Hearing Care for Adults
Conference 2009

# OUTCOMES MEASUREMENT IN THE AUDIOLOGIC REHABILITATION OF THE ELDERLY

Harvey B. Abrams

Bay Pines VAHCS
Bay Pines, FL

University of South Florida

# “Resident of the Month”

“B.B.” is an 88 resident of an ALF. She’s not “hearing as good as I used to” and has difficulty understanding her tablemates at mealtime and she says the woman who occupies the room next to hers complains that she keeps the TV too loud

She just wants to enjoy life again

# B.B.’s Audiologic Challenges

- Peripheral hearing impairment
- Higher level auditory processing
  - Temporal processing
  - Frequency resolution
- Working memory
- Resource allocation
- Visual impairment
- Cognitive decline
- Motor decline
- Divided attention
  - Speech understanding in multiple talker environments

# The Clinician's Challenge

- To select the appropriate tools to measure the effectiveness of B.B.'s audiologic rehabilitation treatment plan *from B.B.'s perspective*
- *i.e. outcome measures*

# How do we decide which measure to use?

- A suggested approach:
  - Determine specific treatment goal(s)
  - Determine which outcome domain(s) are most appropriately matched to the goal(s)
  - Determine which specific measure(s) are most appropriate for addressing the domains of interest

# Determining treatment goals (income measures)

- Why are you here?
  - motivation
- What's important to you?
  - prioritization
- What do you expect?
  - expectation

# APPENDIX: HEARING AID SELECTION PROFILE (HASP)

Name: _____ Age: _____ Date: _____

**Instructions:** Please place a "√" in the box indicating how strongly you agree or disagree with each statement below. If you do not agree or disagree, place a "√" in the Neutral box. Please do not skip any items. Please complete all the items regardless of whether you are going to receive one or two hearing aids.

| | | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|---|---|---|---|---|---|
| 1T. | Computers have made our lives easier and better. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2A. | If I were losing my hair, I would get a transplant, wear a wig or toupee, or take medicine to make it stop. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3T. | I have or would like to have a cellular phone. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4C. | I am not an extravagant buyer. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5P. | It is easy for me to use small objects such as paper clips, coins, small buttons, and/or zippers. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6Cl. | It is very important for me to hear conversations with one other person. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7A. | There is nothing wrong with using plastic surgery to improve one's appearance. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8L. | I consider myself to be an active, busy, on-the-go kind of person. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9P. | I do not have arthritis in my fingers. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10L. | Physical activity is an important part of my life. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11E. | A hearing aid will restore my hearing to normal just as eyeglasses restore vision to normal. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12A. | I do not feel comfortable about leaving the house unless I look "just right." | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13Cl. | It is very important for me to be able to hear on the telephone. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14E. | I expect that my hearing aid will improve my ability to understand speech in background noise. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15P. | I have good sensation in my fingertips. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16M. | I want to wear a hearing aid even if I still have difficulty hearing in some situations. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17A. | I am self-conscious about my appearance. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18E. | My hearing aid will make speech clear, distinct, and understandable in all situations. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19T. | I feel that new technology has improved our lives. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20M. | I know that a hearing aid will help me. | ☐ | ☐ | ☐ | ☐ | ☐ |

Jacobson GP, Newman CW, Fabry DA, Sandridge SA. J Am Acad Audiol. 2001 Mar;12(3):128-41;

# EXPECTED CONSEQUENCES OF HEARING AID OWNERSHIP (ECHO)

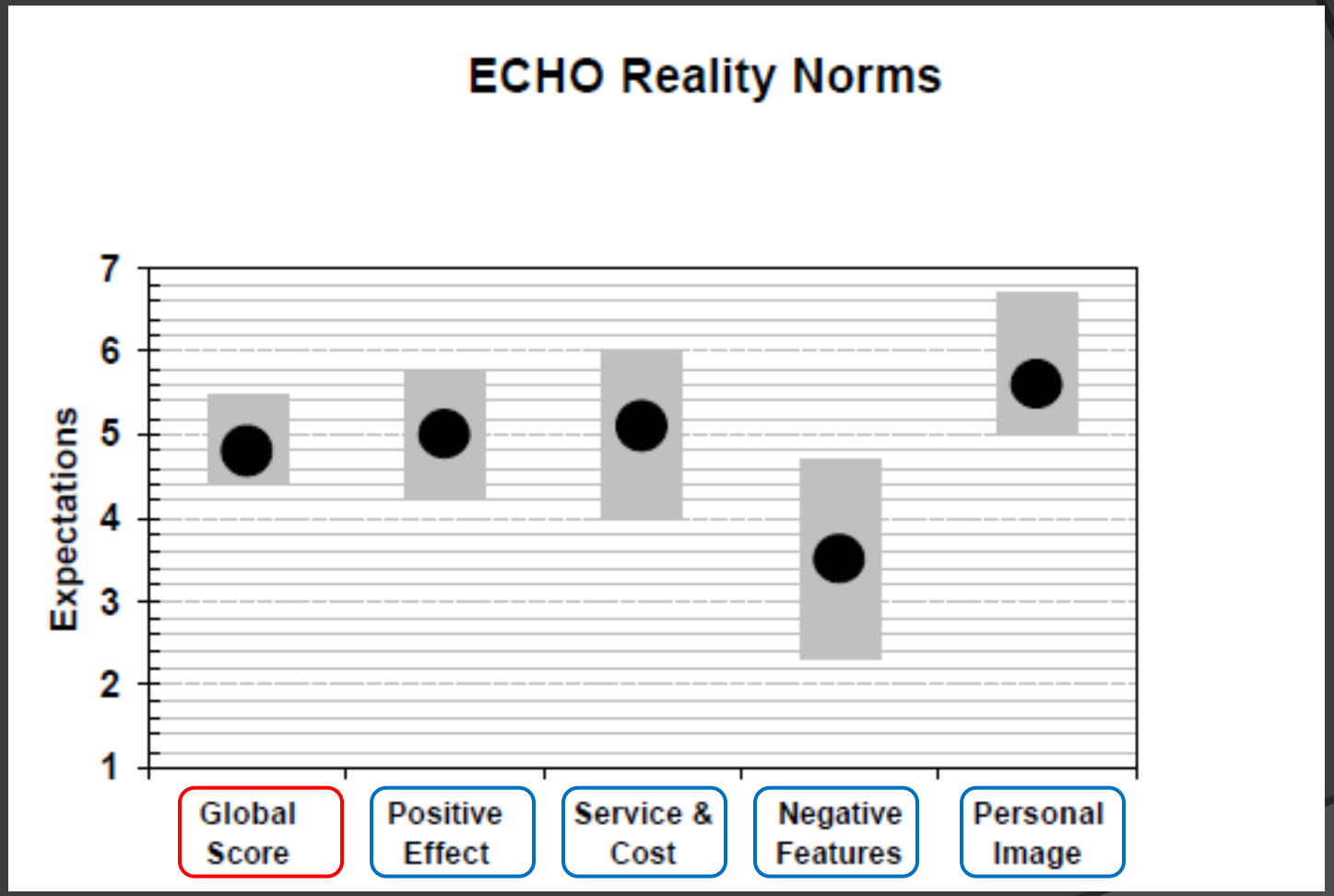
(Cox & Alexander, 2000)

**Name:**_____ **DOB:**_____ **Today's Date:**_____

INSTRUCTIONS: Listed below are statements about hearing aids. Please circle the letter that indicates the extent to which you agree with each statement. Use the list of words below to determine your answer.

A. Not at all
B. A little
C. Somewhat
D. Medium
E. Considerably
F. Greatly
G. Tremendously

| EVALUATIVE QUESTION | RESPONSE | CONCERNS/COMMENTS |
|---|---|---|
| 1. My hearing aids will help me understand the people I speak with most frequently. | A B C D E F G | |
| 2. I will be frustrated when my hearing aids pick up sounds that keep me from hearing what I want to hear. | A B C D E F G | |
| 3. Getting hearing aids is in my best interest. | A B C D E F G | |
| 4. People will notice my hearing loss more when I wear my hearing aids. | A B C D E F G | |
| 5. My hearing aids will reduce the number of times I have to ask people to repeat. | A B C D E F G | |




http://www.memphis.edu/ausp/harl/downloads/ECHOplot.pdf

# Client Oriented Scale Of Improvement

Name : _____
Audiologist : _____
Date : 1. Needs Established _____
2. Outcome Assessed _____

**SPECIFIC NEEDS**

Category New _____
Return _____

Indicate Order of Significance

☐ *I want to be able to understand my tablemates*

☐ *I want to able to hear and understand the TV at a volume that won't bother the woman next door*

☐ *I want to enjoy life again*

☐

☐

**Degree of Change**

| Worse | No Difference | Slightly Better | Better | Much Better | CATEGORY |
|---|---|---|---|---|---|
| | | | | | 4 |
| | | | | | 5 |
| | | | | | 16 |
| | | | | | |
| | | | | | |

**Final Ability**
Person can hear

| 10% | 25% | 50% | 75% | 95% |
|---|---|---|---|---|
| Hardly Ever | Occasionally | Half the Time | Most of the Time | Almost Always |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Categories
1. Conversation with 1 or 2 in quiet
2. Conversation with 1 or 2 in noise
3. Conversation with group in quiet
4. Conversation with group in noise
5. Television/Radio @ normal volume
6. Familiar speaker in phone
7. Unfamiliar speaker on phone
8. Hearing phone ring from another room
9. Hear front door bell or knock
10. Hear traffic
11. Increased social contact
12. Feel Embarrassed or stupid
13. Feeling left out
14. Feeling upset or angry
15. Church or meeting
16. Other

NATIONAL ACOUSTIC LABORATORIES

H. Dillon (NAL) et al
H. Dillon (NAL) et al

# How do we decide which measure to use?

- A suggested approach:
  - Determine specific treatment goal(s)
  - Determine which outcome domain(s) are most appropriately matched to the goal(s)
  - Determine which specific measure(s) are most appropriate for addressing the domains of interest

