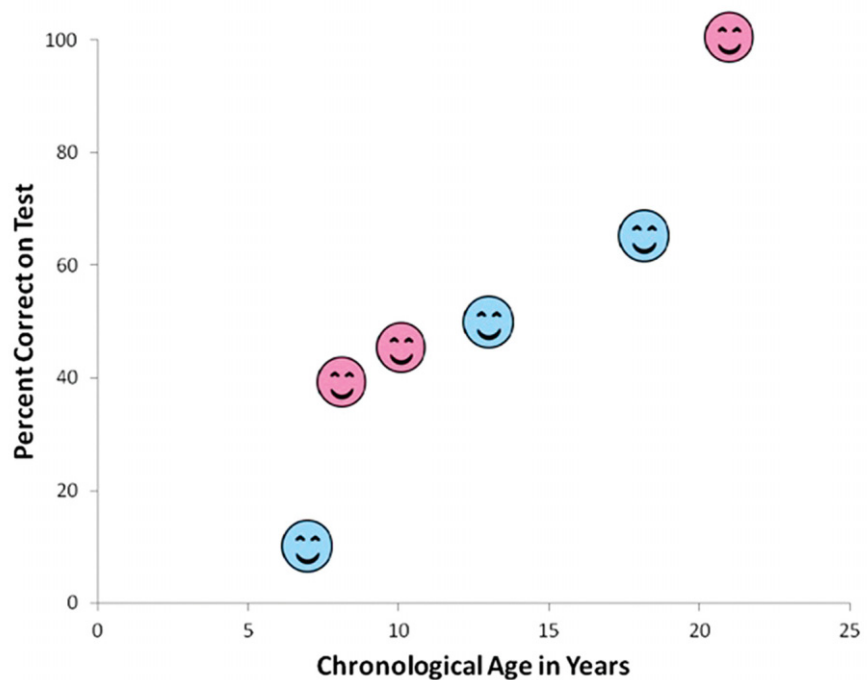
**Correlation**

A *correlation* describes the strength of linear association between two continuous variables. A *continuous variable* is one in which the variable's values reflect some magnitude on a continuum. Both chronological age and test performance could be considered continuous variables, as these variables encompass a continuous range from lower magnitude (e.g., low test performance or younger age) to higher magnitude (e.g., high test performance or older age). A *positive linear association* occurs when values of one variable tend to increase with increasing values of another variable. A *negative linear association* occurs when values of one variable tend to decrease with increasing values of another variable. Correlation coefficients are reported as *Pearson r*, which can range from -1 to +1. A

value of +1 indicates a perfect positive linear association, while a value of -1 indicates a perfect negative linear association. Values closer to zero indicate no association between the variables. In our example (FIGURE 1), it is clear that as age increases, so does test performance. We see that the participants in this figure form a line going from bottom-left to top-right, since younger participants have lower scores (bottom-left) and older participants have higher scores (top-right). This positive linear association is supported by a high Pearson *r* value of .93, which is statistically significant with a p-value of .007. Based on this result, we might conclude that there is a maturation effect on test performance.

**Independent Samples T-Test**

In an *independent samples t-test*, two different samples are each assigned to a condition of a categorical variable. These conditions are then compared statistically to determine the probability that the samples came from populations with different means. A *categorical variable* is one in which the values of the variable reflect discrete groups (e.g., gender or education) rather than numeric magnitude. The term *independent samples* indicates that each participant appears only once in the data set, either in the first or second condition. Like the correlation, t-values that are larger in either the positive or negative direction can indicate a stronger statistical effect.



**FIGURE 1.** Each face represents a participant, with age plotted on the x-axis and test score on the y-axis, and gender represented by the color of the face (males are blue and females are pink).

RESEARCH TO REALITY

**TABLE 1.** Independent Samples T-Test: Means and Standard Deviations

| Gender       | Speech-in-Noise Score |
|--------------|-----------------------|
| Male (N=3)   | M=41.67, SD=28.43     |
| Female (N=3) | M=61.67, SD=33.29     |

Means (M) and standard deviations (SD) for our hypothetical database separated by gender. N indicates the number of participants in each group.

**TABLE 2.** Independent Samples T-Test and Paired Samples T-Test Comparison

| Test                       | Conditions Compared                                | Statistics       | Conclusion   |
|----------------------------|--|------------------|--|
| Independent Samples T-Test | Males x Females                                    | t=-.79, p=.47    | Males and females do not differ significantly on this speech-in-noise measure. |
| Paired Samples T-Test      | Pre-Training Test Score x Post-Training Test Score | t=-5.00, p=.004* | Post-training scores are significantly greater than pre-training scores.       |

\*-p<.05  
T-test results comparing mean values from two groups.

**TABLE 3.** Paired Samples T-Test: Means and Standard Deviations

| Condition (Training)      | Speech-in-Noise Score |
|---------------------------|-----------------------|
| Pre-Training Score (N=6)  | M=51.67, SD=29.78     |
| Post-Training Score (N=6) | M=8.33, SD=23.81      |

Means (M) and standard deviations (SD) for our hypothetical database for pre- and post-training test performance. N indicates the number of participants in each group.

The sign associated with the statistic indicates the direction of the difference, whether condition one was larger than condition two or vice versa. In our example, gender can be thought of as a categorical variable, with condition one representing male participants and condition two representing female participants. The means and standard deviations for each of these two conditions are shown in TABLE 1 and are based on the data reported in FIGURE 1. As can be seen in this table, males scored approximately 42 percent while females score 62 percent. Statistics for an independent samples t-test comparing these two conditions can be seen in TABLE 2, and show that a t-value of -.79 and a p-value of .47 were obtained. Since the p-value is greater than .05, this statistic is considered not significant, indicating that even though the means are numerically different, it is unlikely that they reflect scores from two different populations.

Therefore, from a statistical perspective, male and female participants performed similarly. If we were truly interested in this research question, though, a much larger sample size would be needed. One final point: an *analysis of variance* (ANOVA) is commonly used instead of a t-test when the categorical variable has more than two conditions. The ANOVA addresses questions that are similar to the t-test and is represented by an F value instead of by a t value.

**Paired Samples T-Test**


A *paired samples t-test* is similar to an independent samples t-test, with the exception that every subject is included in both conditions of the categorical variable. The paired samples t-test is generally a more powerful test than its independent samples counterpart, particularly

RESEARCH TO REALITY

if scores in the two conditions are highly correlated. Let us say that, in our example, participants were enrolled in a two-hour speech-in-noise training session following their completion of the test. After this two-hour training, a second test was administered that was identical to the first test in every way, except different words were used. If we wanted to ask whether performance increased significantly following the training, we could use a paired samples t-test. Condition one would be performance on the pre-training test, and condition two would be performance on the post-training test.

