

Introduction

Direct-to-consumer hearing aids (DTCs) are intended to improve access to affordable hearing devices for individuals with hearing loss. Although this dispensing model might result in better access to more affordable hearing devices, there is some concern that, without accompanying audiologic services, DTC users will have poorer satisfaction with their devices and, ultimately, will discontinue further attempts to improve their hearing health. This research compared patients' satisfaction when DTCs were provided using a traditional audiological model and a self-fitting model of care. The following questions were explored:

- Q1.** Is self-reported satisfaction with DTC devices, measured with the SADL, different compared to norms collected with traditional devices and services?
- Q2.** When DTC-type devices are issued with accompanying audiologic services, are patients' satisfaction with amplification in daily listening different from those who self-fit their devices?

Methods

Design: Double-blinded randomized control trial

Participants: 22 adults with bilateral mild to severe SNHL and no previous experience with hearing aids were randomized to one of two groups (AUD and BOX, described later). Demographics and mean composite audiograms are provided below for each group.

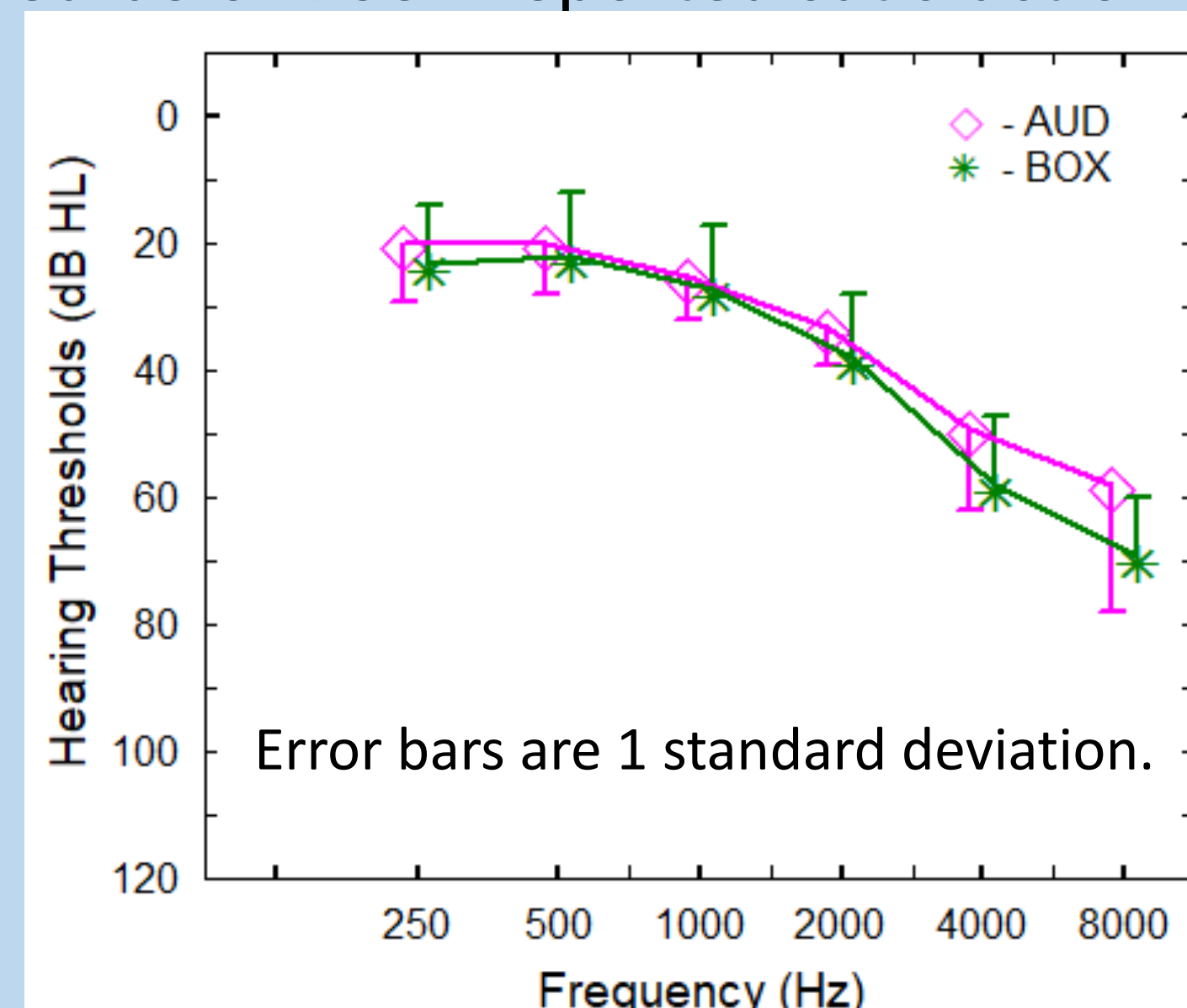
Devices: Bilateral DTC hearing devices were used for this research. These mini-BTE devices had multiple coupling options, a volume wheel, and 3 manually accessible programs. The manufacturer's box also contained an instruction manual, and participants had access to the manufacturers' online and telehealth resources.

