Evaluation of hearing aid benefit through a new questionnaire: CISQ (Complete Intelligibility Spatiality Quality)

La valutazione del beneficio protesico mediante un nuovo questionario: CISQ (Complete Intelligibility Spatiality Quality)

P. GIORDANO[1], P. ARGENTERO[2], A. CANALE[1], M. LACILLA[1], R. ALBERA[1]

[1] Department of Clinic Physiopathology, ENT Division, University of Turin, Italy; [2] Department of Psychology, University of Pavia, Italy

SUMMARY

The purpose of this work was to create a rapid and simple instrument to evaluate the benefits of a hearing aid, that was at the same time reliable and complete. We created a new questionnaire by integration of other well consolidated psychometric tests to better investigate all the aspects that contribute in determining the hearing aid benefit, also considering as important some areas that are not usually considered (spatiality and quality of sound). We started from a 36-item questionnaire divided in six subscales (spatiality and quality of signal, intelligibility in silence, background noise intelligibility, averseness and reverberation), and submitted it to patients before hearing aid application and at 2-3 months after that. A statistically significant difference between results before and after hearing aid application was found. To obtain the final 30-item questionnaire, we analyzed the reliability of each subscale using Cronbach's alpha coefficient, and eliminated the item whose internal consistency was lower for every subscale. For these reasons, the CISQ questionnaire is a rapid and simple test that can be considered a reliable and complete instrument to evaluate the benefits of a hearing aid.

KEY WORDS: Hearing aid benefit • Psychometric test • Hearing aid

RIASSUNTO

Lo scopo di questo lavoro è stato quello di creare un questionario per valutare il beneficio protesico che fosse rapido e di facile utilizzazione, ma allo stesso tempo completo e attendibile. Partendo da altri test psicometrici ormai ben consolidati, abbiamo creato un nuovo questionario in grado di indagare i diversi aspetti che concorrono nel determinare il beneficio protesico del paziente, ovvero il grado di soddisfazione soggettiva che, insieme al guadagno protesico, porta alla definizione della cosiddetta resa protesica. Partendo dai test ad oggi maggiormente utilizzati abbiamo creato un primo questionario costituito da 36 domande, divise per sei sottoscale riguardanti i diversi ambiti che ci interessava indagare: comprensione in ambienti riverberanti, intelligibilità, intelligibilità nel rumore, percezione dei rumori forti, qualità del segnale e spazialità. Abbiamo poi somministrato il questionario a 40 pazienti ipoacusici prima della protesizzazione e tre mesi dopo l'applicazione della stessa, al termine cioè dell'adattamento protesico. Confrontando i due questionari mediante un'analisi statistica è stato possibile evidenziare una differenza statisticamente significativa tra le risposte date prima e dopo la protesizzazione. Affinché il questionario fosse attendibile abbiamo poi calcolato l'Alpha di Cronbach, coefficiente che serve a valutare la coerenza interna di raggruppamenti di items. Abbiamo quindi eliminato per ogni sottoscala la domanda dotata della minore coerenza interna, ottenendo così il questionario definitivo costituito da 30 domande. Il numero relativamente ridotto di items consente la rapida esecuzione del test rendendolo pertanto facilmente fruibile; allo stesso tempo però le sei sottoscale assicurano la completezza dell'indagine, comprendendo anche ambiti solitamente meno indagati (spazialità e qualità del suono). L'analisi statistica e il calcolo dell'Alpha di Cronbach assicurano altresì che le domande siano chiare, che portino a dare risposte nettamente differenti in una condizione di ipoacusia rispetto ad una di buona udibilità, e completamente attendibili. Per tutte queste caratteristiche il questionario CISQ può essere considerato un completo strumento di valutazione del beneficio protesico.

