

Auditory Training

Geoff Plant, OAM

Hearing Rehabilitation
Foundation





Introduction

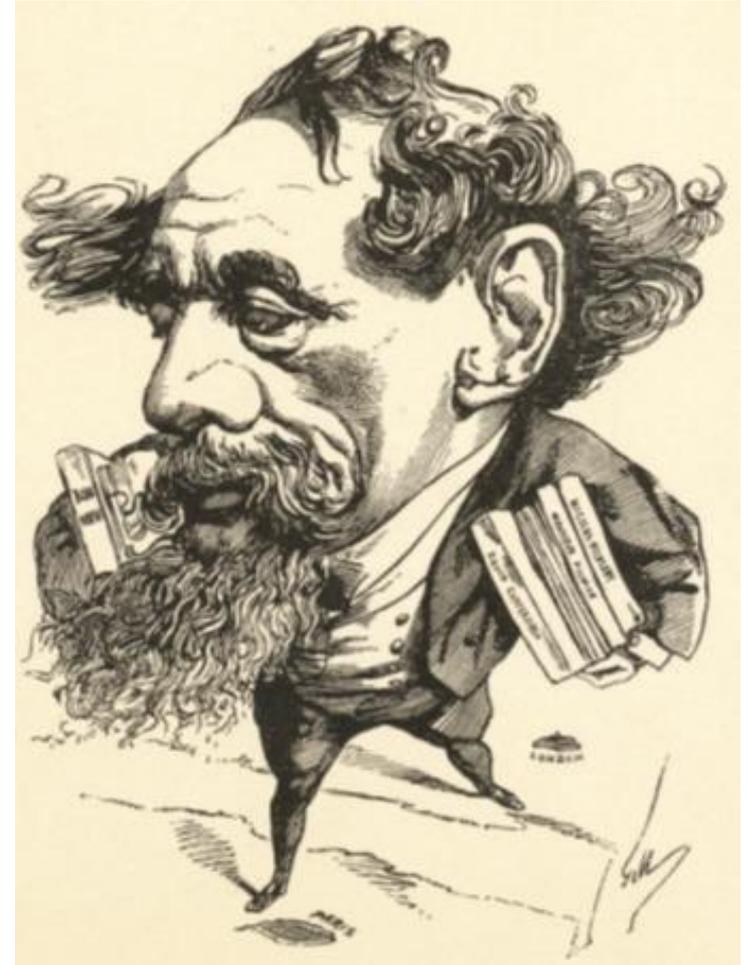
The past thirty or so years have seen great advances in hearing technology – hearing aids and cochlear implants.

It would be difficult to argue that there have been great advances in the provision of aftercare in the same period. We have better technology, but other forms of support for people with HL have decreased in many ways.

The best of times and

Technology offers assistance to people with a very wide range of HL

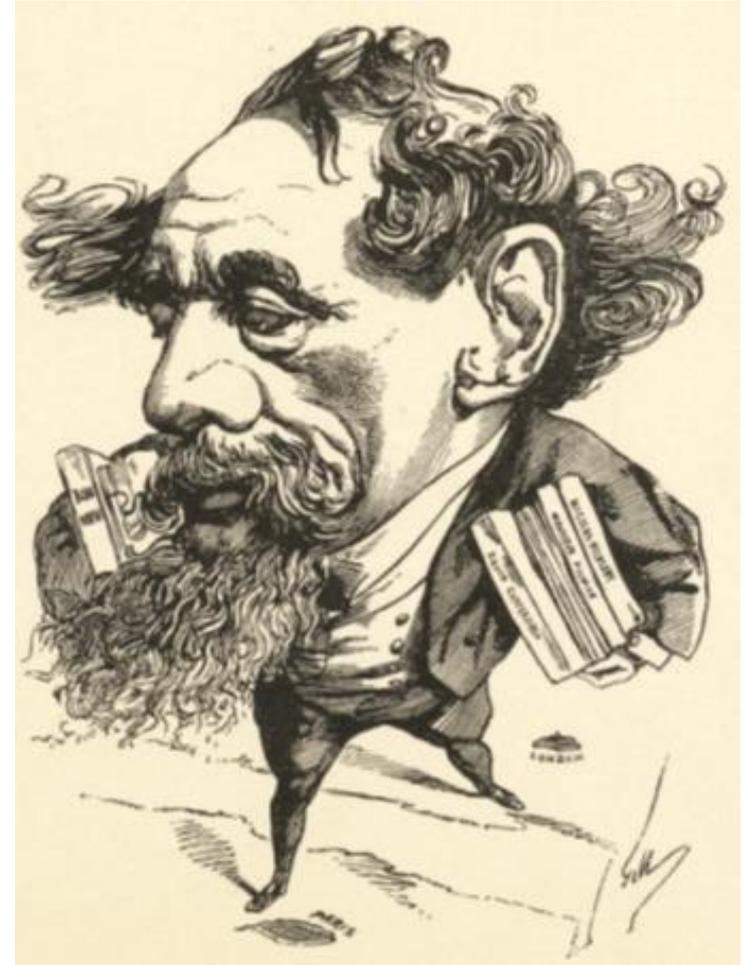
Hearing aids, cochlear implants, the rapidly emerging range of PSAPS, and Assistive Technology, are changing the way we think of HL



The worst of times

Support offered to people with HL is much poorer than in the past.