For our hypothetical example, let us say that participants who scored less than 80 percent on our test before training now improved their scores by 20 percent post-training. The resulting means and standard deviations on post-training are included, along with the pre-training values in TABLE 3. The numeric trend for post-training scores to be higher on average than pre-training scores is evident. The last row of TABLE 2 shows the statistics comparing pre- and post-training scores, with a t-value equal to -5.00 and a significant p-value of .004. This significant p-value indicates that the higher mean value of condition two reflects the performance of a different population (trained participants) than the lower mean value of condition one (untrained participants). We might conclude in this case that training significantly improved test performance, though in reality we would most likely need a control group as well in order to say this with greater certainty. Similar to the independent samples t-test, a *repeated measures ANOVA* can be used if the categorical variable has more than two conditions.

**Summary**

While this article provides only a preliminary look at the complex world of statistics, understanding the fundamentals of these three commonly used statistical approaches can be advantageous when critically evaluating new research. The interested reader is encouraged to look into one of the many introductory statistics books currently available, such as Neil Salkind’s *Statistics for People Who (Think They) Hate Statistics*. 

*Jeffrey Weihing, PhD, is an assistant professor at the University of Louisville, Division of Communicative Disorders, in Louisville, Kentucky.*



COMPLIANCE

# Rampant: Workplace Theft and Embezzlement

By Terri E. Ives



It is no longer a question of “if” your employees are stealing, but how much they are taking. Depending on the survey cited, up to 95 percent of employees admit to stealing from their employer (ACFE, 2014).

According to a Kessler International survey, the level of dishonesty is increasing. Compared to the same survey in 1999, theft from employers rose from 79 percent to 95 percent in 2013.

Small businesses (less than 100 employees) are more likely to

suffer than big companies. The 2013 median loss a business sustained due to fraud by employees in the health-care industry was \$175,000 (ACFE, 2014).

### It Happens for Years

An employee without supervision responsibilities who steals from you is usually discovered after a year of theft. The higher the employee status, the longer it takes for discovery: for managers it is 18 months and the owner/executive, two years

(ACFE, 2014). If the theft was embezzlement, the average scheme lasted 4.7 years (Marquet Report, 2013). A study presented by a doctoral student in the University of Cincinnati criminal justice program reported the average age of those perpetrators of embezzlement are just under 43, with 40-to-49 year olds being the most common age group. Women were more likely than men to commit embezzlement, but men would steal larger amounts (Kennedy, 2014).

COMPLIANCE

**Time, Office Supplies, Your Products, and Cash**

Time is the most common theft from business. Your employees are posting on Facebook, texting friends, talking to friends or family, checking personal e-mail, and cruising the Internet. The employee is taking office supplies and using the copier for personal business, resulting in everything from simple paper clips to extension cables heading home. Your products also are walking out the door. The most common embezzlement scheme involved forging or issuing unauthorized checks (Kessler International, 2013). Skimming cash by forging documentation of returns for credit and putting chargebacks on to their own credit cards from employers' point-of-sale credit card machines also were quite common (Merchant Connect, 2014).

**Fraud Is Rarely Reported**

Only 16 percent of small businesses ever report the crime to authorities. The perpetrator frequently was a trusted relative or friend, so owners just want to put it behind them. Other businesses reported they don't trust the justice system to help and they would recoup very little, if any, of the money (Kennedy, 2014). In fact, 58 percent never recover any money and only 14 percent are able to get back all their losses (ACFE, 2014).

**Take Control**

The small business is typically under-protected. Small business owners are overburdened with work, short on time, and tend to know and trust employees to a greater degree, causing the business to be vulnerable to fraud. Fraud can damage the business's reputation and client trust, leading to more losses. So what can be done? The "X-Files" TV show and movies probably said it best: "Trust no one." Your trusted

business associate, family member, or employee is less likely to rip you off if you create many restrictions and cross checks. The bottom line will improve.

**Start with the hiring process.** Pay the small amount needed for a criminal background check. Call all the references and verify the correct contact phone number, rather than use the one on the resume. Most fraud occurs from a first-time offense, not from habitual criminals, but caution can protect you from known criminals.

**Keep an eye on your employees and tell them you are.** Software to monitor computer use is not expensive. Have them check in/out with you if they are paid hourly and note the time in a log. Inquire if your payroll system has this function as an option.

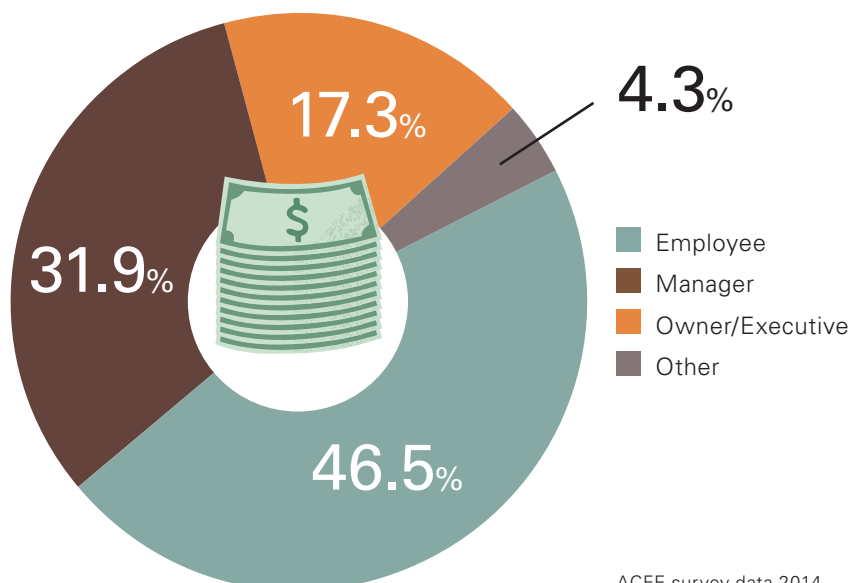
**Have systems in place for inventory** and check-out of laptops, office supplies, and for all your merchandise. Do regular inventory checks to

verify that what is in stock matches what was logged in/out.

**Segregate accounting steps** between different employees so that no one person has access to everything. Have daily log sheets of every transaction that must be filled out and match it to what was done. Audit every refund to customers, as well as verify that forms have not been copied or altered. The point-of-sale system should require a code to authorize sales and chargebacks for each employee. Limit the number of people who can authorize chargebacks onto credit cards and audit all chargebacks. Don't keep patient credit card data on file. Verify vendors and procedures for approving orders, authorizing and issuing payment; ensure orders and payment to vendors are the responsibility of different employees.