PAROLE CHIAVE: *Beneficio protesico • Test psicometrico • Protesi*

Introduction

Hearing aid satisfaction or hearing aid surrender is the general advantage that a patient with a hearing aid has that derives from his handicap reduction. Hearing aid satisfaction is influenced by numerous factors such as the type and the severity of the deafness, cognitive ability of the patient, expectancy about the hearing aid, motivation and, furthermore, his character and overall quality of life [1-3]. Hearing aid satisfaction is something that is difficult to predict and evaluate [4]. Hearing aid satisfaction can be

defined as the sum of *hearing aid gain* with *hearing aid benefit*. *Hearing aid gain* refers to the difference between the unaided and the aided auditory threshold, and can be measured with subjective and objective tests. Subjective tests are the tonal auditory test and vocal auditory test with and without the auditory aid. Objective tests are the real ear unaided response (REUR), the real ear occluded response (REOR), the real ear aided response (REAR) and the real ear insertion response (REIR).

The REAR is also called the *in situ gain and* is the prosthetic amplification measured in situ. The *insertion gain* derives instead from the difference between the REAR and the REUR. These in situ measures are used to have an objective evaluation of hearing aid gain, but are not able to investigate the aided benefit.

Hearing aid benefit can be evaluated using a questionnaire that checks the acoustic universe and the psychological sphere of the patient.

Measures of aided benefit include the client oriented scale of improvement [5], the Glasgow hearing aid benefit profile [6] and the profile of hearing aid benefit [7]. Shorter measures of benefit include the abbreviated profile of hearing aid benefit (APHAB [8]) and the international outcome inventory for hearing aids [9].

Certainly the most used questionnaire nowadays is the APHAB [10]. It derives from the PHAB inventory whose value is limited in clinical applications because the time required to complete the 66 items (about 30 min) is not always available. However, the time needed to complete the APHAB questionnaire is about 10 min or less and produces scores for unaided and aided performance as well as hearing benefit. The APHAB does not consider however some situations that need to be investigated.

In our practice, a rapid, reliable and complete instrument is needed to evaluate the aided benefit. For this reason, we created a new questionnaire, the CISQ (Complete Intelligibility Spatiality Quality) questionnaire, to better investigate some areas that are not usually considered such as spatiality and quality of sound.

Materials and methods

Subjects

A total of 40 subjects (21 males and 19 females) were recruited in our Audiology Department and participated in the study; the mean age was 69.8 years and the age range was 25 to 86 years.

All patients were evaluated with the tonal auditory test and vocal auditory test. The mean value of the neurosensorial hearing deficit on 0.5/1/2/3/4 kHz frequencies was 58.75 dB.

The hearing aid fittings were binaural in 36 cases (90%) and monaural in four (10%). The hearing aids used were conventional and digital instruments in 39 cases.

They were behind-the-ear in 37 cases (92.5% of total), and in-the-ear in two cases (5%). One patient used a bone conduction hearing aid.

Study design

We submitted the 36-item questionnaire to patients before the hearing aid application and 2-3 months after that, at the end of the period of hearing aid adaptation [11]. We analyzed the distribution of answers in the two conditions (before and after hearing aid application), looking at the absolute and percentage frequency of the answers, and evaluating the difference between the mean values in the two conditions. After that we conducted statistical analysis to obtain a 30-item questionnaire, whose consistency and reliability were considered optimal [12].

CISQ questionnaire

We created the questionnaire by integration with other well established and consolidated tests. These tests are called psychometric tests and use subjective measures to evaluate motivation, expectancy, abilities and personality traits of patients.

We considered the Denver Scale and the hearing handicap inventory of elderly (HHIE), which investigates subjective handicap, the Sanders Test that evaluates communicational abilities in different situations, the COSI, usually used to best understand a patient's expectation from the hearing aid, and the APHAB, currently the best instrument to evaluate hearing aid benefit that consists of 24 statements, four subscales (ease of communication, background noise, reverberation, averseness) and has a 7-point rating scale.

To create our test we started from a 36-item questionnaire developed in six subscales: spatiality of signal, quality of signal, reverberation, background noise intelligibility, averseness and intelligibility in silence.

