

Comparison of Benefits Provided by Various Hearing Aid Technologies in Older Adults

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IU Hearing Aid Outcome Studies

- Four primary studies conducted over the past decade
 - IU-1: 173 older adults fit with analog, linear, Class D full-concha ITE hearing aids
 - IU-2: 53 older adults fit with analog, 2-channel, WDRC ITC hearing aids
 - IU-3: 109 older adults fit with digital, 4-channel, WDRC ITE hearing aids, ½ with directional mics
 - IU-4: 35 older adults fit with digital, 6-channel, WDRC BTE open-fit devices with directional mics
- Primary focus in each study was on individual differences in outcome—what to measure and when—but looking across studies allows a comparison of technologies

Group Comparisons of Technology: Subject & Technology Characteristics

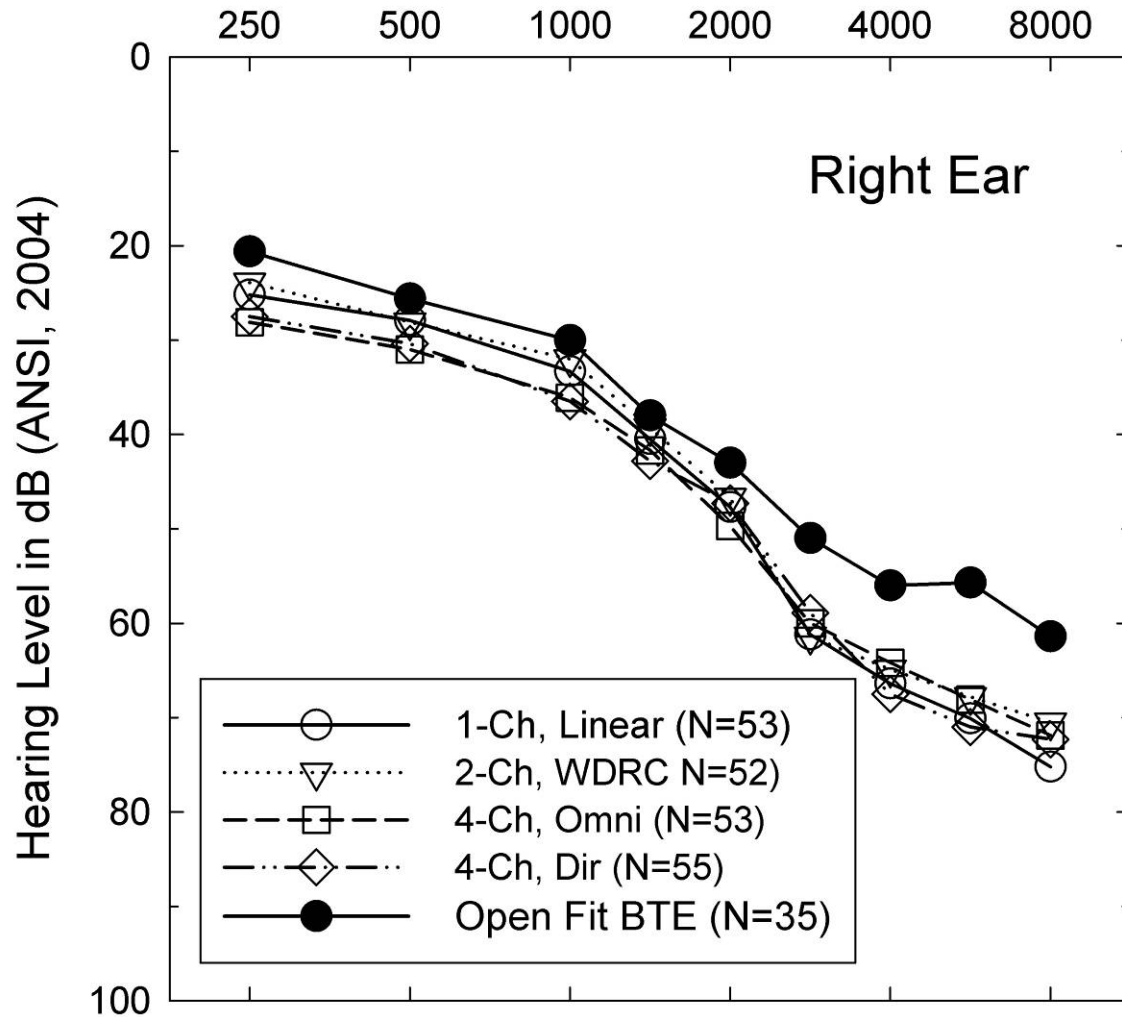
GROUP	N	AGE (M, sd)	BHFPTA*	%MALE	%NEW users
1-Ch, Linear	53	74.0 (6.7) y	48.4 dB HL	66	74
2-Ch, WDRC	52	74.6 (7.0) y	48.3 dB HL	66	74
4-Ch, Omni	53	75.4 (6.4) y	50.3 dB HL	60	67
4-Ch, Dir	56	74.5 (7.6) y	50.9 dB HL	71	71
Open Fit BTE**	35	73.6 (8.0)y	44.0 dB HL	51	71

