

# Counseling in Audiologic Rehabilitation: Perspectives, Patient-Centered Care, and Lessons Learned from the Trauma Literature

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## Disclosures

1. Financial: Salary from East Tennessee State University and the Mountain Home VAMC
2. Non-financial: Chair, American Tinnitus Association's Scientific Advisory Committee and ATA Board member

The contents of this presentation do not represent the views of the Department of Veterans Affairs nor the United States Government.

# Agenda: Apologies to Dr. John Greer Clark

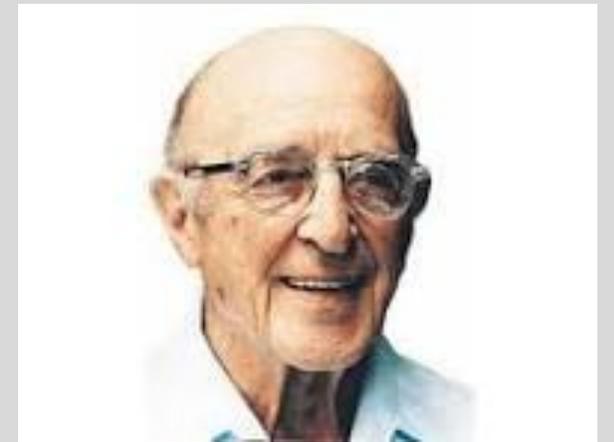
- 8:00-8:45AM: Components of person-centered care and personal impact of hearing loss
- 8:45AM-9:30AM: Measures of hearing loss impact: intake form validation and self-efficacy for patients in the audiology clinic
- 9:30-9:45AM: break
- 9:45-10:30 AM: Translating trauma counseling to the audiology clinic (45 minutes)
- 10:30-10:45AM: Break
- 10:45AM-11:15AM: Medical Humanities in audiology
- 11:15-11:45: Case presentations
- 11:45-12:00: Q&A?

# Patient well-being requires vigilance

- Sir Osler (1899) quoted in Clark et al (2021): “Care more particularly for the individual patient than for the special features of the disease.”
- Another example (from tinnitus), Pryce & Shaw (2019) suggest: “In order to explore tinnitus, it is vital that we understand the experience of the perceiver rather than extricate the perception from the perceiver.”
- Counseling should extend beyond the “typical content transfer of hearing information, into the realms of personal support, self-advocacy, development and motivational engagement.” (Clark & English, 2019)
- Clinician must be vigilant to the patient’s condition beyond screening and testing; includes observing and reporting appropriately patient stress, abuse, depression, or colleague/caregiver stress
- Likely includes difficult conversations w/ patients, their families, interprofessional partners

# Person-Centered Care: Carl R. Rogers

- Theory of therapy and interpersonal relationships within the “client-centered” framework (1959)
- Note that this book chapter has been cited 10,432 times as of 1/21/26
- Roots of the Person-centered approach: “It is that the individual has within him or herself vast resources for self-understanding, for altering the self-concept basic attitudes, and his or her self-directed behavior – that these resources can be tapped if only a definable climate of facilitative psychological attitudes can be provided.”
- Rogers specifies three elements important for the clinician who intends to support the growth of the client/patient:
  - Genuineness, realness or congruence
  - Creating a climate in which the clinician’s acceptance of the patient is unconditional
  - Therapist senses the “feelings and personal meanings” being experienced by the patient and communicates clearly the “empathic understanding”



# Person-Centered Care: Carl R. Rogers

- Genuineness, realness, congruence
  - The person-centered approach “rests on a basic trust in the organism” and it is imperative to establish and nurture trust
  - “The more the therapist is him or herself in the relationship, putting up no professional front or personal façade, the greater is the likelihood that the client will change and grow in a constructive manner.”
  - Therapist making themselves “transparent” to the patient is prioritized, the client therefore recognizes that the therapist is not “holding back” in any way, and that what is being expressed is being experienced “at a gut level” by the therapist
  - Therefore, there is close matching, or congruence, between “the gut level” awareness of the therapist’s understanding of the patient and what is being expressed to the patient

# Person-Centered Care: Carl R. Rogers

- Creating a climate for change through acceptance, caring for and prioritizing a sense of “unconditional positive regard” for the patient
  - The possibility for positive therapeutic change is enhanced through the therapist’s acceptance of the patient in that moment
  - The patient is “prized...in a total rather than a conditional way.”
- Empathic understanding
  - Therapist communicates the desire to develop an understanding of the patient’s feelings and “personal meanings” regarding hearing loss and its effect on quality of life/life activities
  - Requires active listening; being “inside the private world of the other” so that the therapist can put into words the thoughts (worries, challenges) of the patient
  - “Listening, of this very special kind, is one of the most potent forces for change that I know.”

# Components of Person-Centered Care: Carl R. Rogers; adapted by Clark and English, 2019

- Authors identify 7 components applicable to audiologic practice – obvious, but routinely practiced?
  1. **Diversity recognition:** Respect for differences in cultural and lived backgrounds/opinions that aims the interaction toward a recognized common ground (ie., minimizing biases)
  2. **Therapeutic listening:** clinician demonstrates an attempt to understand patient/family perspective (ie., empathically) regarding hearing loss impact with an “unconditional positive regard” and without judgment
  3. **Information sharing:** Discussing findings in the context of the patient’s expressed concerns, with detail matching patient readiness to accept detail, and with terminology that the patient can employ for themselves in the future
  4. **Shared decision making:** Shared goal setting encourages participation and compliance
  5. **Assessed Outcomes:** Functional capabilities and care satisfaction evaluated using validated and accepted measures
  6. **Holistic outlook:** Vigilance directed at safety and well-being of patient in the clinic and in their life/environment
  7. **Follow-through:** Framework to support timely and accessible service provision that maximizes the likelihood of satisfaction and success with intervention

# Perspectives regarding empathy

- Reiss (2017): The Science of Empathy
  - Two forms of empathy are described: emotional empathy and cognitive empathy
    - “Empathy is not always an equal opportunity benefactor. People are evolutionarily wired to recognize and respond to differences and socially or culturally based perceptions can trigger subconscious fears...” and this would impede emotional empathy; hence, Cognitive Empathy also required
    - “Cognitive empathy must play a role when a lack of emotional empathy exists because of racial, ethnic, religious, or physical differences.”
    - Perhaps a difficult case for a healthcare provider: Consider the family refusing vaccinations, then suffering from the disease
    - As Reiss reminds us: “Health care settings are no exception to conscious and unconscious biases...” and that,
    - “If human existence was simply the result of ‘survival of the fittest,’ we would be wired solely to dominate others, not respond to their suffering.”

# Perspectives regarding empathy

- Reiss (2017): The Science of Empathy
  - Regarding diversity, biases, and unconditional positive regard:
    - “...emotional sharing most easily occurs among members of the same ‘tribe.’” As such, implicit and explicit biases affect the willingness to empathically view ‘others.’
  - Further, “research on empathy and altruism has demonstrated that enhancing perspective taking, the capacity to see a person’s situation from his or her point of view, coupled with enhanced value being placed on the welfare of those who are unfamiliar, can override bias.”
  - Batson and colleagues (2007) found that empathic concern is not necessarily elicited by perceived similarity to others or by affective sharing but can also be elicited by valuing the welfare of people who appear dissimilar [to the clinician]
  - “If we learn to open our hearts, anyone, including the people who drive us crazy, can be our teacher.” – Pema Chodron

# There is No “I” in “Empathy”; English, 2021

## Sample Shift-Responses:

When we say: “I know how you feel;” we may be announcing (in a way), “This is me empathizing with you” in which case we are shifting attention and care to ourselves.

Similarly: “I understand why this is worrying you,” or

“I can see how this is difficult”

## Sample Support-Responses

“How are you feeling about the situation?”

“This is weighing on your mind? Can you explain for me how and why?”

“This is a difficult stage for you, what do you believe is important for me to know?”

# Patient well-being requires vigilance (Greer et al., 2020)

- Example: being vigilant to a patient's self-concept, or their beliefs about themselves; has implications not only for the clinic population often seen by audiologists, but particularly for those audiology patients who are trauma victims, perpetrators, witnesses
- Consider the more typical case of an aging individual (specifically someone who has the luxury of aging); “I'm too young for.....(hearing aids, chronic pain, etc)”
- We may apply “continuity theory” (ie., Amesberger et al., 2019) in an attempt to maintain a patient's prior self-concept; although an adult may resist change, self-concept is not immutable as it can be influenced by life experiences
  - I still want to play basketball, but.....
- Consider the difference between asking someone their age, and asking someone how old they feel; Bergland et al (2014) asked 2471 participants “how old do you feel” at two different points in time (5 years apart). Respondents reported subjective age up to 20 years less than chronological age, and after 5 years passed, the difference between subjective and chronological age *increased*
- “Successful aging” was found to be more likely among the patients whose subjective age was low

# Turns out: Patients often belong to families

- Vigilance will help the clinician untangle challenges that the patient does not readily acknowledge (to themselves and others)
- Family members with different opinions re: hearing loss affecting one of them; may compel separation, or at least consistent contention(?)
- Important to comment upon the hearing loss without offending the patient or (unproductively) agreeing with (and thereby offering validation to) a partner's complaints? Commenting re: the high prevalence of hearing loss, and related challenges expressed by a variety of patients, may help
- Attendance by other family/support members to be encouraged, consider using telemedicine platforms if distance is an issue
- Important to recognize that, although the patient may not have been complaining re: hearing (ie., everyone except the patient seemed to notice a change in hearing) the patient's experiences must be considered, and often reveal that the patient was having substantial difficulty and was aware of the difficulty (denial? stoicism?)

# Bennett (2024): AIMER intervention

- Asking: Ask clients about their wellbeing; many hearing healthcare providers wait for the patient to raise difficult topics, such as MH concerns
- Inform: Patients benefit from an understanding of the social-emotional well-being impacts of hearing loss, as well as the effects hearing loss has on relationships
- Manage: support patients' well-being and provide help-seeking opportunities for patients; many auds “expressed lack of knowledge regarding who, when and how to refer for psychological services.”
- Encourage: patients may have the means by which they can access resources to support well-being, the clinician should facilitate accessing the resources
- Refer: Interprofessional care facilitates patients addressing issues that could impede rehab goals
- NOTE: “cure” is not listed among the intervention's objectives

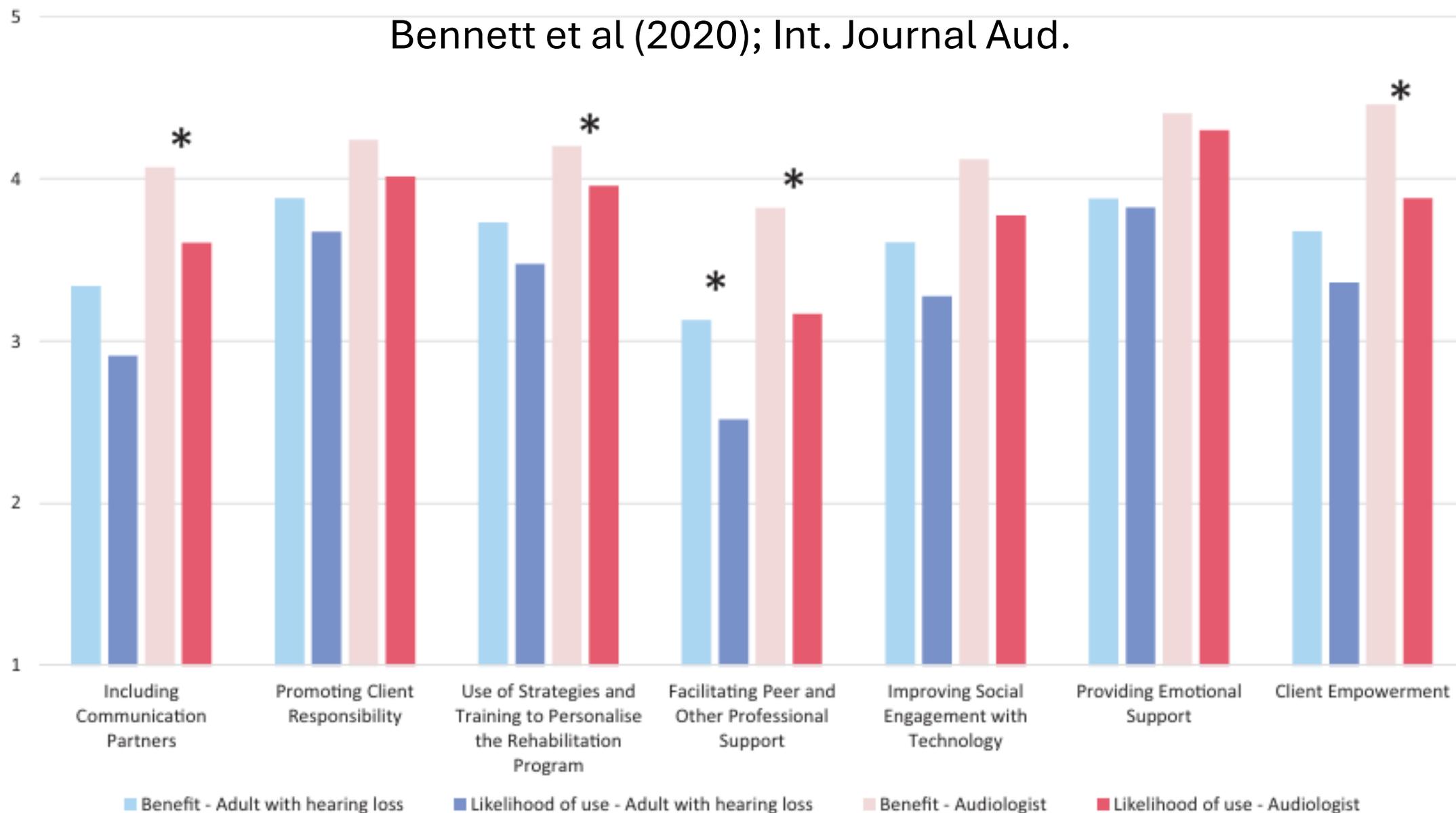
# Bennett et al (2020): comparison of intervention components' perceived benefit versus the likelihood of a component's implementation

- 200 patients and 65 Auds completed an online survey in which perceptions of interventions' "perceived benefit" was rated and compared to each intervention's "perceived likelihood of use"
- 7 elements of clinical intervention were assessed
  - Including Communication partners
  - Promoting Client Responsibility
  - Use of Strategic and Training to Personalize the Rehabilitation Program
  - Facilitating Peer and Other Professional Support
  - Improving Social Engagement with Technology
  - Providing Emotional Support
  - Client Empowerment
- In all cases, patients and auds rated perceived benefit as higher than likelihood of use; greatest differences observed for "Facilitating Peer and Other Prof. Support"

# Bennett et al (2020): comparison of intervention components' perceived benefit versus the likelihood of a component's implementation

- Trends and findings
- Greater value was reported by patients and providers for the “internal-based” approaches (ie., the patient’s emotional response, sense of empowerment, and responsibility)
- Perceptions of support groups and communication partners was given less value
- Authors acknowledge that much of the profession’s literature emphasizes the value of a patient’s social environment and social support
- Emotional support was regarded as an important element of intervention, however “clinical observations suggest that emotional support is infrequently provided.”
  - Barriers specified by audiologists included “lack of skill, confidence, time, and uncertainty about scope of practice, and lack of evidence for [emotional support’s] value”
  - “The most difficult times for many of us are the ones we give ourselves.” — Pema Chodron

## Bennett et al (2020); Int. Journal Aud.



**Figure 1.** Comparison *perceived benefit* against *perceived likelihood of use* for participant mean rating scores for each theme (participant groups analysed separately). Significant differences denoted by \*, calculated using independent t-tests with Bonferroni corrected  $p$  values below 0.007 indicating significance.