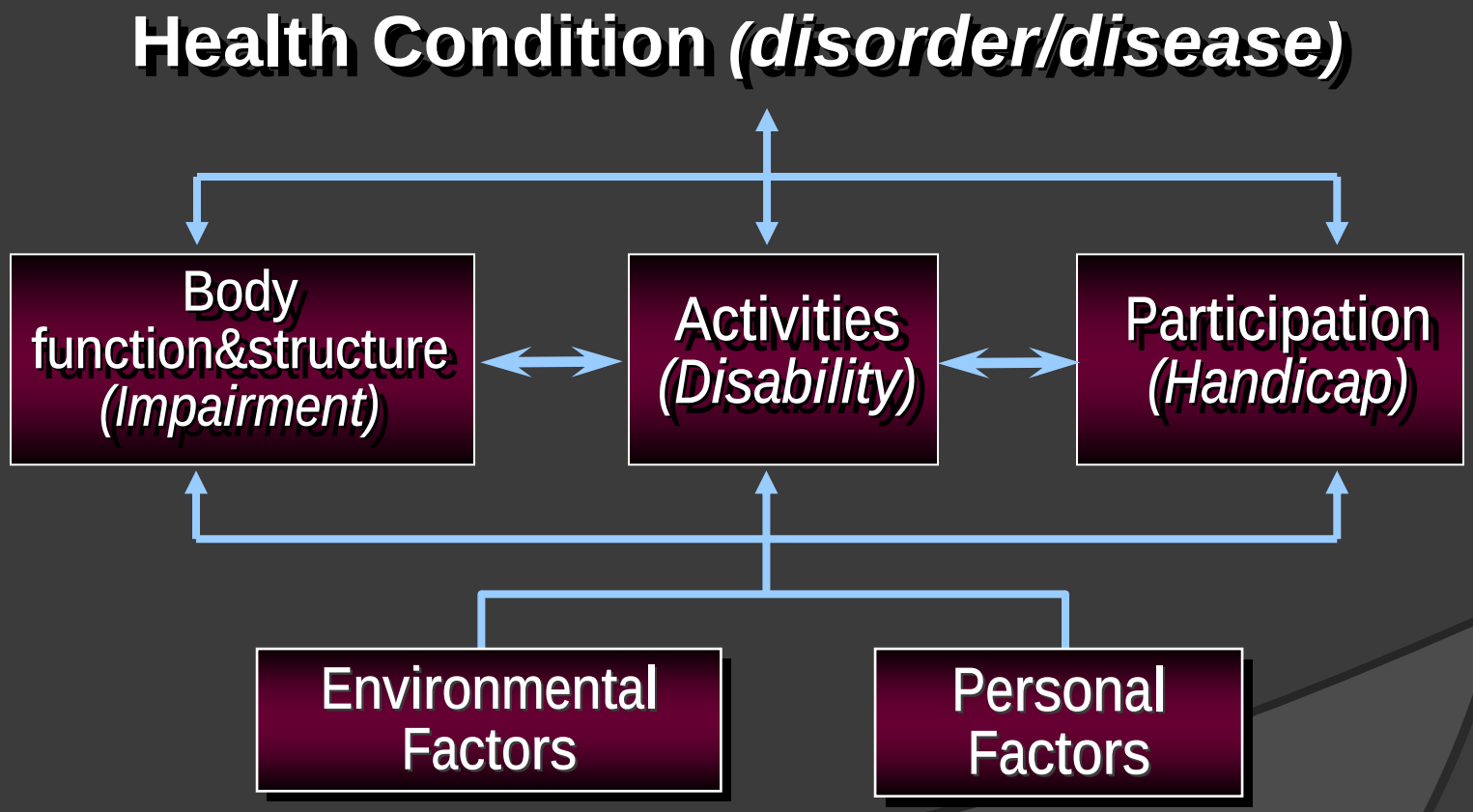
# World Health Organization's

www.who.int/classification/icf

# ICF

## International Classification of Functioning, Disability & Health

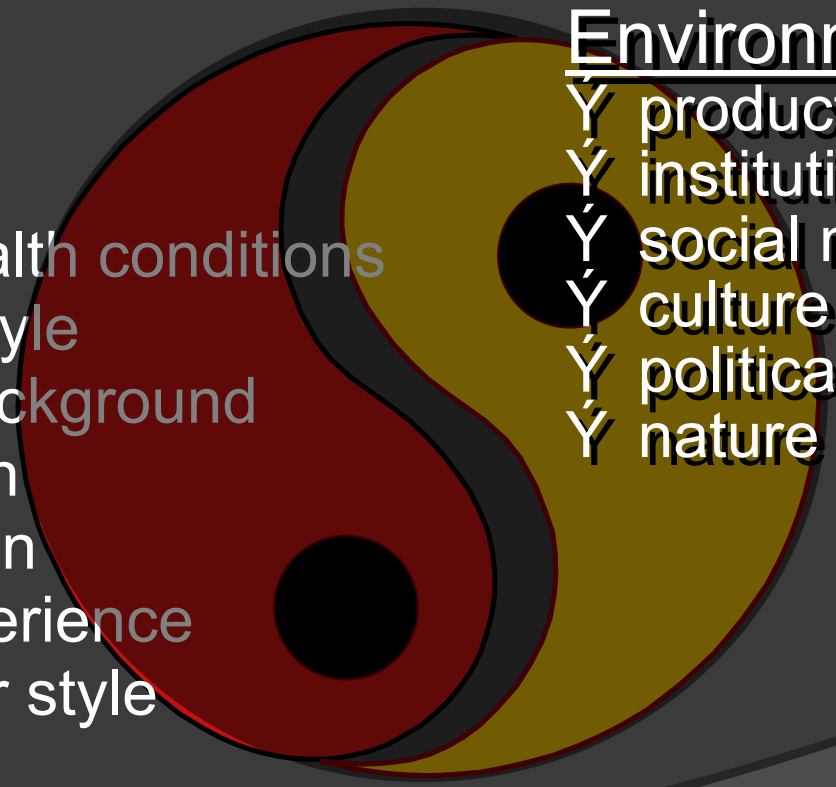
# ICF


Health Condition (disorder/disease)
Body function&structure (Impairment)
Activities (Disability)
Participation (Handicap)
Environmental Factors
Personal Factors

# Contextual Factors

<u>Personal</u>

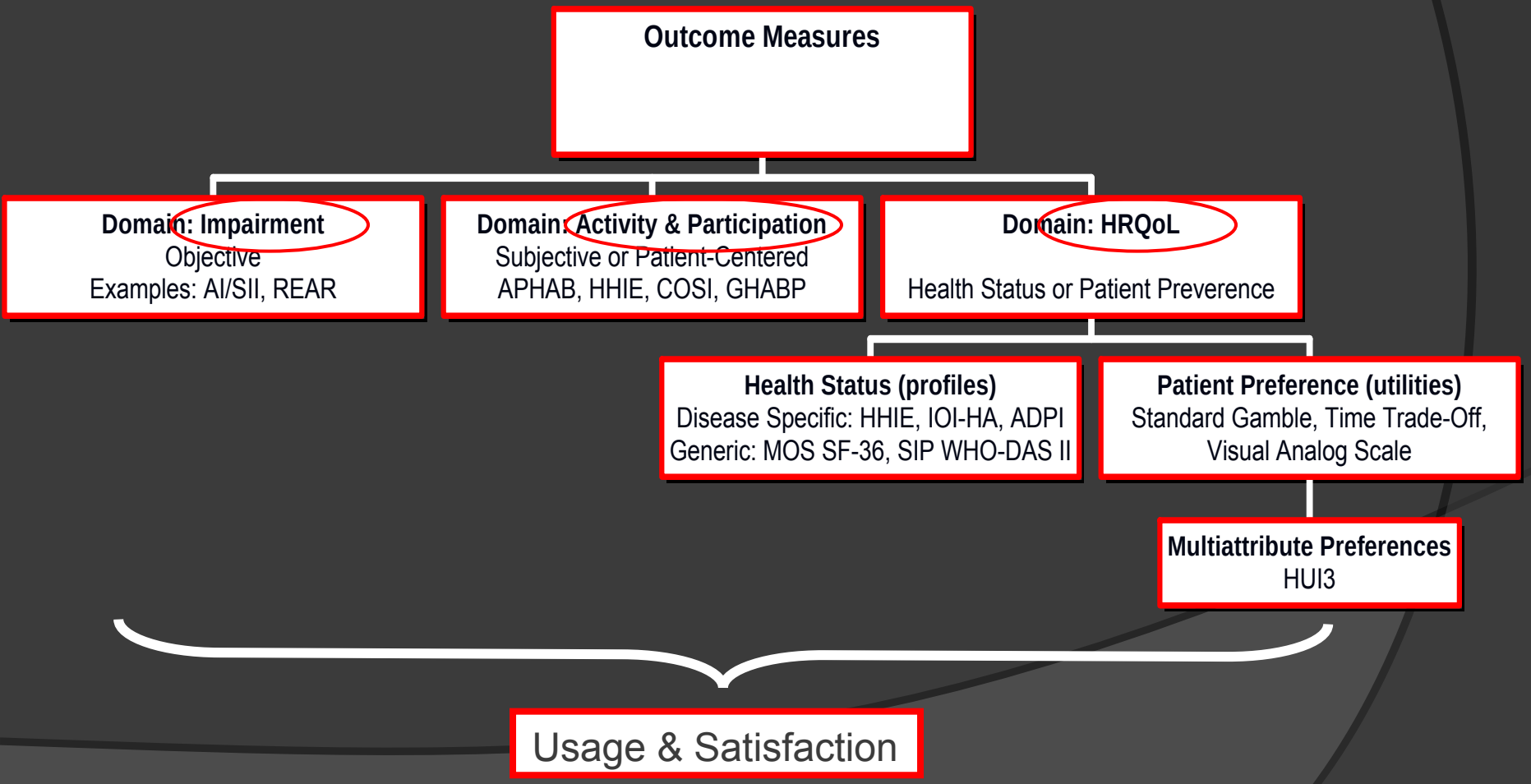
- gender
- age
- other health conditions
- coping style
- social background
- education
- profession
- past experience
- character style