*BHFPTA = Bilateral pure-tone average at
1000, 2000 and 4000 Hz

**6-channel, WDRC, Directional mic

Audiograms

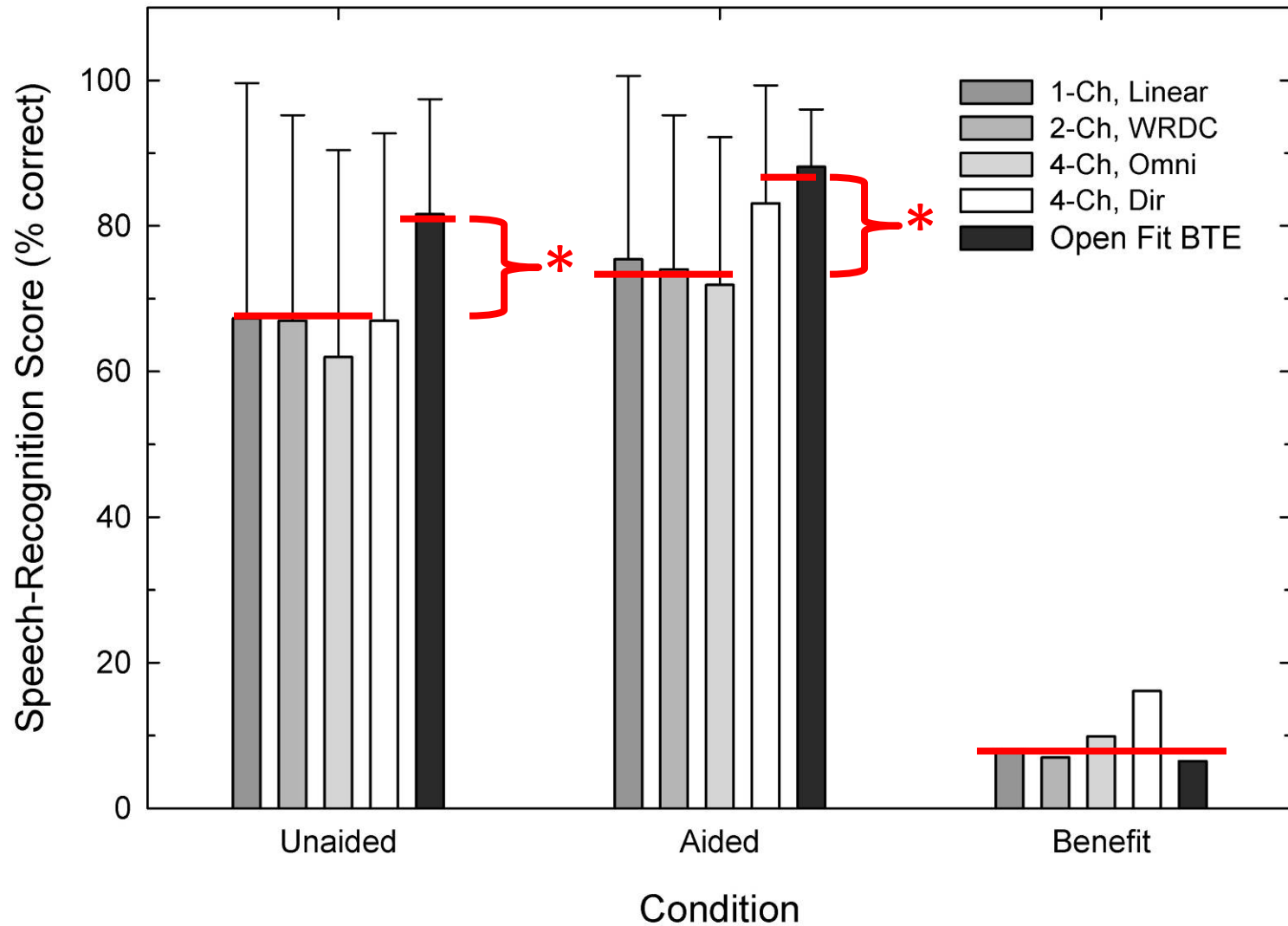
Frequency (Hz)



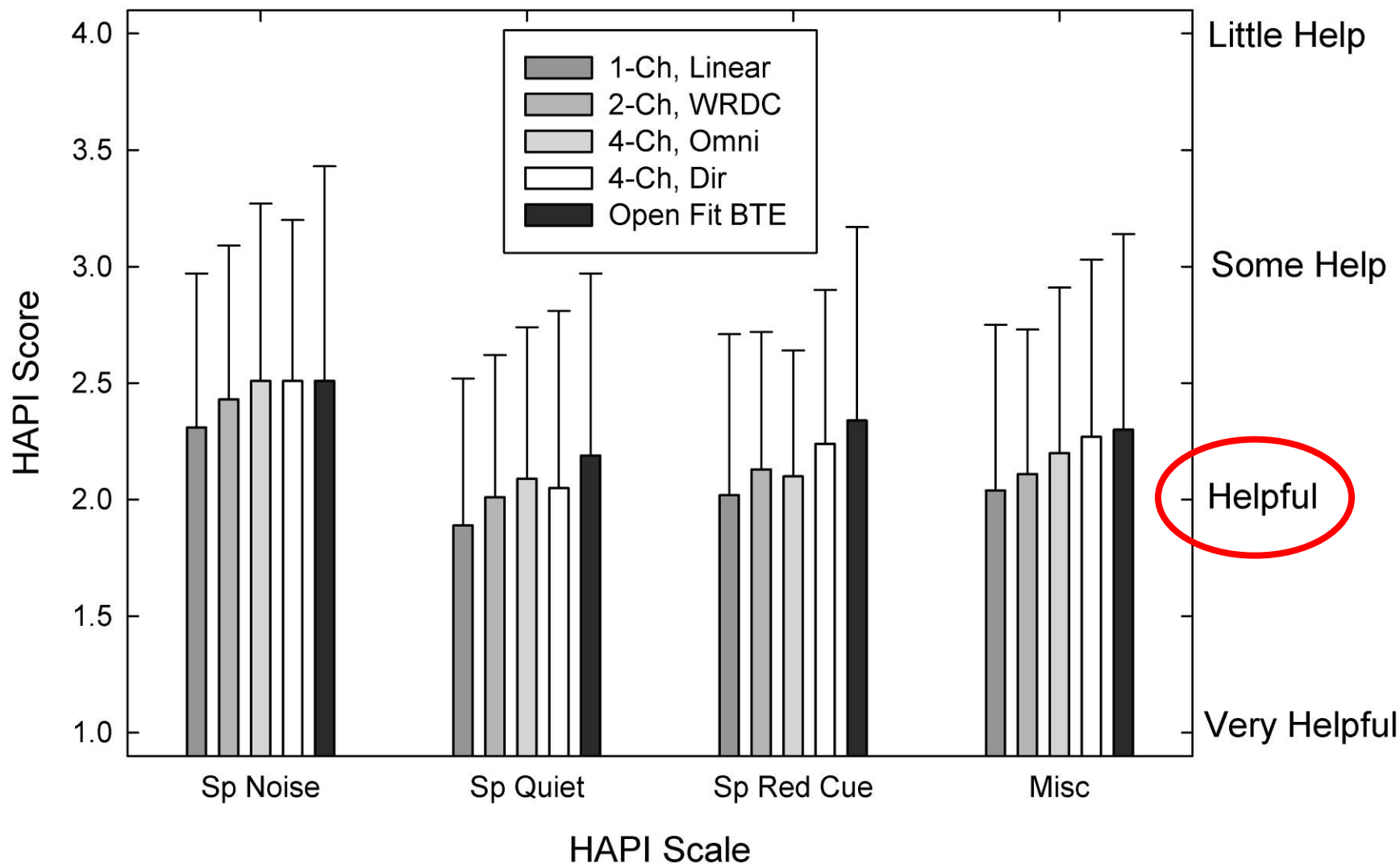
Outcome Measures Included

- Connected Speech Test (CST), 65 dB SPL, +8 dB
 - Speech at 0-deg azimuth, babble at 180-deg
- Hearing Aid Performance Inventory (HAPI)
 - Four subscales of self-reported benefit (“help”)
- Glasgow Hearing Aid Benefit Profile (GHABP)
 - Three subscales of benefit, satisfaction, usage
- MarkeTrak Hearing Aid Satisfaction Survey
 - Hearing aid features and listening situations
- Daily Hearing Aid Usage Diary