# Counseling myths to consider

Clark & English (2026)

1. Content counseling: patient education, requires monitoring the pt's state and their accepting of the counseling information
  - Patient with thresholds in the mild loss range
  - Express loss with consideration of the dB's logarithmic scaling
2. Personal adjustment counseling: most auds report lower levels of confidence counseling in this area (no wonder patients bothered by tinnitus are underserved)

Myth #1: not enough time to counsel effectively in routine aud clinic settings

Refutation: Authors indicate (ie., Stewart et al., 2024) that the effectiveness of personal adjustment counseling has less to do with the time taken than the acceptance and listening demonstrated by the clinician; person-centered counseling employs the time to develop common ground and explore the patient's experience with hearing loss; arguably a better use of time than providing a "crash course" on the audiogram

# Counseling myths to consider

Clark & English (2026)

Myth #2: Counseling is all about giving advice and telling patients what to do

Refutation: The “expert model” is the “antithesis of shared-decision making,” one of the keystones of person-centered care. SDM conveys respect to the patient by combining clinical evidence with a patient’s personal context – serves in this way as a optimal blending of patient education and personal adjustment counseling. Advice is not “given” rather patient and provider strive for cooperative problem-solving

Myth #3: We need to fix the person’s problems

Refutation: Carl Rogers led the way in development of accepting professional relationships; patients are provided the tools to navigate barriers and resolve problems. Compassion and positive regard facilitate the patient’s natural history, while facts promote accurate self-talk, or narrative that maximize the probability that the patient can manage and, if necessary, co-exist with, the hearing-related challenges

“If someone comes along and shoots an arrow into your heart, it’s fruitless to stand there and yell at the person. It would be much better to turn your attention to the fact that there’s an arrow in your heart...” - Pema Chodron

## ....and another thing...Sweetow, 2019

Discusses training of Aud students re: counseling; summarizes much of what we've covered today

1. “The value of counseling to patient satisfaction cannot be overstated”
2. “Effective counseling entails conveying information and assisting patients in achieving personal adjustment” – requires listening, acknowledging patients’ feelings and experiences, and drawing the patient out (ie., ‘can you clarify what you meant’?)
3. Students learning to counsel face similar barriers as patients, and educators can adjust the classroom to a student-centered exchange rather than teacher-centered; everyone benefits from “achieving personal adjustment”

“We don't set out to save the world; we set out to wonder how other people are doing and to reflect on how our actions affect other people's hearts.” Pema Chodron

# Guidance for providing patient-centered care: English, 2022

- Addresses clinical applications of Audiology Practice Standards Organization (2021) guidelines for Hearing Aid Fittings for Adults and Geriatrics (APSO Standards 2 and 13 will be discussed)
- 15 APSO standards that address hearing aid assessments, fitting, standards; counseling is addressed as well
- English (2022) provides a summary of the counseling elements, intended to support patient-centered care
- Distinguishes “person-centered care” from “patient-centered care”
  - Person-Centered care associated with a “meaningful life”
  - Patient-Centered care associated with a “functional life”
  - English suggests that in audiologic practice, the setting and our training prioritizes “patient centered” more consistently (and reasonably) than “person centered”

# Guidance for providing patient-centered care: English, 2022

- Standards 2 and 13 specified by English as relevant for patient-centered care counseling and management in intervention endeavors including, but not limited to, hearing aid fitting and management
- Standard 2: (a) “Patient communication is conducted in a clear, empathetic manner (b) consistent with the patient's communication mode, comprehension, and their health literacy level. (c) Patient-centered and (d) family centered care is provided. The patient is encouraged to include communication partners (e.g., family members, significant others, companions) throughout the selection, fitting, and follow-up process.”
- The four components (a-d) suggest that the clinician can and will communicate professional values, inquire/learn about the patient’s values, patient goals and reservations; ultimately, the audiologist has a short time to build a “trust-based” relationship
- English quotes Teddy Roosevelt: “People don’t care how much you know until they know how much you care.”

# Guidance for providing patient-centered care: English, 2022

- Standard 2a: “Patient communication is conducted in a clear, empathic manner...”
  - Use of lay terminology and clear speech techniques, in addition to minimizing background noise and using effective lighting
  - A dialogue consists of at least two people talking, taking turns, listening when not talking
  - Not just gathering facts and details about a patient’s concerns, empathy requires more than attending to concerns the patient has, we must ask how the concerns affect living with hearing difficulties, AND we must express our understanding to the patient
  - Cites the 4 Habits Coding Scheme, an assessment of clinicians’ communication behavior as a way to assess and practice empathic communication objectives
  - “Empathic clinicians communicate understanding by encouraging patients to express the emotional impact of hearing loss, and supporting them as they identify and label those emotions.”

# Guidance for providing patient-centered care: English, 2022

- Standard 2b: “...consistent with the patient’s communication mode, comprehension, and health literacy level.” Example:
  - Conveying for example realistic expectations re: fitting
  - Assessing what a patient understands about hearing (loss), amplification, adjustment, needs, goals
  - Remember: “Just because we explained it doesn’t mean it was understood.”
  - The “teach back” strategy is recommended (ie., rather than asking a patient if something was understood, the clinician asks the patient to explain detail or understanding of a topic area
  - Consideration of health literacy: patient’s ability to use information rather than “just understand it”; pts benefit from being able to read graphs (ie., an audiogram, tympanogram, etc), calculate, use computer, etc. Literacy competence cannot be assumed, as 1/3 of adults (approx. 77 million) demonstrate limited literacy skills (US Dept. of Health/Human Svcs)
  - Health literacy affected by age, education (4-8<sup>th</sup> grade reading level specified), SES, first language variables

# Guidance for providing patient-centered care: English, 2022

- Standard 2c: “Patient-centered care...” Example:
  - The standard stresses “individualized” or “personalized” care; note, personalized care is not the same as person-centered care
  - Care components include obtaining case history, determining communication needs and preferences, and consideration of patient’s available resources
  - As English summarizes: “personalized care is the ‘what’ and person-centered care [as specified in the standards] is the ‘how’ as the latter entails, ‘providing care that is respectful of and responsive to individual patient preferences, need, and values, and ensuring that patient values guide all clinical decisions.’” Note: “guide” clinical decisions; the decisions are collaborated upon (ie., shared decision making)

# Guidance for providing patient-centered care: English, 2022

- Standard 2d: “...family centered care is provided. The patient is encouraged to include communication partners (e.g., family members, significant others, companions) throughout the selection, fitting, and follow-up process.”
  - There remains the need for considering what exactly “family” means
  - Not merely biological, “any group of intimates with a history and a future.”  
The family is defined by the patient
  - Ensures focus on shared disability or “third party” considerations: the hearing loss affects more than its owner; Scarinci indicated up to 98% of family members experience and report “third party hearing difficulty”
  - Suggestions for Family-Centered Care
    - Invite family members to join the appt.
    - Set up clinical spaces to be welcoming and effective for family members
    - Confirm at outset of appt. that family input will be sought along with patient-specific information

# Guidance for providing patient-centered care: English, 2022

- Standard 13: (a) Counseling is conducted to ensure appropriate adjustment to amplification, (b) and to address other concerns regarding communication. (c) Additional rehabilitative audiology is recommended if deemed appropriate.”
- 13a: “Counseling is conducted to ensure appropriate adjustment to amplification”
  - “Appropriate adjustment” identified as “mutually satisfactory conclusion to a joint goal-setting process.”
  - For example, reconcile target gain values with loudness comfort
  - Stress, pressure from family, lack of a ‘cure’ may confound adjustment
  - Compare standard instructions to joint goal-setting
  - “It’s normal to dislike the sound of your own voice [w/ new hearing aid fitting] but you will get used to it” versus, “How many more days would you like to try to get comfortable with your voice? After that trial period, call or email me and let me know how you’re doing. Then we can figure out the next steps.”

# Guidance for providing patient-centered care: English, 2022

- Standard 13: (a) Counseling is conducted to ensure appropriate adjustment to amplification, (b) and to address other concerns regarding communication. (c) Additional rehabilitative audiology is recommended if deemed appropriate.”
- 13b: “...and to address other concerns regarding communication. ”
  - Can choose from a number of self-assessment forms: HHIE, HHIA, THI, TFI, S-5, IOI-HA, etc.
  - Self-assessments as “springboard” to goal-setting conversations
  - Also references the International Classification of Functioning, Disability, and Health (ICF) as the means to discover the patient’s audiologic needs (activity limitation, environmental factors) as well as social and personal factors
  - Goal-setting is a negotiation and centered on the patient’s narrative/needs with objectives including “promoting patient responsibility” (ie., outcomes depend on patient’s active involvement) and “client self-empowerment” (patient taking control of the rehab process; patient self-efficacy, or confidence that they can be a productive partner in the rehab endeavor)

# Guidance for providing patient-centered care: English, 2022

- Standard 13: (a) Counseling is conducted to ensure appropriate adjustment to amplification, (b) and to address other concerns regarding communication. (c) Additional rehabilitative audiology is recommended if deemed appropriate.”
- 13c: “Additional rehabilitative audiology is recommended if deemed appropriate.”
  - Following Boothroyd’s (and others’) goal setting: “the reduction of hearing-loss-induced deficits of function, activity, participation, and quality of life through a combination of sensory management, instruction, perceptual training, and counseling” aims at the holistic approach required by PCC
  - Telehealth options can be explored, as can internet resources (including Individualized Active Communication Education (I-ACE) for self-guided learning
  - Relevant organizations (ASHA, AAA, ATA, IDA Institute, etc.) should be identified for the patient

# Hearing loss impact: WHO

- Key Facts (2/26/2025)
  - By 2050, nearly 2.5 billion people are projected to have some degree of puretone hearing loss, and more than 700 million will require hearing rehabilitation.
  - Unaddressed hearing loss poses an annual global cost of almost US\$ 1 trillion.
  - More than 1 billion young adults are at risk of permanent, avoidable hearing loss due to unsafe listening practices.
- When unaddressed, hearing loss influences many aspects of life for the individual:
  - Limitations in communication and speech
  - Adversely affected cognition
  - Social isolation, loneliness and stigma
  - Financial impact on society and economy
  - Effects on quality of life with regard to years lived with disability and disability adjusted life years
  - Limitations in access to education and employment

# Hearing loss impact: WHO

- Interventions supporting rehabilitation for people with hearing loss include:
  - The provision of, and training in the use of, hearing technologies (e.g. hearing aids, cochlear implants and middle ear implants);
  - Speech and language therapy to enhance perceptive skills and develop communication and linguistic abilities;
  - Training in the use of sign language and other means of sensory substitution (e.g. speech reading);
  - The provision of hearing assistive technology, and services (e.g. frequency modulation and loop systems, alerting devices, telecommunication devices, captioning services and sign language interpretation); and
  - Counselling, training and support to enhance engagement in education, work and community life

# Measuring Hearing Loss Impact: communication focus

- Puretone sensitivity, Speech testing (“why do we continue to do this in quiet?” – Margolis and Wilson)
- Functional measures often provide more implementable information than most testing; Examples include:
  - Communication Profile for the Hearing Impaired (CPHI; Demorest and Erdman, 1987); long (145 items) and extensive interview instrument (we get what we pay for)
  - HHIE/HHIA provide quick self-assessments (Ventry & Weinstein, 1982; Newman et al., 1990; suggestions for revision from Cassarly et al., 2020)
  - Listening Activity Questionnaire (Sandridge & Newman, 2006): Items re: communication in crowded settings, small groups, one-on-one; also questions patients re: situations in which they would like to improve (ie., motivation for wearing hearing aids)
- Assessments re: hearing aid use
  - IOI-HA (Cox & Alexander, 2001)
  - (A)PHAB (Cox, 1997)
  - Hearing Aid Self-Efficacy Questionnaire (West & Smith, 2007)

# Measuring Hearing Loss Impact: psychological elements

- Screening forms employed by Auds in a variety of settings:
  - Hospital Anxiety and Depression Screener (HADS; Zigmond & Snaith, 1983)
  - Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002)
  - Generalized Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006)
  - Primary Care PTSD Screener (PC-PTSD-5)
- Some of these intake forms are more invasive than forms employed by Auds for communication profiles, particularly those related to PTSD
  - In the past month, have you .....
  - “had nightmares about the event...” “felt guilty or unable to stop blaming yourself or others for the events....”
  - Longer forms (ie., the MISS (1988) are even more invasive (“When I think of things I did in the military, I wish I was dead” “The people who know me best are afraid of me”)
- Such intake instruments support onward referrals and triage for MH conditions that may or may not be related to hearing loss (or tinnitus, or sound tolerance issues)

# Self-Efficacy Theory in Audiology

- Belief, or *domain-specific* confidence, individuals have in their abilities (or a specific skills) to accomplish, develop, and/or maintain a certain behavior, including health behaviors (Bandura, 1986, 1997)
  - Different from a general self-confidence or self-esteem, self-efficacy can be high in one domain, low in another
- Balance Dysfunction/Falls (Tinetti et al., 1990)
- Hearing Conservation
  - Hearing protective devices (Lusk and colleagues, 1999, 1997; Melamed et al., 1996)
- Hearing Aid Intervention (Smith & West, 2006 a,b; West & Smith 2007)
- Communication Strategies Training (Jennings, 2007)
- Tinnitus Management (Smith & Fagelson, 2008, 2011; Fagelson & Smith, 2016)

# Tinnitus Self-Efficacy

“The confidence individuals have in their capabilities to perform courses of action needed to manage their tinnitus successfully.”

# Self-Efficacy Theory: Bandura (1986)

- Individuals make judgments about their self-efficacy beliefs through 4 sources of information
  1. Mastery experiences – evidence supported by accomplishment (whether easy or hard)
  2. Vicarious experiences – evidence of, and comparison to, others' success (modeling)
  3. Verbal persuasion – counseling, examples, evaluations
  4. Physiologic and affective states – enhancement of physical status and reduction of negative emotional states, as well as fostering correct interpretation of sensory information and physiologic state

# Measuring Self-Efficacy

- Individuals' perceptions of their tinnitus management abilities assessed through completion of questionnaire
- Questions intended to address specific items associated with tinnitus problems and issues related to control over tinnitus
- Bandura's Guidelines (2001)
- Wording of the item
  - Assesses patients perceived ability to accomplish a specific task, therefore worded: "I *can*"
  - No multi-barreled items (ie., "confidence that I can do this AND that")
- 0-100% response scale, 10-unit intervals that reflect gradations of certainty in ability

• 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Cannot do this at all                      Moderately certain I can do this                      I am certain I can do this

# Development of the Self-Efficacy for Tinnitus Management Questionnaire (SETMQ)

- In the context of existing questionnaires
  - Many functional and emotional items consistent across different intake forms, self-assessments of handicap
  - Sleep, communication/hearing, emotional response to tinnitus, concentration ability (ie., Tyler, 2006)
- Common patient complaints
  - Lack control over the sensation (on tinnitus handicap inventory (THI), more than 85% endorse that specific item)
  - Lack understanding of its source/causes/mechanisms/persistence
  - Self-image affected, ability to thrive and contribute in the workplace questioned, physical and psychological stress, increased listening effort

# Sample TSEQ Items (Smith & Fagelson, 2008)

1. I can control my anger when I hear my tinnitus.

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do                      Moderately certain                      I am certain  
this at all                      I can do this                      I can do this

6. I can control feelings of being afraid when I hear my tinnitus.

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do                      Moderately certain                      I am certain  
this at all                      I can do this                      I can do this

# Sample TSEQ Items (Smith & Fagelson, 2008)

8. I can understand the changes to my hearing system that caused my tinnitus.

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do this at all      Moderately certain I can do this      I am certain I can do this

9. I can do things to protect my hearing without making my tinnitus worse.

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do this at all      Moderately certain I can do this      I am certain I can do this

# Sample TSEQ Items (Smith & Fagelson, 2008)

13. I can avoid thoughts that my tinnitus makes me less of a person than I was before I had tinnitus.

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do this at all      Moderately certain I can do this      I am certain I can do this

14. I can avoid thoughts that I have lost my identity because I have tinnitus

How certain are you that you can do this right now?  
(circle one %)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%  
Cannot do this at all      Moderately certain I can do this      I am certain I can do this