<u>Environment</u>

- products
- institutions
- social norms
- culture
- political factors
- nature

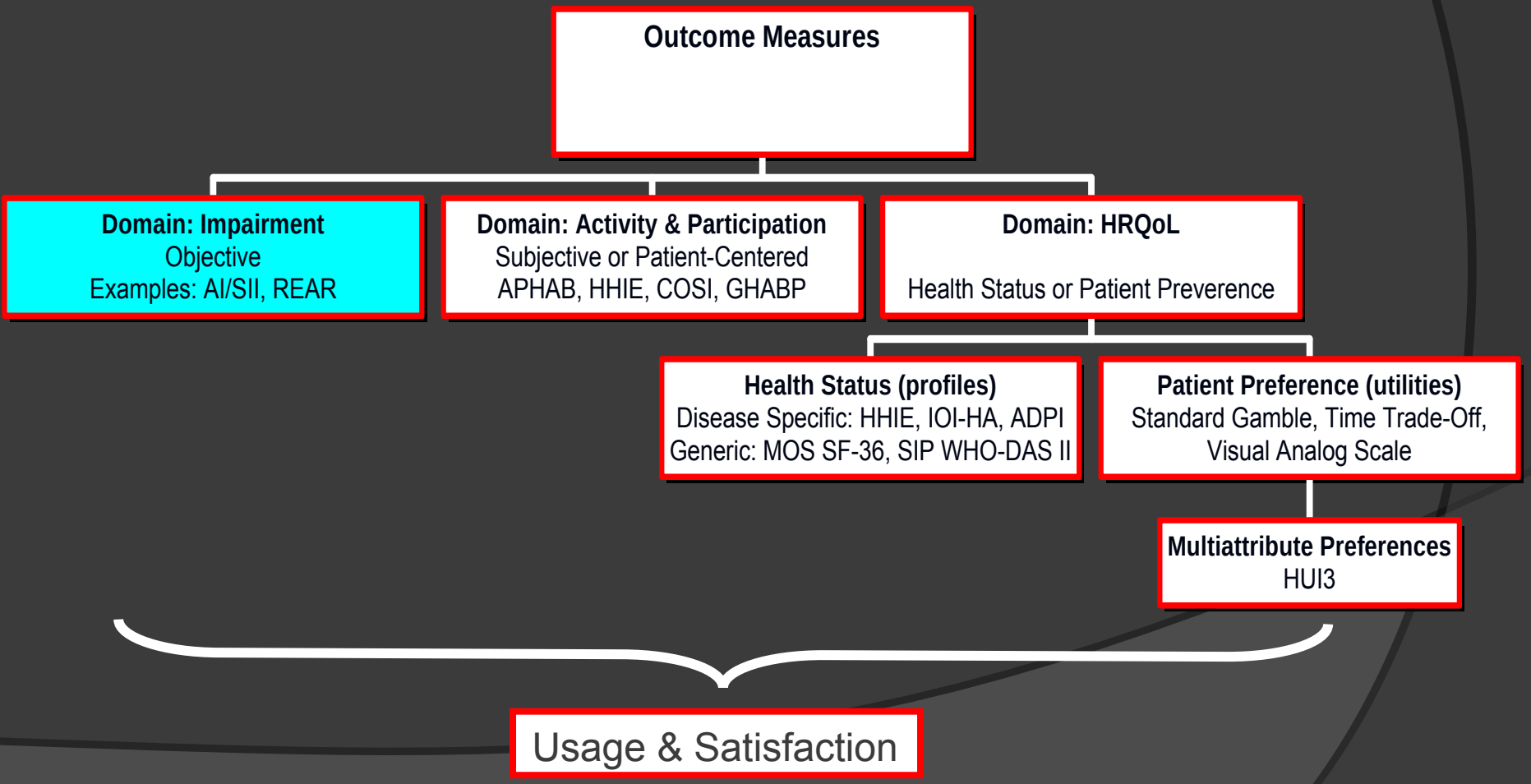
# An Outcomes Taxonomy for Audiology



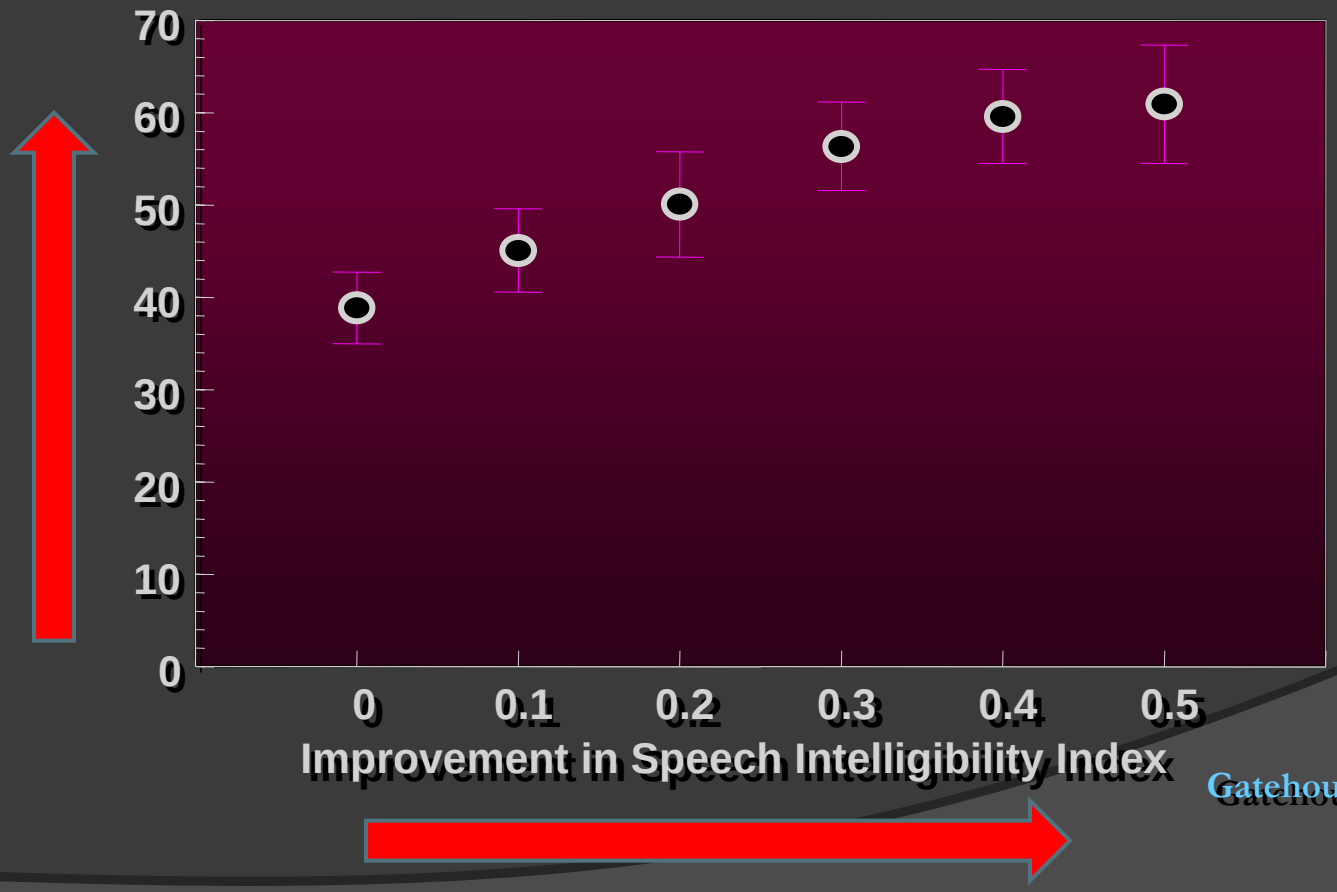
# Outcome Domains

- **Impairment**
- **Activity/Participation Benefit**
- **Quality of life**
- **Device usage**
- **Satisfaction**

# An Outcomes Taxonomy for Audiology



# Plot of the Reported Benefit score from the Glasgow Hearing Aid Benefit Profile & 95% CI as a function of improvement in SII after control for impairment level




Gatehouse, 2002

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | | | | | |
| HHIE | | | | | | |
| SSQ | | | | | | |
| COSI | | | | | | |
| WHO-DAS | | | | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Application for the Elderly

- The verification of audibility is a quick, easily tolerated, and effective outcome measure in the impairment domain
- While improved audibility does not guarantee improved intelligibility, the absence of audibility guarantees the absence of improved intelligibility

# Outcome Domains

- **Impairment**
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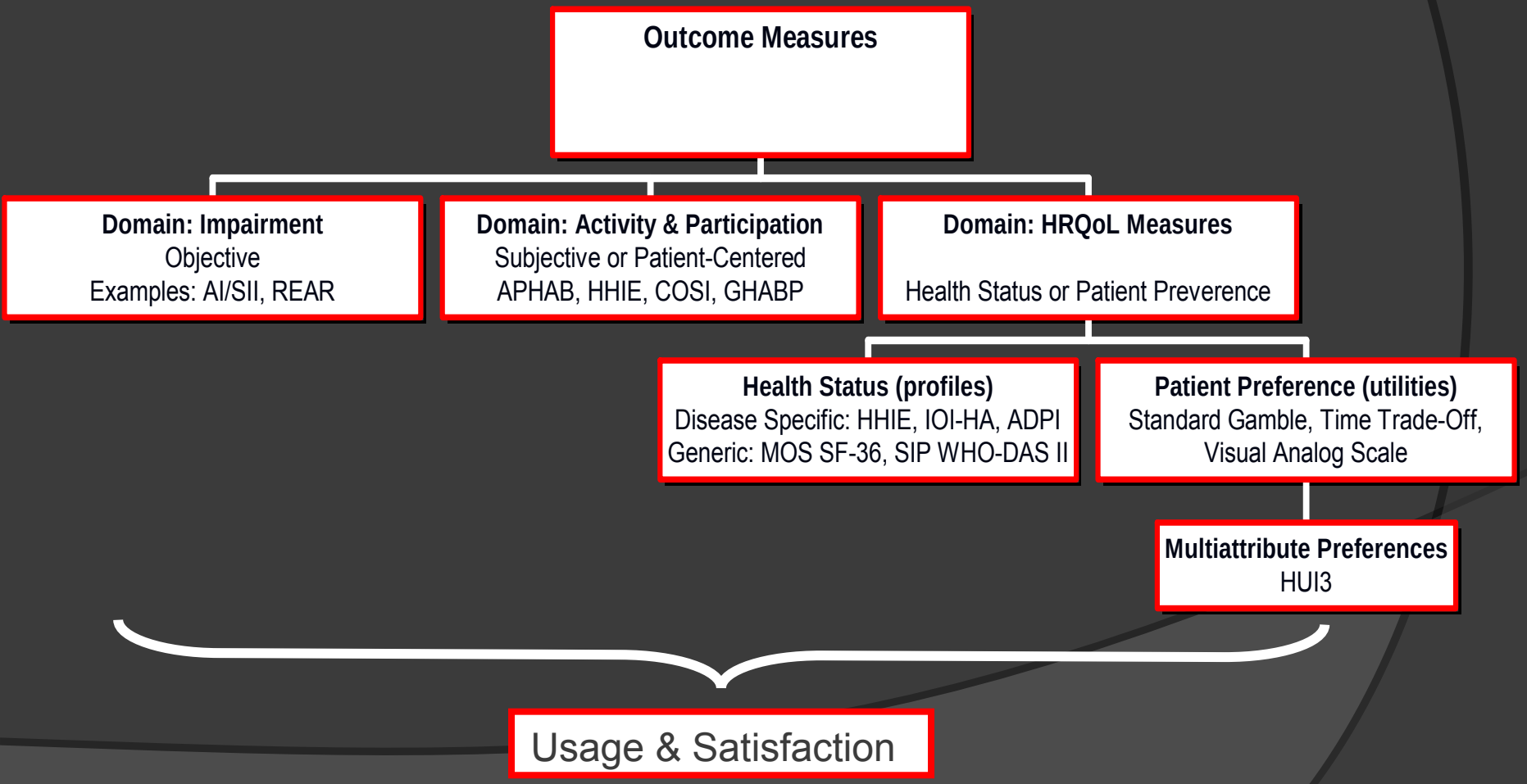
# An Outcomes Taxonomy for Audiology



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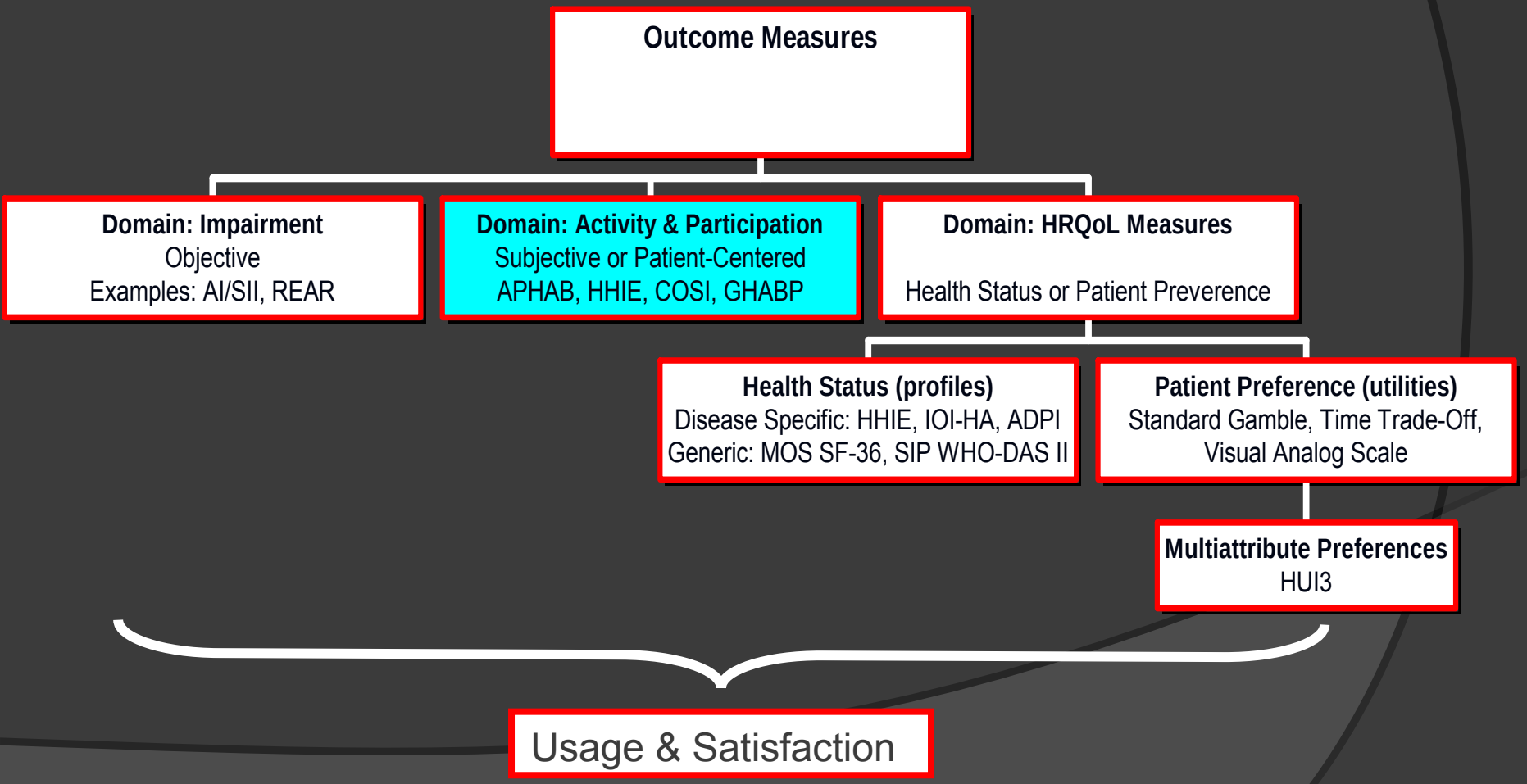


# **Subjective** (Patient-Centered) **Measures**

- Assess benefit/communication effectiveness across many environments and situations

# Abbreviated Profile of Hearing Aid Benefit (Cox & Alexander, 1995)

Four subscales (examples of items):

Ease of communication

- When I am in a small office interview or answering questions, I have difficulty following the conversation.

