

Left to their own devices: self-fitting hearing aid outcomes among older adults

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Introduction

Hearing aids and personal sound amplification products (PSAPs) that are designed to be self-fitted by the user at home are becoming increasingly available in the online marketplace. While these devices are often marketed as a low-cost alternative to traditional hearing health care, little is known about people's ability to successfully use and manage them.



Figure 1. The rechargeable test device used in the study, which includes three ear tip sizes and adjustable tubing.

Aims

1. Can older adults with mild to moderately severe hearing loss set up a pair of commercially available self-fitting hearing devices for their own use?
2. What factors influence success with the self-fitting task?
3. How do the fitting outcomes of a self-fitted device compare with those obtained from hearing aids professionally fitted by an audiologist?



Self-Fitting Steps

- ✓ identify L and R devices
- ✓ select ear tip sizes
- ✓ adjust tubing length
- ✓ switch on devices
- ✓ insert devices into ears
- ✓ connect to app
- ✓ automatic audiometry
- ✓ fine-tune settings



Figure 2. The fine-tuning screen of the self-fitting app, which allows users to adjust the overall gain as well as high-, mid-, and low-frequency gain.

Method

Phase I

Forty hearing-impaired adults between the ages of 50 and 88 followed a set of instructions to self-fit a commercially available self-fitting hearing aid. Twenty-four participants brought partners, who were available to assist with the task as needed. Standardized measures of cognitive function, health literacy, locus of control, hearing aid self-efficacy, and manual dexterity were performed.

Phase II

Experienced participants who successfully completed Phase I were eligible to progress to a 9-week field trial. Participants wore their self-fitted devices for 6 weeks and their own hearing aids for 3 weeks. Speech reception in noise, horizontal localization, loudness scaling, and aided benefit measures were conducted for both device types.

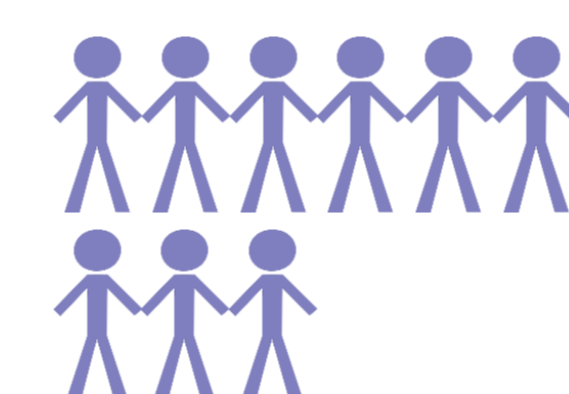
Experienced with hearing aids



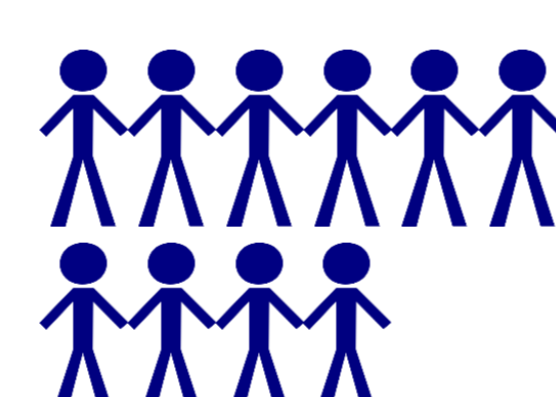
Successful



Unsuccessful



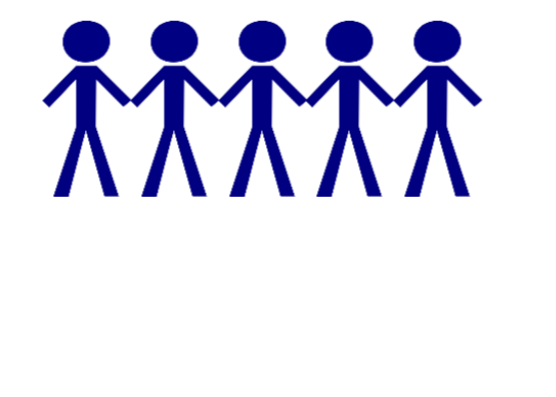
Started trial



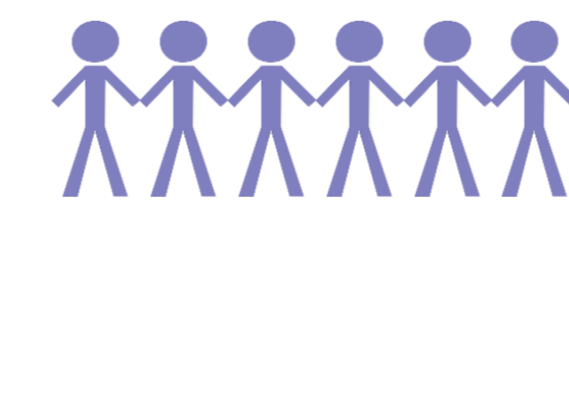
Device failed



Completed trial



Did not complete trial



Inexperienced with hearing aids



Successful



Unsuccessful



CAUTION!

Phase II results should be interpreted carefully, since they reflect the experiences of only 5 participants.