**Do regular audits and spot checks.** Look deeper into anything that is outside the norm, doesn't balance, lacks original documentation, or is

FIGURE 1. Who Is Stealing?



ACFE survey data 2014

## COMPLIANCE

written off. Reconcile bank statements. Consider any manually entered check or credit card to be suspect. Each mail payment should be individually listed by the mail opener, who is not the same person who puts payments in the system. Then reconcile the payment log with the daily receipts.

### Establish policies and procedures.

Review these policies and procedures regularly with your employees, including a zero-tolerance fraud policy. Use real-world example scenarios of what is fraud and what happens if it is committed. If you are a large enough company, establish an anonymous “tip” line. Require that employees take their vacations, as that is the most effective anti-fraud measure. The person assuming the perpetrator’s duties could notice the fraud and report it.

**Get fraud-prevention checks and know where they are.** Strictly limit access to company checks, audit blank check stock, and investigate any checks that are unaccounted for.

**Place notification alerts on accounts.** Set up alerts from your bank if access happens when you are not open, when returns are authorized, and for unusual activity. Also, use a payroll system that alerts you to any unusual changes.

**Keep company files locked.** Employees should not have unsupervised access to employee Social Security numbers and other personal and personnel data.

### Report and prosecute fraud.

Assess where there are additional opportunities for fraud. The more systems you put in place to monitor for theft, the greater your chances of catching the fraud more quickly. This may result in smaller amounts being stolen and give your business a better chance of recovery.

## Conclusion

Protect yourself with business fraud insurance that covers as much of the impact to your business as possible, in addition to the actual cash loss to the employer. Remember, the major reason employees get away with fraud is because employers trust them (Cassola, 1993), so do your business a favor and “trust no one.”

*Terri E. Ives, ScD, AuD, currently serves as the chair of the Practice Compliance Committee.*

## References

Association of Certified Fraud Examiners (ACFE). *Report to the Nations on Occupational Fraud and Abuse, 2014 Global Fraud Study.* Accessed at [www.acfe.com/rtnn/docs/2014-report-to-nations.pdf](http://www.acfe.com/rtnn/docs/2014-report-to-nations.pdf).

Cassola GA. (1993) The trust factor. *Managerial Auditing* 8(7).

Kennedy J. (2014) From Apathy to Disdain: Why Small Businesses Refuse to Call the Police When Employee Theft Occurs. February 18-22. Academy of Criminal Justice Sciences Annual Meeting.

Kessler International. (2013) Employee Theft No Longer an If—Now It Is How Much! Accessed at [www.investigation.com/press/press118.htm](http://www.investigation.com/press/press118.htm).

Marquet International. The 2012 Marquet Report on Embezzlement (Marquet Report). Accessed at [www.marquetinternational.com/pdf/the\\_2012\\_marquet\\_report\\_on\\_embezzlement.pdf](http://www.marquetinternational.com/pdf/the_2012_marquet_report_on_embezzlement.pdf).

Merchant Connect. Employee Fraud, the Threat Within. Accessed at <https://www.merchantconnect.com/cwrweb/employeefraud.do>.





## LEARN AT YOUR LEISURE

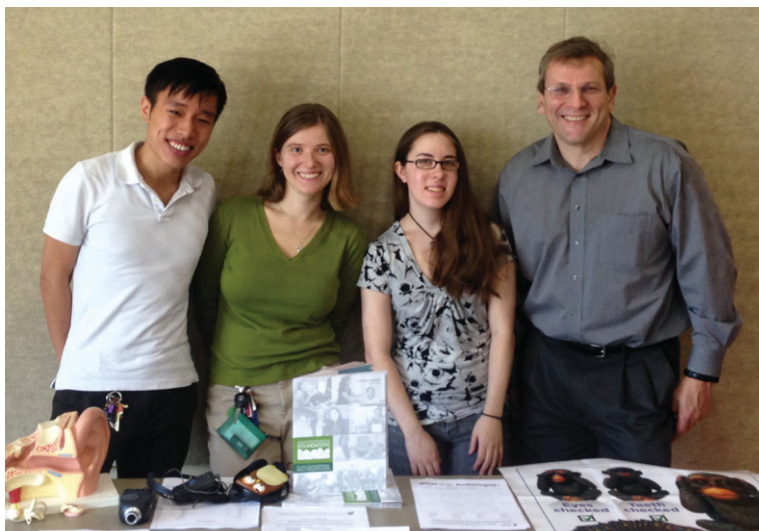
| AVAILABLE ON-DEMAND  | CEUs |
|--|------|
| <b>Induction, Induction What's Your Function? Telecoils Revisited</b><br>Presented by Ingrid McBride, AuD  | .1   |
| <b>GSI TympStar: Basic Operation and Maximum Efficiency</b><br>Presented by Laura Prigge, AuD  | .1   |
| <b>Coding and Reimbursement Series: Contract Negotiations—Two to Tango</b><br>Presented by Debra Abel, AuD   | .1   |
| <b>How to Create a Successful E-mail Newsletter</b><br>Presented by Kayce Bramble, AuD   | .1   |
| <b>Research-to-Reality Series: The Mayo Clinic Experience—Vestibular/Balance Dysfunction in Sports-Related Concussion</b><br>Presented by Jamie M. Bogle, AuD, PhD                                   | .15  |
| <b>Technology Behind the Hearing Aids Grand Rounds—Round Two</b><br>Presented by Michael Nilsson, PhD; Thomas Powers, PhD; and Don Schum, PhD  | .2   |
| <b>Requirements for Effectively Managing Hearing Loss</b><br>Presented by Samuel Trychin, PhD<br><i>ABA Certificants: Tier 1</i>   | .3   |
| <b>Ethical Equilibrium: The Changing Landscape of Relationships and Ethics in Audiology</b><br>Presented by Gloria Garner, AuD and Michael Page, AuD<br><i>ABA Certificants: Tier 1 &amp; Ethics</i> | .3   |

VISIT [EAUDIOLOGY.ORG](http://EAUDIOLOGY.ORG) TO VIEW THE COMPLETE LIBRARY OF LIVE AND ON-DEMAND SEMINARS.