Reverberation

- When I am talking with someone across a large empty room I understand the words.

Background noise

- When I am in a crowded grocery store talking with the cashier I can follow the conversation.

Aversiveness

- Traffic noises are too loud.

| Elderly with none or mild subjective hearing problems - Unaided | | | | |
|---|---|---|---|---|
| **Percentile** | **EC** | **RV** | **BN** | **AV** |
| 95 | 38.5 | 49 | 51 | 65 |
| 80 | 17 | 29 | 36.5 | 39.5 |
| 65 | 14 | 27 | 29 | 21 |
| 50 | 12 | 20 | 23 | 10.5 |
| 35 | 8.5 | 14.5 | 18.5 | 5.5 |
| 20 | 3 | 6.5 | 13.5 | 3 |
| 5 | 1 | 1 | 1.5 | 1 |

http://www.memphis.edu/ausp/harl/downloads/AP95NORM.pdf

| Users of WDRC capable hearing aids- Benefit | | | | |
|---|---|---|---|---|
| **Percentile** | **EC** | **RV** | **BN** | **AV** |
| 95 | 76 | 70 | 56 | 16 |
| 80 | 52 | 52 | 47 | 0 |
| 65 | 46 | 41 | 39 | -8 |
| 50 | 38 | 34 | 33 | -13 |
| 35 | 29 | 27 | 23 | -25 |
| 20 | 19 | 16 | 12 | -41 |
| 5 | -10 | -3 | -1 | -61 |

http://www.memphis.edu/ausp/harl/downloads/AP2005NORM.pdf

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | ✓ | | ✓ | | |
| HHIE | | | | | | |
| SSQ | | | | | | |
| COSI | | | | | | |
| WHO-DAS | | | | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Hearing Handicap Inventory for the Elderly (HHIE; Ventry & Winstein, 1983)

- Assesses psycho-social impact of hearing loss
- 25 items provides a Total score, and Social and Emotional scores

| | Yes | No | Sometimes |
|---|---|---|---|
| 1. Does a hearing problem cause you to feel embarrassed when you meet new people? | ___ | ___ | ___ |

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | ✓ | | ✓ | | |
| HHIE | | ✓ | ✓ | | | ✓ |
| SSQ | | | | | | |
| COSI | | | | | | |
| WHO-DAS | | | | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Speech, Spatial and Qualities of Hearing Scale (SSQ; Gatehouse & Noble, 2004)

- 43-item questionnaire organized into 3 categories:

# Speech…

**S[peech] S[patial] Q[ualities] version 3.1.1 I. Speech hearing rating scale**

NAME _____ CONDITION _____ DATE _____

| | | |
|---|---|---|
| 1. You are talking with one other person and there is a TV on in the same room. Without turning the TV down, can you follow what the person you're talking to says? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |
| 2. You are talking with one other person in a quiet, carpeted lounge-room. Can you follow what the other person says? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |
| 3. You are in a group of about five people, sitting round a table. It is an otherwise quiet place. You can see everyone else in the group. Can you follow the conversation? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |
| 4. You are in a group of about five people in a busy restaurant. You can see everyone else in the group. Can you follow the conversation? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |
| 5. You are talking with one other person. There is continuous background noise, such as a fan or running water. Can you follow what the person says? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |
| 6. You are in a group of about five people in a busy restaurant. You cannot see everyone else in the group. Can you follow the conversation? | Not at all — Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min — Max | tick if not applicable ☐ or wouldn't hear it |

Draft questionnaires 6-Nov-09 1

Gatehouse S. & Noble W. (2004). The Speech, Spatial and Qualities of Hearing Scale (SSQ), Int J Audiol 43(2):85-89.

# Spatial…

| | | |
|---|---|---|
| 13. Can you tell from the sound whether a bus or truck is coming towards you or going away? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 14. Do the sounds of things you are able to hear seem to be inside your head rather than out there in the world? | Inside my head … Out there<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 15 Do the sounds of people or things you hear, but cannot see at first, turn out to be closer than expected when you do see them? | Much closer … Not closer<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 16. Do the sounds of people or things you hear, but cannot see at first, turn out to be further away than expected when you do see them? | Much further … Not further<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 17 Do you have the impression of sounds being exactly where you would expect them to be? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |

# Qualities…

| | | |
|---|---|---|
| 6. Can you tell the difference between different sounds, for example, a car versus a bus; water boiling in a pot versus food cooking in a frypan? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 7. When you listen to music, can you make out which instruments are playing? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 8. When you listen to music, does it sound clear and natural? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 9. Do everyday sounds that you can hear easily seem clear to you (not blurred)? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 10. Do other people's voices sound clear and natural? | Not at all … Perfectly<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |
| 11. Do everyday sounds that you hear seem to have an artificial or unnatural quality? | Unnatural … Natural<br>0 1 2 3 4 5 6 7 8 9 10<br>Min … Max | tick if not applicable ☐ or wouldn't hear it |

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | ✓ | | ✓ | | |
| HHIE | | ✓ | ✓ | | | ✓ |
| SSQ | | ✓ | | | | |
| COSI | | | | | | |
| WHO-DAS | | | | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Client Oriented Scale of Improvement (COSI; Dillon & Ginis, 1997)

- Patient-constructed, self-report questionnaire
- Eliminates some of the disadvantages of standardized measures
- Encourages clinician and patient to be specific
- Encourages realistic expectations
- Identifies need for alternative technology

# Client Oriented Scale Of Improvement

Name : _____
Audiologist : _____
Date : 1. Needs Established _____
2. Outcome Assessed _____

**SPECIFIC NEEDS**

Category New _____
Return _____

Indicate Order of Significance

☐ *I want to be able to understand my tablemates*

☐ *I want to able to hear and understand the TV at a volume that' won't bother the woman next door*

☐ *I want to enjoy life again*

☐

☐

**Degree of Change**

-1 0 1 2 3

**Final Ability**
Person can hear

| Worse | No Difference | Slightly Better | Better | Much Better | CATEGORY | Hardly Ever (10%) | Occasionally (25%) | Half the Time (50%) | Most of the Time (75%) | Almost Always (95%) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ✓ | | | 4 | | | ✓ | | |
| | | | ✓ | | 5 | | | | ✓ | |
| | | | ✓ | | 16 | | | ✓ | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Categories
1. Conversation with 1 or 2 in quiet
2. Conversation with 1 or 2 in noise
3. Conversation with group in quiet
4. Conversation with group in noise
5. Television/Radio @ normal volume
6. Familiar speaker in phone
7. Unfamiliar speaker on phone
8. Hearing phone ring from another room
9. Hear front door bell or knock
10. Hear traffic
11. Increased social contact
12. Feel Embarrassed or stupid
13. Feeling left out
14. Feeling upset or angry
15. Church or meeting
16. Other

NATIONAL ACOUSTIC LABORATORIES

$\frac{1+2+2}{3} = 1.7$

H Dillon (NAL) et al

H Dillon (NAL) et al

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | ✓ | | ✓ | | |
| HHIE | | ✓ | ✓ | | | ✓ |
| SSQ | | ✓ | | | | |
| COSI | | ✓ | ✓ | | ✓ | ✓ |
| WHO-DAS | | | | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Application for the Elderly

- Standardized measures (e.g. HHIE, APHAB) may not reveal importance or priority of needs and may be too complex (length, reading level)
- COSI can be the most “ecologically valid” but must be very specific – *where, when, with whom, how often, how important*

# Outcome Domains

- **Impairment**
- **Activity/Participation Benefit**
- **Quality of life**
- **Device usage**
- **Satisfaction**

# Health-Related Quality of Life (HRQoL)

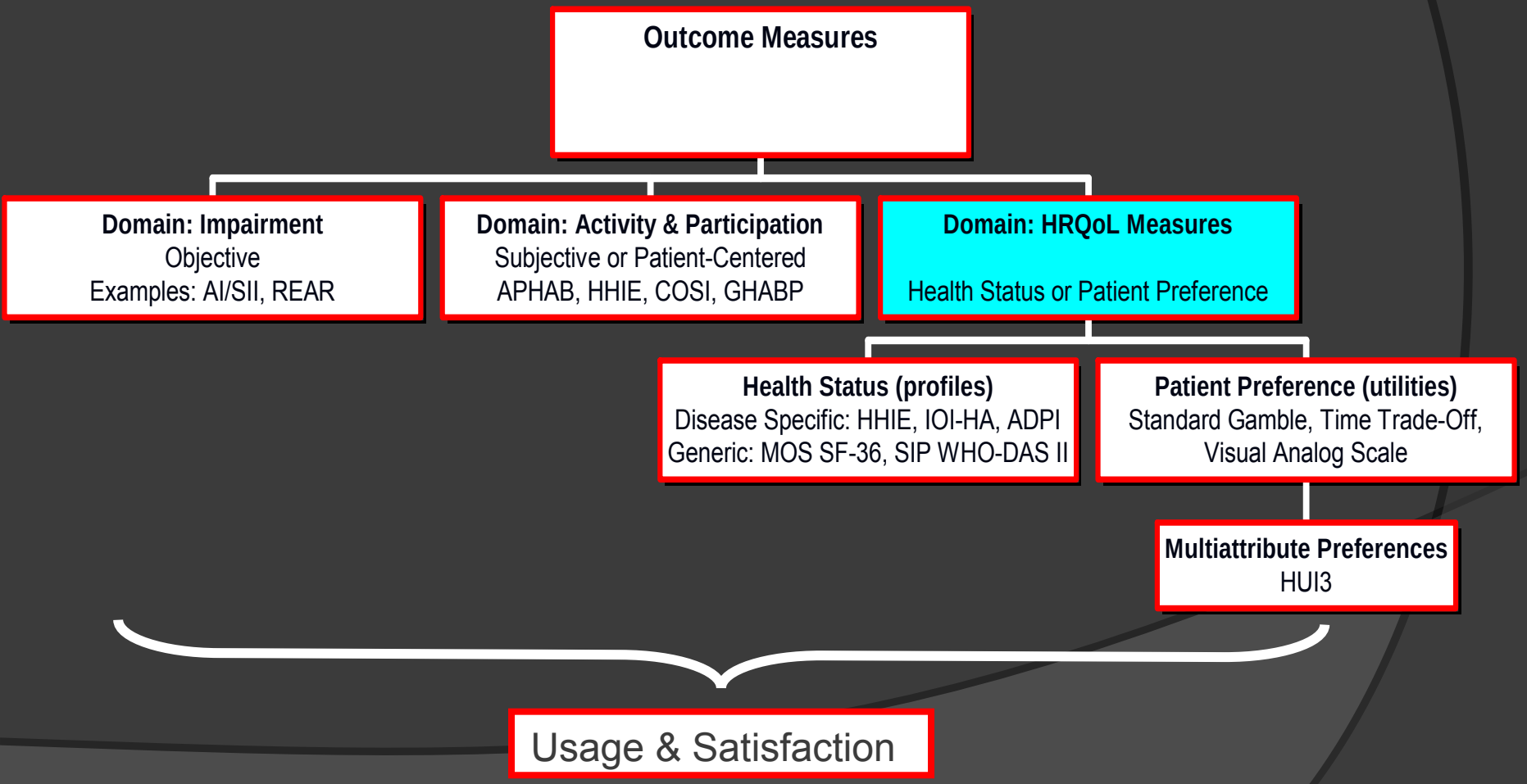
- The impact of a disease, injury, treatment or policy on the individual's:
  - Functional states (physical, social, role, and psychological)
  - Self perception (which is related to individual values and preferences)
  - Societal and familial opportunities