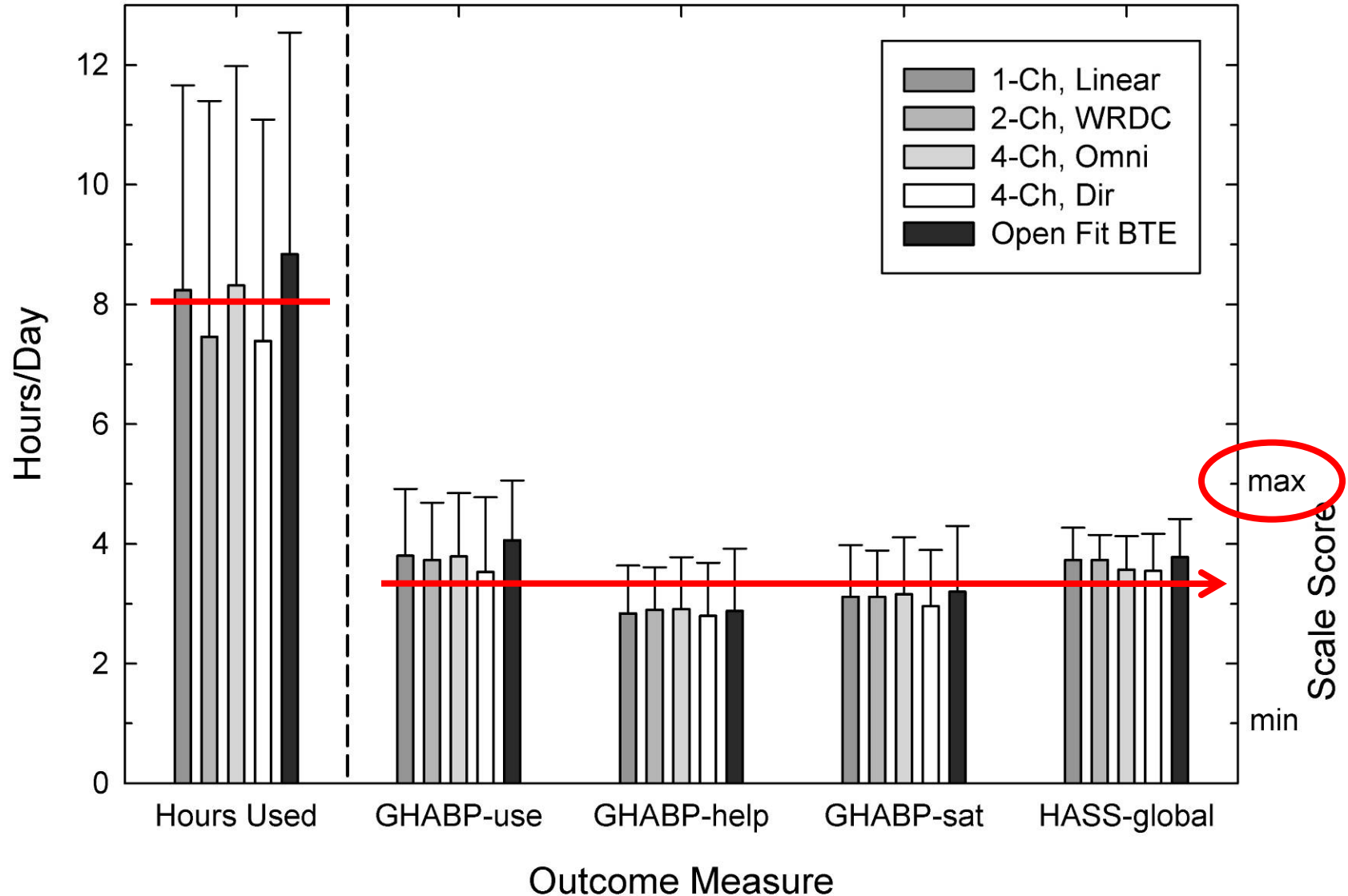
Speech-Recognition Performance (CST)



Hearing Aid Performance Inventory



Usage, Satisfaction, Benefit



Interim Summary

- When well-fit “contemporary” hearing aid technology is incorporated into bilateral hearing aid fits in older adults...
 - average outcomes are positive in several outcome domains, but
 - average outcomes don’t vary systematically with technology

Perhaps, We've Not Been 'Looking' in the Right Place???

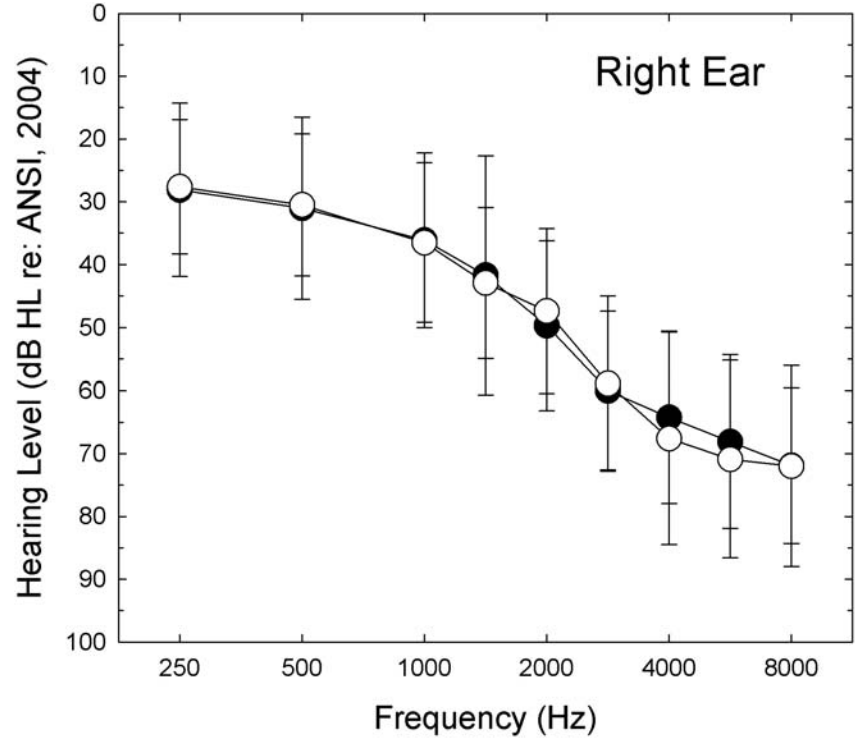
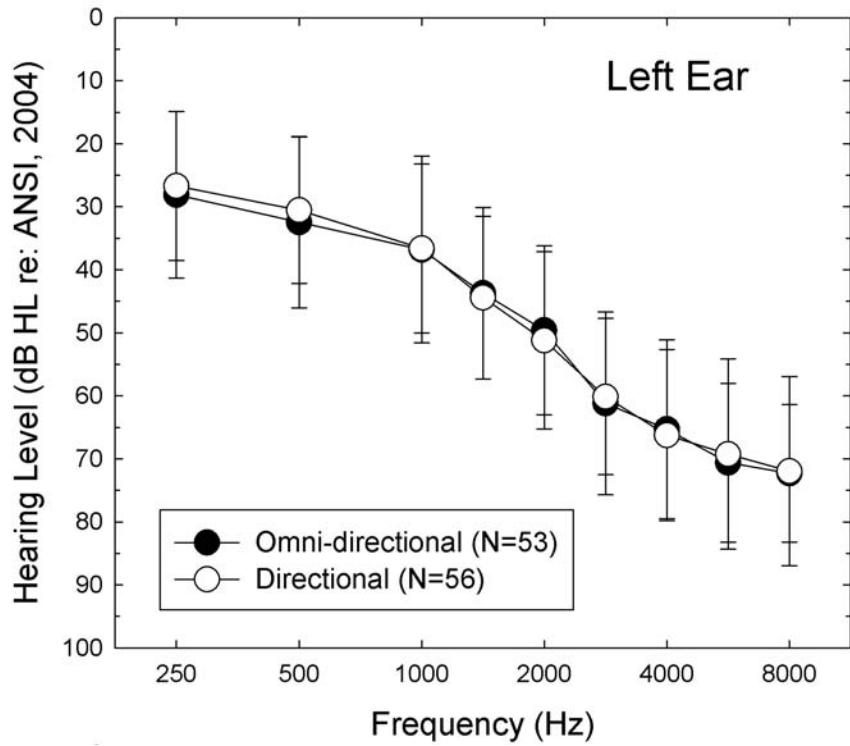