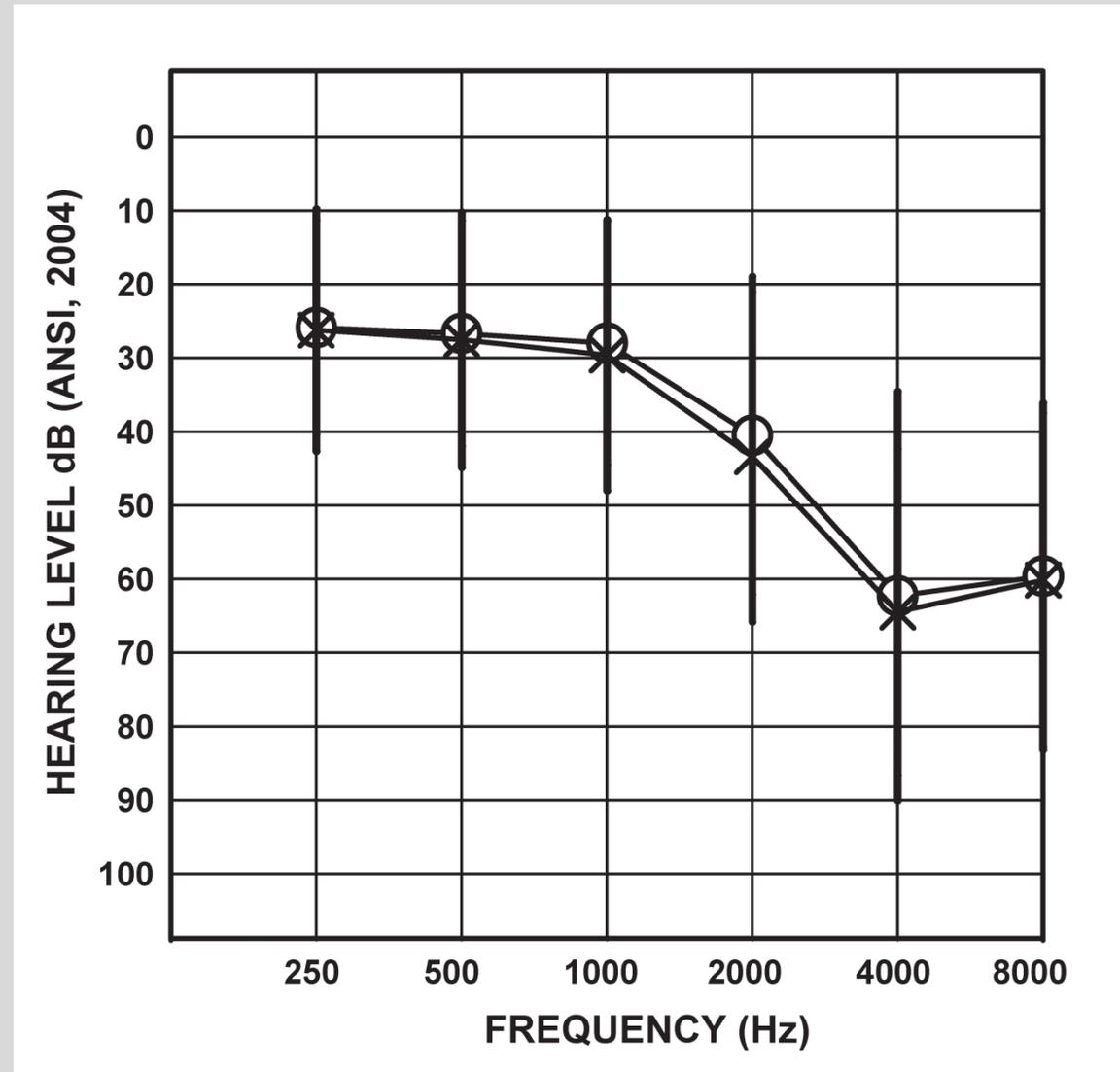
# Assessment of the Psychometric Properties

- Principal component analysis (PCA) with varimax rotation
  - Provides subscale structure by assessing relations between variables and combining those that are correlated, thereby reducing the number of dimensions in a large data set (ie., reduces a dataset to its principal components)
  - Construct validity – the extent to which the questionnaire assesses tinnitus’s effects (or some other underlying concept that motivates the questionnaire)
  - On the DHI, 25 questions elicited responses with “principal components” corresponding to the Function, Physical, and Emotional effects of imbalance
- Chronbach’s  $\alpha$ 
  - Internal consistency – how strongly are the survey items, presumably measuring some coherent underlying concept, correlated w/ one another?
- Intraclass correlation
  - Test-retest reliability

# Methods: Participants

- N=199 veterans (193 male, 6 female)
  - 63.3 years ( $SD = 9.5$ , range = 27.1 to 86.6)
  - 195 had hearing loss as depicted on a puretone audiogram
  - 166 w/ bilateral tinnitus, 14 unilateral, 12 extracranial, 7 could not report location
  - 131 aided, 178 received masking devices (either ear level or bedside)
  - Piloted 44 questions with input from patients and providers who work with patients bothered by tinnitus

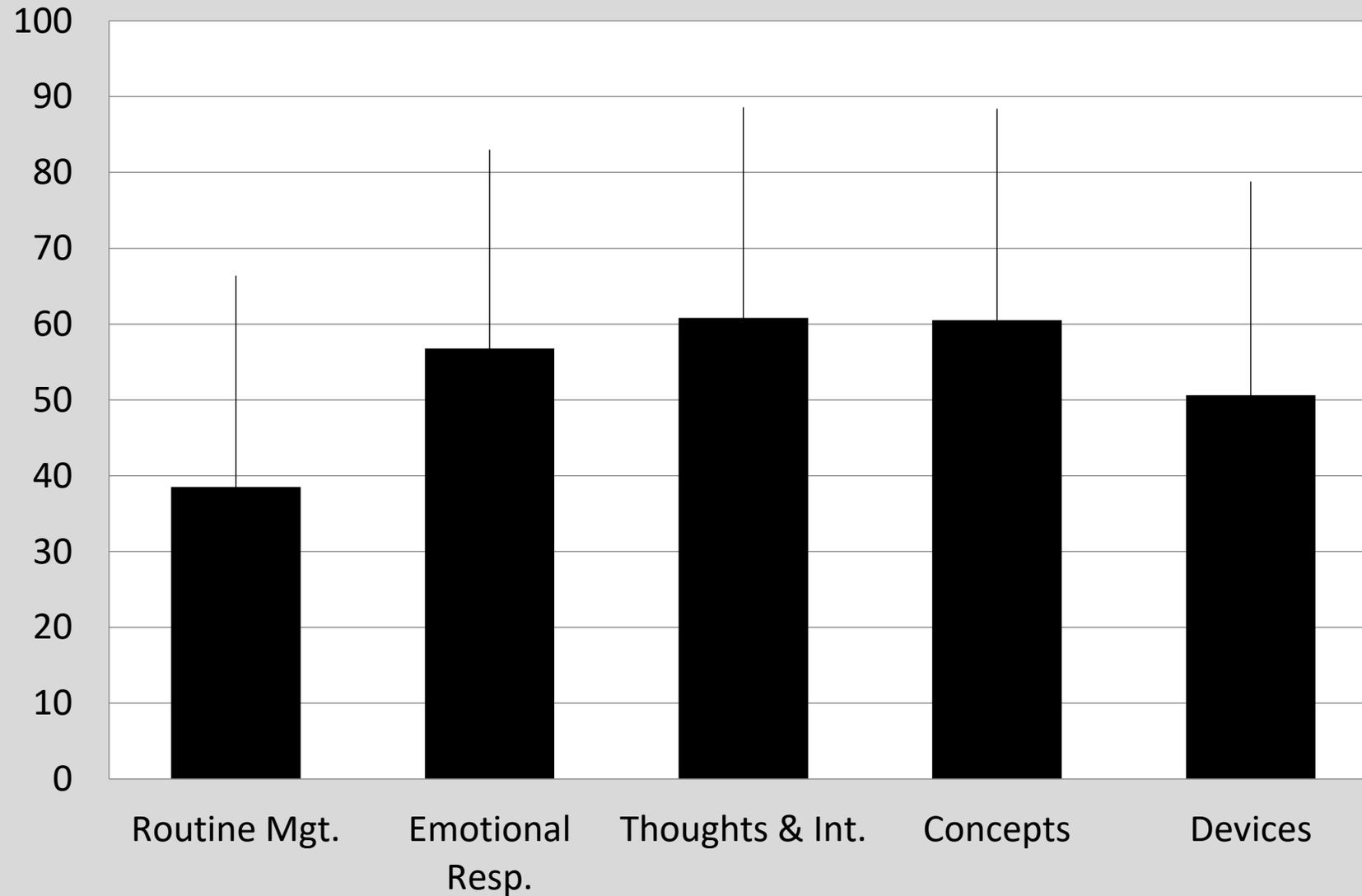
Participants: N=199; 98 w/ T only; 36 w/ Psych. Dx; 65 w/ PTSD Dx



# Results: PCA

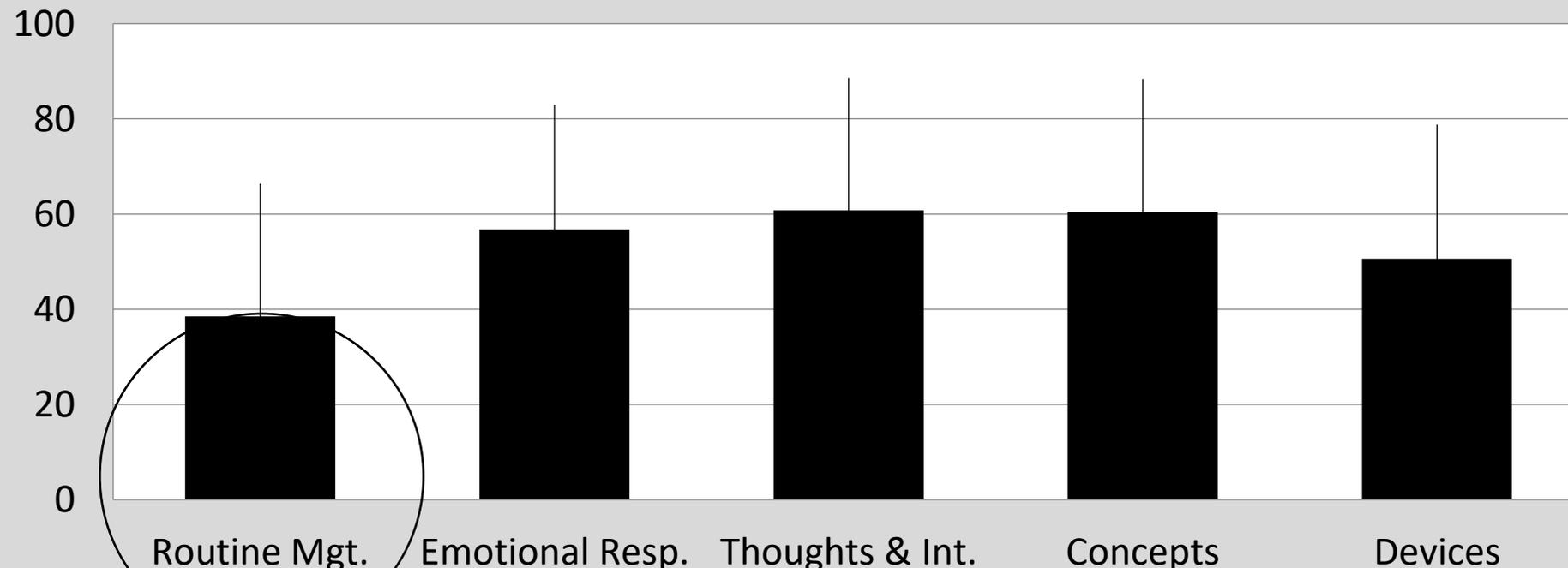
- 5-factor solution accounted for 75.8% of the variance
  - Routine Tinnitus Management Subscale (26.1%)
  - Emotional Response Subscale (18.8%)
  - Internal Thoughts and Interaction with Others Subscale (16.0%)
  - Tinnitus Concepts Subscale (8.5%)
  - Devices Subscale (6.4%)
- Average factor loading values was .71 (range = .51 to .86)
- 4 questionnaire items failed to load acceptably on a single factor and were omitted in the final version, leaving 40 total questions

# Mean (w. SD) Subscale Responses



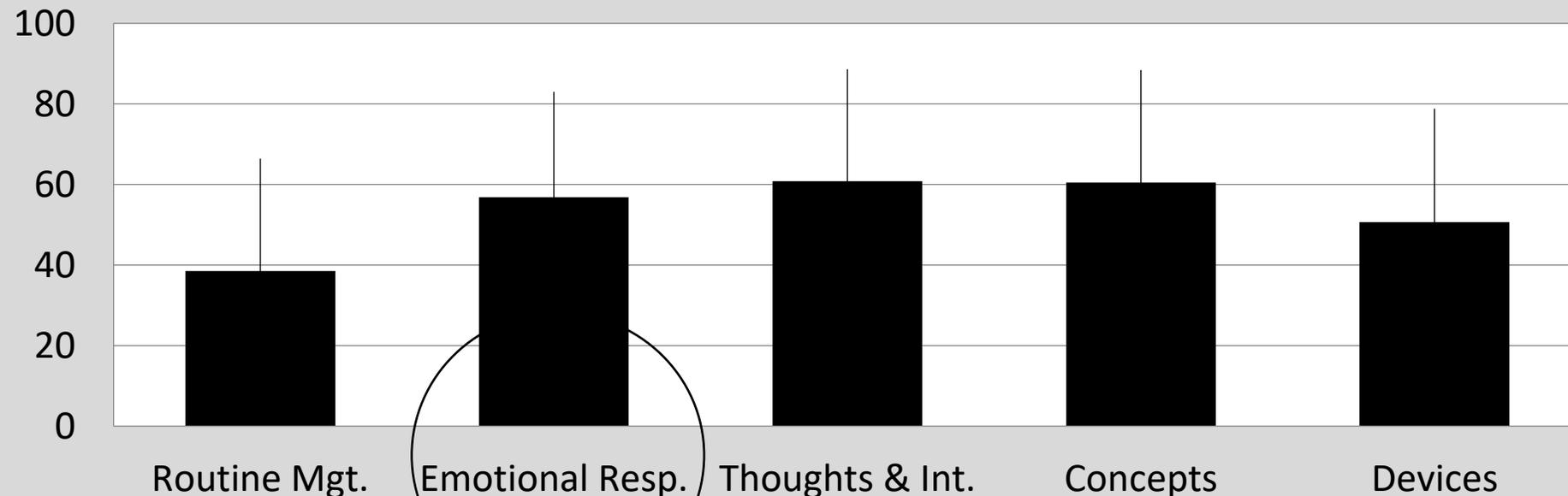
# Routine Tinnitus Management Items

- 16 items (mean=38.5; SD=27.9): Item examples
  - I can ignore my tinnitus when listening to music
  - I can ignore my tinnitus when reading in a quiet place
  - I can ignore my tinnitus when I try to go to sleep at night
  - I can ignore my tinnitus when driving in heavy traffic
  - I can ignore my tinnitus when I am working



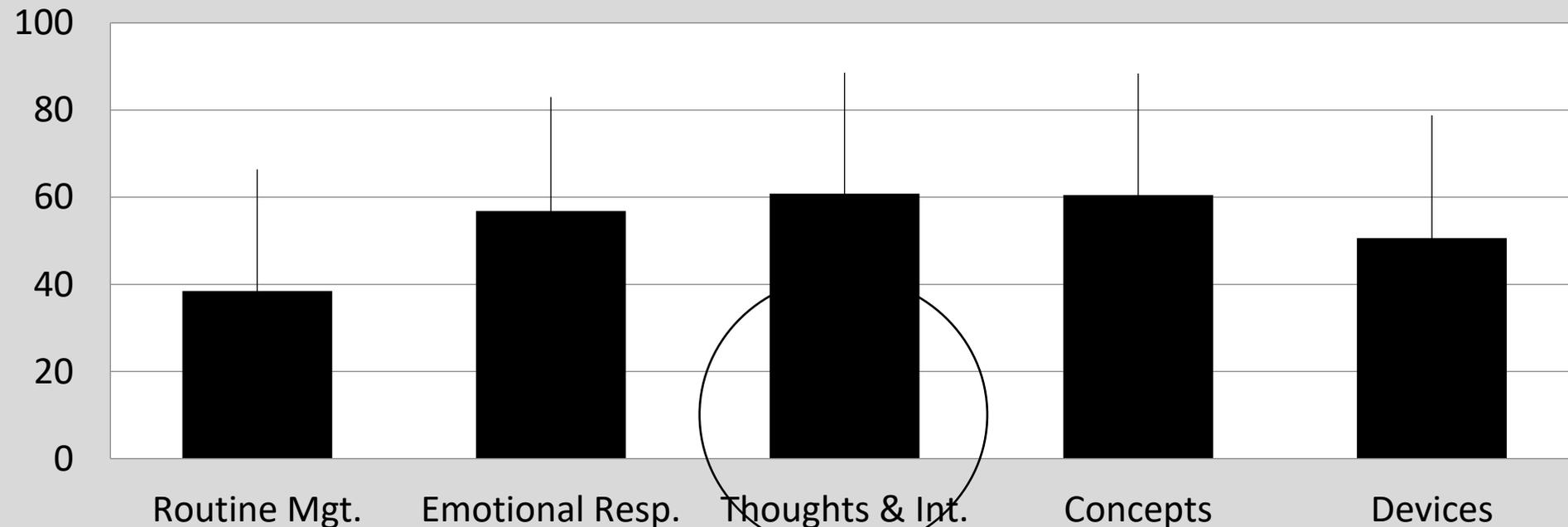
# Emotional Response Items

- 9 items (mean=56.8; SD=26.2): Item examples
  - I can manage my anger when I hear my tinnitus
  - I can manage my stress level when I hear my tinnitus
  - I can manage feelings of nervousness when I hear my tinnitus
  - I can manage feelings of fear when I hear my tinnitus.