(NIH, 1997)

# Health-Related Quality of Life (HRQoL) in the Elderly

- Hearing impairment decreases a person's ability to communicate
- Decreased communication can lead to many negative emotions (isolation, withdrawal, depression)
- Negative emotions can affect general health
- Audiologic rehabilitation increase the ability to communicate
- Therefore, audiologic rehabilitation can partially improve HRQoL

# An Outcomes Taxonomy for Audiology



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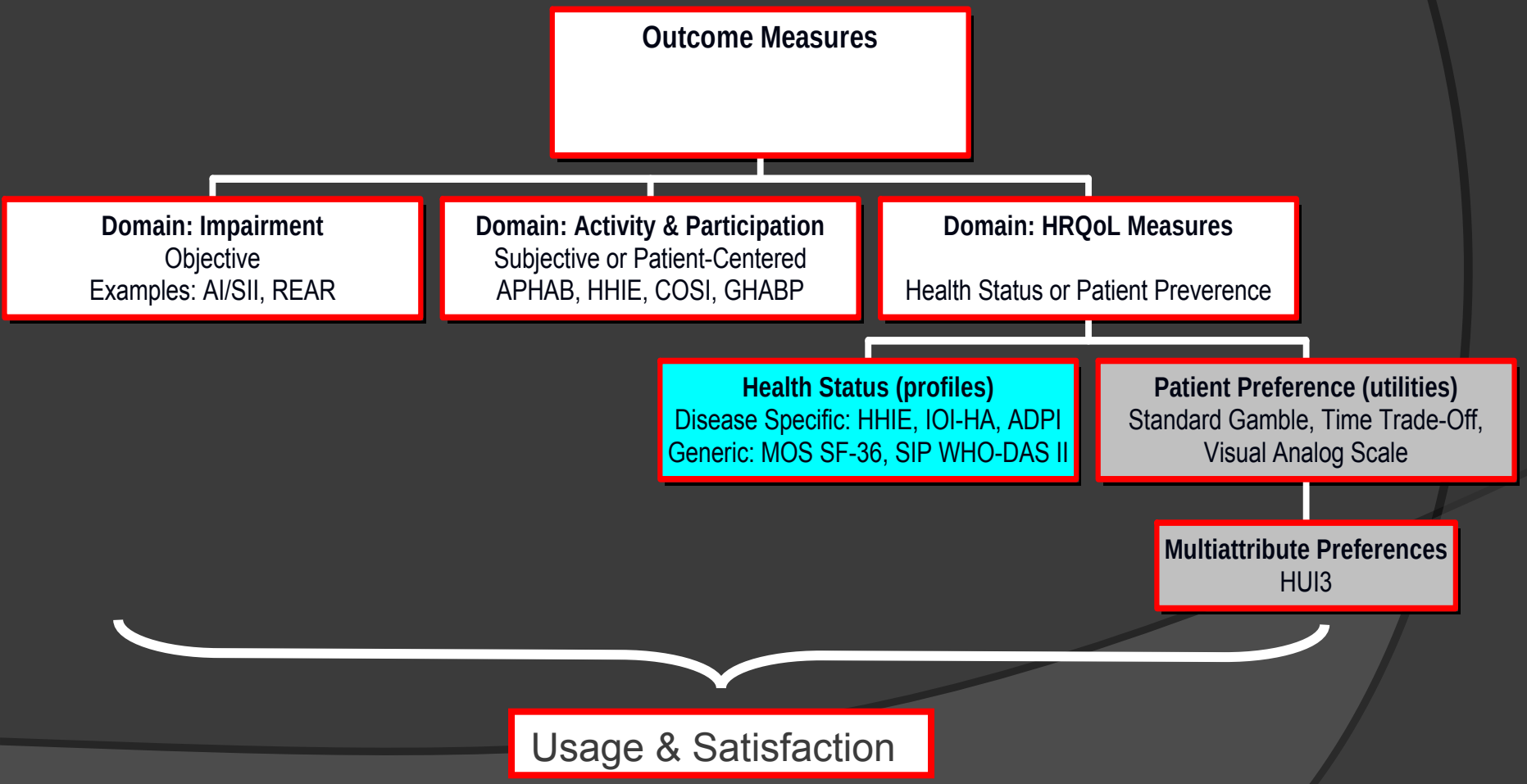


# WHO-Disability Assessment Schedule II (WHO-DAS II)

- 36-item instrument (12, and 12+24 items available)
- Assesses what people do in different areas of life
- General health state assessment measure
- Provides a total score as well as profile scores across six domains

# Domains map directly to ICF's Activity & Participation Classification

- Understanding and communicating
- Getting around
- Self care

- Getting along with others
- Household and work activities
- Participation in society

# Understanding and Communicating

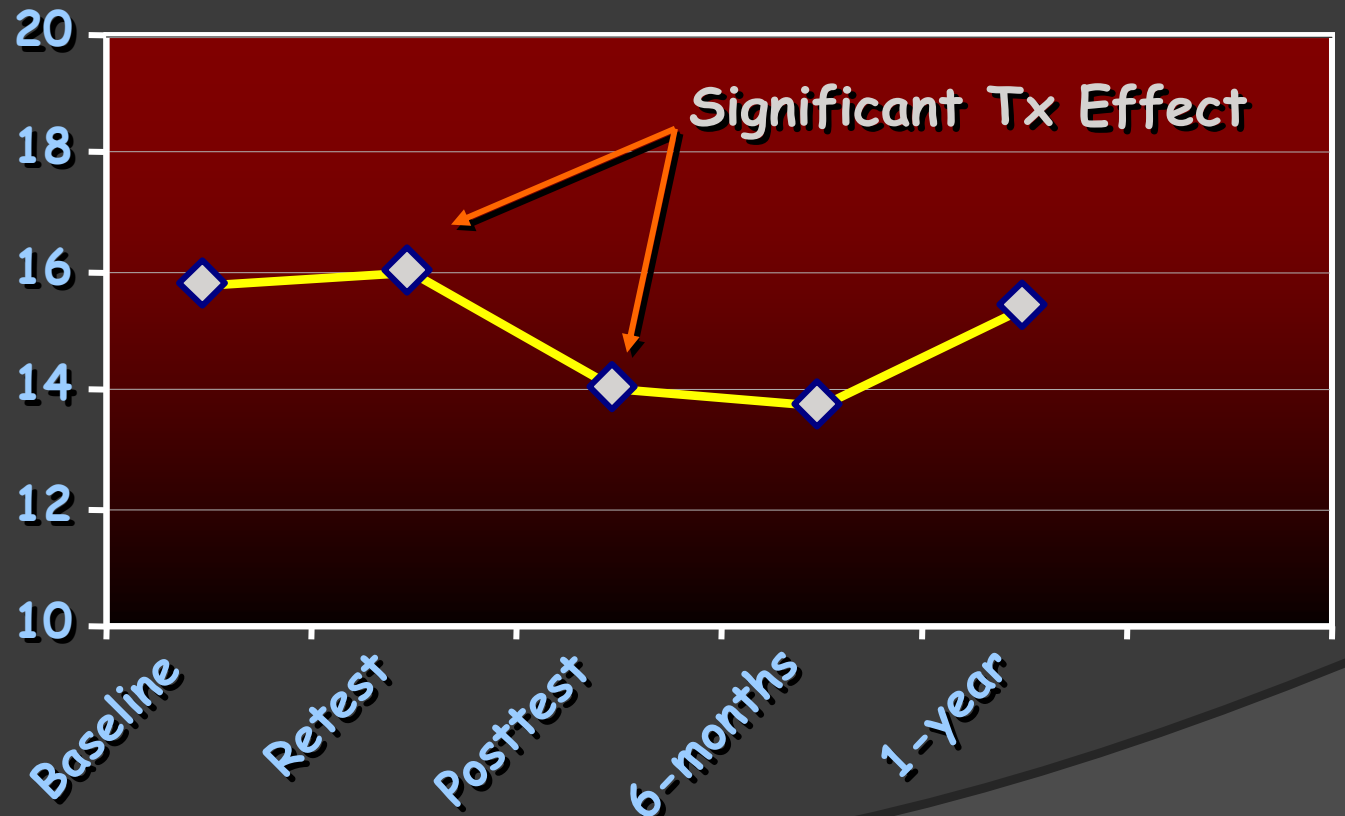
Generally Understanding What People Say

Starting and Maintaining a Conversation

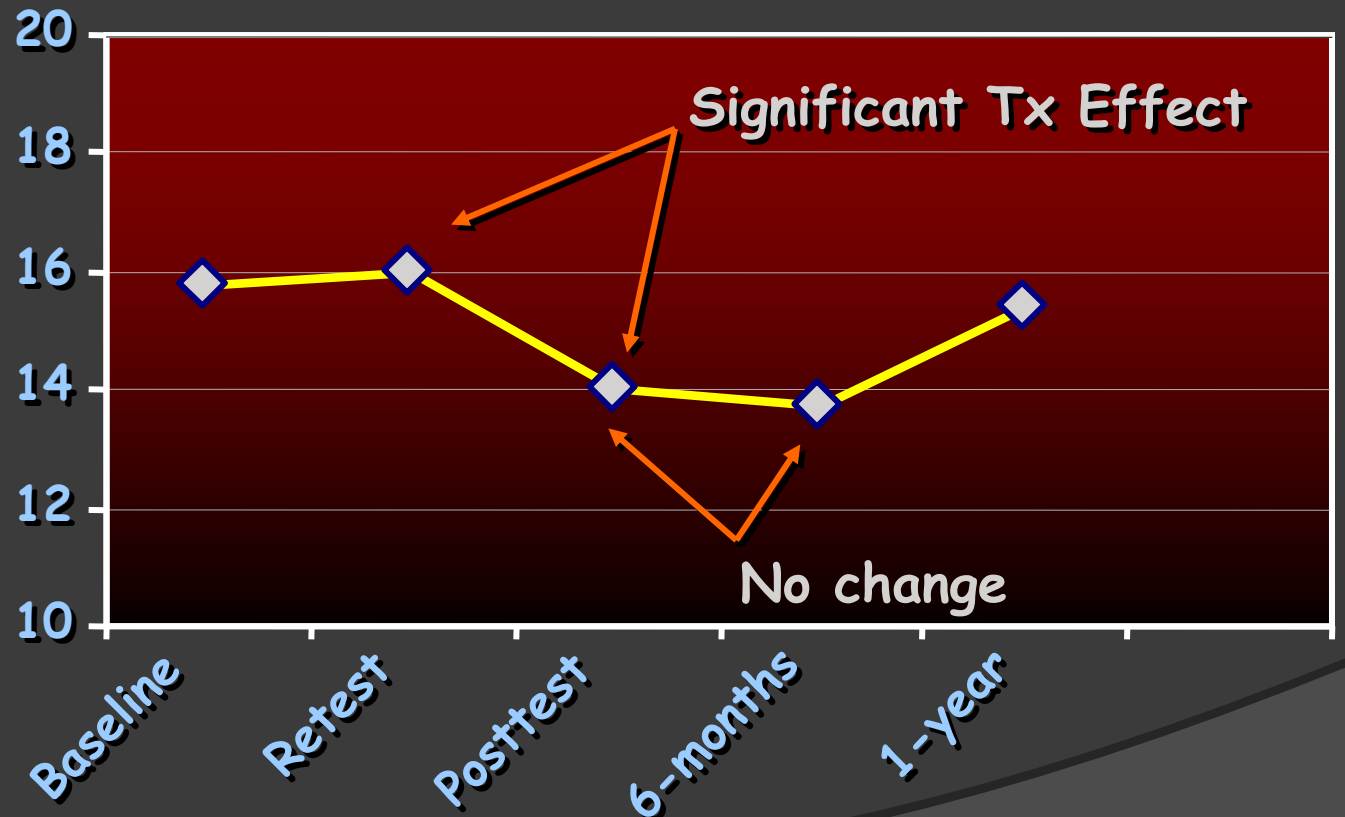
# Sensitivity of WHO-DAS II to Hearing Aid Intervention