A rather blinkered and naïve view that technology has solved all the problems created by HL





Introduction

Many professionals might argue that there is no pressing need for support after HA fitting or CI mapping; the technology solves the problem.

HA or CI users, however, often feel that they have failed the technology and blame themselves if they don't achieve the results promised (or expected).

Others want a better, expanded service.

What's wrong
with me?



NO!

Why aren't I
getting more
support?



YES!



Introduction

Others realize that no technology can achieve the same results with all users and ask why there is no follow-up support.

“Where are the hearing ‘physical therapists,’ ‘personal trainers?’”

“Why are we expected to cope without follow-up?”

A new idea?



“Those who cannot
remember the past are
condemned to repeat it.”

George Santayana



A new idea?

Audiology dates back to the 1940's

Two important events at that time were critical in the development of audiology

Advances in technology allowed the development of truly wearable HAs

Hearing Retraining Centers set up by the US military during WWII



AGAIN, ZENITH MAKES HEARING AID HISTORY!

Brings New Smartness and Style at No Extra Cost with the

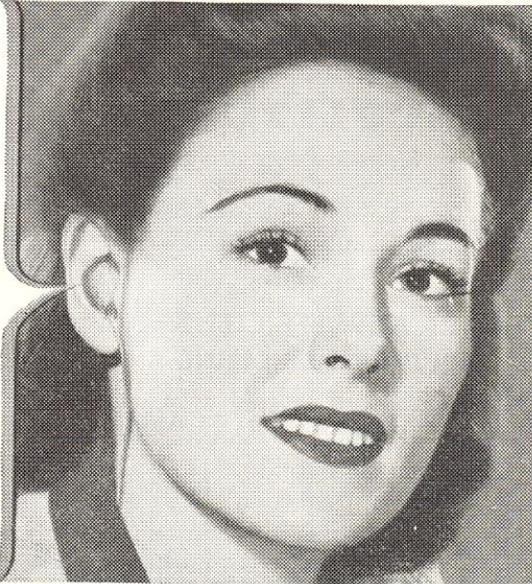
New Neutral-Color Earphone and Cord

ZENITH made hearing aid history by bringing fine precision *quality* within reach of all. Now Zenith follows through—makes history again—brings you, in its complete production, an entirely new standard of hearing aid *smartness and style!*

After years of research—Zenith now does for the hearing aid what modern styling did for eyeglasses! Now America's hard of hearing can wear an aid with visible parts that are *scarcely noticeable*, because they blend with any complexion.

This smart new Zenith ensemble brings an attractive new "look of youth" to the hearing aid. You'll notice it immediately when you look at yourself in the mirror. Now, no one need feel self-conscious about wearing a hearing aid.

See the proof of this today. And *hear* the proof of excellence in performance that has made America swing *overwhelmingly* to the New Zenith Radionic Hearing Aid. Visit the Zenith-franchised dispenser nearest you. Or, for complete information by mail, use the convenient coupon below.



THE NEW EARPHONE

- Smart, modern, scarcely noticeable! Pleasingly neutral in color so that it blends with any complexion.
- Sturdily constructed of beautiful, long-wearing plastic.
- Comfortable to wear because it's feather-light in weight.

THE NEW CORD

- Translucent plastic—looks well with any apparel. Greatly reduces friction or clothing noise.
- Slender, light in weight, more comfortable, lasts longer.
- Perspiration-proof . . . water-proof . . . kink-proof . . . washable. Will not fray, wipes clean with damp cloth.

THE NEW ZENITH RADIONIC HEARING AID



\$40 COMPLETE, READY TO WEAR
With New Neutral-Color Earphone and Cord—Crystal Microphone—Radionic Tubes—Batteries—One Quality, Zenith's Best.

Accepted by American Medical Association Council on Physical Therapy



There are cases in which deficient hearing is caused by a progressive disease and any hearing aid may do harm by giving a false sense of security. Therefore, we recommend that you consult your otologist or ear doctor to make sure that your hearing deficiency is the type that can be benefited by the use of a hearing aid.



Mail Coupon for Free Descriptive Booklet

Zenith Radio Corporation, Dept. VR-8
P. O. Box 6940A, Chicago 1, Illinois

Please send me your Free descriptive booklet on the New Zenith Radionic Hearing Aid.

Name _____
Address _____
City _____ State _____

Physicians check here for literature.



A new idea?

