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The 12-item *Speech, Spatial and Qualities of Hearing Scale* questionnaire: administration suggestions and guidance

Oscar M Cañete*
School of Psychology, The University of Auckland, New Zealand

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Correspondence
*Oscar M Cañete
Speech Science, School of Psychology,
The University of Auckland,
Building 507, Grafton Campus, Private Bag
92019, Auckland, New Zealand
email: ocan093@aucklanduni.ac.nz

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Abstract

Hearing questionnaires are extremely useful tools for describing people's hearing abilities and for measuring and documenting hearing device fitting outcomes. The Speech, Spatial and Qualities of Hearing Scale (SSQ) questionnaire is often used and is even available in different versions and formats. However, detailed instructions and guidance for the clinician administering the questionnaire are limited. Below are some suggestions and guidance for reducing variability when administering the questionnaire, thereby maintaining consistency in both clinical and research settings alike.

Keywords

SSQ12, questionnaire, hearing aids, hearing, hearing loss

Findings, Limitations, Perspectives and Considerations

Findings

- The SSQ12 questionnaire provides individualised information on hearing abilities, that are not reflected by the audiogram.
- The SSQ12 is a useful and efficient way of assessing hearing aid fitting.

Perspectives

- Questionnaires such as the SSQ12 can help evaluate interventions and service quality.
- Widespread use of this type of tool will enhance retrospective research and facilitate the evaluation of specific interventions.

Limitations

- This tutorial is designed to be a step-by-step guide; however, there may be variations in administration methods that are not covered in this communication.

Considerations

- Other tools, such as questionnaires on participation restrictions (disabilities) and hearing-aid satisfaction may complement the use of the SSQ12.

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Introduction

Tests such as tonal audiometry are essential when diagnosing hearing pathologies, but they provide limited information about people's functional hearing in everyday situations (Cox, 2003). Because assessments are mainly conducted in controlled environments, they fail to reflect people's conditions in real life (Tharpe, 2004). Subjective methods such as questionnaires afford a more realistic view of individual auditory functioning and a person's relationship to their environment. Functional hearing assessments that use questionnaires not only provide information about what people hear, but also how those people interact with what they hear in everyday life and how their listening behaviour changes depending on different environmental conditions and different speakers. Questionnaires also inform on individual needs for intervention or further assessment and can be used to document the benefits of amplification systems and interventions (Cox, 2003; Tharpe, 2004).

Among the most widely used instruments, in clinical and research settings alike, to measure the impact of an intervention (such as amplification; ASHA Ad Hoc Committee Guidelines for Hearing Aid Fitting et al., 1998) is the *Speech, Spatial and Qualities of Hearing Scale* (SSQ) questionnaire (Gatehouse & Noble, 2004), which aims to assess hearing disabilities in everyday situations. The original questionnaire consists of 49 items grouped into three subscales: 1) speech (e.g. speech in noise, speech in speech), 2) spatial (e.g. sound localisation) and 3) other qualities of hearing (e.g. clarity or listening effort); see **Table 1**. Many versions are currently available, with 5, 12, 15 and 19 items (Demeester et al., 2012; Kiessling et al., 2011; Moulin et al., 2019; Noble et al., 2013), some designed for parents, children and teachers (Galvin & Noble, 2013), and others to investigate hearing aid benefits (SSQ-b) and compare devices (SSQ-c; Jensen et al., 2009).

In order to reduce differences when administering the questionnaire, this paper offers some suggestions and points to be considered by the evaluator when using the 12-item version of the questionnaire in an interview format (Cañete et al., 2022).

Table 1. Distribution of items by subscale (SSQ12)

	Pragmatic scale	Item	Subscale
1	Speech in noise	1-4	*Speech*
2	Multiple speakers	2-5	
3	Speech in speech	3	
4	Localisation	6	*Spatial*
5	Distance and movement	7-8	
6	Segregation	9	*Qualities*
7	Identification of sound	10	
8	Quality and naturalness	11	
9	Listening effort	12	

Administration instructions

1. Explain the purpose of the questionnaire to the patient (see supplementary material 1 for the full questionnaire).
2. Give instructions on how to respond to the questionnaire (these instructions are also included in the questionnaire itself), for example:

"Answer on a scale of 0 to 10 points (show the patient the printed scale while giving the explanation and during the evaluation). You may choose any point on the scale, bearing in mind that 0 (on the far left of the scale) means a lot of difficulty performing the activity/situation mentioned in the question, and 10 (on the far right of the scale) means no difficulty performing the activity/situation in the question"

Note that the patient may read the instructions directly in the questionnaire itself, receive the instructions verbally from the clinician, or a combination of the two.

3. It is important to always explain the context of the assessment to the patient. The context depends on the objective, for example, if the patient is a hearing aid user, they might be asked to respond considering when they use the devices.
4. The aim of the situations outlined in each question is to reflect everyday circumstances. Therefore, some patients may report that some situations do not apply to them. The patient should tick the "Not Applicable" box in that case.