- Multi-site study July 2001-July 2004
  - VAMC-Bay Pines, FL;  VAMC-Pittsburgh; James H. Quillen VAMC, Mountain Home, TN; VAMC-Nashville

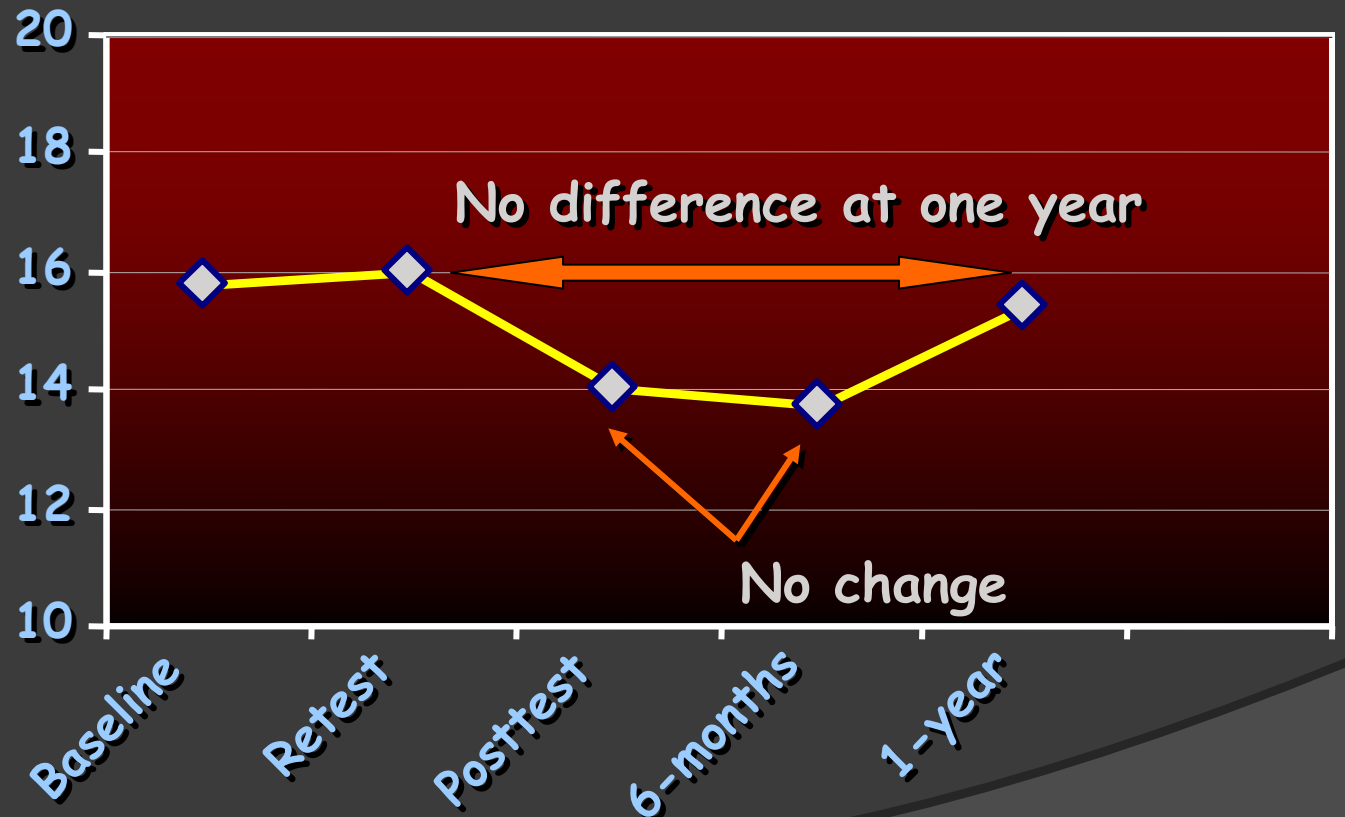
# WHO-DAS II - Total



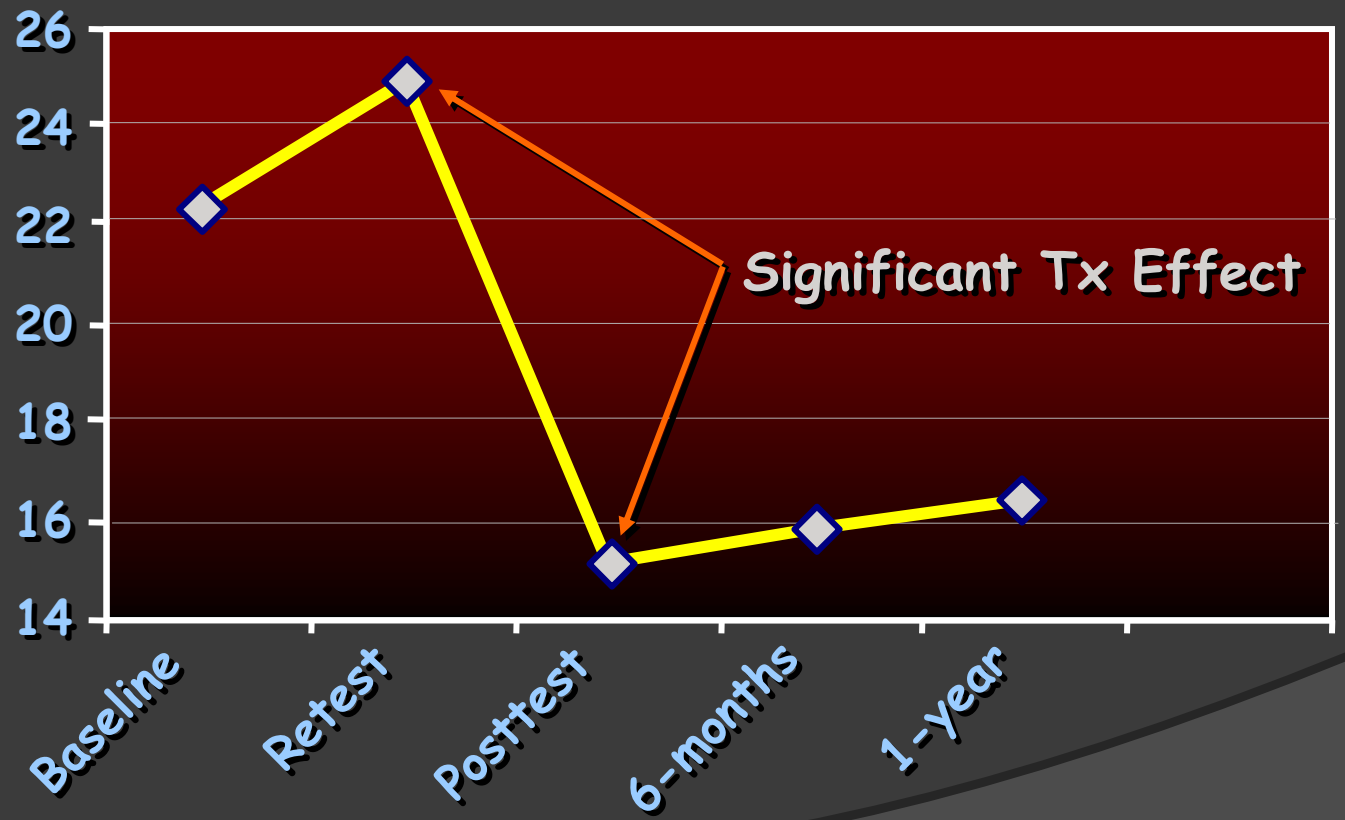
# WHO-DAS II - Total



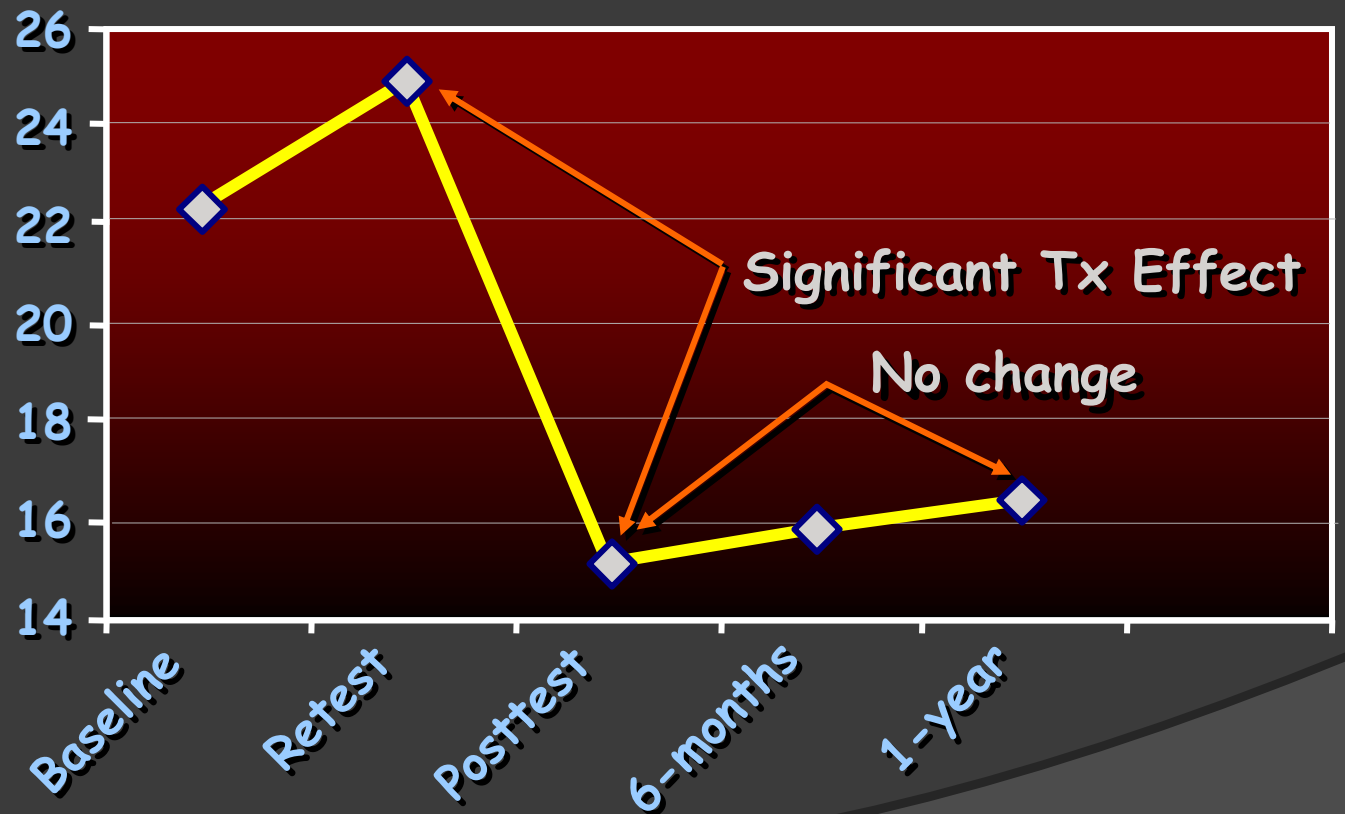
# WHO-DAS II - Total



# Understanding & Communication



# Understanding & Communication



# Summary

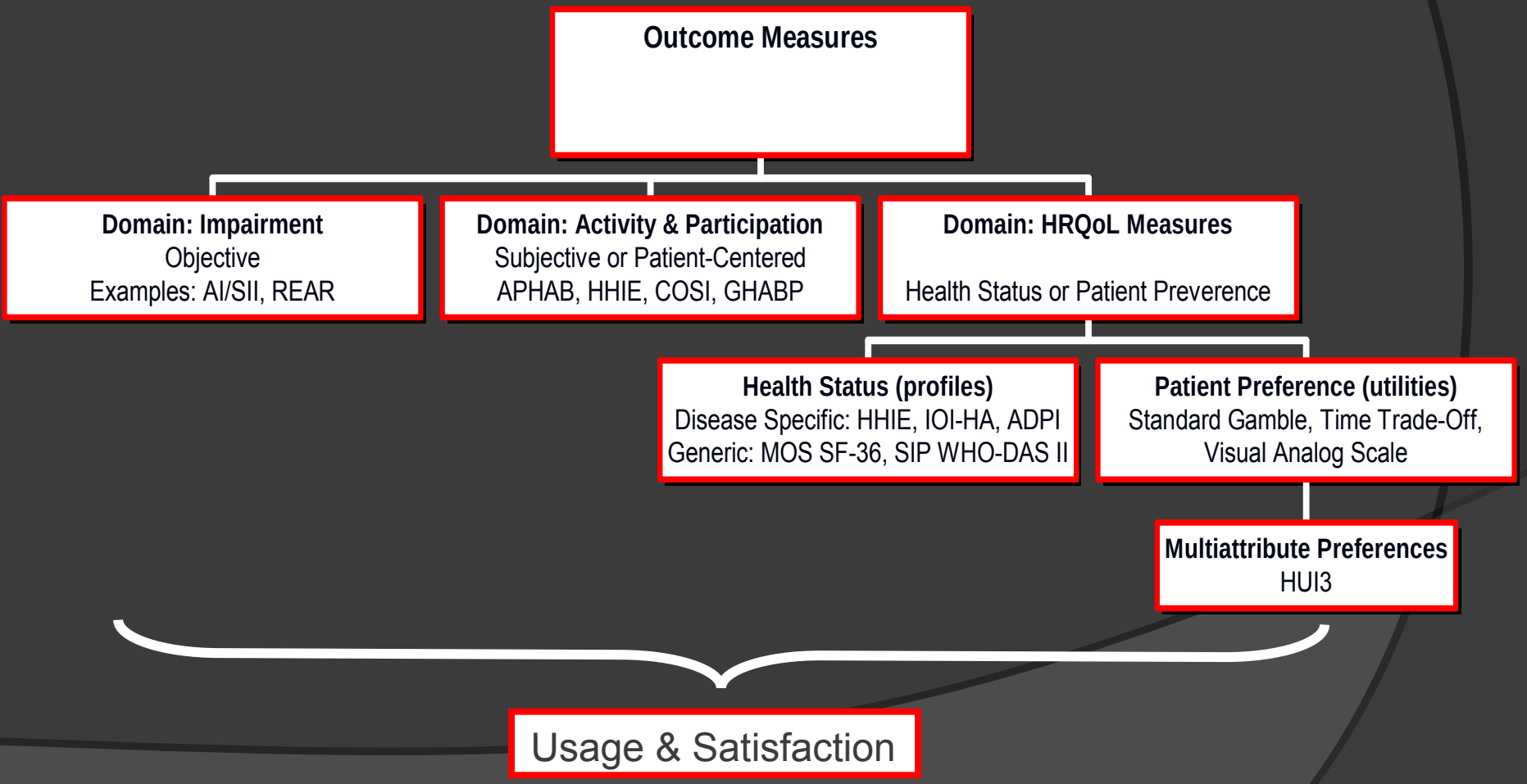
- WHO DAS II is sensitive to effects of Hearing Aid Intervention in group studies
  - due to Understanding & Communicating sub-scale

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
|---|---|---|---|---|---|---|
| Probe Tube | ✓ | | | | | ✓ |
| APHAB | | ✓ | | ✓ | | |
| HHIE | | ✓ | ✓ | | | ✓ |
| SSQ | | ✓ | | | | |
| COSI | | ✓ | ✓ | | ✓ | ✓ |
| WHO-DAS | | ✓ | ✓ | | | |
| SADL | | | | | | |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Application for the Elderly

- While generic profiles are useful research tools they have limited application for assessing outcomes on an individual basis. The questions and structure may present a challenge for elderly patients