First retraining center was at Walter Reed Hospital in Washington, DC, but soon moved to centers at:

Deshon General Hospital, Butler, PA

Borden General Hospital, Chickasha, OK

Hoff General Hospital, Santa Barbara, CA

US Naval Hospital, Philadelphia, PA

At first, focus on lipreading training, but quickly there was a shift towards use of residual hearing



A new idea?

Service personnel posted to these facilities for a few months

Received lipreading training, auricular (auditory) training, speech conservation, and information counseling

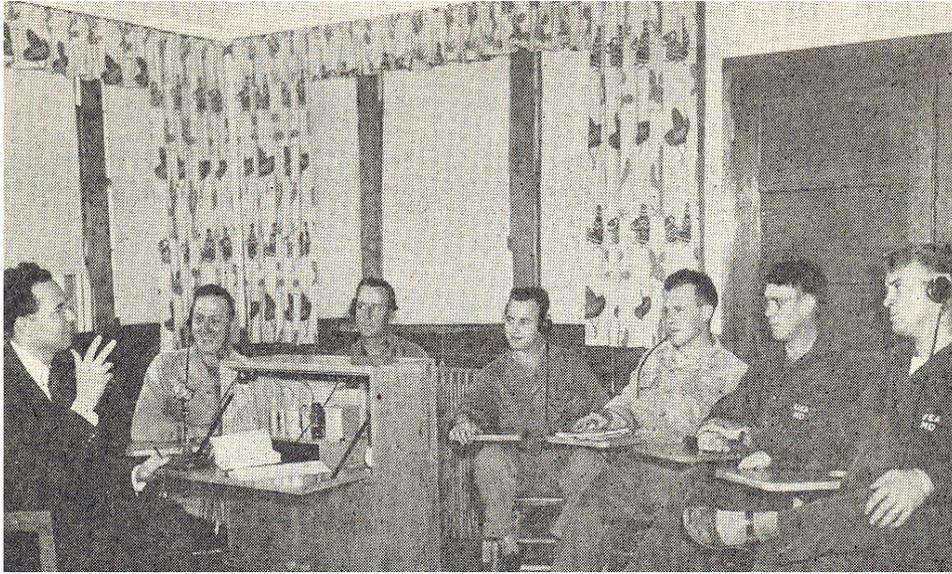
Training provided 1:1 and in groups, many opportunities to mix with others with hearing loss

A new idea?



—By courtesy of Acousticon
**HIS HEARING AID KEEPS
PVT. R. E. B. IN THE IN-
FANTRY**

A new idea?



A new idea?



Mary Wood Whitehurst

Mary Wood Whitehurst



Worked at Hoff General Hospital in WWII

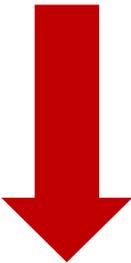
Program started Auricular Training in summer of 1944

Described program used in an article in The Volta Review, May, 1946



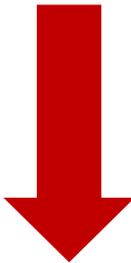
Mary Wood Whitehurst

Pre-training Testing – understand instructions, short sentences, word perception including some minimal pairs



*Low scores,
difficulties in
noise, one
poorer ear*

*Good scores,
able to cope
with noise,
symmetrical HL*



Individual

TRAINING TYPE

Group

Auricular Training



Individual training done using microphone, amplifier and headphones, only after training was change made to HA

Early group (10 – 12) training conducted with headphones and then with HA

Minimum instruction period was 30 hours, but provision for more for those who needed it.
Included information sessions and listening training

Auricular Training



Training included both analytic and synthetic materials

Some work on music listening – included pitch discrimination and listening to lyrics

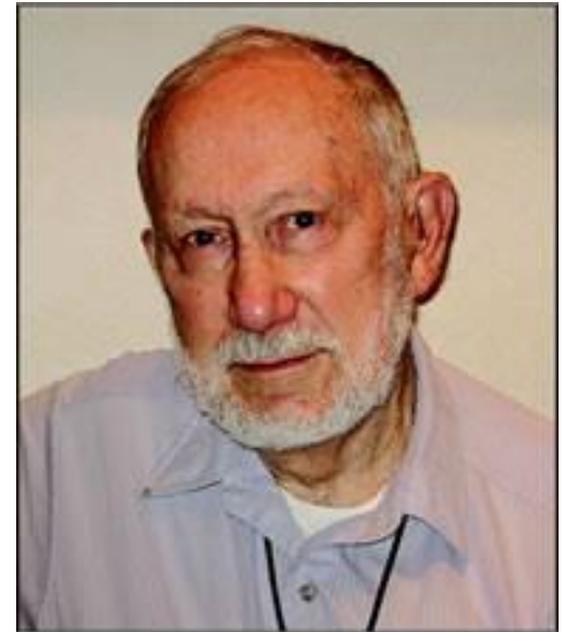
Many aspects of the program outlined would seem to have direct relevance to clinicians working with clients with HL today

Mark Ross



Centers closed at the end of the war, but a similar service was continued at Walter Reed Hospital

Mark Ross has provided a personal account of his experiences with the program, he spent *two* 2-month periods at Walter Reed Hospital in 1952 & 1954. Describes it as a *Camelot* experience that's never likely to be repeated



Ross (2009)



“There is probably nothing like that available today, but I have to tell you, when you put in the time, make the effort, and participate, you can really accomplish quite a lot! From today’s perspective, however, not only was it a bit of overkill, but clearly out of the question economically.