The subscale "spatiality of signal" examines the subject's ability to discriminate from which direction the sound source arrives. The subscale "quality of signal" examines the third property of the sound: the tone. More in general this subscale investigates about the clarity of sounds. The third subscale evaluates the subject's ability to hear in a large, empty place, where sounds are altered by reverberation. The subscale "background noise intelligibility" investigates the verbal communication capacity of the subject in noisy places [13]. The subscale "averseness" investigates about loud sounds, and the latter about the verbal communication capacity of the subjects in silence. The questions were divided in six groups, so that in every group there was an item for each subscale.

The answers were represented by an 11-point rating scale (0-10), in which the minimum and the maximum were labelled with descriptive words (never and always; Fig. 1). We used this format to obtain a quantifiable result so that the questionnaire had good measurability. The measur-
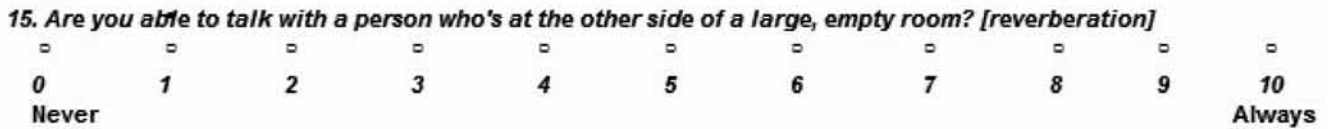
15. Are you able to talk with a person who's at the other side of a large, empty room? [reverberation]

0	1	2	3	4	5	6	7	8	9	10
Never										Always

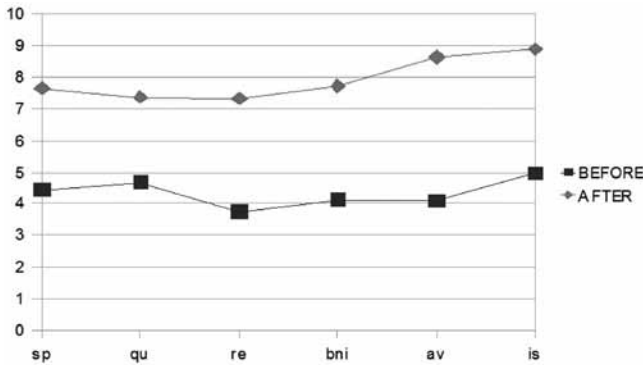**Fig 1.** A sample item from the hearing aid benefit questionnaire.

Fig 2. Hearing impairment graphic. For each subscale, the physician indicates the average of the answers done by the patient.
sp: spatiality; qu: quality of sound; re: reverberation; bni: background noise intelligibility; av: averseness; is: intelligibility in silence.

Table I. Descriptive statistics and difference between mean values: subscales.

subs.	Before		After		Diff.	T-test	p
	mean	sd	mean	sd			
sp	4.44	1.9	7.65	1.33	3.21	14.17	< 0.01
qu	4.67	1.45	7.37	0.86	2.7	13.11	< 0.01
re	3.75	1.37	7.33	1.03	3.58	17.01	< 0.01
bni	4.13	1.44	7.73	1.16	3.6	16.11	< 0.01
av	4.09	1.85	8.63	0.86	4.54	17.73	< 0.01
is	4.96	1.53	8.89	0.99	3.93	17.08	< 0.01

sp: spatiality; qu: quality of sound; re: reverberation; bni: background noise intelligibility; av: averseness; is: intelligibility in silence.

ability of the instrument is a primary element of its practicality and concreteness, and is something that a questionnaire with a more qualitative approach, as many others in literature, may not always have.

At the end of the questionnaire we inserted a graphic that the physician (or the audiometrist) has to fill in to provide the patient with an immediate perception of the handicap (before the hearing aid application) and benefit (after the hearing aid application; Fig. 2). For every subscale, the patient can clearly see the average of his/her answers, and easily compare it with the average of the answers in the other condition.