# An Outcomes Taxonomy for Audiology



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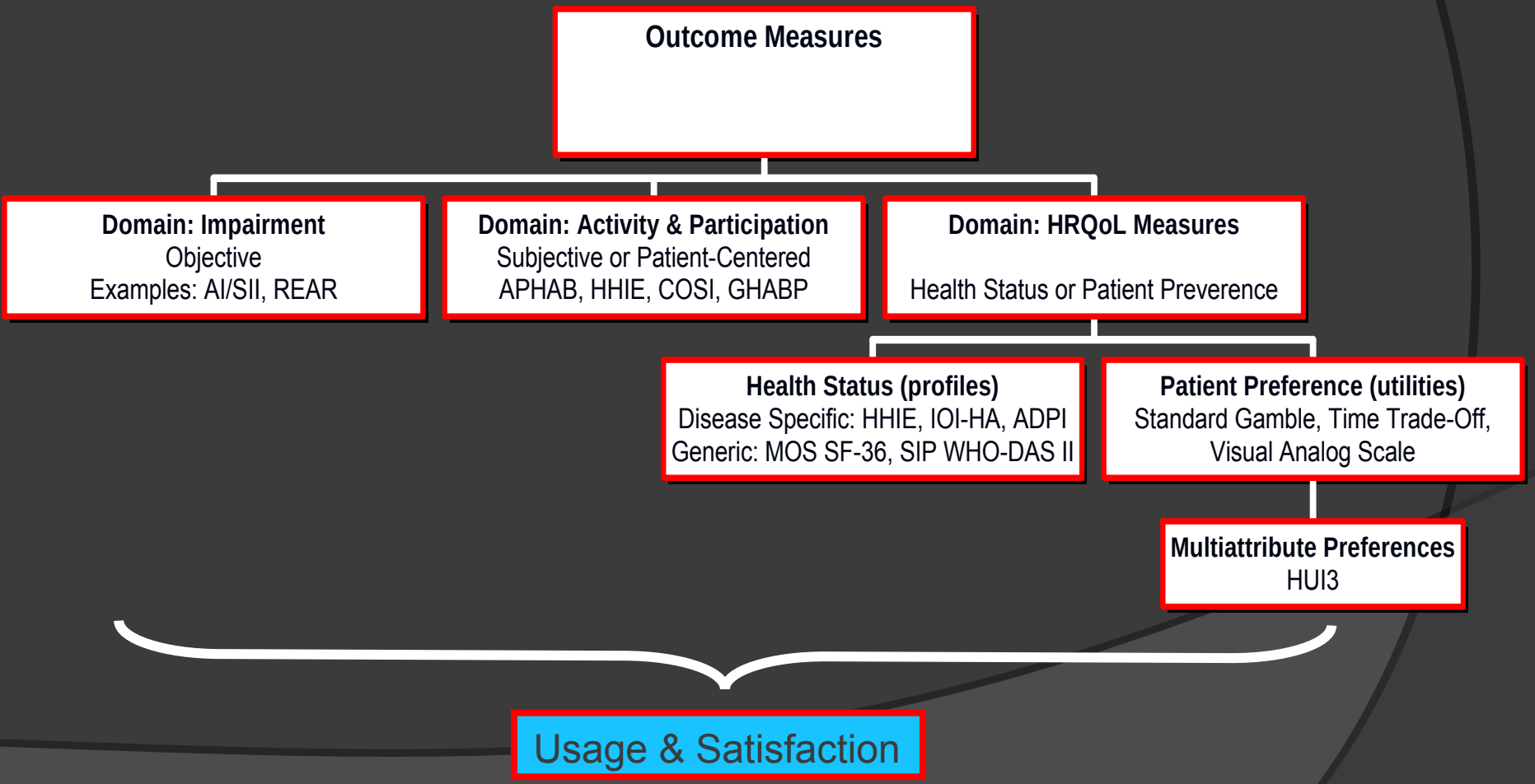


# Outcome Domains

- **Impairment**
- **Activity/Participation Benefit**
- **Quality of life**
- **Device usage**
- **Satisfaction**

# Device Usage

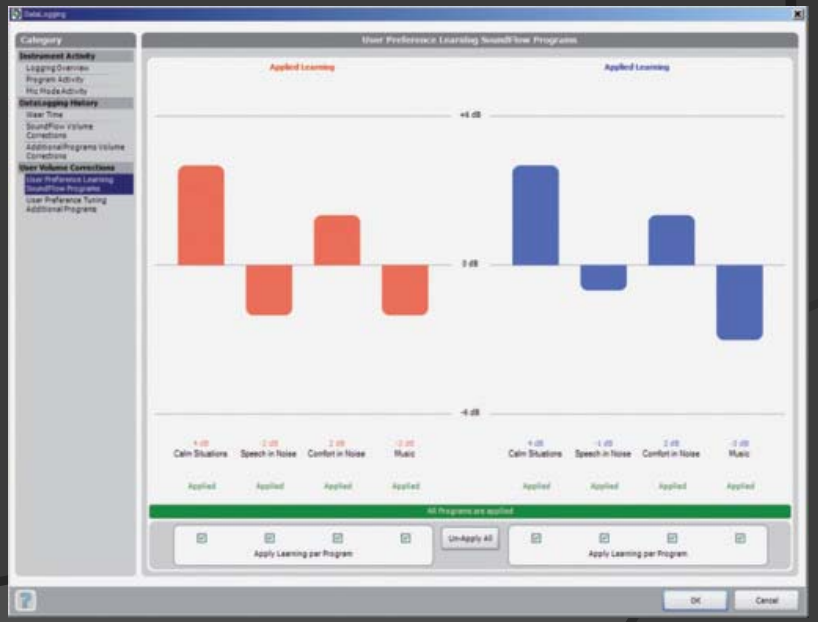
- If hearing aids are worn, we don't necessarily know how much benefit patient is getting; however…
- If hearing aids are NOT worn, then we know there will be NO benefit

# Device usage

- For what proportion of the time that you need hearing aids do you actually wear them?
- On average, how many hours per day do you wear your hearing aids:
  - More than 8 hours
  - 4 to 8 hours
  - 1 to 4 hours
  - < 1 hour
  - Never

# Application for the Elderly

- A quick “surrogate” measure of benefit
- Data logging has provided an objective measure of usage



# Outcome Domains

- **Impairment**
- **Activity/Participation Benefit**
- **Quality of life**
- **Device usage**
- **Satisfaction**

# Satisfaction with Amplification in Daily Life (SADL; Cox & Alexander, 1999)

Four subscales (examples of items):

Positive Effect

- Do your hearing aid(s) reduce the number of times you have to ask people to repeat?

