

# THE ABBREVIATED PROFILE OF HEARING AID BENEFIT (APHAB)

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**Abstract:** The APHAB is a shortened version of the Profile of Hearing Aid Benefit (PHAB). The PHAB is a 66-item self-assessment, disability-based inventory that can be used to document the outcome of a hearing aid fitting or to compare several fittings or the same fitting over time. Although suitable for research settings, it is rather long for clinical use. The APHAB comprises 24 items, scored in four 6-item subscales. This poster presents some psychometric properties of the APHAB and examples of potential applications in clinical settings. (Supported by the Department of Veterans Affairs RR&D Service).

## Description of the inventory:

- ◆ The APHAB uses a subset of 24 items from the PHAB.
- ◆ All of the items are statements about communication abilities or perception of sound in daily life situations.
- ◆ A seven-point response scale is used to indicate how frequently each statement is true.
- ◆ Each item is scored twice, once for "without my hearing aid" and again for "with my hearing aid".
- ◆ The items are allocated into four 6-item subscales.
- ◆ Each subscale produces three scores: (1) unaided performance, (2) aided performance, (3) hearing aid benefit.
- ◆ The APHAB is completed by the client.
- ◆ Administration time is roughly 10 minutes.
- ◆ It is available in software or pen-and-pencil format.

## APHAB Subscales:

- EC** - Ease of Communication (speech understanding under relatively favorable conditions).
- RV** - Reverberation (communication in reverberant settings).
- BN** - Background Noise (communication in noisy settings).
- AV** - Aversiveness (unpleasantness of environmental sounds).

## APHAB Response Scale:

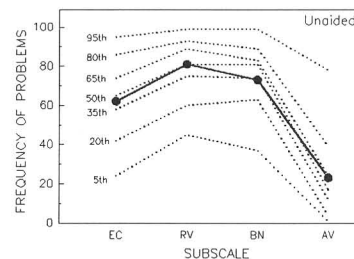
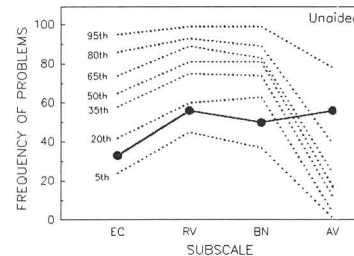
- Always (99%)
- Almost always (87%)
- Generally (75%)
- Half-the-time (50%)
- Occasionally (25%)
- Seldom (12%)
- Never (1%)

## Predicting Success

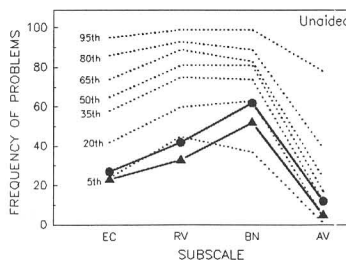
Can we predict success with amplification based on the pattern of unaided scores?

Although we do not have sufficient data on this question to make a definite statement, some unaided response patterns might be predictive of future success. In the figures below, unaided profiles from individuals obtaining their first hearing aids are shown in comparison with equal-percentile profiles for successful wearers of linear hearing aids.

An unaided pattern showing relatively few problems in the speech communication subscales (less than the 35th percentile) in combination with relatively high sound aversiveness (more than the 65th percentile) seems to be an indicator that success with amplification is unlikely.



An unaided pattern showing relatively many problems in 1 or more of the the speech communication subscales (more than the 35th percentile) in combination with relatively low sound aversiveness (less than 50th percentile) seems to be consistent with success with amplification, although not all are successful.



Some patterns are ambiguous. For example, a profile that indicates relatively few problems except in background noise might portend success or failure. One of the subjects shown in this Figure (circles) was successful with amplification while the other (triangles) was not.

## Comparing Profiles

We often wish to compare two profiles from the same individual to see if they are different. There are four kinds of comparisons we might wish to make:

1. Unaided vs unaided (has opinion changed about extent of problems)?
2. Unaided vs aided (is difference significant)?
3. Aided vs aided (do two hearing aids or programs give different performance)?
4. Benefit vs benefit (same as #3 but uses unaided as well as aided scores).

### To evaluate differences:

**Rule 1.** For individual subscales, each considered separately, the 90% critical differences are:

	aided	unaided	benefit
EC, RV, BN	22	22	27
AV	31	17	31

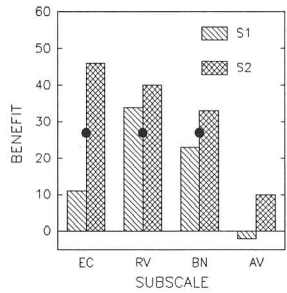
**Rule 2.** Considering EC, RV, and BN together, if the same hearing aid is superior on all three subscales by at least 10 units, this will occur by chance alone on fewer than 5% of observations.

## Measuring Benefit

- ◆ Benefit is calculated by deriving the difference between unaided and aided scores (unaided - aided = benefit). These data tell us how much help the individual feels the hearing aid provides.
- ◆ We can use the two rules given in the box above to assess the statistical significance of the benefit observed.
- ◆ Almost all the results obtained so far indicate that hearing aids provide real benefit (i.e., statistically significant).
- ◆ However, the amount of reported benefit is not always enough to make the purchase of the hearing aid worthwhile for the individual.

## How Much Benefit Is Enough?

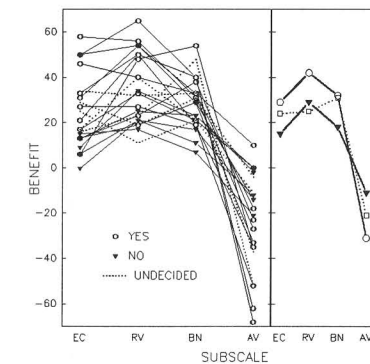
This figure shows benefit data from two different individuals (S1 and S2). The black dots show the 90% CDs for individual speech communication subscales (rule 1). By this rule, S2 registered significant benefit for all three subscales whereas S1 had significant benefit only for the RV subscale.



Applying rule 2 to these data indicates that both individuals derived significant overall benefit from their hearing aids.

**In fact,** only S2 felt that the amount of benefit was sufficient to prompt him to purchase the hearing aid and use it regularly.

This figure depicts benefit for 22 new hearing aid users. Open circles show subjects who purchased hearing aids. Filled triangles show subjects who did not purchase hearing aids. Dotted lines signify subjects who still are undecided whether the benefit is sufficient to warrant purchase. Mean data for each group are shown on the right.



Note the following:

- ◆ As a group, the "keepers" scored higher on EC, RV and BN than the "returners".
- ◆ The "undecideds" overlap with both categories.
- ◆ All the "keepers" showed significant benefit.
- ◆ Most of the "returners" also showed significant benefit.

*The Moral: Statistically significant benefit is not necessarily practically significant. Lifestyle and financial factors also impact amplification decisions.*