Results

As mentioned earlier, we submitted the 36-item questionnaire to patient before the hearing aid application and 2-3 months after that, at the end of the period of hearing aid adaptation. The distribution of answers had a larger frequency among the numbers from 0 to 5 before the hearing aid application, and a larger frequency among the numbers from 5 to 10 after the hearing aid application.

We calculated the average of answers in each condition (before and after hearing aid application) and found a significant difference in 35 of the 36 items. In all cases, in fact, the mean value was higher after hearing aid application than before; this difference was statistically significant with a student's t-test. Item 32 was non-significant with a similar distribution of the answers in the two examined conditions.

Comparing the averages of the answers of each subscale, we again found a difference between the two

situations (before and after hearing aid application) that was statistically significant (Table I). We observed a small difference in the subscale "quality of signal", in which there was question 32, whose difference between the mean of the answers in the two situations was not significant.

To obtain the final questionnaire composed of 30 items, five for each subscale, we analyzed the reliability of each subscale using Cronbach's alpha coefficient, which is commonly used as a measure of the internal consistency or reliability of a psychometric test score. Cronbach's alpha describes the coherence of a group of items; a high alpha value indicates that the examined subjects show a coherent behaviour on each item of every subscale. Cronbach's alpha will generally increase as the intercorrelation among test items increases, and is thus known as an internal consistency estimate of reliability of the test score. To be considered appropriate, with an acceptable level of internal consistency, a psychometric test should have an alpha value of at least 0.6.

We decided to eliminate one item for every subscale to obtain the 30-item questionnaire, whose internal consistency was optimal. We calculated the Chronbach's alpha of each subscale alternately removing each item, and decided to definitely eliminate from the questionnaire the item whose removal lead to a higher alpha value. For example, in the subscale "quality of signal" the removal of the question 8 lead to an alpha value of 0.79, which estimated a very good level of internal consistency. Removing question 32, this level jumped to an alpha level of 0.95. For this reason, on this subscale we eliminated question 32 (Table IIA).

We made the same analysis for each subscale and obtained a 30-item questionnaire, in which every subscale could be characterized by an optimal level of reliability (because of an alpha value of at least 0.92; Table IIB).

Table II. Reliability analysis. A) Difference in mean, variance and Chronbach's alpha values after the removal of each item of the subscale "quality of sound". B) Alpha values of every subscale after the removal of the question with the lower scale correlation.

A						B	
Scale	Scale Mean if Item Deleted	Corrected Variance if Item Deleted	Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted	Subscale	Alpha
Q2	23.35	55.41	0.70	0.63	0.82	**sp**	0.95
Q8	22.27	47.74	0.84	0.75	0.79	**qu**	0.92
Q14	22.63	49.06	0.81	0.70	0.80	**re**	0.94
Q20	23.93	54.33	0.72	0.55	0.82	**bni**	0.95
Q26	23.55	51.23	0.79	0.73	0.80	**av**	0.94
Q32	24.40	67.94	0.12	0.11	0.92	**is**	0.95

Discussion

The purpose of this work was to create a rapid and simple instrument to evaluate the benefits of a hearing aid that was reliable and complete. The time needed to complete the 30 questions of the CISQ questionnaire is about 10 minutes and it can be used in any Audiology Department without excessive waste of time for operators or patients. The questions are formulated in a simple way, so that all patients can easily understand them. For each subscale there are five different items that investigate different situations, so that all types of patients can identify themselves in a situation that is close to their everyday life (patient working in an office, patient who stays all day at home…). The CISQ questionnaire is a complete test to evaluate hearing aid benefit because it investigates important areas that are not always considered (e.g. subscales about spatiality and quality of sound).