In the middle of the night, Fido suddenly developed a wild craving for the bone.

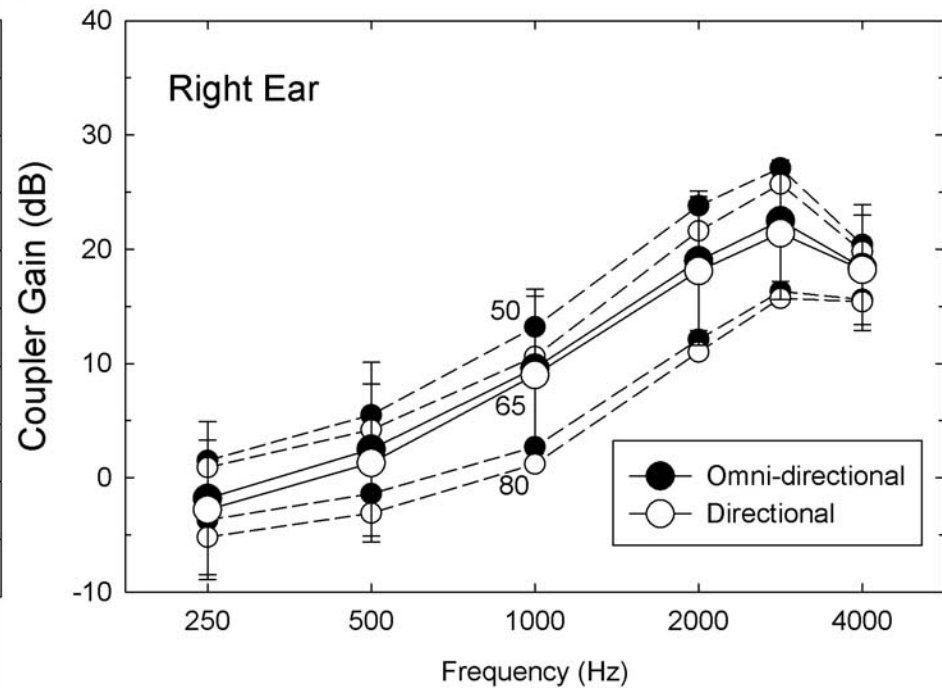
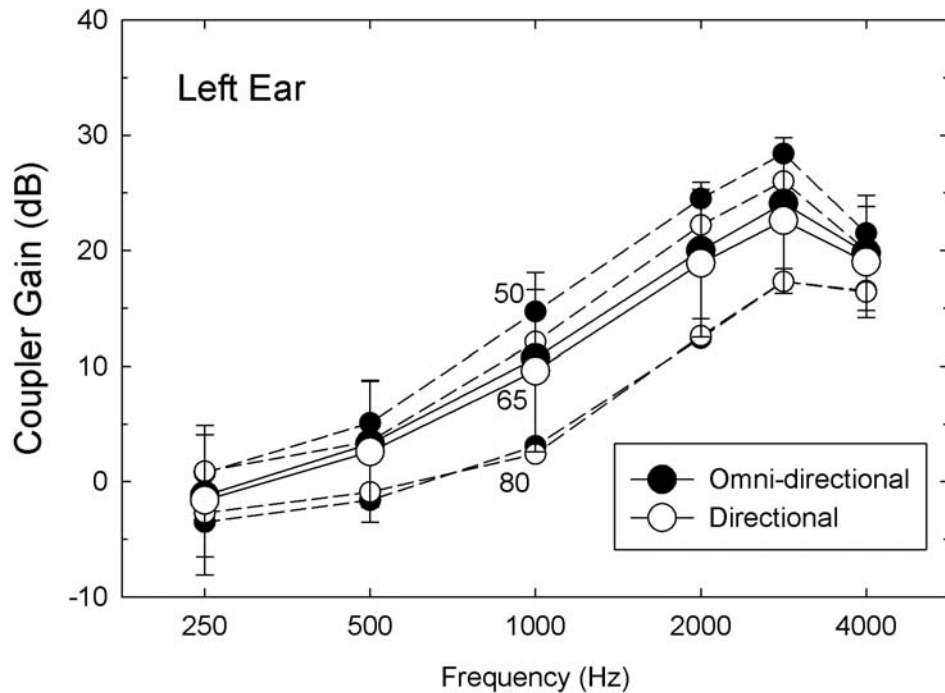
Expanded Set of Outcome Measures

- In addition to outcome measures already noted (CST, HAPI, GHABP, HASS, use diary), added:
 - Satisfaction with Amplification in Daily Life (SADL)
 - Acceptable Noise Level (ANL)
 - Profile of Aided Loudness (PAL)
 - Judgments of Sound Quality (JSQ)
 - Adapted the “Functional Assessment of Non-Life Threatening Conditions” to hearing loss
- Measures obtained from wearers of 4-ch digital hearing aids, with about ½ receiving directional mic and ½ receiving omni-directional mic (wearer blinded as to mic setting)