Results

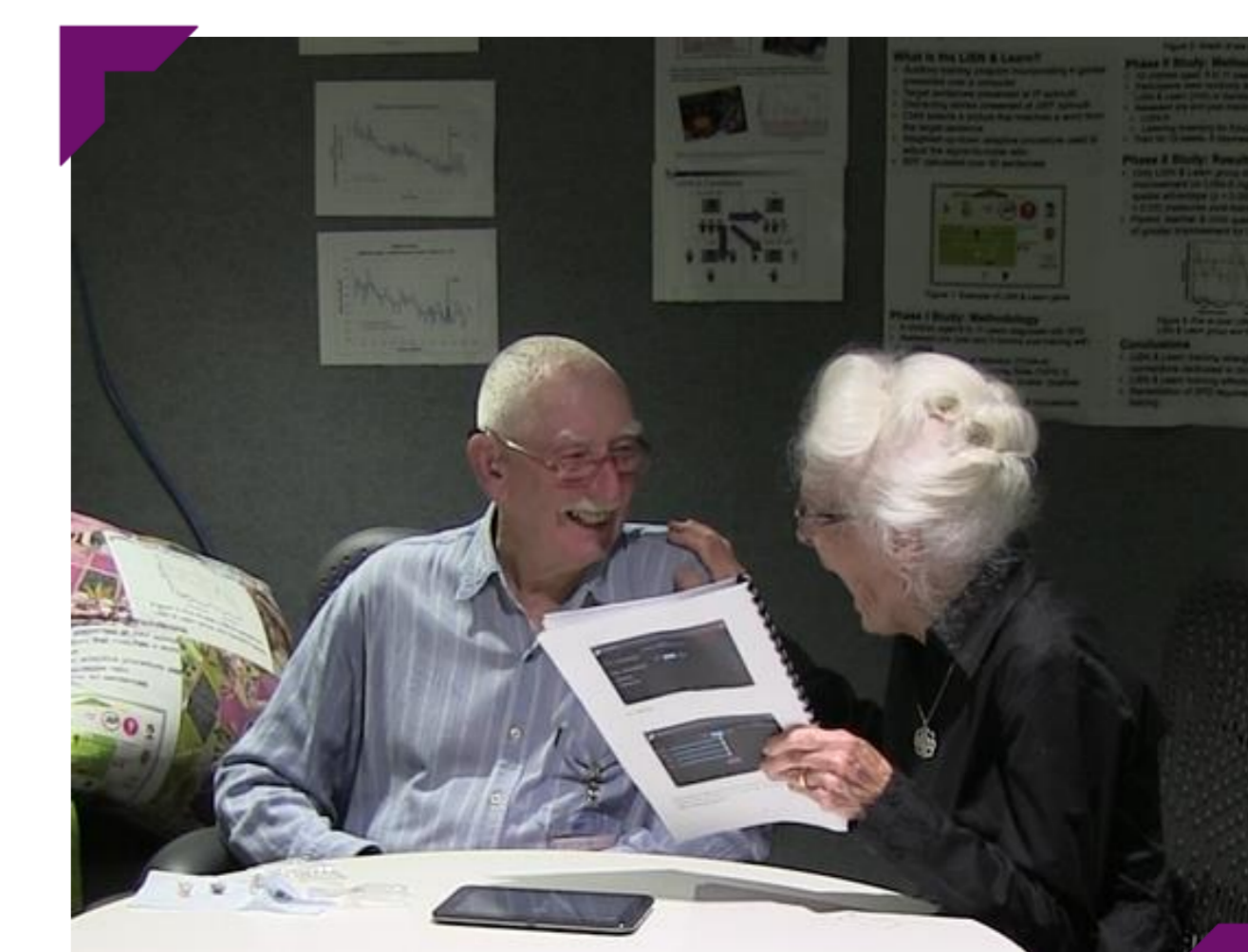
- 55% of participants successfully completed the self-fitting procedure
- No significant effect of independent variable measures, demographic characteristics of the participants, previous tablet experience, or partner contributions
- Only the *types* of errors differed according to hearing aid experience:

- Automatic audiometry and fine-tuning errors
- Physical customization and insertion errors

- 2 cc coupler measurements revealed that the fine-tuned self-fitted devices of the field trial participants had a similar response shape to that of their own hearing aids
- No significant performance differences between the self-fitted devices and the participants' own hearing aids were observed on any of the outcome measures
- Participants reported that the self-fitted devices provided equivalent, or greater, benefit than did their own hearing aids

Discussion

Although the majority of participants were able to complete the self-fitting task without error, many of the participants who made mistakes did not recognize them as such and thus took no action to correct them. The consequences of their errors also seemed to be poorly understood. For example, one participant who performed the automatic audiometry step incorrectly later commented that he did not see the need to fine-tune "because the computer just gave me a hearing test." The inability to self-identify errors has been observed repeatedly in past self-fitting studies and presents a major concern for clinical procedures that are designed to be undertaken independently. The provision of knowledgeable support by trained personnel, rather than by a fellow layperson, should become a priority for further research in this area, particularly identifying who is likely to need support and determining how it should be offered in the context of devices that are largely purchased online.



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