Procedures: Following preliminary assessments, participants were issued DTCs with one of the models described below. Self-reported satisfaction was obtained by a blinded assessor after a 1-week trial.

Service Delivery Model

Experimental Group (AUD): Traditional Audiological Model
Participants received DTCs and were provided recommended volume and program settings based on real-ear measures. They also received professional orientation to the devices and audiologic counseling.

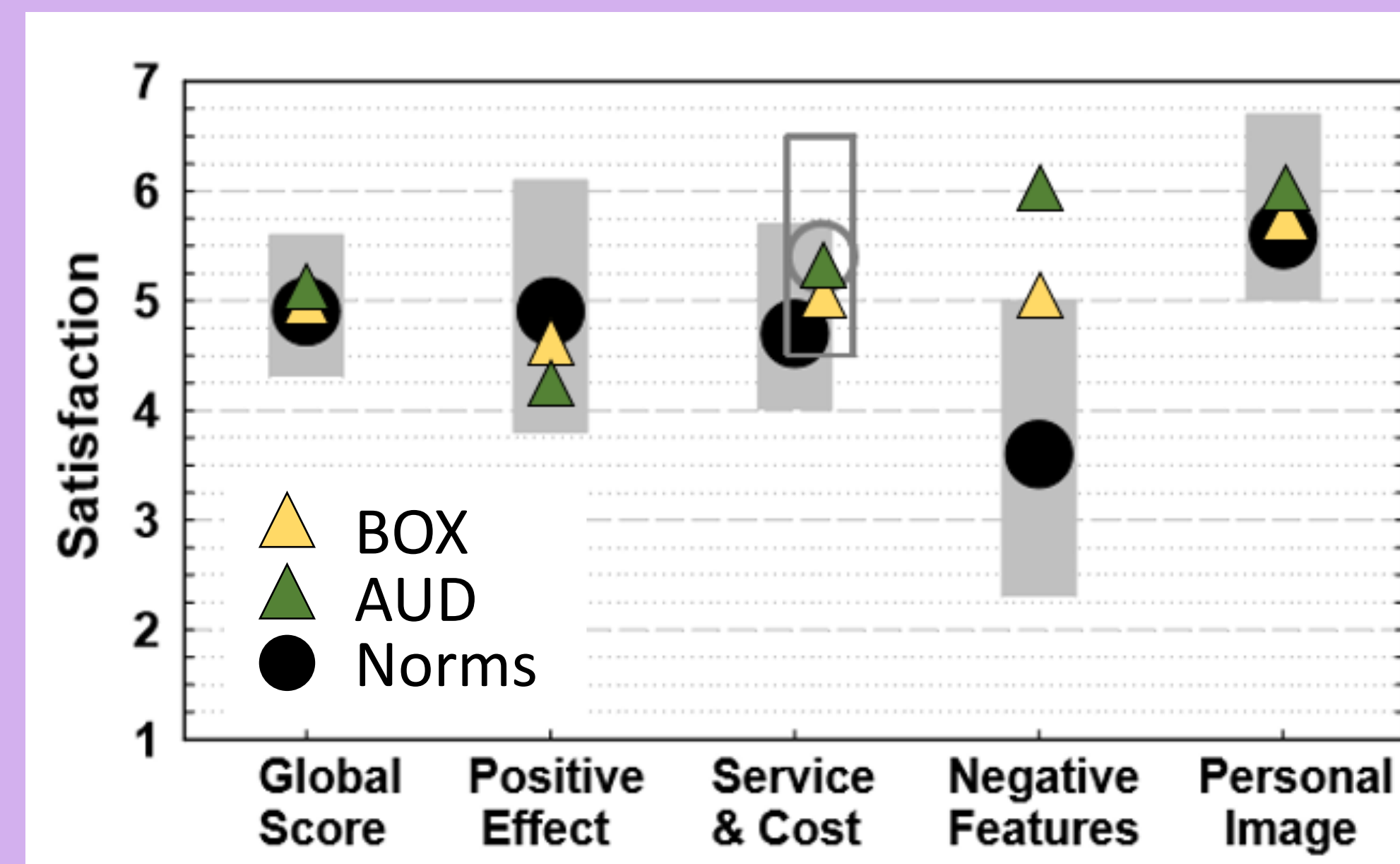
Control Group (BOX): Self-Fitting Model
Participants received the manufacturer's box containing the hearing devices. The control group received no additional training on their devices.