Moreover, each subscale can be considered to be characterized by an optimal level of reliability thanks to the Cronbach's alpha analysis. Eliminating the item whose scale correlation was lower from every subscale, we obtained the 30-item questionnaire, with optimal internal consistency. The removal of the six items whose scale correlation was lower also changed the statistics of every scale. Analyzing the mean values of the answers before and after hearing aid application, and calculating the difference, we found a different odds compared to the values found before the removal of the items (Table III). Before the removal of the question 32 of the quality subscale, for example, we found a subscale mean value-before of 4.67, a mean value-after of 7.37, with a difference between the two values of only 2.7. After its removal, the mean of the answers for this scale before the hearing aid application was 4.88, after the hearing aid application of 8.07, with a difference between the two conditions of 3.19 (Table IV). This can be explained by the fact that in the subscale of quality, the question with the lower scale correlation, was also a question with a low difference of distribution of the answers in the two conditions. This means that the questionnaire resulting from the removal of each item with the lower scale correlation, consisting of 30-questions divided in six subscales whose internal consistency is high ($\alpha > 0.92$ for every scale), is composed of questions that lead to a net difference in the answers in the two conditions (if the patient has a benefit from the hearing aid, of course).

As mentioned before, there is another important factor to evaluate in hearing aid benefit, namely the psychological aspects. This text was conceived to investigate the effect of the hearing aid on the quality of life of the patient, focusing on all those situations in which the patient may have problems with an auditory impairment. It is clear that if we want to investigate the impact that the disability resulting from a bad hearing aid gives to the psychological sphere of the person, then further psychometric tests are needed. There are many psychometric texts in the literature that are commonly used to evaluate the correlation between a disability and its impact on the psychological aspect of the patient [14][15].

In conclusion, we believe that the CISQ questionnaire can be considered a good instruments to evaluate hearing aid benefit, not only at its first application, but also to follow any changes over time. In case of worsening of the auditory impairment, in fact, the auditory aid can become insufficient, and this could be rapidly verified by repeating the test, leading to a faster correction of the hearing aid.

Table III. Descriptive statistics and difference between mean values after the removal of the item with the lowest scale correlation for each subscale.

subs.	Before		After		Diff.	T-Test	p
	mean	ds	mean	ds			
sp	4.38	1.90	7.56	1.38	3.18	14.02	< 0.01
qu	4.88	1.65	8.07	0.81	3.19	12.81	< 0.01
re	3.83	1.46	7.36	1.08	3.53	16.09	< 0.01
bni	4.24	1.49	7.78	1.16	3.54	15.36	< 0.01
av	4.08	1.93	8.59	0.88	4.51	17.37	< 0.01
is	5.13	1.55	9.06	0.92	3.93	17.23	< 0.01

Table IV. Descriptive statistics and differences between mean values in the subscale "quality of sound" with and without question 32.

Quality	Before		After		Diff.	T-Test	p
	mean	ds	mean	ds			
With 32	4.67	1.45	7.37	0.86	2.7	13.11	< 0.01
Without 32	4.88	1.65	8.07	0.81	3.19	12.81	< 0.01

References

1 Boothroyd A. *Adapting to changed hearing: the potential role of formal training*. J Am Acad Audiol 2010;21:601-11.

2 Kollmeier B, Lenarz T, Winkler A, et al. *Indication for and verification of hearing aid benefit using modern methods of speech audiometry in German*. HNO 2011;59:1012-21.

3 Walden TC, Walden BE, Summers V, et al. *A naturalistic approach to assessing hearing aid candidacy and motivating hearing aid use*. J Am Acad Audiol 2009;20:607-20.

4 José MR, Campos PD, Mondelli MF. *Unilateral hearing loss: benefits and satisfaction from the use of hearing aids*. Braz J Otorhinolaryngol 2011;77:221-8.

5 Dillon H, James A, Ginis J. *Client Oriented Scale of Improvement (COSI) and its relationship to several other measures of benefit and satisfaction provided by hearing aids*. J Am Acad Audiol 1997;8:27-43.

6 Gatehouse S. *A self-report outcome measure for the evaluation of hearing aid fittings and services*. Health Bull (Edinb) 1999;57:424-36.