> *You are listening to someone talking to you, while trying to hear the news on TV at the same time. Can you understand what both people are saying?*

Bear in mind that the situations are examples and therefore you could point out that the patient could consider similar situations that are not exactly the same as those described in the question. For example, in the following item (#1), "hear the news" would be similar to "listen to a programme". This question investigates the patient's ability to talk or chat with someone and follow what they are hearing on the television. (However, remember to keep the structure and purpose of the question).

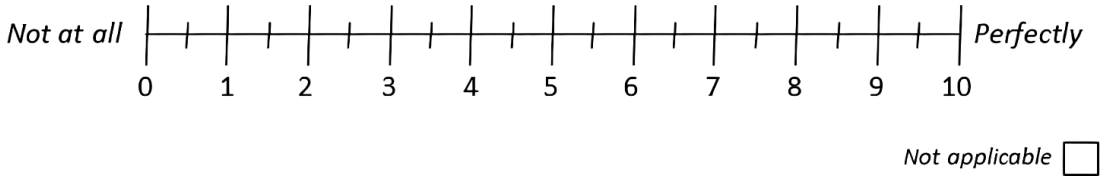

Figure 1. Response scale.

5. Emphasise to the patient that the idea is for their responses to be based on "the most common or usual" situation, and therefore not on a specific situation that happened once. In the same example above, the patient may say that they have great difficulty listening to the news in Spanish when travelling, but this is not the most common situation (unless they live in a Spanish-speaking country or are a native Spanish speaker), even if they have a good command of Spanish. If they are from an English-speaking country, for example, it would be more common to listen to the news in English.
6. Items 9 and 10 may need to be clarified. In the case of item 9, sound segregation skills are assessed, whereby a person is expected to be able to "separate" two or more sounds that are heard together, rather than perceiving them as a single sound.
   Item 10 assesses the ability to identify sound; the patient does not have to be able to specifically recognise the musical instruments by name or type, because the aim is only to recognise them as distinct instruments.
7. The questionnaire can be applied in new or experienced users of any device (e.g. hearing aids, cochlear implants, bone-anchored implants). The questionnaire can also be applied in people who do not have hearing loss but report hearing difficulties, for example when understanding speech in noisy conditions (Bamiou et al., 2015; Obuchi & Kaga, 2020).
8. No consensus exists about when it is best to apply the questionnaire, although it can be used as a baseline measurement (before the amplification or intervention) and during follow-up. In the case of device implantation, it has been suggested that benefit or satisfaction should be assessed from the third month post-implantation (e.g. in new users; Wong & Hickson, 2012). However, timing is always at the discretion of the clinician, who should decide on assessment timing at an individual level for each patient.
9. If the patient uses a hearing aid, they should wear it during the interview to ensure they can hear and understand the questions[1]. In addition, the patient must be able to see the interviewer's face during the assessment (and if the patient uses glasses, they should be worn). The room where the interview takes place should have good lighting to allow the patient to lip read.
10. The questionnaire is validated for self-administration (without intermediaries), although it is recommended that the clinician should talk the patient through the instructions, taking into account the above points. If the patient has any doubts or questions, the clinician should provide assistance. Some patients may need items clarified.
11. The SSQ12 questionnaire (Spanish version) is validated for use in the adult population (18 years and older; Cañete et al., 2022; Gatehouse & Noble, 2004). Use in younger patients should be at the clinician's discretion.

Scoring instructions

1. The SSQ12 questionnaire consists of 12 items, each with a possible score of 0 to 10 points.
2. The item scores can be grouped into four subscales:
   a. Speech scale (items 1, 2, 3, 4, 5)
   b. Spatial scale (items 6, 7, 8)
   c. Qualities-of-hearing scale (items 9, 10, 11, 12)
   d. Overall average score (items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12)
3. To determine the subscale and overall scores, the average is calculated using only the item scores in each subscale (**Table 2**). Remember that higher values (close to 10) indicate less difficulty or no difficultly at all.
4. To use SSQ12 as a screening tool for hearing loss, a score of ≤ 8.5 points for the total average (for all 12 items) should be considered as the cut-off point (Chilean sample in interview format; Cañete et al., 2022). However, it may be appropriate to collect data for the target population where the questionnaire is to be applied, because factors such as educational level and gender have been shown to affect results (von Gablenz et al., 2018).
5. Note that if a score is not given for all the items in a subscale, as in the case of the "Not applicable" option (score omitted), the subscale score and the total score cannot be calculated.

1 The clinician must make sure the device is functioning properly.

Table 2. Example of scores calculated per subscale and overall

Item no.	1	2	3	4	5	6	7	8	9	10	11	12	Total
Score	4.0	7.0	3.0	2.0	7.0	7.0	6.0	8.0	4.0	5.0	8.0	7.0	
Speech					4.6								
Spatial								7.0					
Qualities												6.0	
													5.6

6. Finally, it should be noted that the original version of this questionnaire was designed and validated in a self-administered format (paper-and-pencil; Gatehouse & Noble, 2004), and therefore other methods, such as online administration, should be evaluated for equivalence.

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