	AUD	BOX
Participants	10	12
Age	64 (44-81)	68 (55-79)
PTA	30	34
SRT	28	31
WRS	93	89

Results

Q1. The 15-item Satisfaction with Amplification in Daily Life (SADL) questionnaire divides content into 4 areas: Positive Effect (PE), Personal Image (PI), Service and Cost (SC), and Negative Features (NF). The mean subscale and global scores are plotted against published norms collected with traditional, 1990's-era, hearing aids (HAs) for both groups. Satisfaction with amplification mostly fell within published norm ranges, except for items related to negative features of HAs, which exceeded norms, particularly for the AUD group. Repeated *t*-tests demonstrated that there were no statistical differences between groups for any of the subscales ($p > .05$).



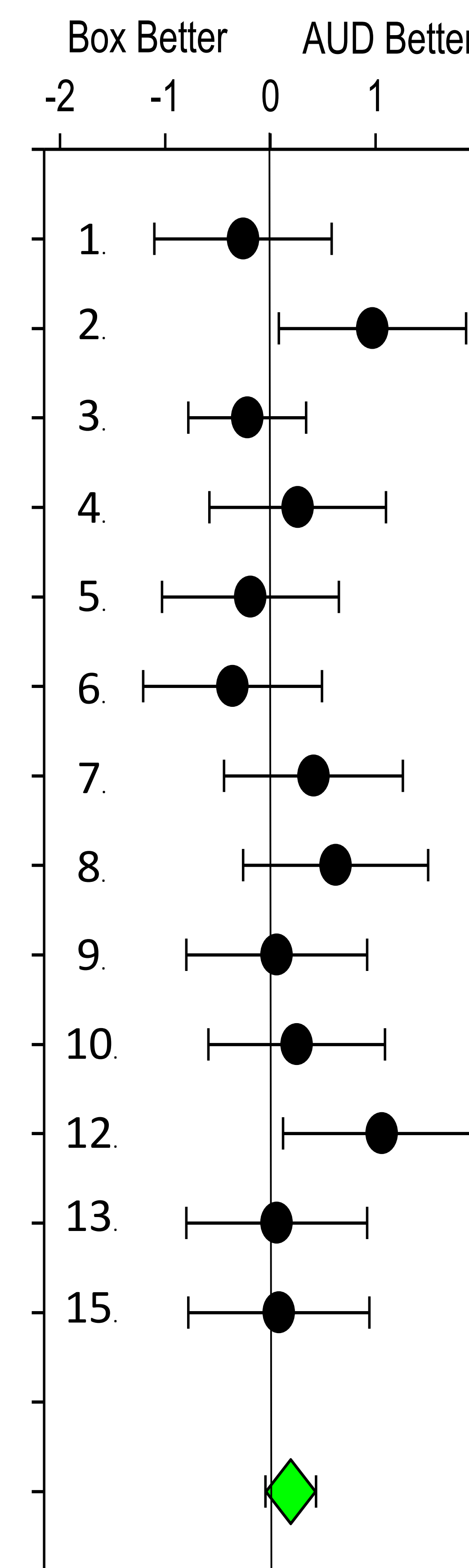
Q2. Differences in satisfaction for AUD and BOX groups (Cohen's *d*) for each SADL item and a combined effect are presented below. Items 11 (telephone benefit) and 14 (HA cost) were not relevant for these participants. Responses to items 2 and 12 demonstrate conclusive improvements in satisfaction with audiologic services.