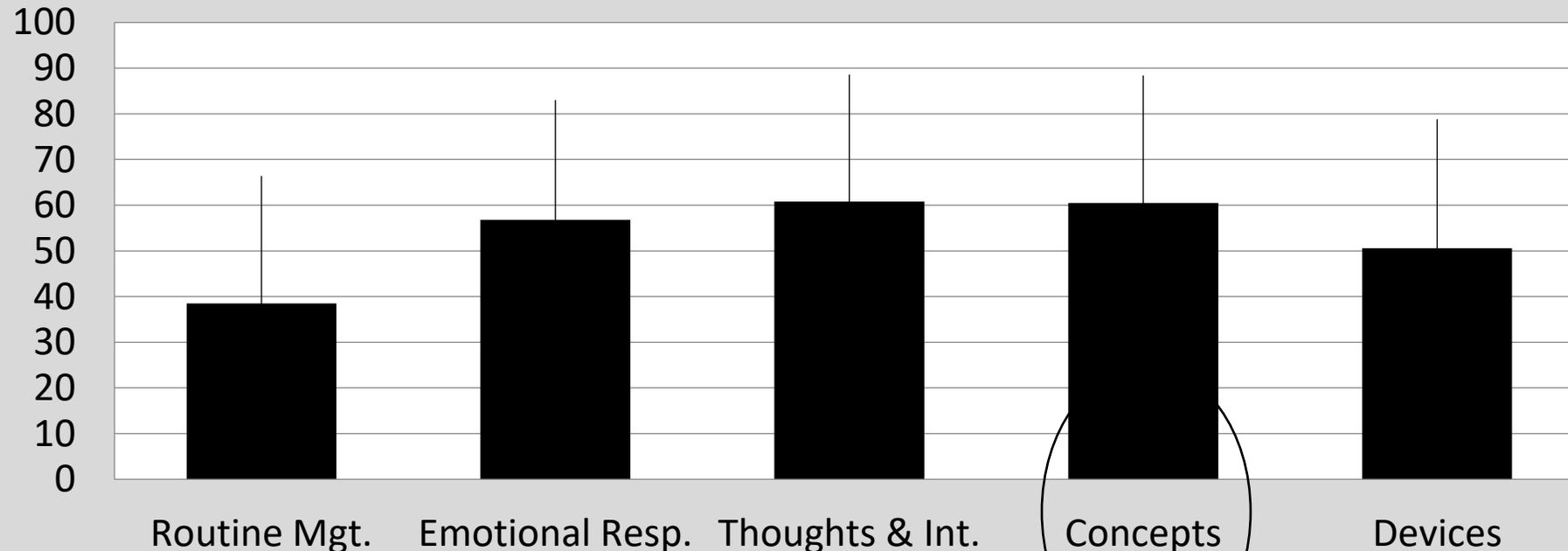
# Internal Thoughts and Interactions with Others

- 8 items (mean=60.8; SD=27.8: Item examples
  - I can help people in my workplace despite my tinnitus
  - I can feel my senses are reliable even when I hear my tinnitus
  - I can manage to have a positive self-image even when I hear my tinnitus
  - I can carry out conversations with a small group of people even when I hear my tinnitus



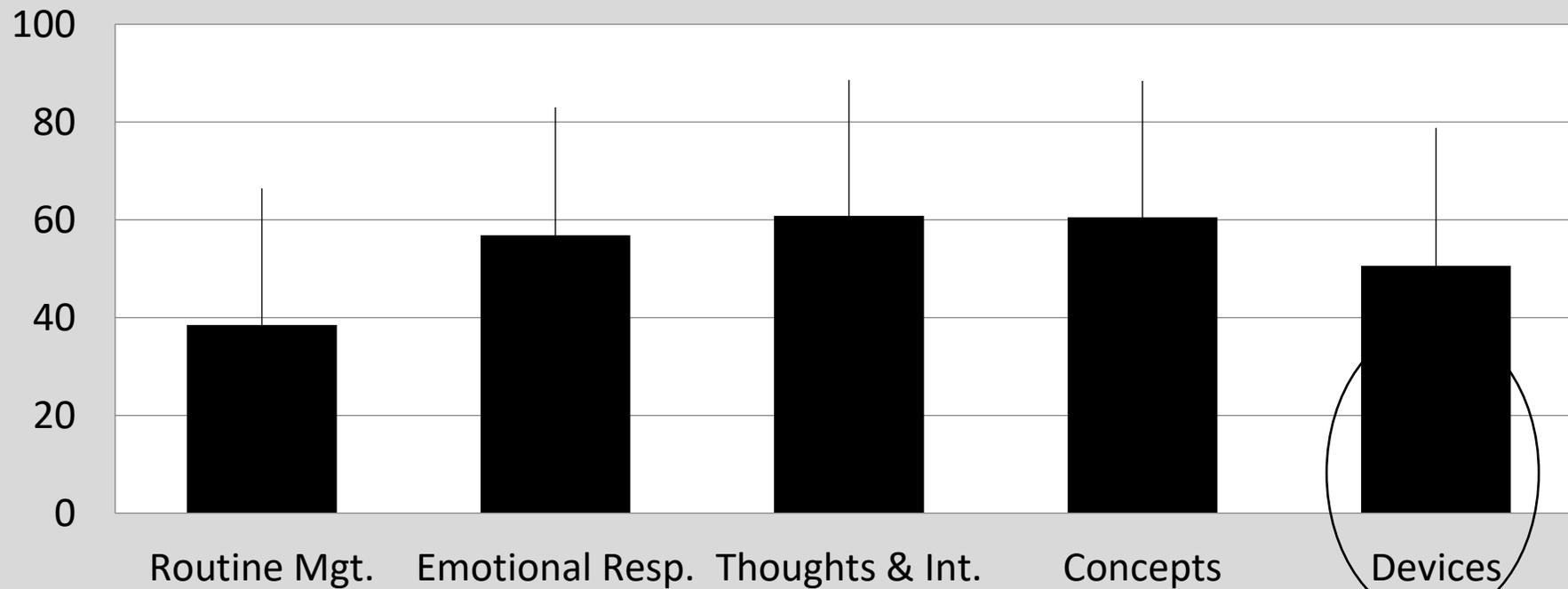
# Tinnitus Concepts Subscale

- 4 items (mean=60.5; SD=27.9): Item examples
  - I can understand the difference between my h. loss and my tinnitus
  - I can understand the changes to my hearing system that caused my tinnitus
  - I can understand that my h. loss is not caused by my tinnitus
  - I can understand the results of my hearing test



# Devices Subscale

- 3 items (mean=50.6; SD=28.2): Item examples
  - I can use hearing aids or other assistive devices to help reduce communication problems caused by my tinnitus
  - I can use a masking device to help reduce my tinnitus without reducing my ability to understand speech
  - I can use a sound generating device such as a fan or noise machine to help me sleep when I hear my tinnitus



# Internal Consistency

<u>SETMQ Scale</u>	<u>No. Items</u>	<u>Chronbach's <math>\alpha</math></u>
Routine Tinnitus Mgt.	16	.98
Emotional Response	9	.96
Thoughts & Interactions	8	.96
Tinnitus Concepts	4	.83
Devices	3	.74
Total SETMQ	40	.98

# Test-Retest Reliability

199 SETMQs sent out a second time (2 wks after initial), 134 returned

<u>SETMQ Scale</u>	<u>Intraclass Coefficient</u>	
	<u>No. Items</u>	<u>ICC</u>
Routine Tinnitus Mgt.	16	.95
Emotional Response	9	.94
Thoughts & Interactions	8	.96
Tinnitus Concepts	4	.85
Devices	3	.87
Total SETMQ	40	.96

## Clinical Tinnitus Measures (for comparison and check of construct validity)

Measure	Mean	St. Dev.
Tinn. Handicap Inventory	47.4	24.0
% Tinnitus Awareness (0-100)	72.3	30.5
% Bothered by Tinnitus (0-100)	44.9	22.8
Tinnitus Severity Rating (0-10)	6.5	2.4
Hearing Loss Rating (0-10)	5.4	2.6
Hyperacusis Rating (0-10)	4.9	3.3

# Relations Between SETMQ and Clinical Measures

	<b>THI</b>	<b>Aware</b>	<b>Both.</b>	<b>Loud</b>	<b>HA</b>	<b>HL</b>
Routine Tinn. Mgt	-.40	-.29	-.45	-.35	-.29	-.25
Emotional Resp.	-.52	-.33	-.48	-.41	-.36	-.36
Thoughts/Interaction	-.53	-.39	-.48	-.35	-.42	-.45
Tinn. Concepts	-.35	-.18*	-.16*	-.16*	-.15*	-.24
Devices	-.30	-.14*	-.25	-.24	-.23	-.20
SETMQ Total	-.49	-.36	-.49	-.39	-.35	-.39

- Correlations significant at  $p < 0.01$  except (\*)  $p < 0.05$

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# Relations Between SETMQ and Clinical Measures

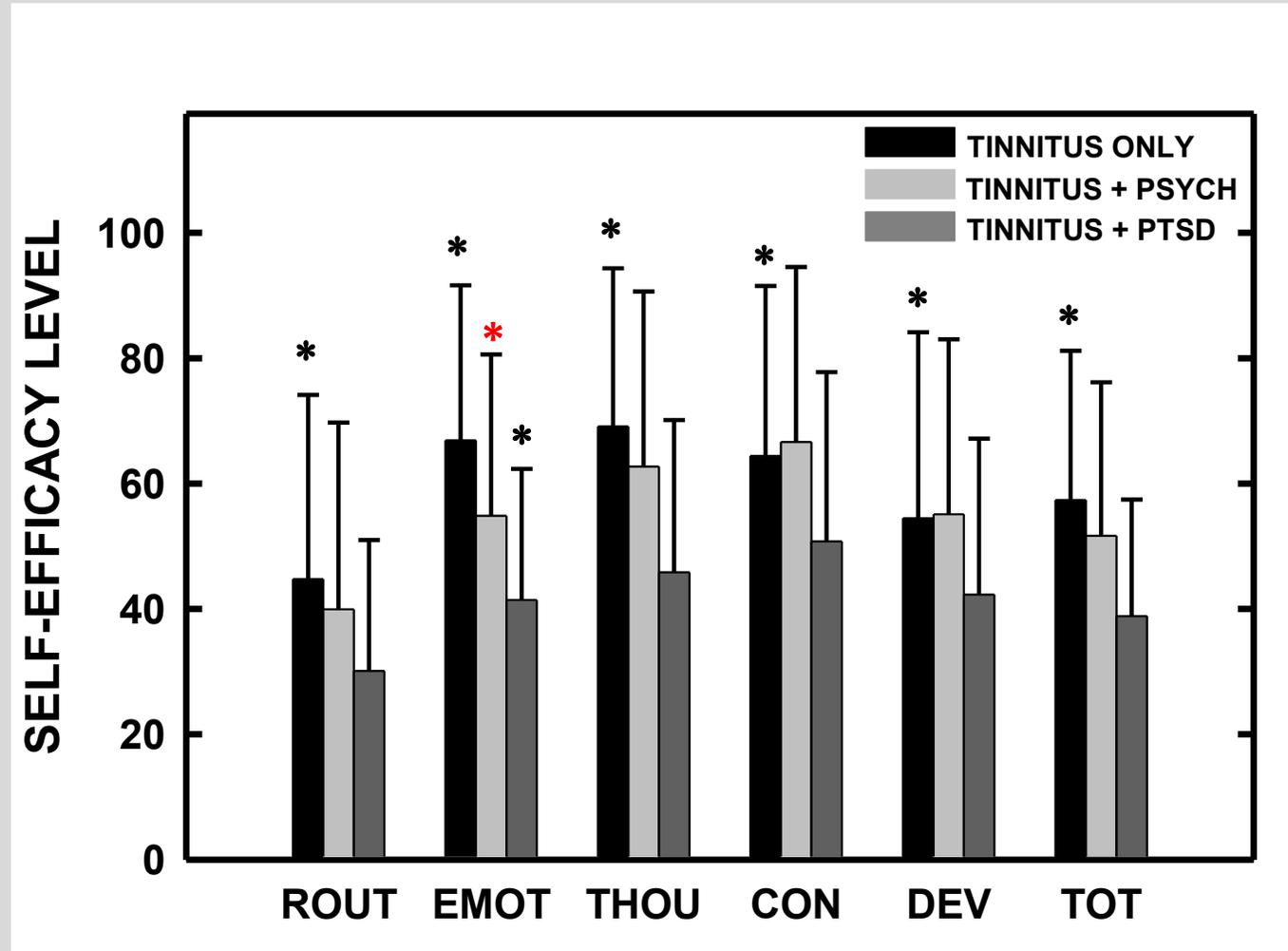
	<b>THI</b>	<b>Aware</b>	<b>Both.</b>	<b>Loud</b>	<b>HA</b>	<b>HL</b>
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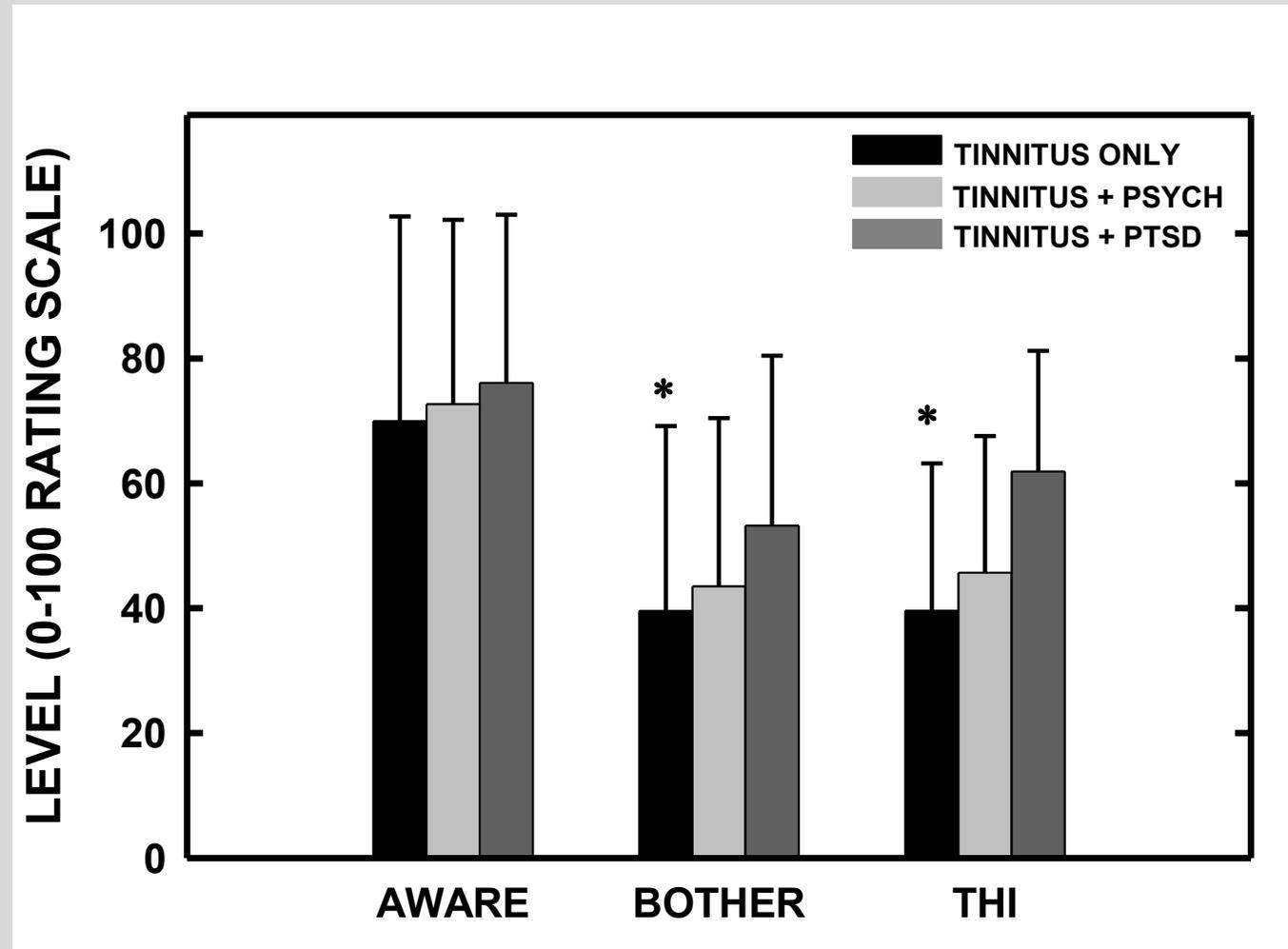
# Clinical Tinnitus Measures: High vs. Mod-Low Self Efficacy for Tinnitus