FOCUS ON FOUNDATION

# Hearing Healthcare Recruiters Partners with Foundation to Support SAA



Gallaudet University SAA members (from left) Jonathan Suen, Claire Morgan, and Kathryn Scholnick, and faculty advisor Larry Medwetsky participate in high school student outreach at the 2013 Fall Career Choice Seminar in Washington, DC, as they work to increase awareness about audiology...and earn points for the SAA Chapter Challenge Awards.

**A**nother generous company has stepped forward with a pledge to support Student Academy of Audiology (SAA) initiatives! Last month, Hearing Healthcare Recruiters (HHR) committed to providing philanthropic support for the SAA Chapter Challenge Awards program for five years through 2019. HHR's \$15,000 grant will enable SAA leadership to expand the annual awards program that encourages SAA Chapters to participate in activities in four main categories: advocacy, fundraising, philanthropy, and education. Chapters are "challenged" to complete as many activities as possible, earning points for all of these grassroots initiatives. The most active chapters will be eligible to win up to \$1,000 in prize money, thanks to the new HHR funding.

"Hearing Healthcare Recruiters has supported audiologists' efforts to secure top-quality employment in a variety of practice settings across the United States," said George Mathis, HHR CEO. "We find it especially gratifying to now support audiology students with their university service and outreach through the SAA Chapter Challenge

Awards program. We applaud all of our student partners for their work in advancing audiology, and wish them many years of happiness and success in this wonderful career!"

The SAA has 68 chapters nationwide, representing more than 90 percent of all AuD programs in the United States. For SAA leadership, it is a priority to create a sense of community among individual members, local chapters, and the national SAA. The Chapter Challenge awards are one of the organization's initiatives that build camaraderie, while fostering friendly competition among current and future colleagues and coworkers.

"We applaud Hearing Healthcare Recruiters for their willingness to encourage our students' community awareness and educational and fundraising projects," said Angela Shoup, chair of the Foundation board. "We hope that all 68 SAA Chapters will

take this opportunity to expand outreach and advocacy programs on campuses and beyond...and perhaps earn a \$1,000 cash grant in the process. Definitely a win-win!"

Visit [www.studentacademyofaudiology.org](http://www.studentacademyofaudiology.org) for details on Chapter Challenge participation.

## Need Funding for Your SAA Chapter Projects?

Additional financial support for SAA Chapter initiatives is available through the Humanitarian, Education, and Awareness Resources (HEAR) Chapter Grants program, funded by the AAA Foundation with a gift from Starkey Hearing Technologies. The next application deadline is February 1; more information is available at [www.audiologyfoundation.org](http://www.audiologyfoundation.org).

FOCUS ON FOUNDATION



Many Ways to Support the Foundation in November and December



**National Philanthropy Day: November 15**

The AAA Foundation and SAA join forces each November to raise funds for student-focused initiatives. During the annual 15-15-15 fundraiser, students are encouraged to work with their SAA Chapters to find 15 friends and colleagues to donate \$15 on November 15. Your support as a university alumni can have a great impact on the efforts underway at your alma mater. Contact Kathleen Devlin Culver ([kculver@audiology.org](mailto:kculver@audiology.org)) in the Foundation office for information on how you can contribute, or even match, the fundraising efforts of our next-generation audiologists!

**Cyber Monday**

The Auction 4 Audiology San Antonio Preview opens December 1! Score big savings and support the AAA Foundation by bidding on San Antonio offerings during Auction 4 Audiology: San Antonio Preview, open from December 1–11. This is your chance to grab the best the city has to offer before AudiologyNOW! Treat yourself to entertainment, dining, and accommodations or purchase a holiday gift for your favorite San Antonio-dwelling friend, family member, or colleague. Proceeds benefit the AAA Foundation, so bid often at [www.biddingforgood.com/auction4audiology](http://www.biddingforgood.com/auction4audiology).

**Giving Tuesday**

Take a break from holiday shopping on December 2! The AAA Foundation is joining nonprofits around the world to support Giving Tuesday! Established in 2012, this growing movement offers donors the chance to make holiday gifts to their favorite nonprofits. So forget shopping; instead make an AAA Foundation gift that supports audiology research, education, and public awareness—and many other great programs that advance your favorite cause: hearing wellness! Visit [audiologyfoundation.org](http://audiologyfoundation.org) and click on “Make a Gift!”

**Year-End Annual Fund and SuiteHeart Drawing**

Make your AAA Foundation Annual Fund gift on or before December 31 so you are eligible for a charitable tax deduction in 2014 (consult your tax advisor for details). All donors making a gift of \$100 or more are eligible for the SuiteHeart drawing on February 13—one lucky donor registered to attend AudiologyNOW! 2015 will receive three nights of free accommodations at a conference hotel. What are you waiting for? Call the Foundation office (703-226-1049) or make your gift online at [audiologyfoundation.org](http://audiologyfoundation.org) today! 📧

Member Assistance Program

If you are experiencing financial hardship (due to medical, family, professional, or for other personal reasons) and cannot otherwise attend AudiologyNOW!, the AAA Foundation encourages you to apply for convention support through the Member Assistance Program (MAP). Selected recipients may receive lodging, registration, and/or a travel stipend to facilitate their participation at the convention on March 25–28, 2015, in San Antonio. Applications are due January 9, 2015. For more information and to apply, visit [www.audiologyfoundation.org](http://www.audiologyfoundation.org). The Foundation thanks Auban, Inc., and Oaktree Products for their generous support of the Member Assistance Program!

# Meet the SAA 2014–2015 Board of Directors



## Laura Chenier

Hometown: Holyoke, Massachusetts  
 University: Arizona State University  
 Externship: Arizona Hearing and Balance  
 Position: SAA president,  
 Nominations Committee chair

As president, Laura serves as chair of the Nominations Committee, which is responsible for organizing and finalizing the election process of the SAA board. She also serves as a liaison to the American Academy of Audiology board, where she serves as an active voice for students. Laura hopes to help the SAA grow by focusing on effective communication between students and audiologists, and working to advocate on behalf of individuals with hearing loss.

## Sarah Crow

Hometown: Strasburg, Ohio  
 University: Northeast Ohio Audiology Consortium  
 Externship: Cleveland Clinic  
 Position: SAA vice president,  
 Humanitarian Committee chair

The Humanitarian Committee focuses on promoting service and philanthropic efforts to the community through audiology, by encouraging the giving of time and effort to those who would, or do, benefit from audiology services. Sarah's goal is to create a database of domestic and international humanitarian trips, along with a "how-to" guide to help SAA members and chapters plan their humanitarian audiology trips or join existing ones.