7 Cox RM, Rivera IM. *Predictability and reliability of hearing aid benefit measured using the PHAB*. J Am Acad Audiol 1992;3:242-54.

8 Cox RM, Alexander GC. *The abbreviated profile of hearing aid benefit (APHAB)*. Ear Hear 1995;16:176-86.

9 Cox RM, Alexander GC. *The International Outcome Inventory for Hearing Aids (IOI-HA): psychometric properties of the English version*. Int J Audiol 2002;41:30-5.

10 Kam AC, Tong MC, Van Hasselt A. *Cross-cultural adaptation and validation of the Chinese abbreviated profile of hearing aid benefit*. Int J Audiol 2011;50:334-9.

11 Megale RL, Iòrio MC, Schochat E. *Auditory training: assessment of the benefit of hearing aids in elderly individuals*. Pro Fono 2010;22(2):1-6.

12 Wu YH, Bentler RA. *Clinical measures of hearing aid directivity: assumption, accuracy, and reliability*. Ear Hear 2012;33:44-56.

13 Strait DL, Kraus N. *Can you hear me now? Musical training shapes functional brain networks for selective auditory attention and hearing speech in noise*. Front Psychol 2011;2:113.

14 Monzani D, Genovese E, Palma S, et al. *Measuring the psychosocial consequences of hearing loss in a working adult population: focus on validity and reliability of the italian translation of the hearing handicap inventory*. Acta Otorhinolaryngol Ital 2007;27:186-91.

15 Monzani D, Galeazzi GM, et al. *Psychological profile and social behaviour of working adults with mild or moderate hearing loss*. Acta Otorhinolaryngol Ital 2008;28:61-6.

Address for correspondence: Pamela Giordano, Department of Clinic Physiopathology, ENT Division, University of Turin, via Genova 3, 10126 Torino, Italy. Tel. +39 011 6336648. E-mail: pamelagiordano2@gmail.com

Appendix 1. CISQ Questionnaire (ENG)

1. Do people's voices seem clear and natural? [quality]
2. You are listening to a conference: are you able to understand most of the words? [reverberation]
3. You are in a crowded supermarket: are you able to understand what the shop assistant is telling you? [background noise intelligibility]
4. An unexpected noise (like an alarm) is for you tolerable? [averseness]
5. Are you able to follow a conversation with your relatives when you are at home? [intelligibility in silence]
6. You are at your friend's home, in silence. A door slams: are you able to understand from which direction the noise is coming? [sp]
7. Does your voice seem natural? [qu]
8. Are you able to well understand the dialogues in a film or at the theatre? [re]
9. You are in your car talking with your friends: are you able to understand the news on the radio? [bni]
10. Is the noise of traffic tolerable for you? [av]
11. Are you able to follow a conversation in a small office? [is]
12. You are outdoors, a dog barks: are you able to understand from which direction does the noise is coming? [sp]
13. Are you able to recognize a friend of yours from his/hers voice? [qu]
14. Are you able to talk with a person who's at the other side of a large, empty room? [re]
15. You are at a dinner, sitting at a table with other persons. Are you able to follow the conversation with one of them? [bni]
16. Are the noises of an airport or a train station tolerable for you? [av]
17. You are talking with a person in a calm, silent living room: are you able to well understand what he's saying? [is]
18. You are on a street: are you able to understand from which direction does the bus come without looking? [sp]
19. While you are listening to music are you able to understand which instrument is playing? [qu]
20. You are in a silent place: are you able to follow a conversation while more than one person is talking at the same time? [bni]
21. Is the noise in a crowded restaurant tolerable for you? [av]
22. Are you able to follow the conversation with your physician while you are in his office? [is]
23. Are you able to understand how far away a car is without looking? [sp]
24. Do the common sounds of your everyday life seem to you clear? [qu]
25. Are you able to well understand who's talking in an election conference? [re]
26. Are you able to understand in which direction a car is running without looking? [sp]
27. You are in a church: are you able to understand the words of the sermon? [re]
28. Are you able to understand who's talking to you if there's an air conditioner on? [bni]
29. Is the noise of screeching tires tolerable for you? [av]
30. You are talking with a friend in a silent room: can you avoid asking him to repeat things? [is]