Audiograms



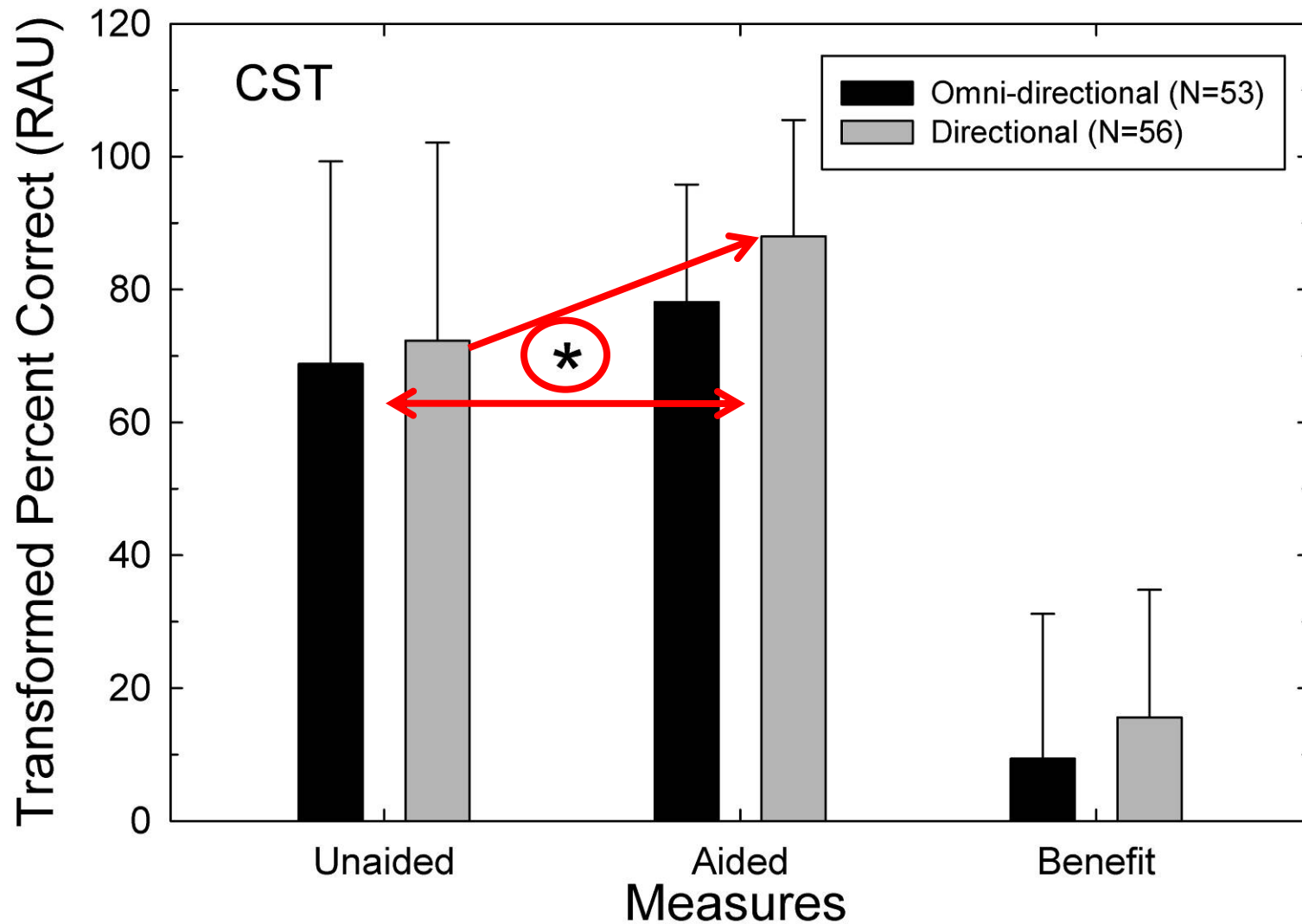
Hearing Aid Frequency Responses: Matched to NAL-NL1 targets



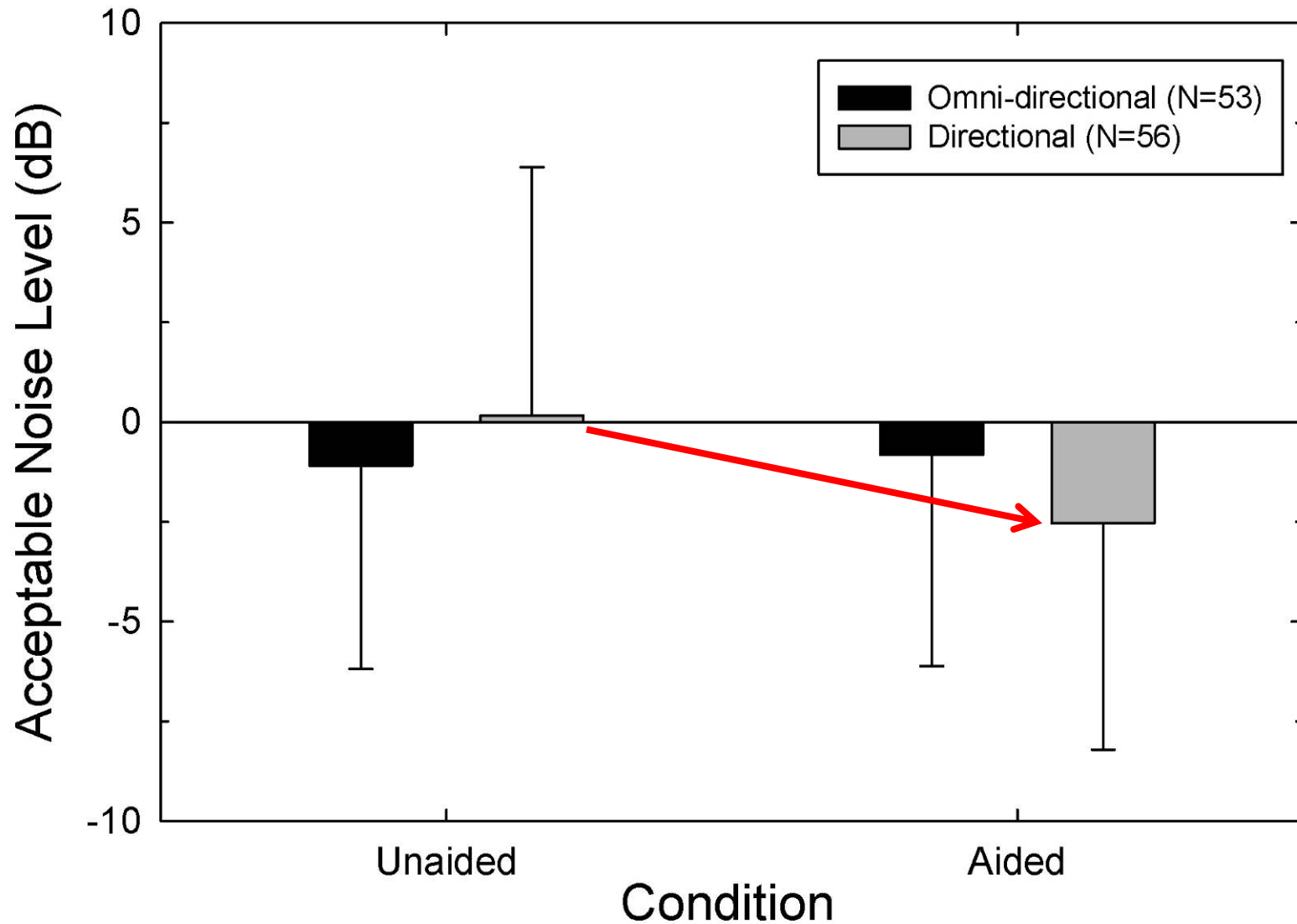
Group Results

Connected Speech Test (CST)