Service and cost

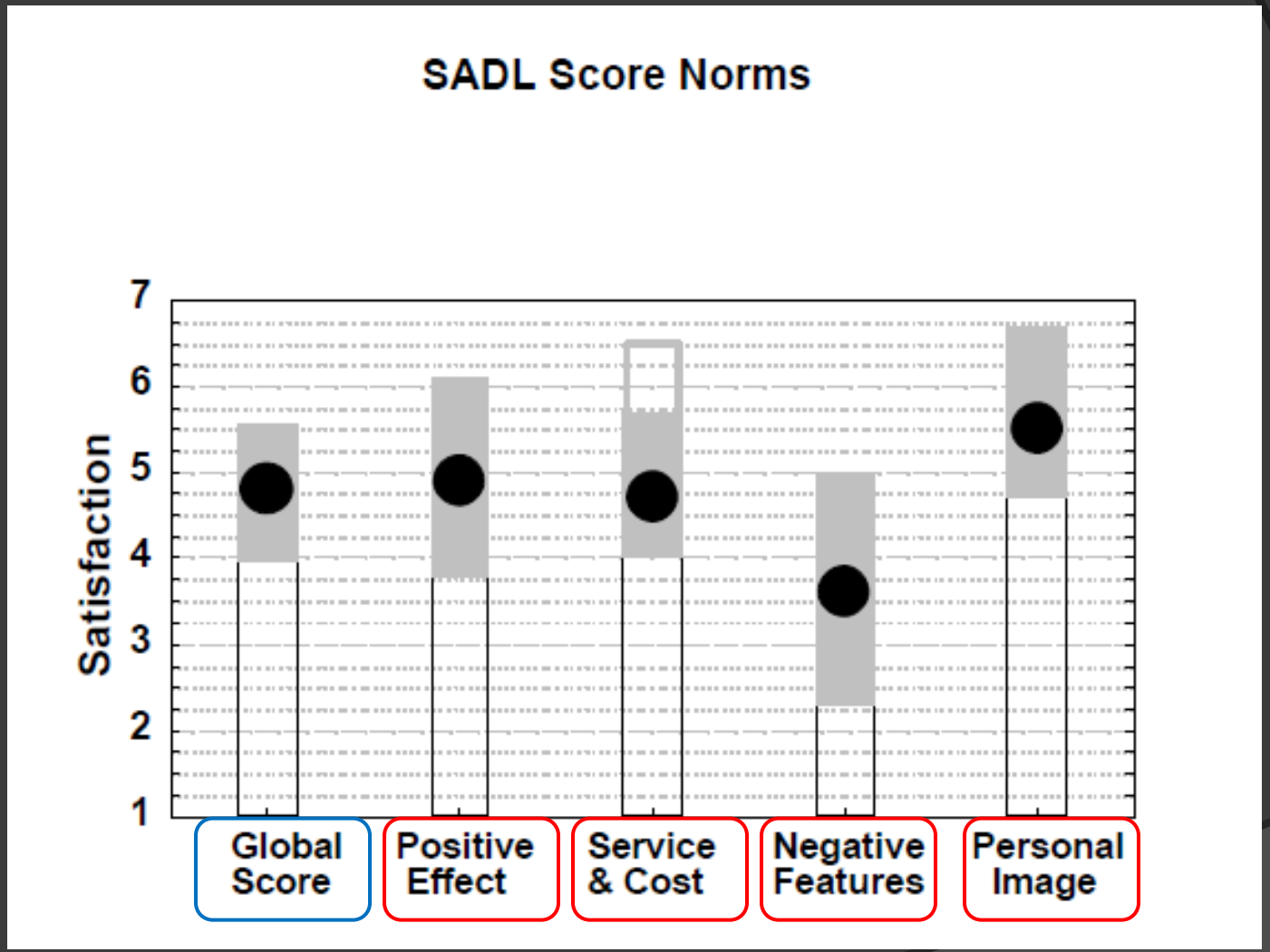
- How competent was the person who provided you with your hearing aid(s)?

Negative features

- Are you bothered by an inability to turn your hearing aid(s) up loud enough without getting feedback (whistling)?

Personal image

- Do you think wearing your hearing aid(s) makes you seem less capable?




http://www.memphis.edu/ausp/harl/downloads/SADLPlot.pdf

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
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| COSI | | ✓ | ✓ | | ✓ | ✓ |
| WHO-DAS | | ✓ | ✓ | | | |
| SADL | | ✓ | | | ✓ | ✓ |
| GHABP | | | | | | |
| IOI-HA | | | | | | |

# Application for the Elderly

- “Satisfaction” is a multi-factorial concept and is only partially associated with benefit

# Global Outcome Measures

- Provide a well-rounded picture of activity, participation, use, HRQoL and satisfaction
  - Glasgow Hearing Aid Benefit Profile - GHABP
  - International Outcomes Inventory - Hearing Aids (IOI-HA)

# Glasgow Hearing Aid Benefit Profile - GHABP (Gatehouse, 1999)

- Combines “set questions” for pre-selected situations with patient nominated situations

## Situations

1. TV at normal volume
2. Conversation in quiet with one person
3. Conversation in busy street or shop
4. Conversation in a group
5. Individual situation # 1
6. Individual situation # 2
7. Individual situation # 3
8. Individual situation # 4

## Questions

1. Does situation occur?
2. How much difficulty?
3. Worry, annoyance, upset?
4. Proportion of time hearing aid is worn?
5. How much does aid help?
6. How much difficulty now with hearing aid?
7. How satisfied with hearing aid?

# Listening to the television with other family or friends when the volume is adjusted to suit other people

Does this situation happen in your life? No

Next

| | | |
|---|---|---|
| How much difficulty do you have in this situation? N/A | How much does any difficulty in this situation annoy or upset you? N/A | In this situation, what proportion of the time do you wear your hearing aid? N/A |
| In this situation, how much does your hearing aid help you? N/A | In this situation, with your hearing aid, how much difficulty do you now have? N/A | For this situation, how satisfied are you with your hearing aid? N/A |

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
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| WHO-DAS | | ✓ | ✓ | | | |
| SADL | | ✓ | | | ✓ | ✓ |
| GHABP | | ✓ | ✓ | ✓ | ✓ | ✓ |
| IOI-HA | | | | | | |

# International Outcomes Inventory - Hearing Aids (IOI-HA; Cox et al., 2000)

1. How many hours per day? (Usage)
2. Helpfulness in most needed situation? (Activity Limitation Change)
3. How much difficulty in that situation? (Activity Limitation Remaining)
4. Overall, worth the trouble? (Satisfaction)
5. Remaining effect on participation? (Participation)
6. Bother caused to others? (Participation)
7. Enjoyment of life? (Quality of Life)

*[8. Subjective problems without hearing aid (norms)]*

| | Impairment | Activity /Participation | HRQoL | Usage | Satisfaction | Ease of Use |
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| COSI | | ✓ | ✓ | | ✓ | ✓ |
| WHO-DAS | | ✓ | ✓ | | | |
| SADL | | ✓ | | | ✓ | ✓ |
| GHABP | | ✓ | ✓ | ✓ | ✓ | ✓ |
| IOI-HA | | ✓ | ✓ | ✓ | ✓ | ✓ |

# Application for the Elderly

- Global measures assess several outcome domains in a single questionnaire with as few as 7 items.
- Results can be aggregated for program evaluation

# Does post-hearing aid fitting AR improve outcomes in the Elderly?

- Auditory training
- Group AR

# Auditory Training

- Kricos et al (1992)
  - significant change in HHIE scores as a function of auditory training
- Kricos and Holmes (1996)
  - no significant change in HHIE scores
- Sweetow and Sabes (2006)
  - statistically significant improvements on the HHIE using LACE

# Group AR

- Abrams et al (1992)
  - significant improvement in HHIE scores among a group of adults who received hearing aids plus counseling-based AR
- Preminger (2003)
  - improvements among participants in a group counseling based AR program as measured by the HHIE
    - greatest reduction in hearing handicap was measured among those who participated in the AR program with their significant others

# Group AR

- Kramer et al (2005)
  - hearing impaired individuals who participated in the home education program had statistically significantly higher scores than those who did not on the HRQoL item on IOI-HA
- Abrams et al (2002)
  - those who participated in group AR exhibited greater mean change in the MCS scale (SF-36V) than those who did not

# Group AR

- Hickson et al (2007)
  - control social group demonstrated a significant change on the MCS scores of the SF-36 while the AR group participants did not

J Am Acad Audiol 18:151–183 (2007)

# A Systematic Review of Health-Related Quality of Life and Hearing Aids: Final Report of the American Academy of Audiology Task Force on the Health-Related Quality of Life Benefits of Amplification in Adults

Theresa Hnath Chisolm*
Carole E. Johnson†
Jeffrey L. Danhauer‡
Laural J.P. Portz*
Harvey B. Abrams§
Sharon Lesner**
Patricia A. McCarthy††
Craig W. Newman‡‡

**Abstract**

This is the final report of the American Academy of Audiology Task Force on the Health-Related Quality of Life (HRQoL) Benefits of Amplification in Adults. A systematic review with meta-analysis examined evidence pertaining to the use of hearing aids for improving HRQoL for adults with sensorineural hearing loss (SNHL). Relevant search strings applied to the CENTRAL, CINAHL, Cochrane Reviews, ComDisDome, EBMR, and PubMed databases identified randomized controlled trial, quasi-experimental, and nonexperimental pre-post test designed studies. Sixteen studies met a priori criteria for inclusion in this review. A random-effects meta-analysis showed differential results for generic versus disease-specific HRQoL measures for within- and between-subject designs. Although generic measures used for within-subject designs did not demonstrate HRQoL benefits from hearing aids, mean effect sizes and confidence intervals for within-subject designs and disease-specific instruments suggested that hearing aids have a small-to-medium impact on HRQoL. Further, the between-subject studies supported at least a small effect for generic measures, and when measured by disease-specific instruments, hearing aids had medium-to-large effects on adults' HRQoL. This review concludes that hearing aids improve adults' HRQoL by reducing psychological, social, and emotional effects of SNHL. Future studies should include control groups using randomized controlled trials.

**Key Words:** American Academy of Audiology Task Force on the Health-Related Quality of Life Benefits of Amplification in Adults, health-related quality of life, hearing aids, hearing loss, meta-analysis, nonacoustic benefits, systematic review

**Abbreviations:** AAA = American Academy of Audiology; ADPI-VAS = *Auditory Disability Preference Index—Visual Analog Scale;* AHRQ = Agency for Healthcare Research and Quality; CENTRAL = Cochrane Central Register of Controlled Trials; CI = confidence internal; CINAHL = Cumulative Index to Nursing and Allied-Health Literature; ComDisDome = Communication Sciences and Disorders DOME; EBM = evidence-based medicine; EBMR = Evidence-

*Department of Communication Sciences and Disorders, University of South Florida, Tampa; †Department of Communication Disorders, Auburn University; ‡Department of Speech and Hearing Sciences, University of California Santa Barbara; §Bay Pines Veterans Affairs Healthcare System, Audiology and Speech Pathology Service, Bay Pines, FL; **University of Akron, School of Speech and Audiology, Akron, OH; ††Rush University Medical Center, Communication Disorders and Sciences, Chicago, IL; ‡‡Cleveland Clinic, Head and Neck Institute, Cleveland, OH

Carole E. Johnson, Ph.D., Au.D., Department of Communication Disorders, 1199 Haley Center, Auburn University, AL 36849; Phone: 334-844-9603; Fax: 334-844-4585; E-mail: Johns19@auburn.edu

# Does AR improve HRQoL outcomes?

- research findings appear to be mixed
- evidence is beginning to emerge that audiologic rehabilitation, to include both hearing aids and non hearing aid based interventions, have a positive impact on the self-perceived HRQoL among elderly adults with hearing loss

# B.B.'s Outcome Measurement Protocol

- Administer "income" measures to maximize appropriateness of treatment plan
- Use COSI to identify specific treatment goals based on income measures
- Verify audibility (probe microphone)
- Measure 30-day post-treatment outcome using COSI
- Reassess in 6+ months using IOI-HA

# Future Considerations

- Outcome assessment of audiologic rehabilitation in the elderly may involve the measurement of non-auditory performance
  - Visual attention
  - Reaction time
  - Measures of resource allocation

# Objective Measures of Listening Effort: Effects of Background Noise and Noise Reduction

**Anastasios Sarampalis**
University of California at Berkeley

**Sridhar Kalluri**
**Brent Edwards**
Starkey Hearing Research Center, Berkeley, CA

**Ervin Hafter**
University of California at Berkeley

**Purpose:** This work is aimed at addressing a seeming contradiction related to the use of noise-reduction (NR) algorithms in hearing aids. The problem is that although some listeners claim a subjective improvement from NR, it has not been shown to improve speech intelligibility, often even making it worse.
**Method:** To address this, the hypothesis tested here is that the positive effects of NR might be to reduce cognitive effort directed toward speech reception, making it available for other tasks. Normal-hearing individuals participated in 2 dual-task experiments, in which 1 task was to report sentences or words in noise set to various signal-to-noise ratios. Secondary tasks involved either holding words in short-term memory or responding in a complex visual reaction-time task.
**Results:** At low values of signal-to-noise ratio, although NR had no positive effect on speech reception thresholds, it led to better performance on the word-memory task and quicker responses in visual reaction times.
**Conclusions:** Results from both dual tasks support the hypothesis that NR reduces listening effort and frees up cognitive resources for other tasks. Future hearing aid research should incorporate objective measurements of cognitive benefits.

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  - Rachel A. McArdle, Ph.D.
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- The contents of the presentation do not represent the views of the Department of Veterans Affairs or the United States Government

# Here's to growing old gracefully…