## SAA SPOTLIGHT



### Nicholas Reed

**Hometown:** Baltimore, Maryland  
**University:** Towson University  
**Externship:** Georgetown University Hospital  
**Position:** SAA board member-at-large, Advocacy Committee and PhD Subcommittee liaison

The Advocacy Committee is charged with organizing events and facilitating communication to promote the field of audiology through public awareness, education, and government relations. This includes educating students about advocacy initiatives and helping them become actively involved in government relations at the state and national level. Nick hopes to develop a network of student contacts across SAA to help facilitate grassroots advocacy efforts and see an increase in SAA chapters visiting their congressional representatives' local and Capitol Hill offices.

### Jenna Pellicori

**Hometown:** Laurel Springs, New Jersey  
**University:** Salus University  
**Externship:** Nemours/Alfred I. DuPont Hospital for Children  
**Position:** SAA board member-at-large, Media Committee chair

The aim of the Media Committee chair is to connect students to the field of audiology through the use of media outlets, including Facebook and Twitter, as well as through the SAAy *Anything* e-newsletter, *Audiology Today* magazine, and the SAA Web site. Jenna's goal is to keep students connected to the Academy and up to date on current events and local chapter news, as well as to provide articles of professional interest.

### Susan Von Dollen

**Hometown:** Santa Barbara, California  
**University:** University of Wisconsin  
**Externship:** Cincinnati Children's Hospital  
**Position:** SAA board member-at-large, SAA Programs Subcommittee chair

The SAA Programs Subcommittee charge aims to enhance the student experience at *AudiologyNOW!* by planning educational sessions, organizing social events,

and promoting networking opportunities. Susan's main goal for this year is to foster good working relationships between the SAA chapters and National SAA. Susan hopes to see you all in San Antonio for a wonderful *AudiologyNOW!* 2015 experience!

### Nicole Jordan

**Hometown:** Cincinnati, Ohio  
**University:** University of Texas—Dallas  
**Status:** Third-year student  
**Position:** SAA board member-at-large, SAA Conference Committee chair

The SAA Conference Committee aims to organize and coordinate the annual SAA Conference, which is held in conjunction with *AudiologyNOW!* Nicole would like to design an educational program for SAA members to foster their professional development by inviting and attracting high-quality speakers to the conference to enhance the academic value of the meeting through innovative teaching methods (i.e. interactive sessions, collaborative problem solving, hands-on activities, etc.). She hopes to provide students with an affordable, informative, and diverse SAA Conference experience with more networking opportunities.

### Amy Safran

**Hometown:** New York, New York  
**University:** University of Washington  
**Externship:** Weill Cornell Medical College  
**Position:** SAA board member-at-large, Chapter Relations Committee chair

The Chapter Relations Committee aims to strengthen the SAA family through increased membership, engagement, and communication between local university chapters and the national SAA group. The goal is to educate doctoral students and undergraduate students interested in audiology on the mission of the Academy and SAA, as well as networking opportunities, organizational efforts, and goals. Amy's goals for SAA include increasing participation in Chapter Challenges, and creating a resource for local chapters to reference a variety of how-to documents on topics including advocacy, fundraising, humanitarian efforts, and more.



## SAA SPOTLIGHT

### Lyndsey Spencer

Hometown: Wellsboro, Pennsylvania  
 University: Salus University  
 Externship: Virginia Commonwealth University  
 Position: SAA board member-at-large,  
 Undergraduate Committee chair

The Undergraduate Committee focuses on helping to develop undergraduate chapters at universities that do not have an AuD program or local SAA chapter. The committee will begin with a beta program where we will welcome two undergraduate programs as SAA chapters, and work closely with these programs to strive to better understand their unique needs and involvement over the course of the year.


### Kevin Seitz

Hometown: Newburgh, Indiana  
 University: Northwestern University  
 Externship: Hearing Associates  
 Position: SAA board member-at-large,  
 Education Committee chair and ACAE liaison

Kevin's role as the Education Committee chair and ACAE liaison is to encourage a positive experience and smooth transition from student to professional life, as well as to promote audiology to the general public through awareness campaigns and government relations. His main goal is to engage local SAA chapters in raising awareness of the profession of audiology for high school and undergraduate students.

### Sarah Kate Fisher

Hometown: Huntsville, Alabama  
 University: Auburn University  
 Externship: Civitan-Sparks Clinic  
 Position: SAA board member-at-large,  
 Fundraising Committee chair

The Fundraising Committee is involved in achieving a budget-neutral status and aims to identify, plan, and implement fundraising opportunities for the SAA, in affiliation with the AAA Foundation. Sarah's main goal is to build upon the success of past fundraising committees and increase the stability and success of the current SAA fundraising events. 

## New Members of the Student Academy of Audiology

- Jeni Abrams
- Sonya Bowers
- Anna Clayman
- Lauren Copus
- Emily Crewe
- Kaci Edwards
- Olivia Ettinger
- Tara Gelernter
- Erin Glickman
- Carly Hemmingson
- Kacy Hooten
- Joshua Huppert
- Emerald Lauzon
- Erin Luther
- Ryan Masi
- Stephanie Palazzolo
- Kaleen Rodriguez
- Devon Shock
- Nicole Stanley
- Shelby Swafford
- Laura Taliaferro
- Lauren Van Curen

# Audiologists Say ABA Certification Demonstrates Commitment and Raises Professional Credibility

By Torryn P. Brazell

**A**s a certifying body and advocate of the audiology profession, the American Board of Audiology (ABA) makes it a priority to learn whether audiologists value certification, why they value it, and what they value most about it. We recently surveyed our certificants and asked them those questions to determine the value of ABA Board Certified in Audiology®, Pediatric Audiology Specialty Certification (PASC®), and Cochlear Implant Specialty Certification (CISC®).

We received thoughtful feedback from 266 audiologists who hold one or more ABA credentials, the majority of whom agreed or strongly agreed that certification by the ABA demonstrates commitment to audiology, shows that professional knowledge is current, and raises professional credibility.

In fact, when asked to best describe the value of ABA certification, our respondents said that it shows they have credibility, are professional, and hold expertise in the field. Other words that audiologists find describe the value of ABA certification include “dedication” and “knowledge.”

One of our respondents shared, “Board certification shows a willingness to be the best in a chosen profession. It does not by any means suggest you *are* the best, as there are

really good audiologists who are not board certified. But it shows a level of commitment to your field to strive to be the best.”