65 dB SPL, +8 dB SNR

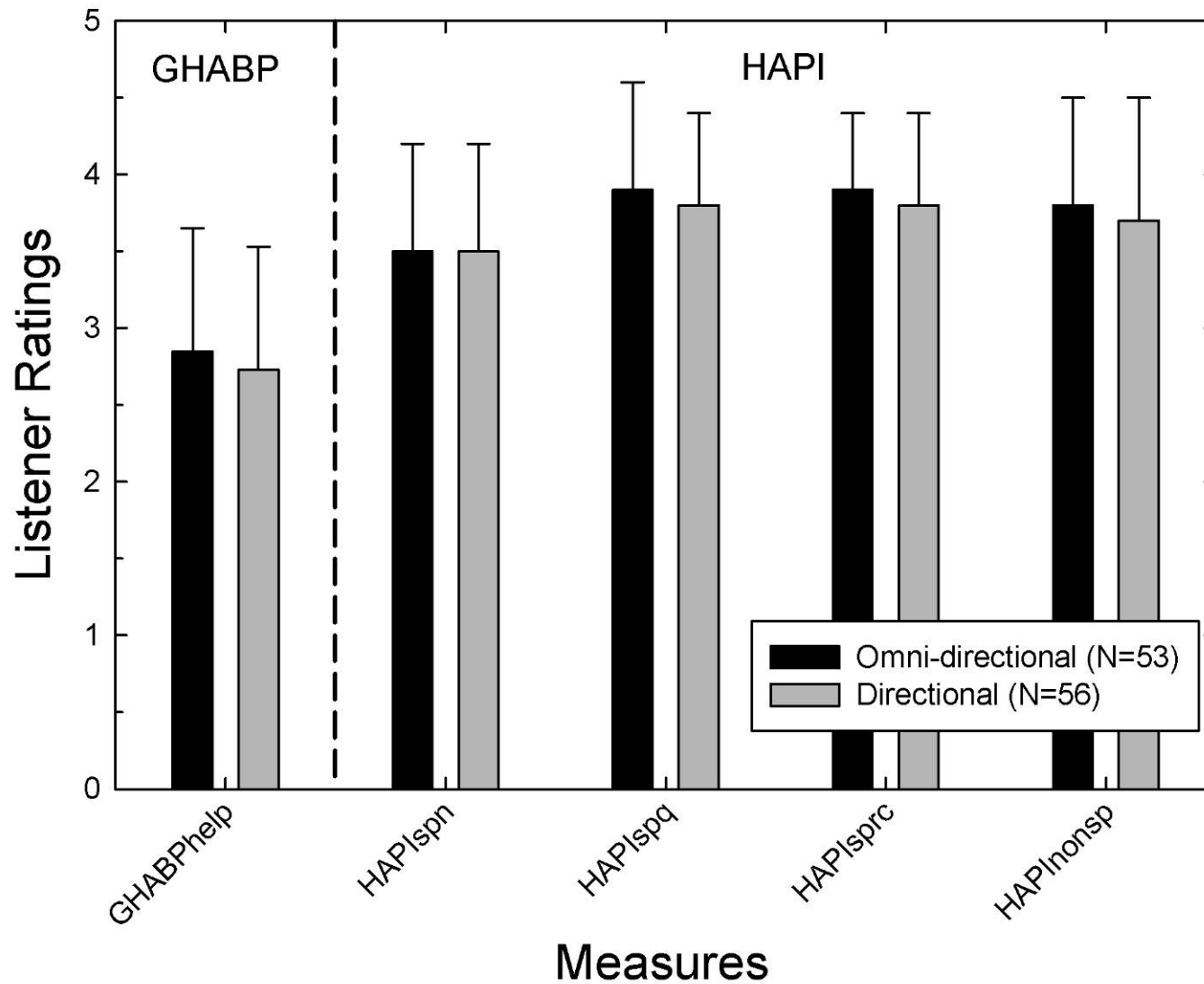


Acceptable Noise Level (ANL)