	<b>High SETMQ Score (<math>\geq 70\%</math>)</b>			<b>Low-Mod SETMQ (<math>\leq 70\%</math>)</b>			
	Mean	SD	n	Mean	SD	n	p
% of Time Aware of Tinn.	53.3	35.4	45	76.6	28.3	154	<.001
% of Time Bothered by Tinn	19.3	17.7	45	50.3	27.1	154	<.001
THI Score	32.0	21.5	45	52.7	23.0	154	<.001

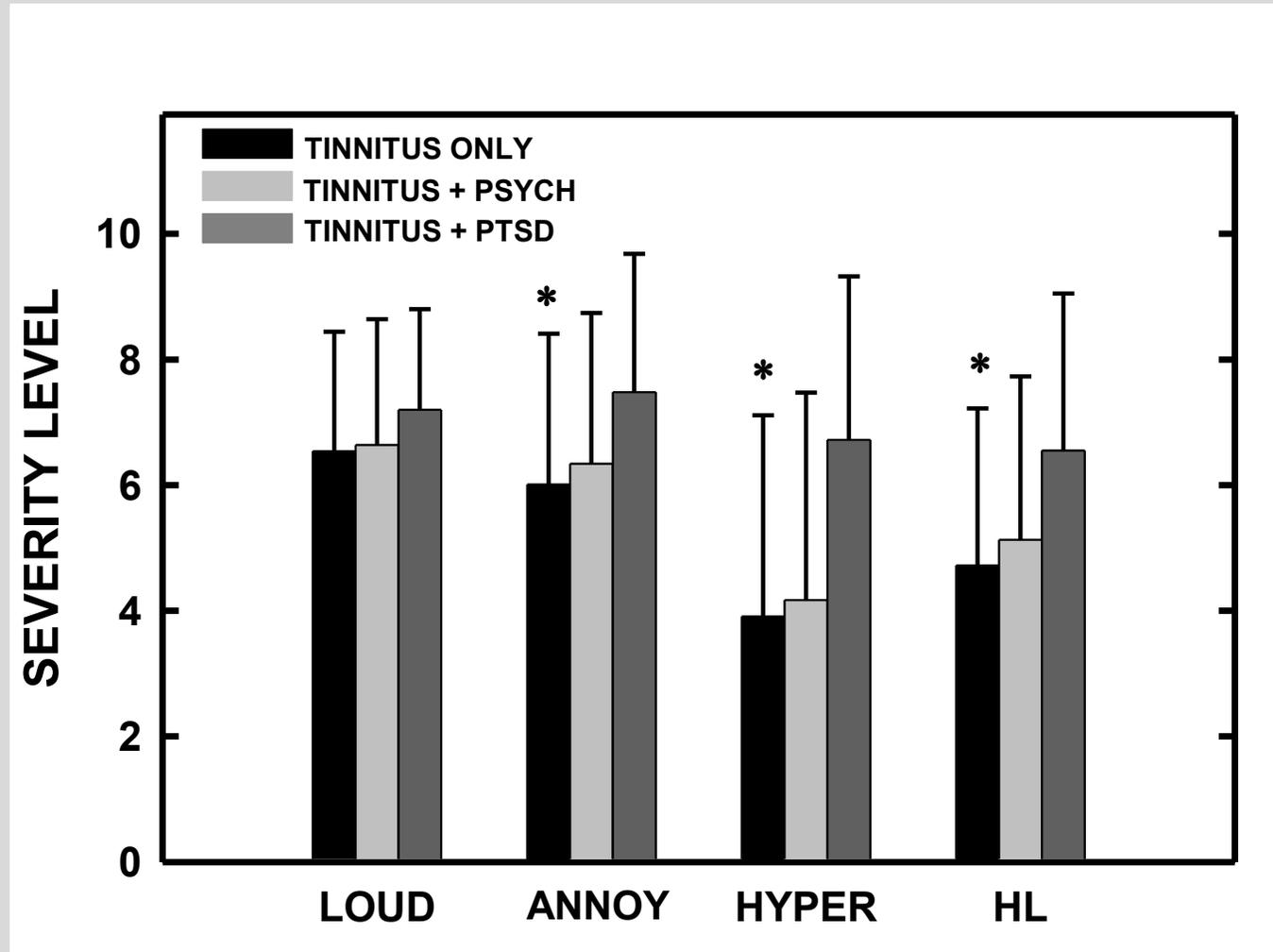
# Self-Efficacy for Tinnitus Management Questionnaire Results



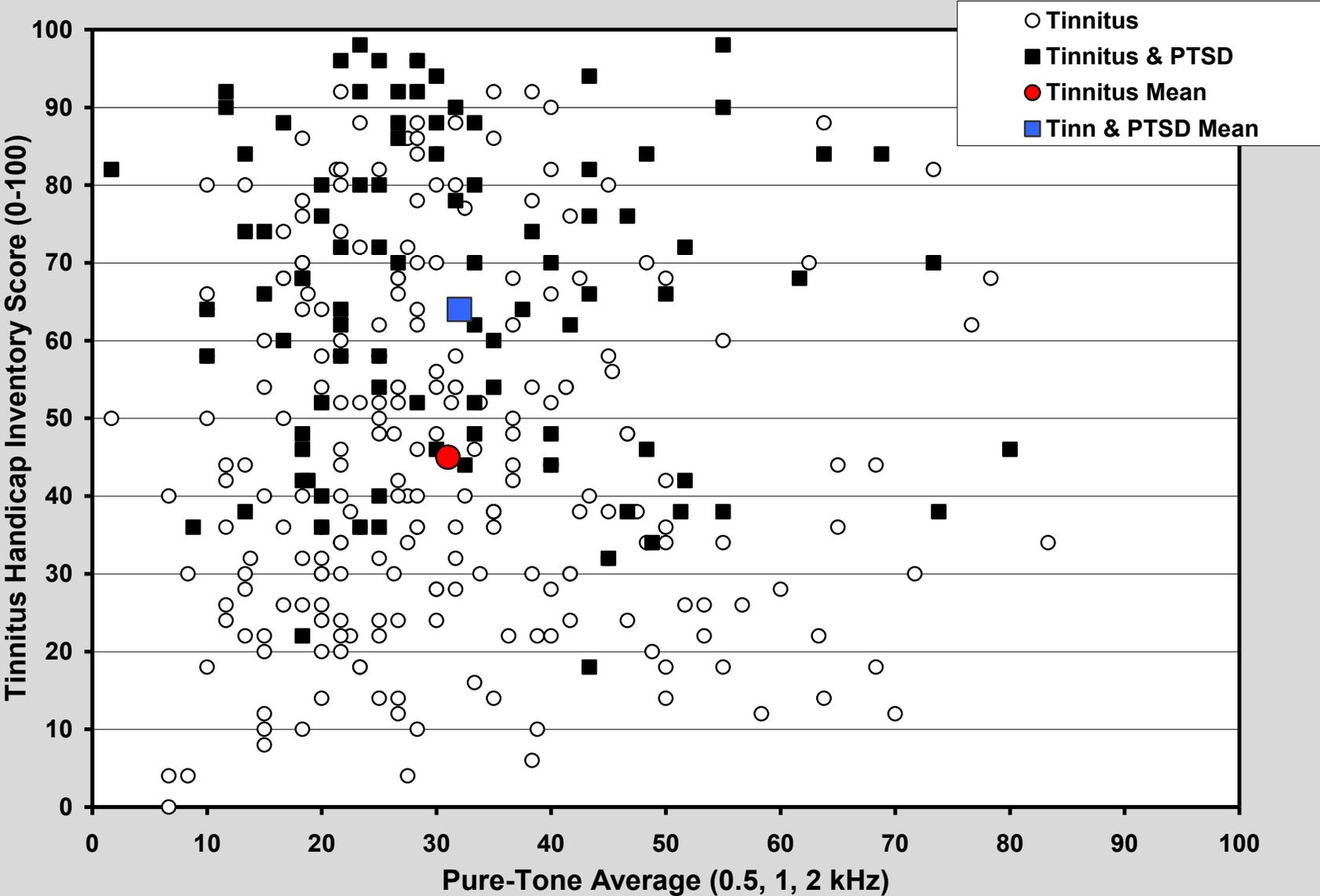
# Patient Ratings of Symptoms



# Patient Ratings of Symptoms



# Perceived Tinnitus Handicap, and Relation to Auditory Sensitivity



# Conclusions

- Psychometric properties of the SETMQ
  - 5 subscales addressing domains of tinnitus complaints
  - Good internal consistency
  - Good test-retest reliability
- Validity
  - Significant and generally fair to moderate correlations to tinnitus ratings
  - Differences in high vs. moderate-to-low tinnitus self-efficacy groups

# Conclusions

- SETMQ responses different across patient groups
  - Patients with PTSD respond with significantly lower tinnitus self-efficacy than patients with other psych. disorder(s)
  - Patients with other psych disorder(s) respond with lower self-efficacy than those without
  - Self-rated tinnitus loudness has the poorest power of discrimination between groups of all tested variables

# Self-Efficacy Theory: Bandura (1986)

- Individuals make judgments about their self-efficacy beliefs through 4 sources of information
  1. Mastery experiences – evidence supported by accomplishment (whether easy or hard)
  2. Vicarious experiences – evidence of, and comparison to, others' success (modeling)
  3. Verbal persuasion – counseling, examples, evaluations
  4. Physiologic and affective states – enhancement of physical status and reduction of negative emotional states, as well as fostering correct interpretation of sensory information and physiologic state

# Self-Efficacy and Tinnitus

- Self-efficacy objectives for the **patient** with hearing loss/tinnitus:
  - To enhance Mastery: Identify specific activities for which the patient lacks sense of control (communication, concentration, sleep, etc.) and target intervention accordingly. Support use of masking devices, assistive devices, hearing aids, etc.
  - To provide Vicarious Experiences: group sessions, anecdotes/meetings with other patients, review of data
  - To provide Verbal Persuasion: counseling regarding mechanisms, communication strategies, sleep hygiene, concentration, hearing loss effects, tinnitus features, etc.
  - To influence Physiologic and Affective States: Increase sense of control over the influences of hearing loss on daily function and emotions through collaborative counseling, use of hearing aids or assistive devices, and interprofessional approaches when necessary (ie., in cases of co-occurring psychological injury)

# Self-Efficacy and Tinnitus

- Self-efficacy objectives for the **clinician**
    - To enhance Mastery: Identify specific activities for which the clinician lacks sense of control (counseling, understanding of mechanisms, real-ear measures, fitting hearing aids, managing psychological injury) and seek experience and literature to support competence
    - To provide Vicarious Experiences: Participating at workshops, sharing successful cases with other clinicians, observing master clinicians
    - Verbal persuasion: Evidence that realistic approaches to management can be implemented by the audiologist; understanding and conveying the mechanisms of hearing loss/tinnitus targeted by intervention to support counseling objectives
    - Physiologic and Affective States: Increase sense of control in the clinic by improving clinician knowledge during training, skill building, adaptability.
- “A further sign of health is that we don't become undone by fear and trembling, but we take it as a message that it's time to stop struggling and look directly at what's threatening us.” - Pema Chodron
- Remember: We need to care deeply for something in order to experience ‘burnout’

# Considerations from Trauma Counseling

**Janet, 1919:** Speaking of memory as an action; the action of telling a story:

“A situation has not been satisfactorily liquidated...until we have achieved, not merely an outward reaction through our movements, but also an inward reaction through the words we address to ourselves, through the organization of the recital of the event to others and to ourselves, and through the putting of this recital in its place as one of the chapters of our personal history.” (quoted by Herman; p. 37; *Trauma and Recovery*)

**Rushdie, 1991:**

“Those who do not have power over the story that dominates their lives, power to retell it, to rethink it, deconstruct it, joke about it, and change it as times change, truly are powerless because they cannot think new thoughts.”  
**(1000 Days Trapped Inside a Metaphor)**

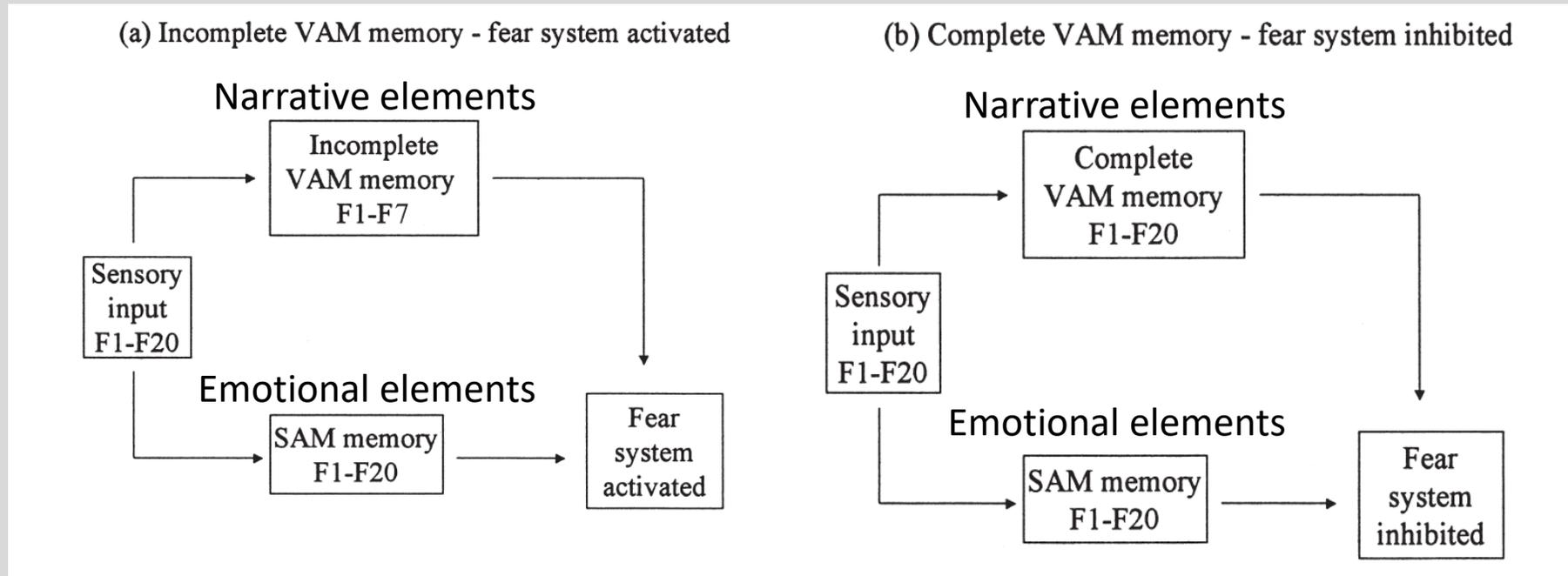
## Links between tinnitus and PTSD: Survivors of the Khmer Rouge in Cambodia (J. of traumatic stress, 2006; Transcultural Psychiatry, 2008)