SADL Items

1. Do your hearing aids help you understand the people you speak with most frequently?
2. **Are you frustrated when your hearing aids pick up sounds that keep you from hearing what you want to?**
3. Are you convinced that obtaining your hearing aids was in your best interests?
4. Do you think people notice your hearing loss more when you wear your hearing aids?
5. Do your hearing aids reduce the number of times you have to ask people to repeat?
6. Do you think your hearing aids are worth the trouble?
7. Are you bothered by an inability to get enough loudness from your hearing aids without feedback?
8. How content are you with the appearance of your hearing aids?
9. Does wearing your hearing aids improve your self-confidence?
10. How natural is the sound from your hearing aids?
12. **How competent was the person who provided you with your hearing aids?**
13. Do you think wearing your hearing aids makes you seem less capable?
15. How pleased are you with the dependability of your hearing aids?

Combined ESs across items shows a small, inconclusive, effect of overall improved satisfaction with amplification for those who received audiologic services.

Satisfaction (AUD - BOX)



Q&A

Q1. Was self-reported satisfaction with DTC devices, measured with the SADL, different compared to norms collected with traditional devices and services?

- **Yes**, in one area. Although averaged subscale scores with DTCs mostly fell within the 20-80th percentiles for the original norms, responses to the Negative Features subscale, which comprises items 2 & 7 for this sample, suggests that these participants were less bothered by loudness and background noise than the original respondents were with traditionally fitted, 1990s-era, HAs. It is encouraging that advances in HA technologies have resulted in improved satisfaction in these areas of difficulty, even for lower-cost DTC devices.

Q2. Did audiologic services result in more satisfaction with DTC hearing aids?

- **Yes**, especially in some areas. Although combined ESs across all items showed only a small potential positive impact of audiologic services on overall satisfaction with amplification in daily listening, comparisons of individual item scores suggest clinically important positive impacts of audiologic intervention in a few specific areas:
 - Those who received audiologic services perceived fewer frustrations with amplified background noise and improved perceptions of the audiologist.
 - Other elements of HA satisfaction that might have been positively impacted by audiologic services (i.e., small to moderate ES, but with inconclusive confidence intervals) were related to issues with acoustic feedback and device cosmetics.

Items related to satisfaction with the acoustic benefits and reliability of the devices were not different between the two groups. Since both groups wore the same DTC devices for this trial, this result was not surprising.

It is worth noting that experiencing audiologic services had a small, inconclusive, negative effect on satisfaction with efforts related to wearing HAs (Item 6).

Discussion

Although DTC hearing aids are limited in the amount of individualized adjustments that can be accomplished by a hearing healthcare professional, novice HA users with uncomplicated age-related hearing loss are likely to receive at least as much satisfaction with them as with older ('90s era) traditional devices. They are likely to be equally satisfied with the acoustic benefits of these devices regardless of how they are delivered (i.e., with or without audiologic services) but can receive even more satisfaction with some aspects of device performance in daily listening if the devices are fitted and issued by an audiologist. Hearing health practitioners and audiologic researchers should explore efficient methods to optimize patients' experiences with DTC devices.

Reference

Cox, R.M. & Alexander, G.C. (1999). Measuring Satisfaction with Amplification in Daily Life: The SADL Scale. *Ear and Hearing*, 20(4), 306-320.

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