The lesson we should take from it, is that at the time, the U.S. government conceptualized hearing loss as a serious condition, and that attitude needs to prevail and underlay any serious effort at AR today.”

<http://www.audiology.org/news/interviews/Pages/20091007a.aspx>



The Hearing Rehabilitation Foundation









Auditory Training

Provide training aimed at improving person's ability to understand speech – usually via listening only, but do provide some auditory-visual training

Series of training programs developed by the HRF

Although most clients are CI-users have also provided training to people with HA's

Important part is the use of KTH Tracking Procedure



Speech Communication Training

Develop ability to listen for extended periods – people with hearing loss often comment on how hard it is to focus on speech for more than a short period of time

DEVELOP HEARING STAMINA

Work on improving confidence in ability to stay on task – a demonstration of how well the person can focus in a listening situation.



Auditory Training Session

Wherever possible, clients attend once a week for a two-hour session.

Although there is no break in the session, I make sure that there is time for chatting, asking questions, etc.

Try to also have some time for listening for enjoyment – story telling, discuss a slide show, etc.

Warm-Up Exercises



Begin each session with a short exercise aimed at encouraging attentive listening

Examples include:

**NUMBER STRINGS,
RHYMING ALTERNATIVES,
SENTENCE MATRICES**

Materials presented without visual cues (lipreading)



Number Strings

NAME _____

DATE _____

PRESENTATION MODE A V AV QUIET

NOISE _____

LEFT CI HA UNAIDED

RIGHT CI HA UNAIDED

FIVE ITEMS

#	NUMBERS	RESP	#	NUMBERS	RESP	#	NUMBERS	RESP
1	3 9 8 1 0		1	1 2 4 3 7		1	6 3 8 9 7	
2	4 0 2 1 3		2	4 7 8 6 9		2	5 3 2 1 6	
3	9 0 7 5 8		3	1 2 8 3 6		3	9 5 1 7 3	
4	5 3 8 7 4		4	4 8 2 7 9		4	0 2 6 3 1	
5	3 1 9 5 0		5	6 3 5 1 8		5	4 7 2 9 1	
6	9 7 8 2 0		6	2 0 9 4 7		6	3 7 8 1 5	
7	2 9 1 4 3		7	3 8 7 9 1		7	1 9 6 8 5	
8	3 0 2 7 4		8	8 4 2 5 0		8	1 2 9 8 0	
9	1 3 2 6 4		9	2 3 4 0 1		9	9 0 7 6 1	
10	9 3 4 5 0		10	6 4 8 9 3		10	1 7 8 4 3	

A photograph of a cityscape at sunset. The sun is low on the horizon, creating a bright lens flare and reflecting off the water in the foreground. The buildings are silhouetted against the sky, and their reflections are visible in the water. A prominent feature is a tall, brick chimney stack. In the foreground, there are some boats and a red structure with the letters 'BAR' and 'BYE' visible. The overall scene is a mix of modern and industrial architecture.

RHYMING ALTERNATIVES

SEVEN WORDS



She said he was very

DEMOCRATIC.
DIPLOMATIC.
BUREAUCRATIC.
ACROBATIC.
AUTOCRATIC.
CHARISMATIC.
SYSTEMATIC.



She knows about the REPUTATION.
SPECULATION.
VALUATION.
RADIATION.
RESTORATION.
SEPARATION.
RESIGNATION.

Playing Cards





Analytic Training

Many occasions on which we are forced to rely on the acoustic signal and can't use our language knowledge to derive the meaning.

Analytic training is designed to provide practice in discriminating between speech sounds such as consonants and vowels, may also look at other speech “features” such as syllabic, or stress patterns.



BYE

SIGH

DIE

GUY

PRY

PIE

TIE

VIE

FLY

PLY

FRY

THIGH

CHAI

TRY

CRY

NIGH

MY

LIE

WHY

DRY

RYE

HIGH

SHY

SPY

STY



Synthetic Training

Materials that attempt to replicate the realities of everyday conversations

Connected materials enable the client to use her/his language knowledge to “fill in the gaps,” which are often created by hearing loss.





Slide Shows

I have built up a large collections of pictures over the past ten years and often use these in collections related to a specific theme.

Can be presented as PowerPoint files or using the iPad



Where on earth?

Part 1



Africa

South Africa



Hong Kong







Malaysia





Australia





Story Telling

May seem a strange material to use with adults, but stories provide the opportunity for the client to “sit back and listen” to several minutes of connected speech.