Specifically, survey respondents shared their agreement or disagreement with the following statements:

**93.3%** strongly agreed/agreed that ABA certification demonstrates commitment to audiology.

**84.7%** strongly agreed/agreed that ABA certification raises professional credibility.

**83.5%** strongly agreed/agreed that ABA certification shows that professional knowledge is current.

**83.4%** strongly agreed/agreed that ABA certification indicates professional growth.

**75.8%** strongly agreed/agreed that ABA certification increases professional confidence.

**70.9%** strongly agreed/agreed that ABA certification validates mastery of knowledge in audiology.

**62.6%** of respondents find that ABA certification increases their marketability.

The survey responses also showed us a few areas upon which we need to concentrate effort for our certificants. Specifically, less than 50 percent of respondents agreed that ABA certification helps advance their careers.

As a certifying body, the ABA is dedicated to enhancing audiological services to the public, and we will continue to work diligently with the profession in our efforts to create universally recognized standards in professional audiology practice that will help increase marketability and advance careers.

We greatly appreciate the valuable feedback from our survey respondents, and will continue to reach out to certificants to find out more about ways we can work together to help create greater visibility for audiology, and the value that seeking care from a certified audiologist can bring to patients and their families.

*Torryn P. Brazell, MS, CAE, is the managing director for the American Board of Audiology.*



ACAE CORNER

# 2014: A Year of Challenge and Gratitude 2015: A Promise for the Future of Audiology Education

By Lisa L. Hunter and Doris Gordon

**A**s 2014 comes to a close, the ACAE Board of Directors would like to thank some visionary champions of audiology education, especially as we look forward to 2015—a crucial turning point in standards for the AuD.

ACAE could not have hoped for a more enthusiastic supporter of education than President Bettie Borton, AuD. Dr. Borton challenged ACAE to think about how we can promote the rigorous standards that our patients, students, and practitioners deserve. Dr. Borton has worked tirelessly to advocate for AuD education. She encouraged each of us to recognize the treasure we have in our own independent accreditation organization, created exclusively to develop a strong, respected audiology profession. We are thrilled to report that the Academy increased funding to ACAE by 15 percent in 2013. We are also pleased with the generous gifts contributed to ACAE from the American Academy of Audiology Foundation in 2014.

We are excited to announce that we received a significant grant from Starkey Hearing Technologies and Widex-USA over a three-year period, totaling \$160,000. These crucial funds will enable ACAE to continue our upward trajectory of bringing on new “programs of excellence” into the rigorous and innovative Web-based accreditation program ACAE

pioneered. We extend our sincere appreciation to Jerry Ruzicka, president, Starkey Hearing Technologies, and Rodney Schutt, former president, Widex-USA, Inc., for their generosity to audiology and their pioneering vision for audiology education.

Jeff Browne, JD, ACAE public board member and political strategist, challenged the ACAE board to identify tough questions about accreditation, education and the profession. Read more of what Jeff Browne thinks about this issue in his article, “Do Audiologists Want More?” *Audiology Today*, November/December 2013. In response, we have compiled our top 10 tough questions and answers.

## 1 How can we prevent complacency in audiology education?

ACAE has embraced a model of autonomous audiology practice, recognizing that with greater autonomy comes greater responsibility. We have pledged that, through our accredited programs, audiologists will be educated and trained to the full scope of hearing and balance care, using the best-available diagnostic and treatment methods and technology. Our accreditation standards and processes must reflect this best-practice attitude. A rigorous collaborative accreditation system that ensures new audiologists are

fully prepared to enter the profession is critical to the goal of autonomy.

## 2 Are there neglected aspects of audiology that need to be addressed in audiology education?

There are many areas that need to be addressed more rigorously in doctoral-level education, and the ACAE stakeholder survey last year identified many such areas including pharmacology, gerontology, rehabilitation science, and genetics. Business management practices, noise abatement, and prevention of hearing loss are crucial. Areas related to professional responsibility such as independence/autonomy, counseling and engagement with patients in treatment goals, and leadership skills must be strengthened, and these will be included in our new standards.

## 3 What proof do you have that audiology is, or is not, up to par?

Less than 40 percent of people in need of hearing help are seeking audiology services, and many of those are not satisfied with their outcomes (MarketTrak surveys over many years). Audiology still has not successfully differentiated itself from hearing instrument dispensers in the marketplace. Sadly, despite universal newborn hearing screening and success of available treatments,





only about 50 percent of infants with hearing loss are receiving timely intervention due to poor accessibility and inadequate systems.

**4** What is audiology doing to keep up with rapid changes in technology?

Currently, not enough. The pace of technology is accelerating and could be harnessed to provide better hearing and balance for patients, but antiquated training models and lack of investment in new technologies mean today’s students are often trained with yesterday’s tools. ACAE is actively working to bring accredited “programs of excellence” on board that are capable of educating students with the technology of today and tomorrow, and with the critical thinking skills to continually stay at the leading edge.

**5** Is the present state of audiology education able to meet the growing demand for high-level audiology services?

Not at this time! Audiology needs to supplement technical-level services with assistants, and needs educational models that teach us how to use them effectively and ethically. The U.S. Bureau of Labor Statistics estimates that opportunities for audiology careers will increase by 34 percent over the next 10 years (4,300 new audiologists needed). Under the current model of education, this would require almost a doubling of current graduation rates. ACAE standards and processes are designed to promote innovation in educational models, which could allow for higher numbers of students to become highly educated practitioners. Our new standards will address this need.

**6** Why raise the bar in audiology education?

The purpose of accreditation, and the reason ACAE exists, is to protect consumers of hearing health care to insure that their insurance and private dollars are being spent on evidence-based diagnostics and treatment. We intend to do this by educating students to the higher level their investments deserve. In this time of health-care change, we must be viewed as independent, unique providers of a necessary service. We have to be correctly perceived as the profession that fully manages hearing loss and balance disorders. We are quite late in coming to this part of the game, so there is no time to waste.



ACAE CORNER

**7 Why should practicing audiologists be interested in accreditation (or education)?**

The reputation of the profession depends on the competency of our members in the eyes of the public. Practicing audiologists seeking to hire new partners correctly want the most qualified graduates. Inadequately trained students cannot compete for the best positions. Rigorous accreditation drives programs to graduate fully competent professionals. This educational foundation plays a major role in developing a strong, viable profession that audiologists will take pride in for generations to come.

**8 Why should consumers be interested in accreditation (or in the education of an audiologist)?**

Rigorous and exacting standards, such as those ACAE advocates, signal to the public and marketplace high quality care and outcomes. An audiologist's education translates into patient care. With excellence in education, it is more likely the consumer will receive the reliable, efficient, cost-effective, high-quality care deserved.

