Supplemental Material S2. The translated English quality assessment.

Quality assessment

Introduction

Research goal	1. The goal is described literally or can be clearly deduced.

If this condition is met → 1 point
If this condition is not met → 0 points

Research question	1. The research questions are described literally or are clearly derivable. 2. The research questions are based on hypotheses. 3. The research questions cover the research goal.

If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Total score: /4

Methods

Research design	1. An experimental design was used whereby the control and experimental group were chosen at random. 2. A quasi-experimental design was used whereby the control group was chosen by use of a matching process. At least 3 parameters were matched: e.g. hearing thresholds, cognition, age, gender, and etcetera. 3. A quasi-experimental design was used whereby the control group was chosen by use of a matching process. A match was made on 2 parameters. 4. A within-subject design was used. 5. A quasi-experimental design was used whereby the control group was chosen by use of a matching process. A match was made on 1 parameter. 6. A quasi-experimental design without control group was used.

If the first condition is met → 4 points
If the second condition is met → 3 points
If the third condition is met → 2 points
If the fourth condition is met → 2 points
If the fifth condition is met → 1 point
If the sixth condition is met → 0 points

Participants	Sample size 1. The sample size is based on a power analysis. 2. No power analysis was performed, but a sufficiently large sample size (≥ 20) was used. *3.* No power analysis was performed and the used sample size is too small (< 20).

If condition one or two are met → 1 point
If condition three is met → 0 points

Inclusion and exclusion criteria
1. The inclusion and exclusion criteria are described in detail.
2. Sufficient descriptive data of the study population are present e.g., age range, range of hearing loss, and etcetera.
3. The hearing aid experience is clearly described.

If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Drop-outs
1. Drop-outs are mentioned and explained.

If this condition is met → 1 point
If this condition is not met → 0 points

Experiment

Hearing aid (fitting)
1. It is clearly indicated whether participants' hearing aids or study hearing aids were used.
2. The brand, type, and/or the technology level of the hearing aid are clearly defined.
3. The hearing aid fitting was based on the participants' pure-tone hearing thresholds and was conducted at the start of the experiment.
4. A subjective or objective analysis of the hearing aid fitting was conducted e.g., tone or speech audiometry in free field, real ear measurements, questionnaire, and etcetera.
5. The total duration of the experimental period is mentioned.
6. The average daily hearing aid use was objectively monitored via data logging.
7. The independent variable (hearing aid use in general and/or adjustment of a specific feature) is clearly mentioned.

If seven conditions are met → 7 points
If six conditions are met → 6 points
If five conditions are met → 5 points
If four conditions are met → 4 points
If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Tests – in general
1. All test procedures are discussed in detail and/or the used guidelines are clearly mentioned.
2. All tests were conducted in optimum test conditions e.g., elimination of possible distractors, no environmental noise, and etcetera.

If both conditions are met → 2 points
If one condition is met → 1 point
In none of the conditions are met → 0 points

Tests – reliability
1. Standardized tests were used.
2. No standardized tests were used, but there is a clear motivation why these tests were used.
3. *No standardized test were used, whereby the use of these tests are not justified.*

If condition one is met → 2 points
If condition two is met → 1 point
If condition three is met → 0 points

Tests – hearing
1. The hearing status is measured objectively (e.g., auditory brainstem response) or subjectively (e.g., pure-tone audiometry).
2. Information regarding the hearing status is obtained retrospectively and is based on recent objective (e.g., auditory brainstem response) and/or subjective measurements (e.g., pure-tone audiometry) (< 1 year).
3. Information regarding the hearing status is obtained retrospectively and is based on somewhat older objective (e.g., auditory brainstem response) and/or subjective measurements (e.g. pure-tone audiometry) (≥ 1 year).
4. Information regarding the hearing status is only based on self-reports.
5. Information regarding the hearing status is obtained retrospectively and is based on recent self-reports (< 1 year).
6. Information regarding the hearing status is obtained retrospectively and is based on somewhat older self-reports (≥ 1 year).
7. *It is unknown how the hearing status was measured.*

If condition 1 or 2 are met → 4 points
If condition 3 is met → 3 points
If condition 4 or 5 are met → 2 points
If condition 6 is met → 1 point
If condition 7 is met → 0 points

Tests – cognition
1. Cognition was measured using objective tests (i.e., not self-reports).
2. Cognition was measured before and after hearing aid fitting.

If both conditions are met → 2 points
If only one condition is met → 1 point
If none of the conditions are met → 0 points

Statistical analysis

1. The statistical procedures are described accurately.
2. The used statistical tests are adequate for the data and the research question.

If both conditions are met → 2 points
If only one condition is met → 1 point
If none of the conditions are met → 0 points

Avoiding bias

1. Measures were taken to avoid investigation bias to guarantee that the experiment was performed as reliable as possible by using a randomization tool, calibrating measurement equipment, and etcetera.

2. Measures were taken to avoid learning effects such as counterbalancing, usage of a between-subject design, and etcetera.
3. Measures were taken to reduce external bias as much as possible. This refers to personal matters such as socio-economic status, educational level, hearing aid experience, individual wear time of the hearing aid, age, and etcetera.

If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If no conditions are met → 0 points

Total score	/31

Results

1. The results are described objectively.
2. The statistical tests and values (e.g., *p*-value) are presented correctly.
3. The description of the results is accompanied by figures, graphs and/or tables.
4. The used figures, graphs and/or tables provide sufficient information.

If four conditions are met → 4 points
If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Total score	/4

Conclusion and discussion

Discussion

1. The research goals and/or hypotheses are mentioned.
2. The obtained results are interpreted and linked to the hypotheses.
3. A comparison is made between current and previous results.
4. Shortcomings and/or strengths are mentioned.
5. Suggestions for further research are made.

If five conditions are met → 5 points
If four conditions are met → 4 points
If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Conclusion

1. The research question is described briefly.
2. The research population is mentioned.
3. The most important results are presented concisely.
4. A short conclusion/interpretation of the results is given.

If four conditions are met → 4 points
If three conditions are met → 3 points
If two conditions are met → 2 points
If one condition is met → 1 point
If none of the conditions are met → 0 points

Total score   /9

| TOTAL | / 48 |