Technique is used in other settings with adults – hospices, centers for older people with cognitive impairments, etc.





Speech Tracking

Technique that involves reading a story line-by-line

Client has to repeat *every word* before moving on to the next line

Continues for five minutes, computer automatically calculates number of words correctly repeated over that period to give a *Tracking Rate* in words-per-minute



KTH Speech Tracking

- Spens and Gnospelius (1992)
- Live-voice presentation but text format is predetermined.
- Entered into a computer line by line.
- Displayed on monitor for the speaker
- Computer records presentation times and repeats
- Repeats are only repair strategy
- Word displayed after two repeats





Kumanjayi

The story developed for use with the program is over 160,000 words long

Needed copyright free material for ease of distribution

Told in the first person, and an attempt made to use a relatively constrained vocabulary

Introductory exercise also developed to provide necessary background and orientation



Kumanjayi

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Australia















Australia





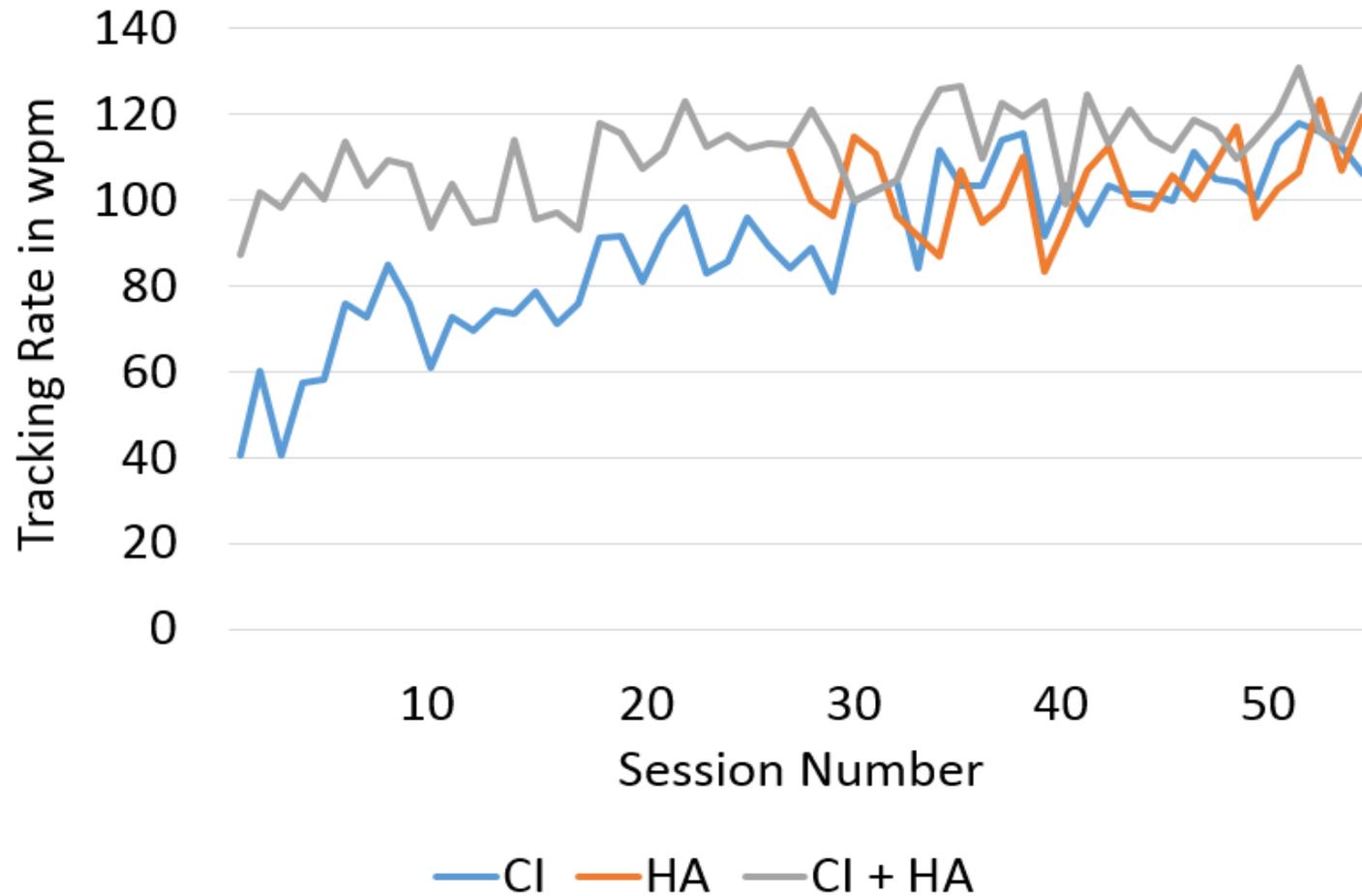


Client #1

Woman in late 50s, long-term HL, opted for CI in one ear, continues to use HA in other ear. At first, training focused on CI only and CI + HA. Then introduced a third condition, HA only, to compare performance.