Appendix 2. CISQ Questionnaire (ITA)

1.   Le voci degli altri ti sembrano chiare e naturali? [qualità]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

2.   Quando ascolti una conferenza, sei in grado di comprendere gran parte dell'argomento trattato? [riverbero]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

3.   Quando sei in un supermercato affollato e parli con la cassiera, riesci a seguire agevolmente la conversazione? [intelligibilità nel rumore]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

4.   Riesci a sopportare un forte rumore inaspettato, come un allarme? [percezione dei rumori forti]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

5.   Riesci a seguire agevolmente una conversazione quando sei a casa con i familiari? [intelligibilità nel silenzio]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

6.   Sei in casa di estranei, nel silenzio. Senti una porta sbattere. Riesci a capire da dove proviene il rumore? [sp]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

7.   La tua stessa voce ti sembra naturale? [qu]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

8.   Riesci a capire i dialoghi in un film o in uno spettacolo teatrale? [sr]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

9.   Se ascolti il notiziario in macchina col motore acceso, in compagnia dei familiari che parlano, riesci a seguire le notizie? [ir]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

10.   Sono sopportabili i rumori del traffico? [f]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

11.   Riesci a seguire una conversazione con una persona in un piccolo ufficio? [i]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

12.   Sei all'aperto e senti un cane abbaiare forte. Riesci a capire dove si trova il cane senza guardare ? [sp]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

13.   Ti riesce facile fra persone che conosci individuare ognuno dalla sua voce? [qu]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

14.   Se parli con qualcuno che si trova all'altro capo di una grande stanza vuota, riesci a capire le parole che pronuncia? [sr]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

15.   Sei a tavola con altre persone e cerchi di conversare con una di loro, riesci a seguire agevolmente il discorso? [ir]
0   1   2   3   4   5   6   7   8   9   10
Mai   sempre

16. Sono sopportabili i rumori di un aeroporto o di una stazione ferroviaria? [f]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

17. Stai parlando con una persona in un salottino tranquillo e silenzioso. Riesci a seguire ciò che dice questa persona? [i]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

18. Sei sul marciapiede di una strada molto trafficata. Riesci a capire la direzione di provenienza di un autobus prima che tu riesca a vederlo? [sp]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

19. Quando ascolti la musica riesci a capire quale strumento sta suonando? [qu]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

20. In un ambiente silenzioso riesci a seguire la conversazione anche quando parlano contemporaneamente diverse persone? [ir]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

21. Sono sopportabili i rumori prodotti da una pizzeria affollata? [f]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

22. Quando parli tranquillamente con il tuo medico nel suo studio, riesci a seguire la conversazione? [i]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

23. Riesci a capire dal rumore quanto è lontano un autobus o un camion? [sp]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

24. I suoni comuni della vita di tutti i giorni ti sembrano chiari (non "sfocati")? [qu]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

25. Riesci a capire ciò che viene detto durante un comizio? [sr]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

26. Riesci a capire la direzione di marcia di un camion o di un autobus senza guardare (esempio: da sinistra a destra o da destra a sinistra)? [sp]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

27. Riesci a capire le parole di una predica quando assisti ad una funzione religiosa? [sr]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

28. Riesci a capire chi ti parla quando è in funzione un condizionatore o un ventilatore?[ir]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

29. È sopportabile lo stridio di pneumatici sull'asfalto? [f]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre

30. Conversando con qualcuno a quattr'occhi in una stanza tranquilla, riesci a non chiedergli di ripetere? [i]

    0   1   2   3   4   5   6   7   8   9   10

    Mai   sempre