“Tinnitus triggered flashbacks and gave rise to catastrophic cognitions, and those trauma associations and catastrophic cognitions had a major role in generating PTSD.” For some participants, tinnitus was evaluated as evidence of “soul loss” (Hinton et al 2006)

Experimenters developed a Tinnitus Flashback Presence Questionnaire and a Tinnitus Flashback Scale

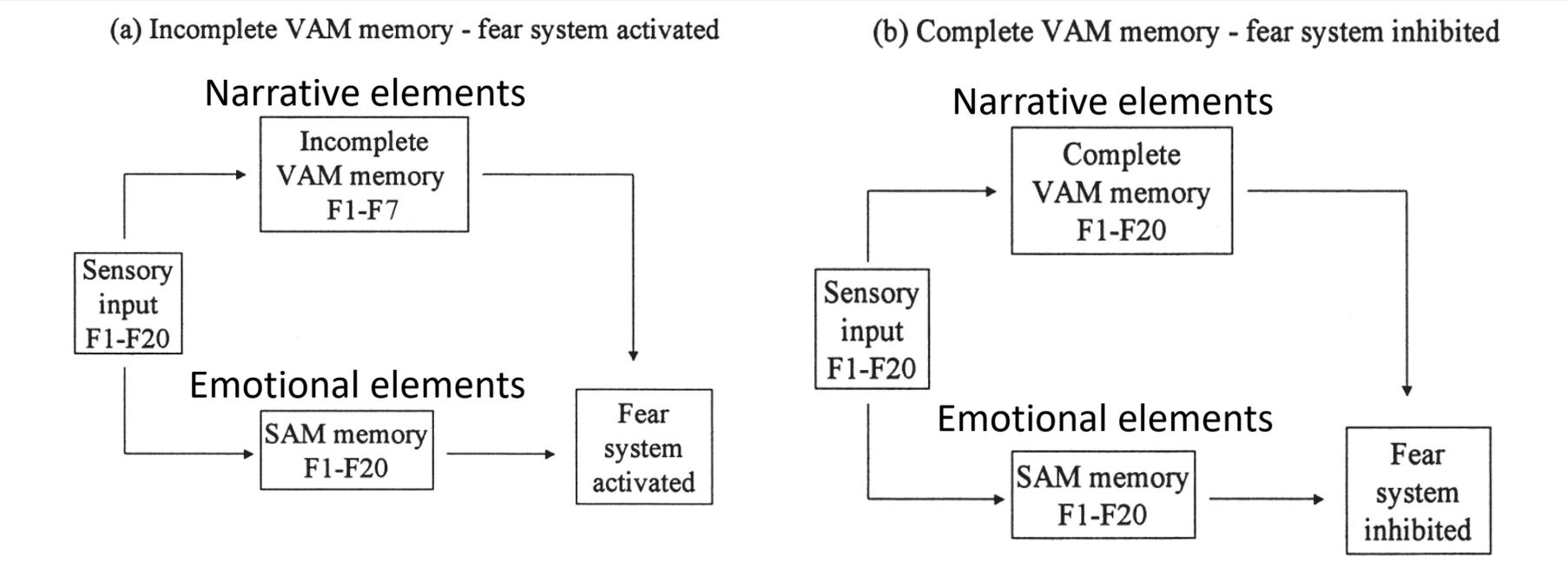
<b>Events related to tinnitus onset and distress</b>	<b>Events relating tinnitus to specific sounds</b>
Blows to the head (w/ traumatic recollection)	Gunfire, ordinance (whistling of projectiles)
Malaria	Submersion of head underwater (drowning or torture)
Starvation, Exhaustion	Buzzing of insects (1.7 of 7.9 Cambodians died between 1975-1979)

# Brewin, 2001; the value of supporting/enriching patient narratives



“As the [accuracy and completeness of the narrative improves], fewer trauma reminders are able to activate the body’s defensive reactions.” (p. 382) Has applicability for tinnitus and hearing loss management.

# Brewin, 2001; the value of supporting/enriching patient narratives



Counseling may be tailored to support the patient’s development and use of narrative elements that could attenuate distress, anxiety, fear associated with a sensory event that triggered negative emotions or memories. Such triggering events (ie., Hinton et al) could include tinnitus and sound tolerance problems.

## Panter-Brick (2014) Eur. J of Psychotraumatology

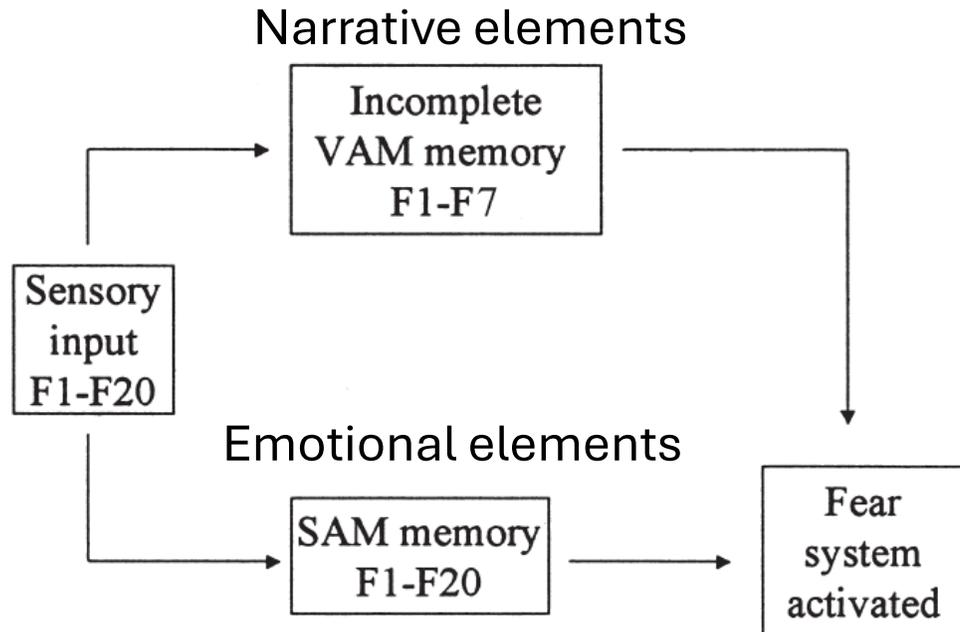
“To my mind, resilience is a process to harness resources to sustain well-being” (Panter-Brick & Leckman, 2013). She goes on to say:

“I like the word “process” because it implies that resilience is not just an attribute or even a capacity. I like the phrase “to harness resources” because it asks us to identify what are the most relevant resources to people in places like Afghanistan, Niger, or the United States [or what would be most relevant for a patient with hearing loss or bothersome tinnitus/disorders of sound tolerance]. And I like the expression “sustained well-being” because resilience involves more than just a narrow definition of health or the absence of pathology.”

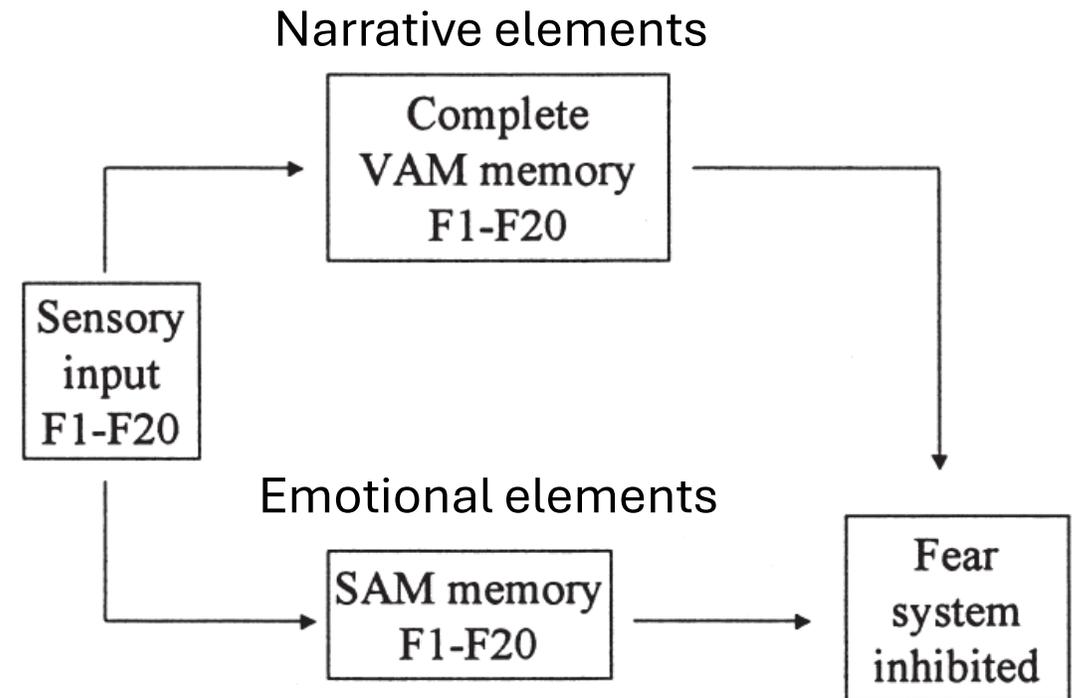
The trauma literature provides ample evidence of the resilience “process” being supported when patients can access and employ accurate narratives re: challenging or triggering situations.

# Brewin, 2001; the value of supporting/enriching patient narratives

(a) Incomplete VAM memory - fear system activated

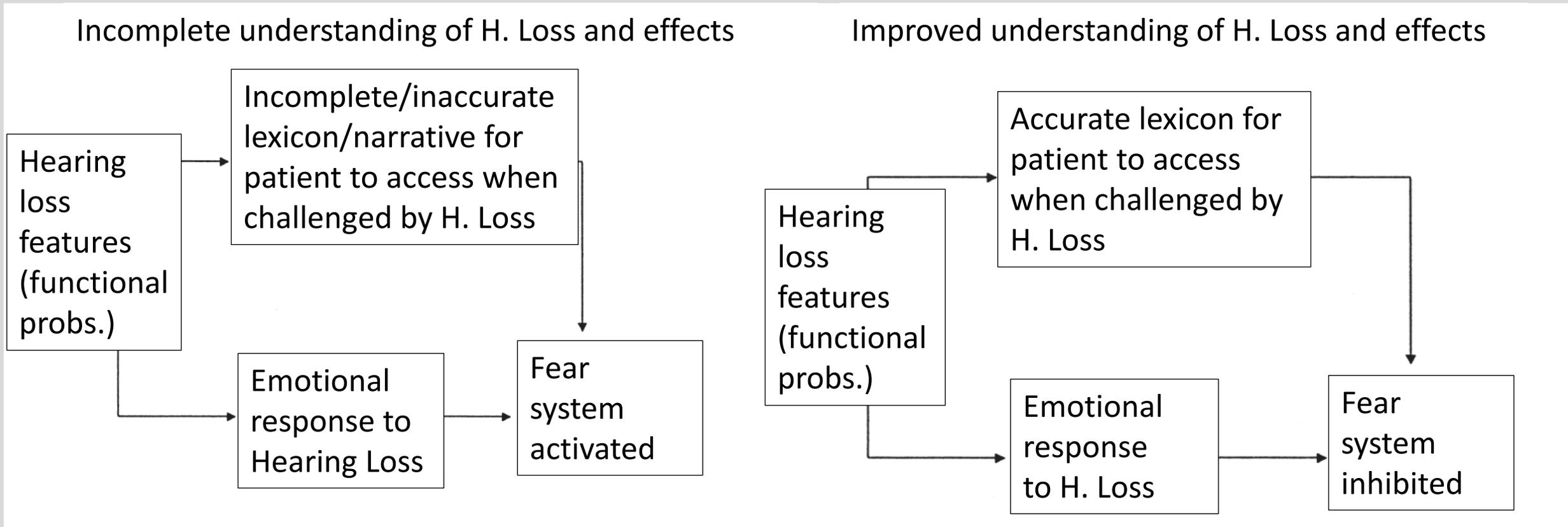


(b) Complete VAM memory - fear system inhibited



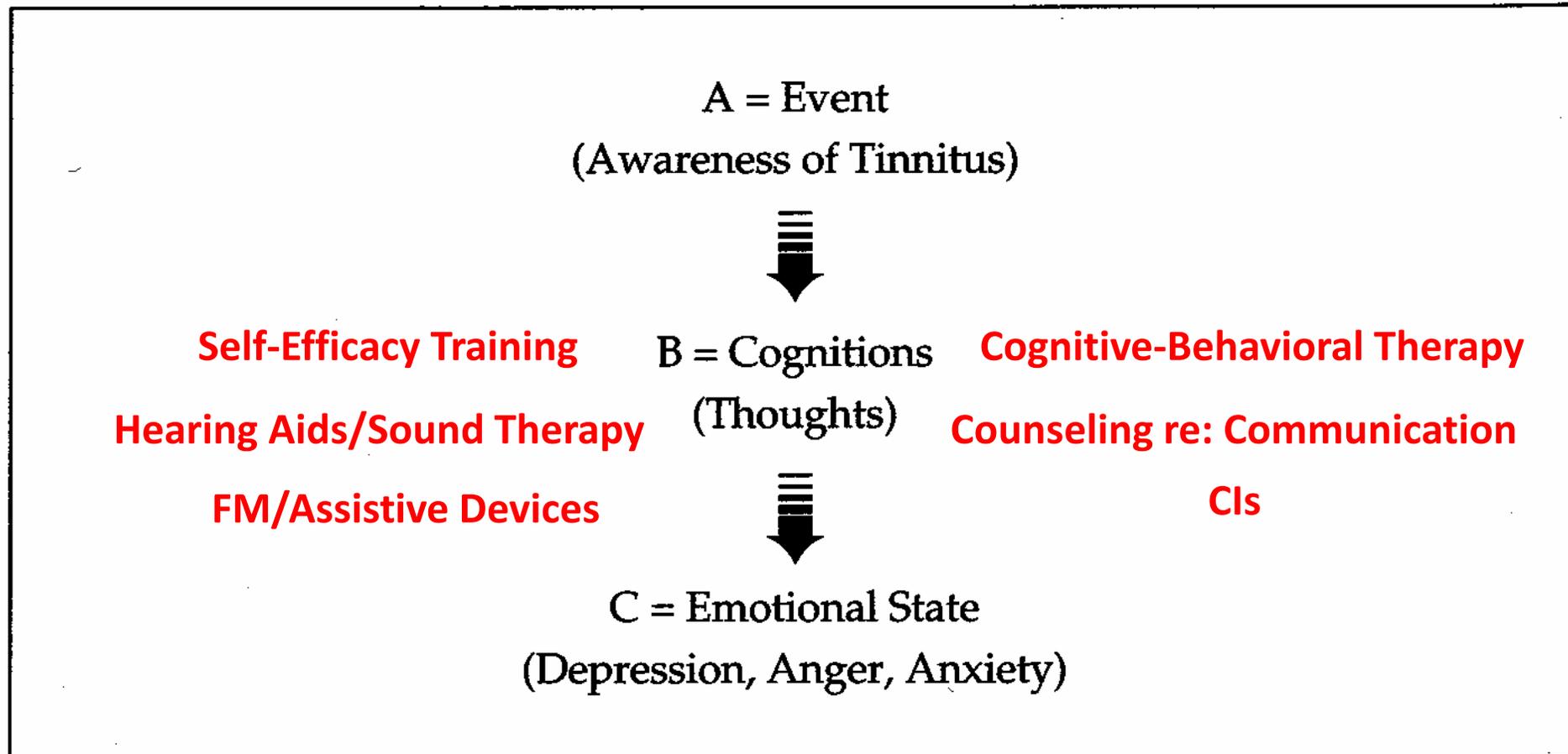
Consider the long-observed “disjointed” nature of trauma narratives, in which coherence of the story is disrupted by powerful emotional elements that do not fit reasonably into the narrative. “As the [accuracy and completeness of the narrative improves], fewer trauma [or tinnitus] reminders are able to activate the body’s defensive reactions.” (p. 382)