Speech Tracking results show a steady improvement over a period of around one year.

Client #1



Client #1



“I thought I had speech discrimination and understanding pretty much under control after wearing a hearing aid for the majority of my life, but, as a new cochlear implant recipient, there were plenty of nonsensical sounds swimming around in my head that I struggled to understand. Auditory training simply helped to make sense of sounds and turn them into comprehensible speech. Geoff not only helped me to maximize my comprehension and processing time, but, more so, guided me in gaining the confidence in my own ability to do so.”



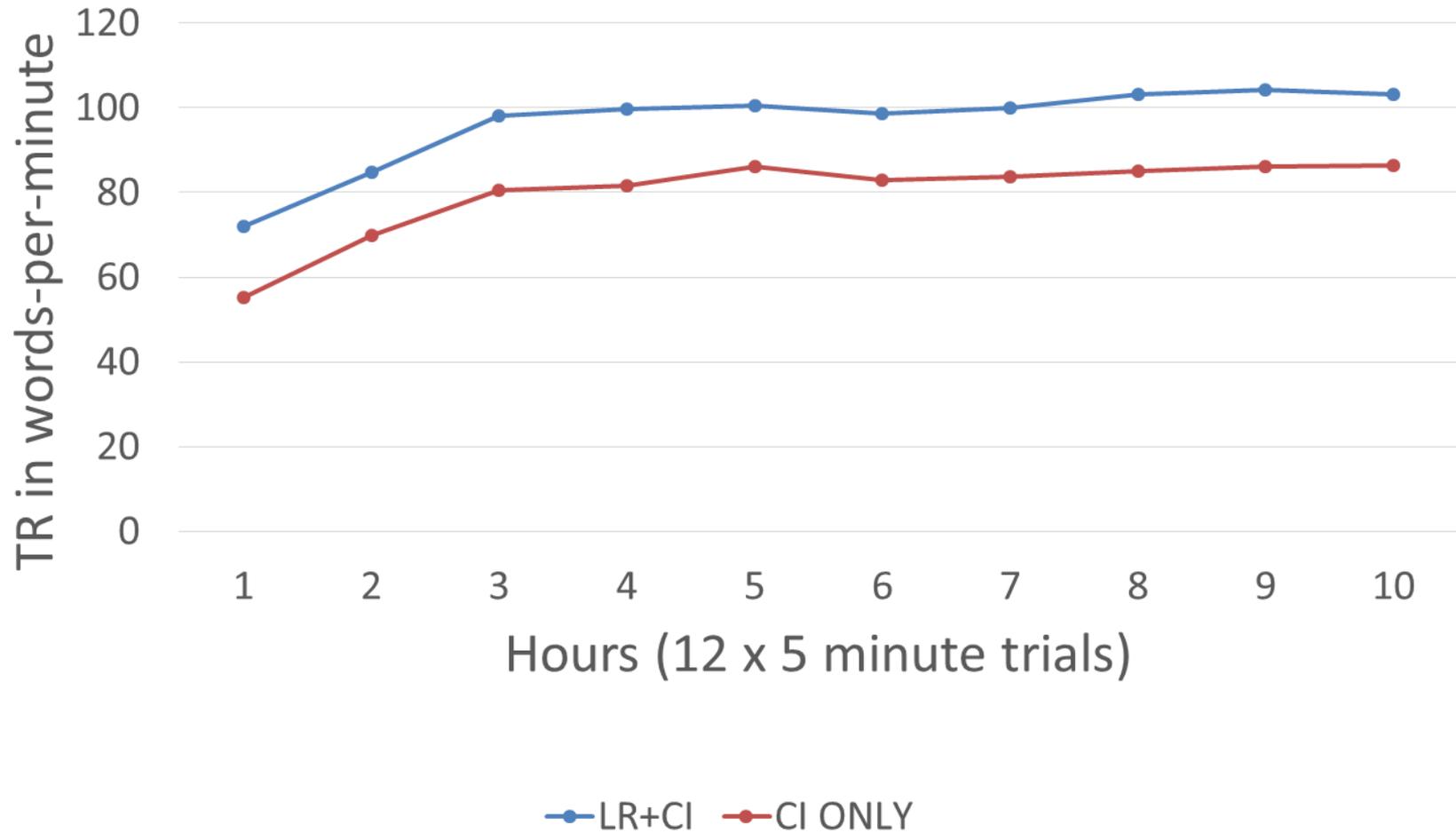
Client #2

Woman in her early 50s with a congenital progressive HL. Had gone from mild HL in elementary school to profoundly deaf by her mid-20s.