**9 Why is accreditation of interest and importance to the hearing industry?**

Better-educated and trained students reduce variance of outcomes, and have the potential to create more demand for beneficial products and services. The core of the audiologist's scope of practice is to provide


**ACAE will not rest until audiologists are viewed as “the” choice providers for hearing and balance care.**

hearing care that includes the selection, programming, and dispensing of hearing aid products. The manufacturer relies on the quality, and professional expertise, of the audiologist. The industry expects that the audiologist will have the requisite knowledge to effectively use its products and assist with feedback about how they can continually improve.

**10 Who should fund audiology accreditation?**

The profession of audiology—through our professional organization—bears the major responsibility—period. There is nothing more important than our educational underpinnings for clinical practice and our research base; therefore, accreditation is appropriately funded as a continuing investment in our future through membership dues. The hearing health industry relies on the excellence of research-and-development departments to produce hearing health products, and should be able to depend on the competence and creativity of audiologists who graduate from outstanding academic programs.

**Conclusion**

All of these questions and answers are tough. But they must be addressed if the profession wants to be viable in the next five to 10 years. ACAE will not rest until audiology is a household word, audiologists are viewed as “the” choice providers for hearing and balance care, audiologists are appropriately compensated for their professional expertise, and hearing and balance treatment is embraced by consumers who need them. If audiologists can unite in this cause, we will make great progress. If we continue to divide our efforts across multiple educational standards, we will stall and slip backward. That is not an option! 

*Lisa L. Hunter, PhD, is the scientific director of audiology at the Cincinnati Children's Hospital Medical Center in Cincinnati, OH, and she is the chair of ACAE. Doris Gordon, MS/MPH, is the executive director of ACAE.*



*Action is the foundational key to all success.*

Take action and register.



*Discover* tools to achieve your professional goals.

*Learn* how to transform and adapt when faced with challenges.

*Interact* with industry partners to uncover new solutions.

*Relax* on the beautiful San Antonio River Walk after a fulfilling day.



[www.AudiologyNOW.org](http://www.AudiologyNOW.org)



**SAN ANTONIO, TX**

American Academy of Audiology

*March 25-28, 2015*

AUDIOLOGY ADVOCATE

# Making Sense of the Mid-Term Elections

By Kate Thomas

**"T**is the season!" No, it is technically not the holiday season, though many retailers may have you thinking otherwise.

Here in Washington, DC, and throughout the country, we are in the midst of another type of season—election season. By now, you most likely have grown tired of the many political commercials dominating the airwaves as you try to enjoy your favorite evening television shows. These political commercials, debates, campaign fundraisers, door-to-door canvassers, and lawn signs that have taken over your community during the past couple of months all lead up to one main event—Election Day.

Tuesday, November 4, 2014, marks the date for the general elections in the United States. On this day, all 435 seats in the U.S. House of Representatives, as well as approximately one-third of the 100 U.S. Senate seats, will be contested, in addition to the many other state and local elections also taking place. This year's elections are referred to as the mid-term elections because they are held two years after the four-year election for the President of the United States. In other words, we are midway through the four-year presidential term.

Though much attention has been focused on the elections themselves, it is also important to look ahead to the remaining legislative days in the 113<sup>th</sup> Congress. After the mid-term elections, Congress is expected to return in December for a "lame-duck" session. A lame-duck, or post-election, session refers to the time period after the elections for the upcoming Congress have been held, but before the current Congress has reached the end of its term. This makes for an interesting time, as many members of Congress who not have been re-elected must return to Washington and complete their term. You may

remember, in November 2012, there were many high-priority issues facing Congress during the lame-duck session, including the impending "fiscal cliff." The outlook appears to be different for this lame-duck session. Many, including the political news source *Politico*, already have referred to this session as the "lamest lame duck session" in a number of years. It is likely that Congress will only address any necessary outstanding items before adjourning, and is not expected to end the session with an aggressive or controversial legislative agenda.


Given this political forecast, the question remains, what does this mean for audiology? For the Academy, this lame-duck session serves as a time to make a final push for our direct access legislation—the Access to Hearing Health Care Act (H.R. 4035, S. 2046), and other key pieces of audiology-related legislation. The Academy also anticipates that Congress will renew its discussions concerning legislation that would provide a permanent "fix," or repeal, of the flawed sustainable growth rate (SGR) formula used to determine Medicare reimbursement payments for providers. The Academy will be monitoring these issues closely and will update Academy members as soon as information becomes available.

The mid-term elections may signify the end of the 113<sup>th</sup> Congress, but they also usher



## AUDIOLOGY ADVOCATE

in a new beginning for setting the Academy’s legislative agenda and building relationships within the 114<sup>th</sup> Congress. As we prepare for the 114<sup>th</sup> Congress, the Academy already has begun the process of reviewing our legislative strategy and developing our agenda for the upcoming Congress. In addition, the Academy will reach out to returning members of Congress and foster relationships with the new members of Congress.

If you are interested in advocacy, relationship building is a great way to become involved. Consider contacting your elected officials, whether they are new or returning members of Congress. Introduce yourself and offer to serve as a resource when it comes to addressing issues related to audiology. This will help lay the foundation for audiology advocacy in the 114<sup>th</sup> Congress. To find more information on your elected officials and to keep up to date on current legislation, visit the Academy’s Legislative Action Center at <http://capwiz.com/audiology/home>. 

*Kate Thomas is the assistant director of state, federal, and political affairs for the American Academy of Audiology.*

## JUST JOINED

### New Members of the American Academy of Audiology

Laura Bullock, AuD

Charles Butler, MA

Chelsea Cagle, AuD

Sydney Cowing, AuD

Lauren Davis, AuD

Ashley Greening, AuD

Kimberly Gustovich, MA

Marissa Land, AuD

Ramia Lnu, AuD

Ann Marie Olson, ScD

Scott Spence, MA



### Classified and Employment Line Listing Rates for Audiology Today

|                      |       |
|----------------------|-------|
| Up to 50 words       | \$125 |
| Each additional word | \$2   |

Agency discount not valid for line listings.

### Advertising Rates for Audiology Today

| Ad                                | 1x      | 6x      | 12x     |
|-----------------------------------|---------|---------|---------|
| Full Page<br>Black and White      | \$1,630 | \$1,425 | \$1,295 |
| Full Page<br>2nd Color Matched    | \$2,430 | \$2,225 | \$2,095 |
| Full Page Full Color              | \$3,005 | \$2,800 | \$2,670 |
| Half Page<br>Black and White      | \$1,230 | \$1,015 | \$900   |
| Half Page<br>2nd Color Matched    | \$2,030 | \$1,815 | \$2,095 |
| Half Page Full Color              | \$2,505 | \$2,290 | \$2,175 |
| Quarter Page<br>Black and White   | \$880   | \$760   | \$730   |
| Quarter Page<br>2nd Color Matched | \$1,580 | \$1,460 | \$1,430 |
| Quarter Page<br>Full Color        | \$2,055 | \$1,935 | \$1,905 |

Agency discount of 10% is valid for recognized agencies only and not valid for line listings.