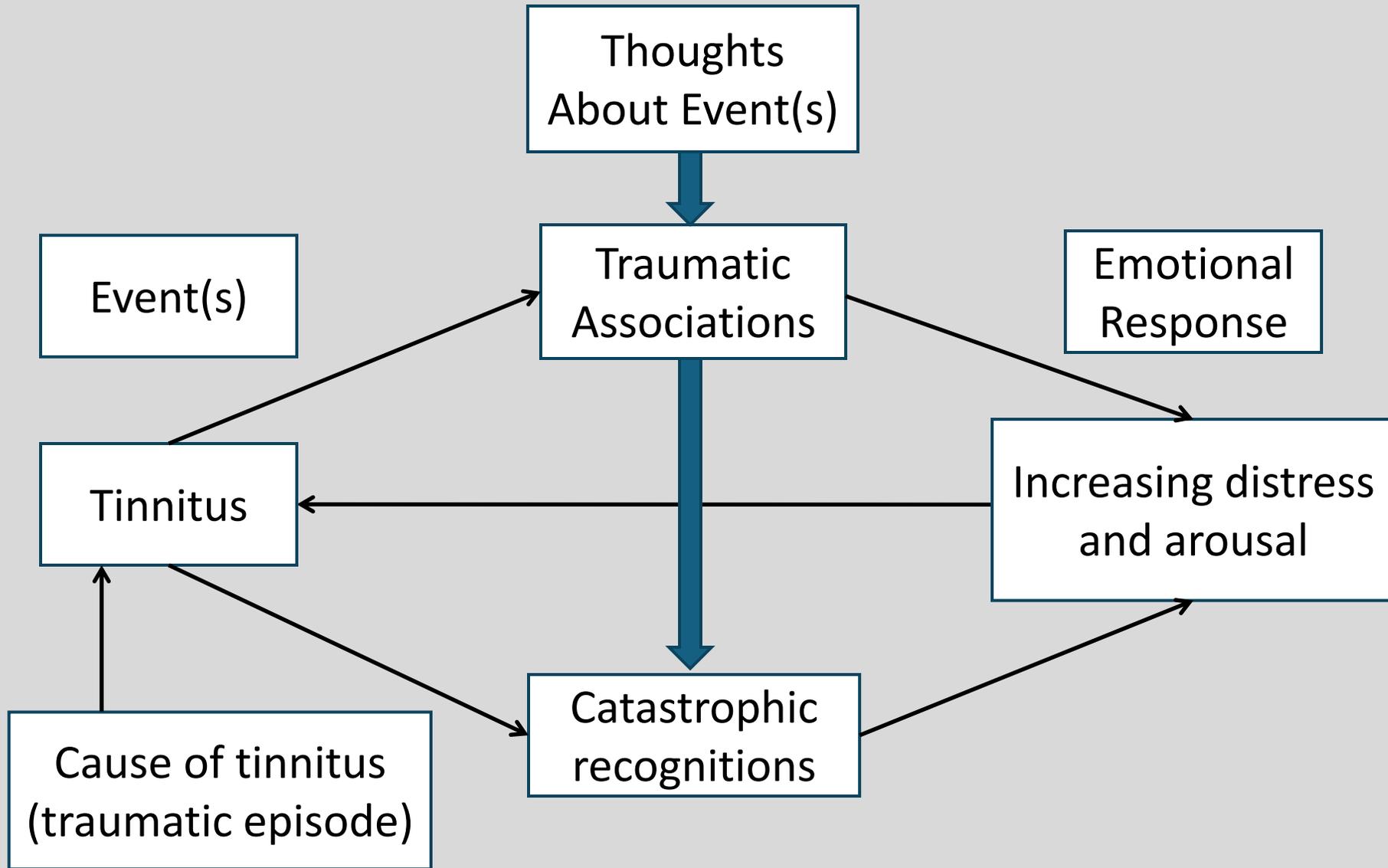
# Brewin, 2001 and the value of supporting patient narratives



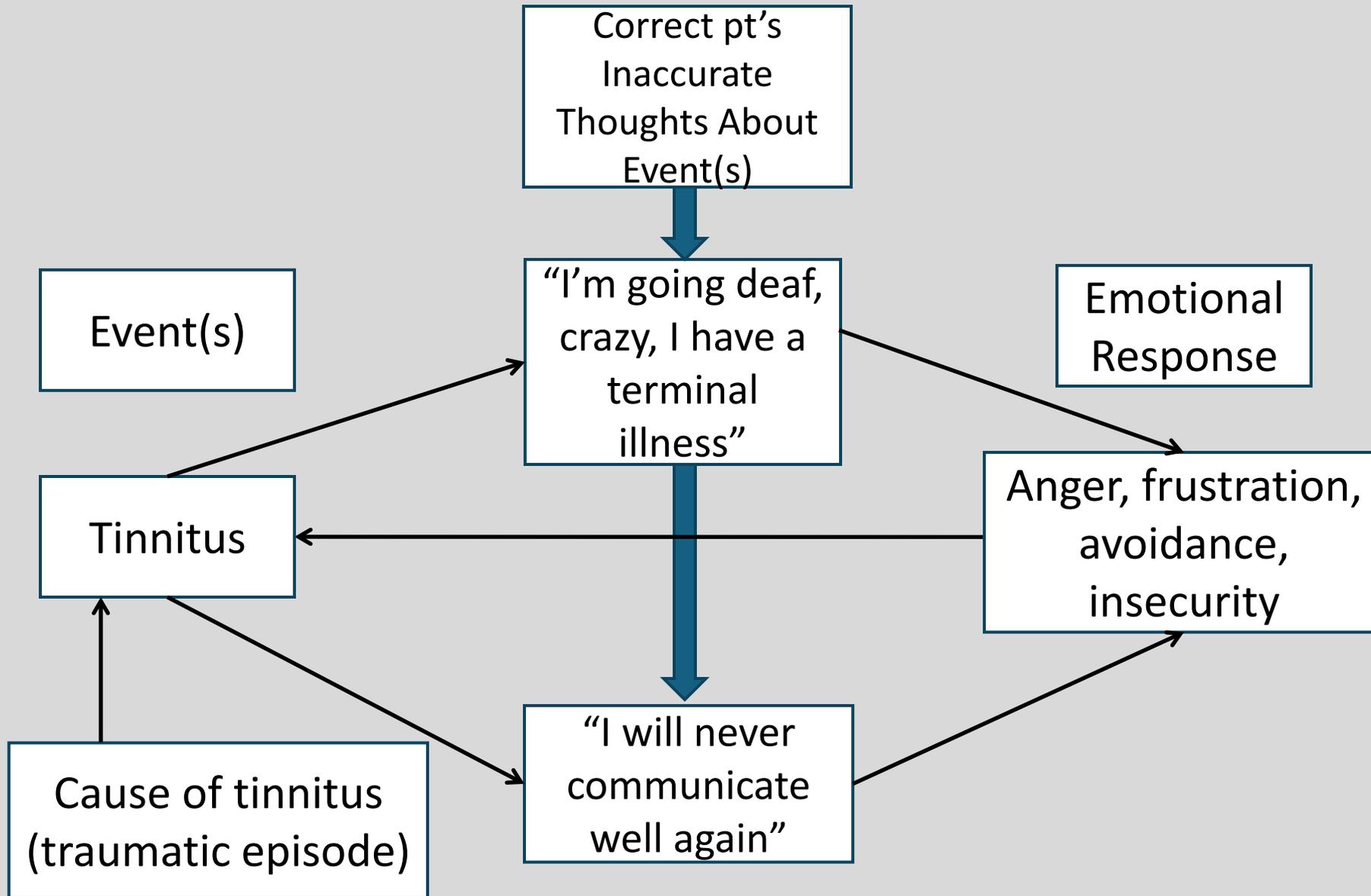
Consider the “features” as being associated with hearing loss, perhaps w/ traumatic onset. Consider the patient’s “sound history” experience, exacerbators, deficits, understanding of mechanisms, comm. problems, concentration problems, emotional distress, understanding of effects on hearing, etc. “Demystifying” tinnitus, or hearing loss, could produce an effect similar to that of Pt-Centered counseling that enhances narrative/declarative resources; a durable and non-invasive mgt approach

# Using the ABC model for hearing loss interventions/counseling





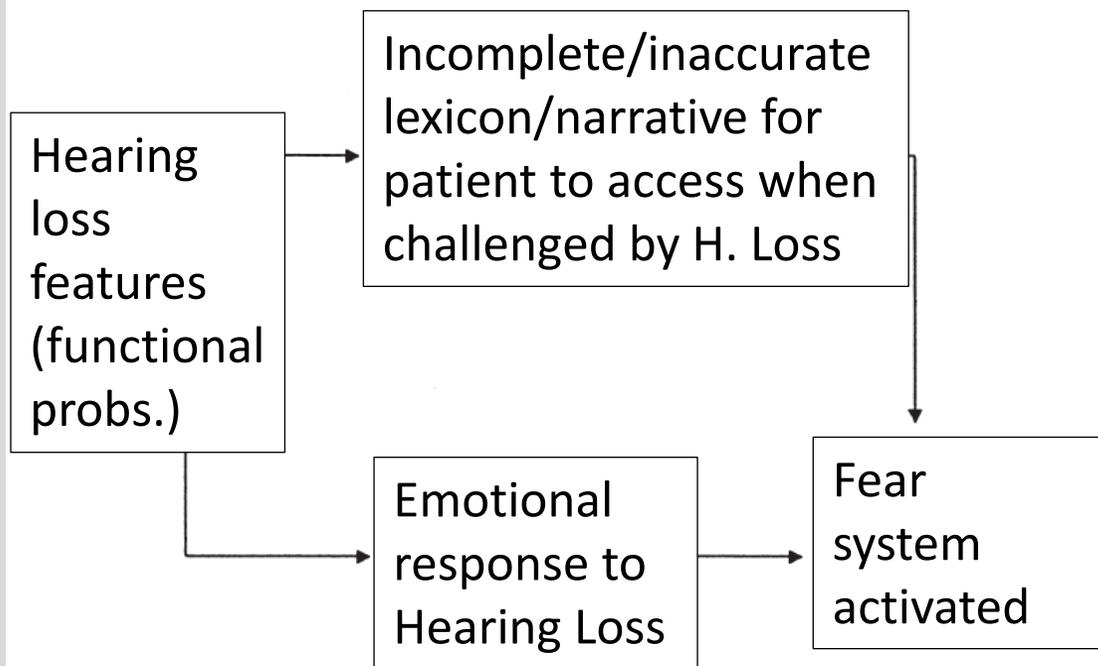
Adapted from Hinton et al., 2006 (J. of Traumatic Stress)



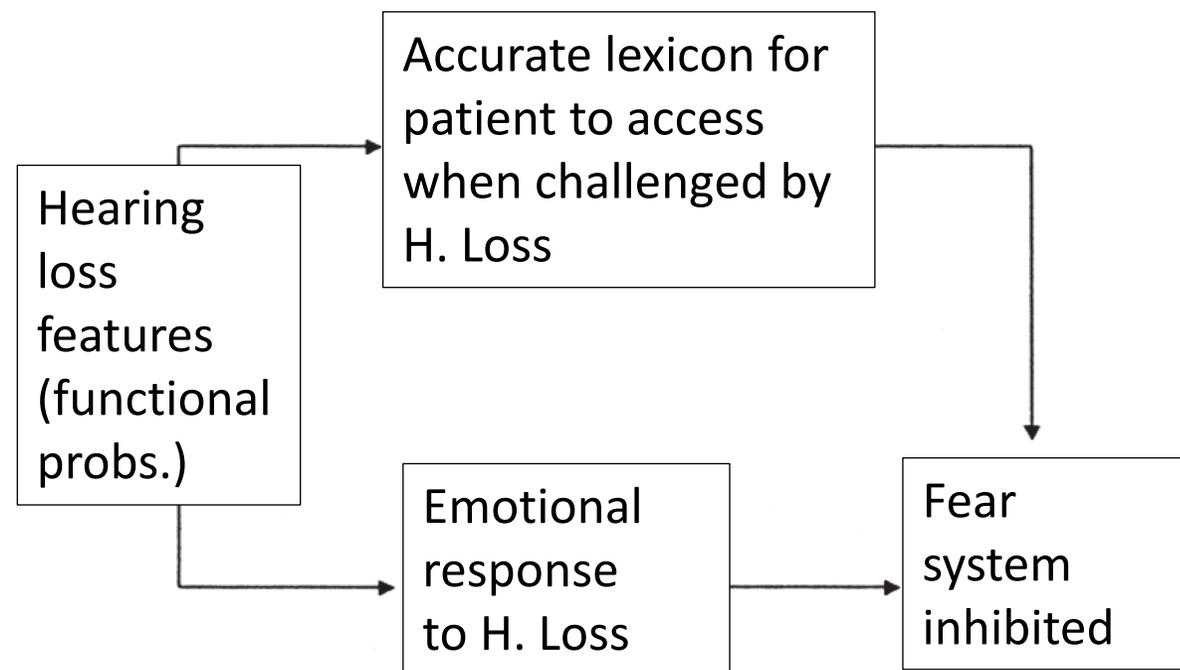
Adapted from Hinton et al., 2006 (J. of Traumatic Stress)

# Brewin, 2001 (adapted); the value of supporting patient understanding

Incomplete understanding of H. Loss and effects



Improved understanding of H. Loss and effects



“Demystifying” tinnitus, or hearing loss, would have the effect of supporting accurate patient narratives that would facilitate navigating challenges and related negative emotions (or as Janet indicated, “liquidating” the negative memories and experiences).

# Medical Humanities

1. Value as supporting assessment: how do we most effectively discern patients' challenges (occupational, recreational, emotional, functional, etc.) and (mis)conceptions re: hearing loss, tinnitus, sound tolerance disorders?
2. Value as supporting management: benefits expressed by patients resulting from comprehensive and accurate narratives is clear from the trauma literature; how can we provide for accurate and comprehensive narratives regarding hearing loss (or as mentioned earlier, demystifying tinnitus)?

# Medical Humanities: Defined

- “Medical humanities presents the international conversation around medicine and its engagement with humanities and arts, social sciences, health policy, medical education, patient experience and the public at large.” (<http://mh.bmj.com>)
- With regard to tinnitus, and generalizable to hearing loss, Pryce & Shaw (2019) suggest: “In order to explore tinnitus, it is vital that we understand the experience of the perceiver rather than extricate the perception from the perceiver.” Or as Rogers would say, fixing the patient is not the goal

# David Baguley at the Crossroads of Art and Audition



- Why consider hearing in the context of the humanities?
  - Audiologists, other health care providers tend to express findings in terms of “impairment, loss, dysfunction, deficit”
  - History of psychiatry and neurology “looking into the arts for insights and inspiration.”
  - Objectives would include providing and using in examples descriptors and lexical elements that:
    - Pertain to challenging mental health and emotional conditions
    - Support interventions that are “creative and humane” in order to represent and advocate for patients
- Gawande (2014): “I am in a profession that has succeeded because of its ability to fix. If your problem is fixable, we know just what to do. But if it’s not? The fact that we have had no adequate answers to this question is troubling and has caused callousness, inhumanity, and extraordinary suffering.”