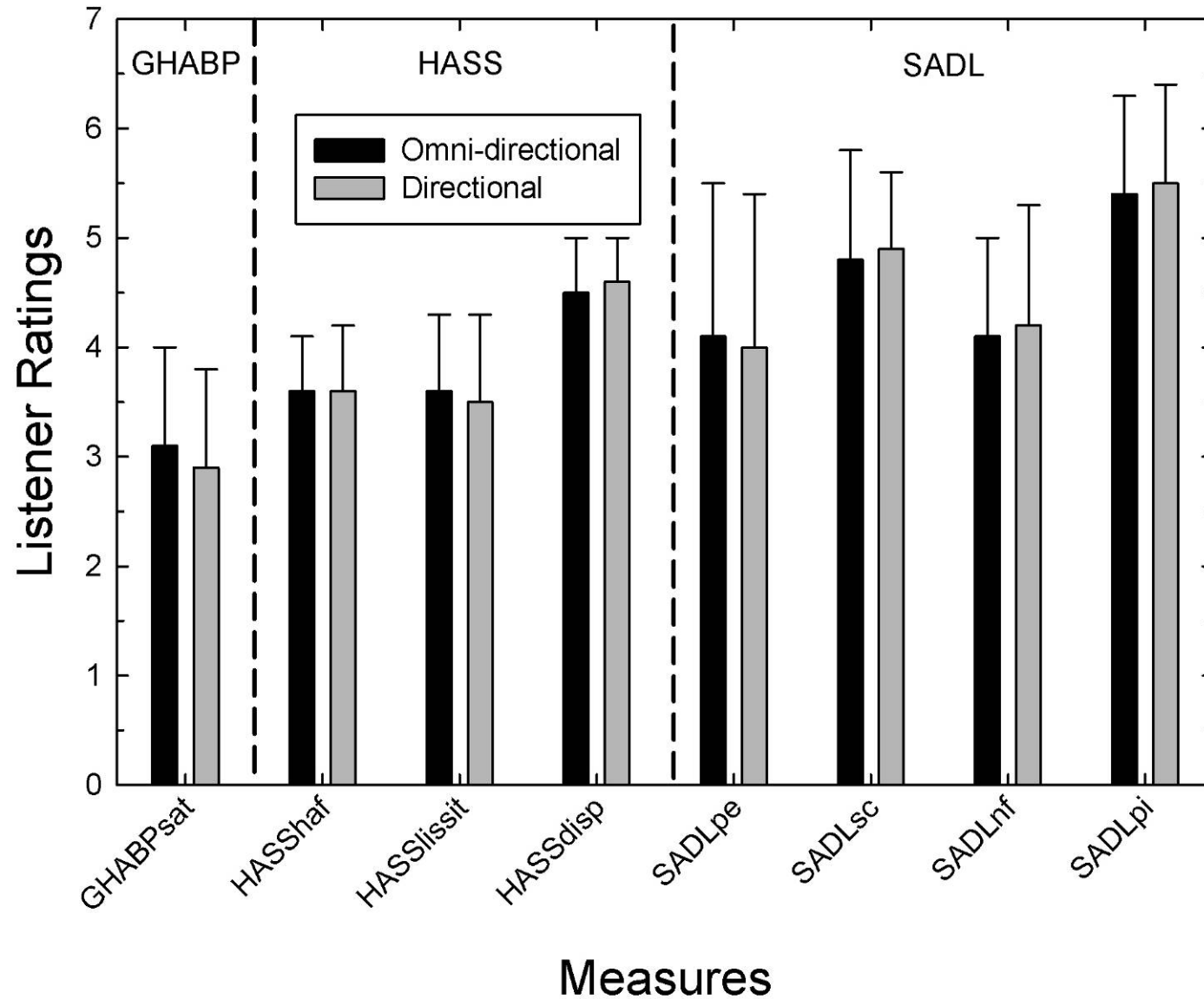
Self-Reported Benefit

Benefit Measures

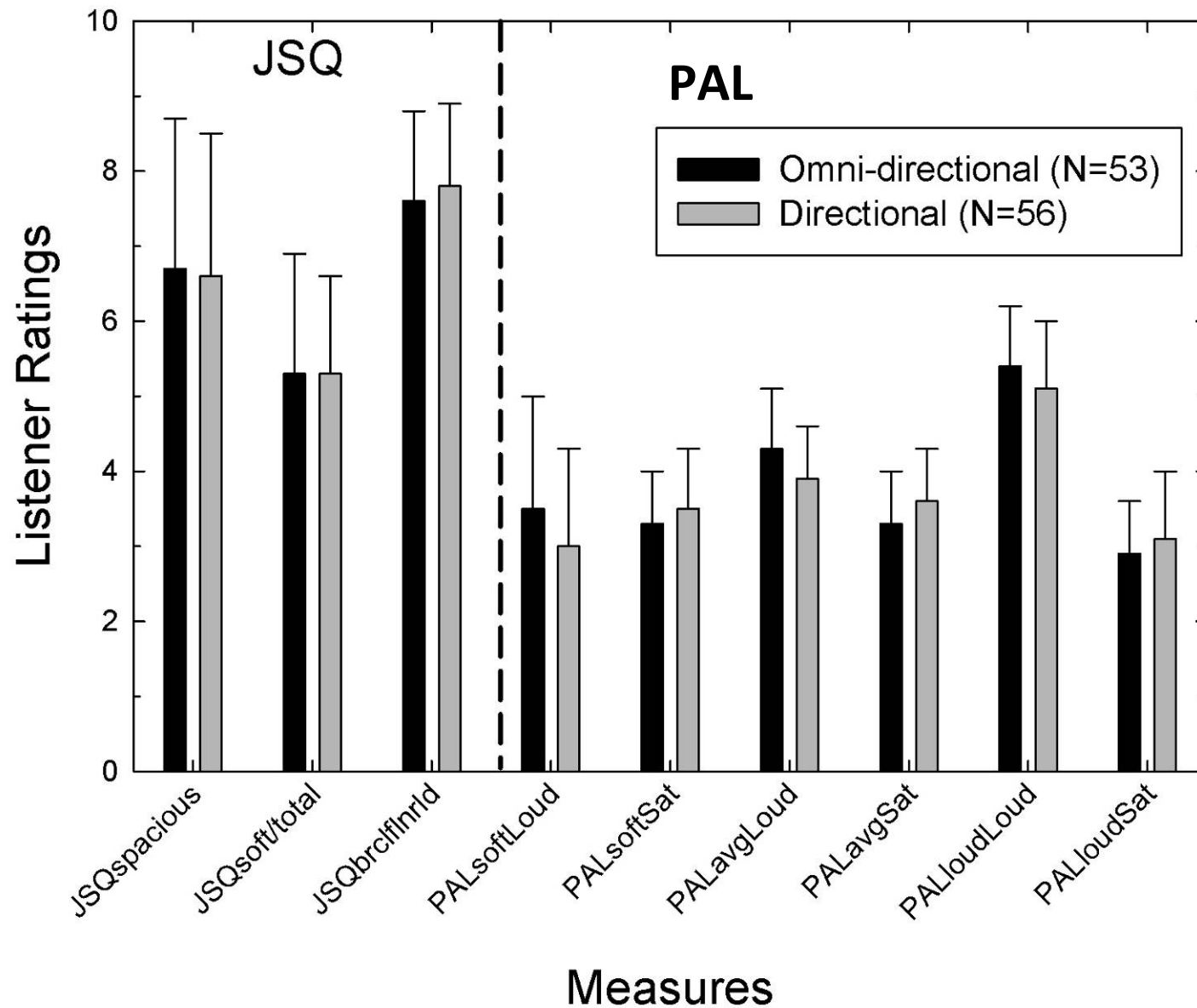


Satisfaction

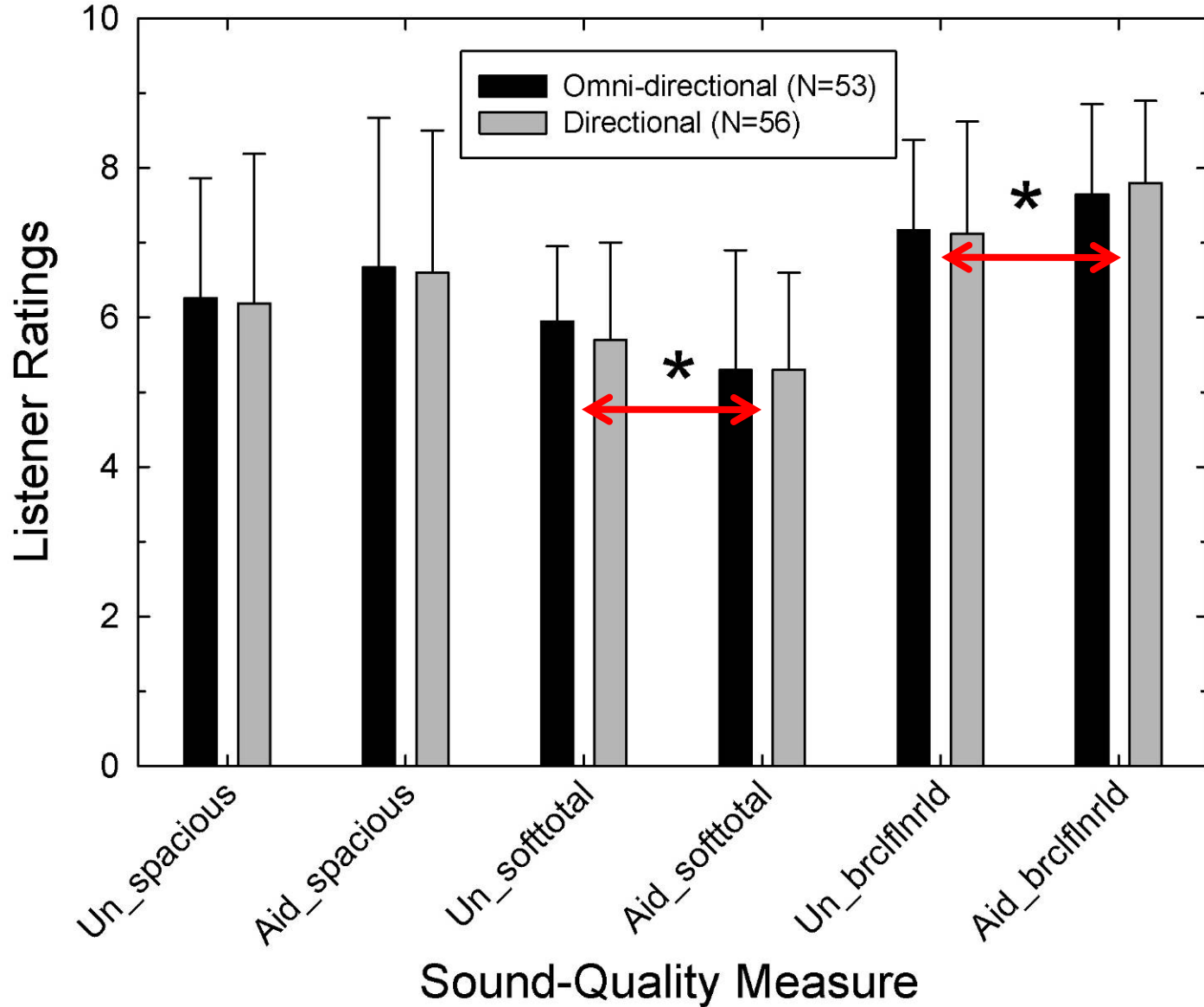
Satisfaction Measures



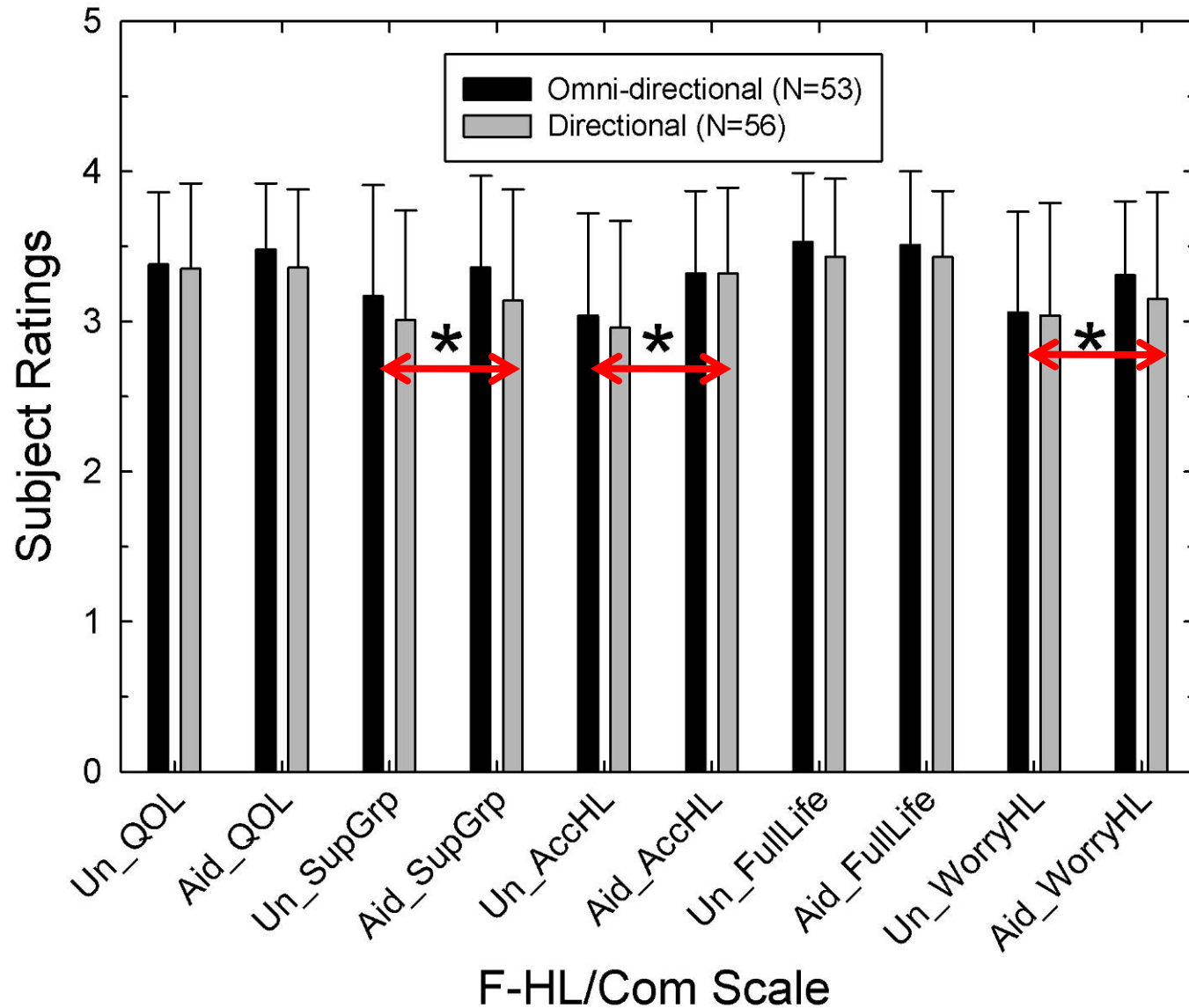
Sound-Quality Measures



Sound Quality: Unaided & Aided



Functional Assessment of Hearing Loss



Functional Assessment of Hearing Loss

INSTRUCTIONS: Below is a list of statements that other people with hearing loss have said are important. **By checking one (1) of the five choices available, please indicate how true each statement has been for you during the past 7 days.**

SOCIAL/FAMILY WELL-BEING

1. I feel close to my friends.

2. I get emotional support from my family.

CHECK ONE

Not at all
A little bit
Somewhat
Quite a bit
Very much

CHECK ONE:

Not at all
A little bit
Somewhat
Quite a bit
Very much

Functional Assessment of Hearing Loss

SOCIAL/FAMILY WELL-BEING (cont.)

3. I get support from my friends.

CHECK ONE

Not at all
A little bit
Somewhat
Quite a bit
Very much

4. My family has accepted my hearing loss.

CHECK ONE:

Not at all
A little bit
Somewhat
Quite a bit
Very much

Interim Summary #2

- Adding a wider array of outcome measures did not result in greater evidence regarding the differential benefit of hearing aid technologies (in this case, directional mics)
- Further documentation of the general benefits of amplification, however, was obtained with these additional outcome measures.

General Summary

- Well-fit contemporary hearing aids show average outcomes which indicate that older adults:
 - find hearing aids to be *helpful*;
 - are generally *satisfied* with hearing aids; and
 - typically *wear* their hearing aids an average of **8 hrs/day**
- Differences in technology, such as linear versus 2-channel WDRC versus 4-channel WDRC, as well as omni-directional versus directional microphones, do not yield significant differences in outcome.

Acknowledgements

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