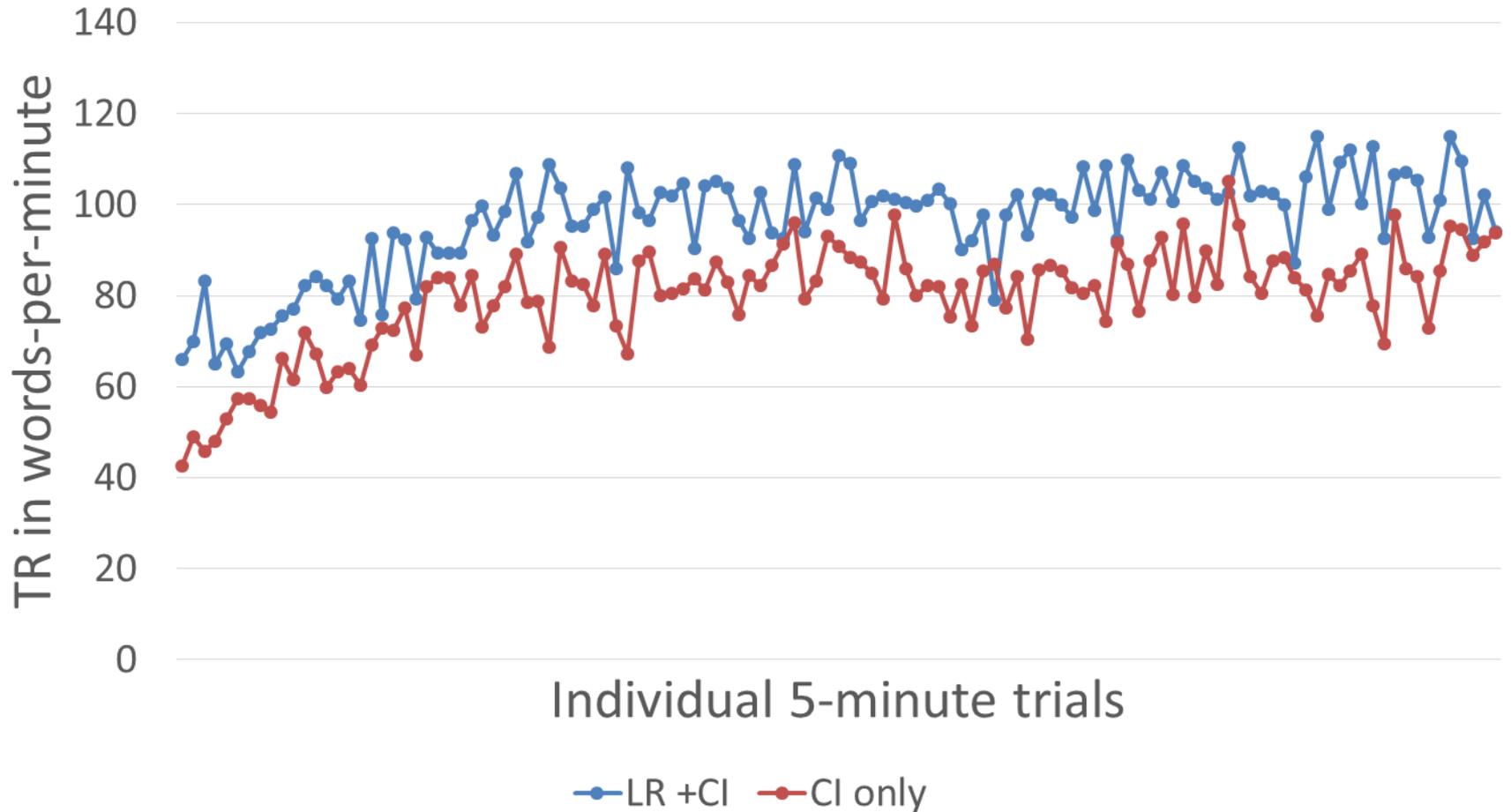
Had not worn HAs for many years prior to receiving a CI about 6 months prior to starting training.

Motivation was “personal training for brain and hearing.”

Client #2



Client #2



Client #2



“I always want to get still higher tracking rates and sentence scores in aural rehab sessions, but I'm finding that it's really more about continuing to develop listening endurance/stamina and learning to listen mindfully, regardless of stress/energy levels, or distractions. I've noticed the more mindful I am during an individual 5 minute tracking segment, the higher the number and ease of listening.”



Speech Tracking Modification

Conventional Speech Tracking is too difficult to use with some subjects. Recommend that it should not be used for training if TR is 20 – 25 wpm.