# Relevance for Management: Counseling and sound

- Many sources to affirm the value of counseling as a stand-alone intervention, or as a component of device-related protocol
  - Most device manufacturers specify the need for counseling (device-specific and/or tinnitus-specific) in order to achieve the best outcomes
  - McKenna (2004) reviewed sound therapy approaches, some that included counseling, some that did not
    - Sound therapy/amplification without counseling not as beneficial as sound with counseling
    - Counseling alone more effective than sound therapy/amplification alone
    - Even when sound is effective, psychological factors influence sounds' value
  - Reminds the audiologist that managing hearing loss (and tinnitus, etc) must address realistic expectations reiterated/supported by counseling

## Medical Humanities and Counseling: “Lifeworld of Tinnitus” (Pryce and Shaw, 2019)

- Considerations for items with the potential to improve patients’ coping by fostering accurate and thorough components of a narrative linked to hearing loss, tinnitus, disorders of sound tolerance
  - Authors set out to answer the question: “what is it like to live with tinnitus?”
  - Authors comment on scripts used by providers that target “symptom eradication” versus “building coping mechanisms” in part by acknowledging the ambiguity surrounding use of word “cure”
  - Authors also indicated that patients report “managing” hearing loss or tinnitus includes avoiding interactions and situations; patients lacked the “medical script with which to expound their symptom.”
  - Patients bothered by tinnitus and hearing loss have complex and multi-dimensional symptoms and complaints
    - Such patients feel “let down” by many medical disciplines and their experiences may produce sensations of “frustration, inadequacy, and powerlessness in clinicians” (Woivalin et al., 2011; and reminiscent of Gawande quote)

## “Lifeworld of Tinnitus (or hearing loss)” (Pryce and Shaw, 2019)

- To paraphrase: “Experience is regarded as unique, and constructed based on individual learning, cultural and psychological perspectives. The perception of [hearing loss] is inseparable from the perceiver.” (p. 429)
- Consideration of a patient’s “lifeworld” requires accepting subjective and unique patient attributes; we do this with current intake forms, but not particularly well
  - The “lifeworld of hearing loss” would be “infused with important meanings and clues about what matters to the [patient]” in addition to what the patient already understands about hearing loss
  - Such items could include audiometric findings, but more importantly would need to address intrusiveness and functional effects, as well as supporting the patient’s “medical script” that supports educational counseling
  - Further, the authors (could also) highlight the value of identifying aspects hearing loss related to traumatic exposures, negative memories, occupational challenges, music enjoyment and aptitude, in addition to common intake form items such as communication, attention, localization, speech in noise, etc.

## Final Word: Baguley (2018)

The medical humanities provide for novel conduits between deeply personal external events (art, music, literature) and deeply personal internal events (hearing loss, tinnitus, chronic pain, emotional disruptions, health problems)

- “Art speaking to science, and science reflecting, and speaking in reply: these are valuable conversations indeed.”

# Tinnitus and Trauma: Case background

- Tinnitus clinic at Mountain Home VAMC
  - Opened in May, 2001
  - 1300+ patients, still enrolling with no foreseeable limit
  - Emphasize management rather than treatment of tinnitus
  - Training of students is a priority
  - Do not ascribe to any particular approach, dialogue with patient dictates the opportunities for management strategies
  - Emphasize for students the importance of referrals and interdisciplinary care for challenged(ing) patients

# Tinnitus and Trauma: Case

- Case History

- 32 year old male first seen in Jan., 2011
  - Mild/mod high-frequency sensorineural hearing loss
  - Sudden onset high-pitched hissing tinnitus following prolonged firefight in which veteran was injured, along with dozens of other casualties
  - Pt. also diagnosed with mTBI and PTSD (pt. first noticed tinnitus in the field, “realized it was not going away” in the hospital)
  - Pt. undergoing CBT in psych. for PTSD at time of aud appt.
  - Tinnitus sound essentially unchanged from its initial appearance

	<b>250</b>	<b>500</b>	<b>1000</b>	<b>2000</b>	<b>3000</b>	<b>4000</b>	<b>8000</b>
2011 R	10	15	25	25	40	40	45
2011 L	15	10	20	15	35	40	50

# Posttraumatic Stress Disorder and Tinnitus

- Tinnitus patients with PTSD:
  - Are 3x more likely than those w/out PTSD to experience reactive tinnitus
  - Are 2x more likely to experience sudden onset tinnitus
  - Rate sound tolerance problems as more severe than pts without PTSD (more than half the pts rate sound tolerance problems as more bothersome than tinnitus)

# Counseling Considerations: Tinn and PTSD

- Pt. may report that nearly all aspects of life affected by tinnitus
  - Sleep, concentration, communication, reading, enjoyment of quiet activities, ability to function in noisy environments
  - Co-occurring psychological complications include depression, anxiety, chronic hyperarousal/hypervigilance, violent outbursts
  - Additionally, tinnitus is reactive; Pt. displays exaggerated startle and reports tinnitus exacerbation may last for “up to a few hours” when that occurs
  - “Sometimes the sound reminds of things, sometimes when PTSD gets triggered, the sound seems to get louder.”
  - Aversions to crowds and unfamiliar places (often difficult to distinguish from sound tolerance problems)

# Counseling Considerations: Self-efficacy

- Use of Self-efficacy scaling
  - In addition to the more typical tinnitus-related complaints, questions also focus upon ability to use devices to ameliorate tinnitus disruption
  - Reveals that the pt's ability to use sound therapeutically will be compromised by the perceived need to monitor his environment (or his 'perimeter'), particularly true at night
  - Loudness tolerance difficulties and near normal hearing complicates use of hearing aids
  - Pt's self-efficacy is very poor

# Initial Appointment (2 hours)

- Initial appointment:
  - Intake forms completed and reviewed with the patient (THI, TRQ, Case Hx, SETMQ)
  - Results from previously-obtained audio are discussed
  - Counseled re: auditory pathway function, tinnitus and hearing loss mechanisms – his understanding is confirmed through questioning during the session
  - Links between PTSD and tinnitus are identified
  - Ear level devices rejected immediately due to effect of masking environmental sounds (pt. had already received a sound generator from the VA, did not use it)

# Case History: Patient ratings of tinnitus

	At intake	Follow up
THI	92/100	
TRQ	98/104	
Awareness (%)	100%	
Bothered by (%)	100%	
Loudness	9/10	
Annoyance	10/10	
Impact on Life	10/10	
Sound Tolerance	10/10	

N=550	Total	Functional	Catastrophic	Emotional
PT (187): Mean	62.8	28.4	11.6	22.8
T (363): Mean	46.0	21.4	9.0	15.6

# Consultation w/ Psychologist

- Goals of CBT reviewed (8-week group course administered through MH clinic)
- Enhancement of tinnitus self-efficacy targeted as a way to support CBT
- Focus of subsequent appt.:
  - Improve pt's understanding of relation between tinnitus and PTSD
  - Identify optimal sound and level for use to facilitate sleep and quiet activities at home
  - Hearing aid demonstration/fitting delayed at pt. request due to concerns re: loudness and tendency to startle, however following discussion re: auditory gain and putative hearing aid benefit, patient agreed to trial period

## Follow-up (nine months later)

- Patient reports improved sleep with use of sound generator at a low level
- Hearing aid use for patient with PTSD:
  - Supports environmental awareness (“nobody sneaks up on me anymore”)
  - Supports masking for tinnitus
  - We’ve reported on device effectiveness even with thresholds at or near the normal range; device set with minimal gain, many pts prefer omnidirection mic to support navigating the environment
- His understanding of tinnitus mechanisms ‘helps, but it’s still there’
- PTSD symptoms reduced ‘slightly’ following group and individual sessions (beyond 8-week group)

## Long-term follow-up (nine months later)

	<b>At intake</b>	<b>Follow up</b>
THI	92/100	70/100
TRQ	98/104	64/104
Awareness (%)	100%	100%
Bothered by (%)	100%	80-90%
Loudness	9/10	9/10
Annoyance	10/10	9/10
Impact on Life	10/10	8/10
Sound Tolerance	10/10	10/10

# Summary

- Collaboration w/ psychology section was essential
- Initial impressions of sound generator may be modified and counseling re: use of the device should improve outcome w/ device; hearing aid benefit (ultimately) revealed pt's adaptability and willingness to try devices after initially refusing them
- Review of mechanisms related to tinnitus (and the links to PTSD) helps, but is not a cure
- Improvement may not mean much when viewing questionnaire results (ie., pt. at last appt. had THI score of 70/100), but by pt. report, the situation was much improved

# Acoustic Shock Case

- Case History: Male patient 65 yrs at time of clinical contact (about 4 months post-exposure)
  - Longstanding bilateral hearing loss (HE 4 years prior to this appt; hearing aid trial unsuccessful)
  - Longstanding tinnitus without prior sound intolerance issues
  - Pt. attributed gradual increase of hearing loss over 30+ years to occupational noise exposure
  - Denied familial history of concern, no sudden changes in hearing, no sudden onset of tinnitus
  - No health concerns other than hypertension prior to exposure, depression and anxiety afterward (expressed desire for minimal pharmacologic intervention)
  - Denies smoking, abusing ethanol, and recreational drugs
  - Occasional OTC sleeping pill

# Acoustic Shock Case

- Case History: Male patient 65 yrs at time of clinical contact
- Acoustic Shock Event
  - Fire engine siren/horn blowing suddenly toward his right side
  - Output of such sirens and horns ranges from 110-130 dB within 20 meters
  - The pt. reported the driver laughing at his startled response, and continuing to sound the horn, in the mind of the patient, unnecessarily and with malintent
  - Immediate exacerbation of tinnitus (no pre-event tinnitus info; THI=70/100; TFI=86/100; all 8 domains averaged at least 7/10)
  - Unexplained pain in right ear following exposure to many sounds, but in particular impulsive and high-pitched sounds
  - No perceived change in hearing
  - Increased anxiety regarding situations with potentially-painful sounds; avoidance

## PT and AR thresholds (separated by ~4 years)

	250 Hz	500 Hz	1000 Hz	1500 Hz	2000 Hz	3000 Hz	4000 Hz	8000 Hz
Pre-PT R	10	20	20		30	55	70	80
Post-PT R	20	20	20	25	45	55	75	90
Pre-PT L	20	10	15		15	30	45	55
Post-PT L	15	20	15		30	50	65	80
AR RI		100	85		85			
AR RC		105	NR		NR			
AR LI		100	85		90			
AR LC		90	95		95			

After event (4 months ago):

Tinnitus remained elevated and is now reported to be reactive

Pain AD despite greater threshold shift AS

Chronically high anxiety (he lived across the street from the firehouse(!))

Sound intolerance that limits activities and personal contacts; rejects sound

therapy for tinnitus due to the potential to affect mood and exacerbate tinnitus

# Acoustic Shock Disorder

- Different from other forms of occupational noise exposure
  - Unlike chronic exposure to regulated sound levels (i.e., OSHA-regulated environments) ASD results from acute trauma (estimated in reports as  $\geq 120$  dBA)
  - 140 dB pk single exposures cause permanent hearing loss in 50% of individuals
  - May be related to acute exposures in atypical occupational settings; earliest and most often-studied group includes workers in call centers exposed to “sudden brief unexpected noise” McFerran, 2015
- Complaints
  - Pain distinguishes ASD from many other otologic disorders affecting the inner ear
  - Tinnitus, dizziness, hyperacusis, subjective hearing problems (ie., speech in noise) and full or blocked sensation

# Acoustic Shock Disorder

- First reported in Denmark in 1999 in an internal document associated with a call center whose employees complained
- Milhinch, 2002 reported on Australian call centers, Lawton, 2003 and Parker et al., 2014 reported regarding UK call centers
  - Call centers in India reporting similar findings
- Westcott et al. (2013) first large-scale study (Australia)
  - 345 patients who had been referred to tinnitus clinics in four different countries

# Acoustic Shock Disorder

- Westcott et al. (2013)
  - Many patients pursue litigation rather than medical care; may be one reason few reports appear in medical journals
  - In help seeking patients:
    - Nearly 90% female (75% of workforce in call centers surveyed are female); average about 40 yrs of age
    - Co-occurring factors include anxiety and depression, panic disorders, PTSD, history of previous head injury, fibromyalgia, migraine

# Acoustic Shock Disorder

- Sound sources associated with call centers (Westcott et al. 2013; McFerran, 2015)
  - Electrical interference due to thunderstorm
  - Accidentally calling fax lines or modems
  - Alarms or gunfire on the client's side of the phone
  - Noises generated by disgruntled clients
    - Air horns
    - Whistles
    - Vuvuzelas
- Other cases not associated with call centers:
  - Generator backfire/explosion
  - Train horn
  - Explosion during science experiment
  - Feedback from PA system

# Acoustic Shock Disorder

- Clinical Features
  - Pain most common (Apparent in 95% of subjects in Milhinch (2002) study (n=103))
    - 81% indicate pain in the ear
    - 11% pain in the jaw or neck
    - 7% pain in the facial area
  - Tinnitus in 50% of patients
  - Vertigo in 48%
  - Hyperacusis in 38%
  - Hearing loss in 18%; in other studies, pts seeking compensation reported hearing loss more often

# Acoustic Shock Disorder

- Mechanisms (primarily from Wescott et al 2013)
  - May be a manifestation of tonic tensor tympani syndrome
  - General startle reflex (as opposed to the AR, or stapedial ref.)
  - Chronic TT contraction associated with tension headache
  - May be provoked by “increased psychic tension” (Patuzzi 2010)
  - Threshold of TT contraction may be reduced in the presence of high stress and anxiety levels (as it is a startle response)
  - In susceptible (ie., anxious, hyperaroused) individuals, a startling sound can trigger long-lasting tonic TT contraction
  - Westcott reported that 41% of patients with normal PT audios had abnormal emission findings

# Acoustic Shock Case

- In terms of Mr. M's case: The patient experiences a pain sensation and as in many cases of traumatic-onset hearing problems, he associates it with a specific cause/location
- Anticipation of the event being repeated produces anxiety and avoidance
- Tissue damage raises the likelihood of a nociceptive response intended as a protective mechanism

However:

- Avoidance contributes to sensitization
- Anticipation of pain may lower thresholds of pain
- And the pt. still has tinnitus and would benefit from therapeutic use of sound

# Acoustic Shock Disorder

- Management for this patient
  - Patients with acoustic shocks in their history may experience long term effects similar to PTSD; exaggerated startle, re-experiencing symptoms, avoidance, cognitive distortions (e.g., sensory mislabeling), increased arousal, stress of anticipation
  - Most literature and guidelines indicate that symptoms lasting more than one month require ongoing attention (ie., the DSM-V)
  - Modification to call center equipment or other occupational accommodations; patients seek help from many diverse sources
  - Auditory training and counseling that addresses events associated with hyperacusis/fosters desensitization may facilitate a form of loudness recalibration

# Acoustic Shock Disorder

- Management: Similar to the approach for PTSD with tinnitus
  - Counseling in Audiology employing tenets of CBT in order to facilitate understanding of sound and its effects, accurate appraisal of environment, and to support his ability to “talk himself through” aversive sound-related events
  - Pt. provided option of maskers and/or hearing aids; opted for combination units
  - Devices set, initially, as low-level maskers (No surprise: he did not want the fire station amplified)
  - Management strategies re: environments and activities discussed and encouraged in order to address hyperacusis/foster desensitization
  - Value of enriching environment with familiar sound (music was deemed appropriate by the pt) when at home and inactive

# Acoustic Shock Disorder

- Epilogue; through the next six months
  - Combination units ultimately set as hearing aids with low-level background noise (streaming different sounds for his next set of devices a possibility)
  - Pain remained and could be triggered by moderately loud sound in a variety of situations, worst when high-pitched or resembling fire engine/siren sound
  - By patient report, hearing aid/masker use facilitated coping with tinnitus (intake forms were not repeated), however sound intolerance remained a challenge
  - He cautions (from experience) against vigorously encouraging patients to practice exposure as he had a few setbacks when doing so
  - As with many patients suffering sound intolerance, a setback during a well-intentioned exposure regimen can negate all progress to that point and have the patient start “at worse than zero”

# Acoustic Shock Disorder

- Epilogue
  - His avoidance of sound is generally reduced, and the fear he experienced related to proximity of the firehouse was solved...
  - When he moved!
- Moral of the story: Interprofessional teams should include a realtor(?)