Contact Brittany Shoul with Network Media Partners at [bshoul@networkmediapartners.com](mailto:bshoul@networkmediapartners.com) for more information or to place an ad.

### HEARcareers

### Web Employment Posting Rates

| Posting               | Members | Nonmembers |
|-----------------------|---------|------------|
| Single 30-Day Posting | \$255   | \$300      |
| Single 60-Day Posting | \$460   | \$560      |

Resume search included with job posting.

Multijob posting packages are available.

Contact Rachael Sifuentes at [rsifuentes@audiology.org](mailto:rsifuentes@audiology.org) for additional information and pricing.

### Advertiser Index

|   |       |
|---|-------|
| <b>Debrox</b><br><a href="http://www.debrox.com">www.debrox.com</a>   | 19    |
| <b>Hamilton CapTel</b><br><a href="http://www.hamiltoncaptel.com">www.hamiltoncaptel.com</a>                                      | 2     |
| <b>Oticon</b><br><a href="http://www.pro.oticonusa.com">www.pro.oticonusa.com</a>   | C2, 1 |
| <b>ReSound</b><br><a href="http://www.resound.com">www.resound.com</a>  | 7     |
| <b>Siemens Hearing Instruments</b><br><a href="http://www.usa.siemens.com">www.usa.siemens.com</a>                                | C4    |
| <b>Tinnitus and Hyperacusis Therapy Masterclass</b><br><a href="http://www.tinnitustherapy.org.uk">www.tinnitustherapy.org.uk</a> | 9     |
| <b>Widex</b><br><a href="http://www.widexpro.com">www.widexpro.com</a>  | 5     |

### Academy Products and Services Index

|  |            |
|--|------------|
| <b>ABA Certification Exams</b><br><a href="http://www.americanboardofaudiology.org">www.americanboardofaudiology.org</a>       | 45         |
| <b>Academy Research Conference</b><br><a href="http://www.academyresearchconference.org">www.academyresearchconference.org</a> | C3         |
| <b>Advocate for Audiology</b><br><a href="http://www.audiology.org">www.audiology.org</a>                                      | 55         |
| <b>AudiologyNOW! 2015</b><br><a href="http://www.audiologynow.org">www.audiologynow.org</a>                                    | 73, Insert |
| <b>eAudiology</b><br><a href="http://www.eaudiology.org">www.eaudiology.org</a>  | 63         |
| <b>HearCareers</b><br><a href="http://www.audiology.org">www.audiology.org</a>   | 39         |
| <b>Membership Renewals</b><br><a href="http://www.audiology.org">www.audiology.org</a>   | 49         |
| <b>SAA Conference</b><br><a href="http://www.studentacademyofaudiology.org">www.studentacademyofaudiology.org</a>              | 12         |

# — SAVE *the* DATE —



#ARC15

## ARC15 VESTIBULAR ASSESSMENT AND REHABILITATION

MARCH 25 | SAN ANTONIO, TX | THE FIRST DAY OF AUDIOLOGYNOW!

REGISTRATION OPENS NOVEMBER 3, 2014.

An estimated 35 percent of adults in the United States over the age of 40 have experienced some degree of vestibular dysfunction. Although the occurrence of these dysfunctions increases with age, vestibular disorders affect the pediatric population as well.

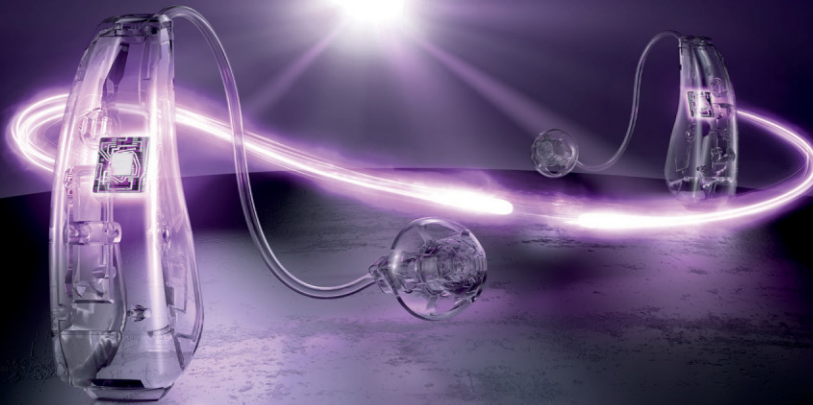
This one-day translational conference will review these various dysfunctions and what research and practice is being done in the areas of vestibular assessment and rehabilitation. Scientists, researchers, clinicians, and students are all encouraged to attend and hear from an internationally respected panel of experts who will present the latest research and evidence from their laboratories and describe how it can be translated into clinical practice.

[www.AcademyResearchConference.org](http://www.AcademyResearchConference.org)

*Funded in part by NIDCD (R13 DC011728).  
Women and minorities are strongly encouraged to register.*



SIEMENS



NEW!

# binax. A world first.

Hearing technology that is clinically proven to outperform normal hearing\*.

[usa.siemens.com/binax](http://usa.siemens.com/binax)

**binax™** the next generation of BestSound™ Technology enables wearers to achieve up to 25% better speech recognition than individuals with normal hearing in challenging listening environments like restaurants and cocktail parties.

The foundation of **binax** is the e2e 3.0 wireless system that enables audio exchange between hearing aids. Coupled with powerful binaural sound processing, the result is unprecedented directionality, while preserving spatial perception automatically with minimal battery consumption. This technology is so advanced, it performs exceptionally well in a car and in wind.

**binax. Clinically proven. Better than normal hearing in challenging listening environments.**



Read the QR code with the QR code reader on your smart phone



Life sounds brilliant.

\*Studies conducted at University of Northern Colorado (2014) and Oldenburg Horzentrum (2013) showed that Speech Reception Thresholds (SRT) in cocktail-party situations improved up to 2.9 dB for wearers with mild to moderate hearing loss using binax with Narrow Directionality, compared to people with normal hearing. This corresponds to over 25% improvement in speech understanding. \*\*When used with the easyTek remote streamer. Copyright © 2014 Siemens Hearing Instruments, Inc. All rights reserved. 9/14 SHI/15355-14