Use a modified task, present a story line by line, one repeat of each line, score number of words correctly identified, provide immediate feedback, at end of each section of the story (around 200 words)

Sometimes use this task in noise with clients with higher TRs



The Emperor's New Clothes



PART 1



I am going to tell you a story



that happened many, many
years ago

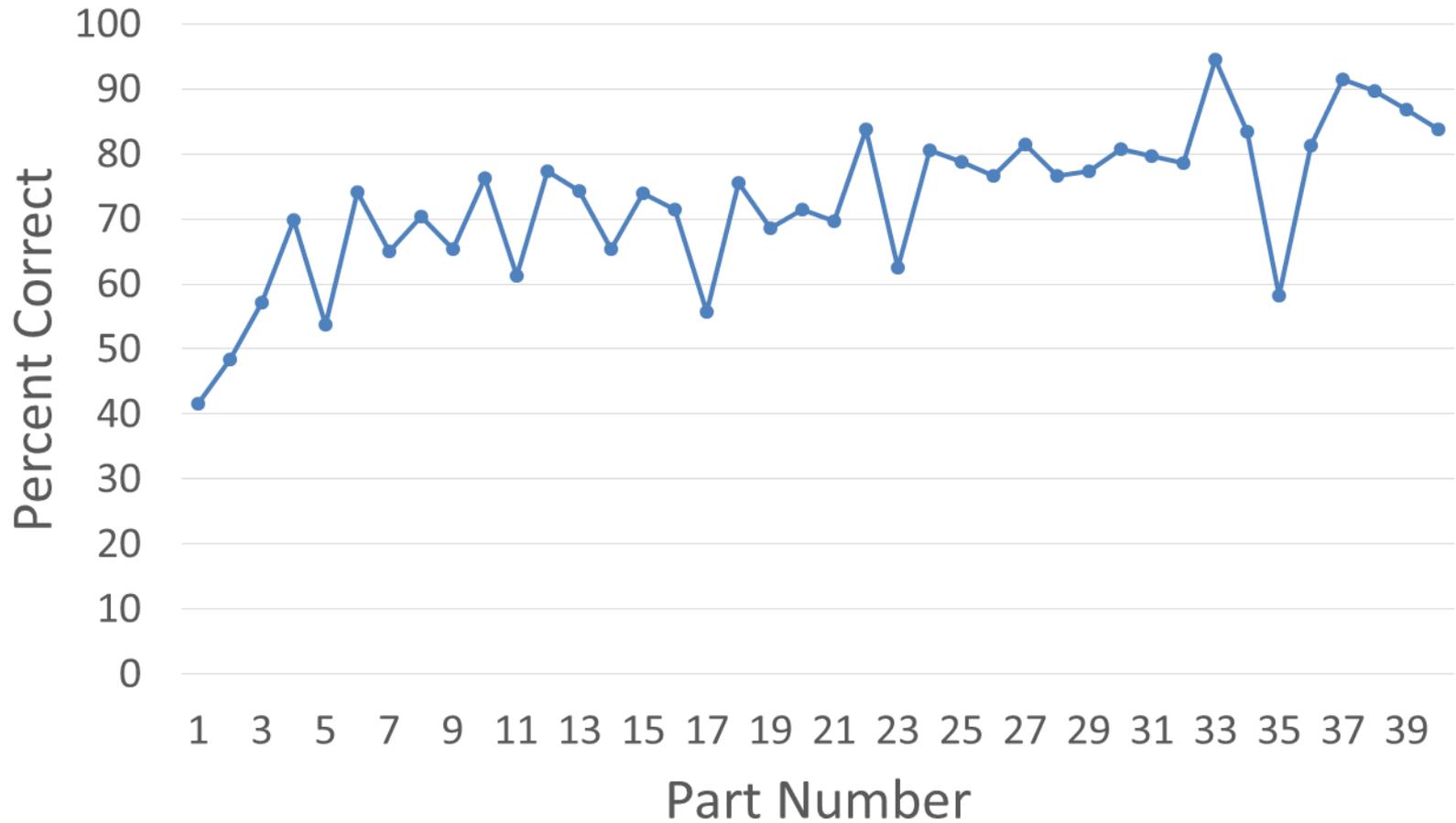


Client #3



Woman in her late 50s with a congenital HL. Wore HA's, but relied heavily on LR for speech understanding. Was unable to complete any open-set auditory exercises at the beginning of training.

Subject 3





How to become an “expert”

Work of Ericsson and colleagues has shown the need for practice to become an “expert”

Striking finding is the ten thousand hour “rule” - applies to figures as different as Bill Gates and the Beatles (Gladwell, 2008, *“Outliers”*)

Unreasonable to expect that any adult CI user could practice for such an extended period BUT Ericsson’s work emphasizes that performance level is correlated with amount of practice – “Time on task”

Self-training



Number of computer-based programs, online resources, and apps for people with hearing loss.

Contact me for a list of iPad apps I find useful

Also consider enlisting the help of family members and friends to start “Hearing at Home”

Might provide way to “clock up the hours”



Conclusion

AT should be an important part of the post-fit period for adults with HAs and/or CIs. Need to try to ensure that adults get as much support and training as possible.

Not enough to fit CIs or HAs.

Need ongoing support, training, encouragement, and affirmation

Perhaps we need to go



Back to the future!





CONTACT

hearf@aol.com

www.hearf.org

Hearing Rehabilitation Foundation

35 Medford Street

Somerville, MA 02143