

Introduction

The Quick Speech-in-Noise Test (QuickSIN) is a widely used tool in audiology to assess an individual's ability to understand speech in the presence of background noise. It is particularly useful for identifying difficulties that might not be evident from standard hearing tests, such as pure-tone audiometry ⁽¹⁾ ⁽²⁾.

According to the literature, the QuickSIN test is particularly noted for its sensitivity and its ability to reflect patients' subjective perceptions of their real-life listening difficulties ⁽³⁾ ⁽⁴⁾.

The QuickSIN test consists of twelve lists of sentences, each with six sentences containing five keywords each presented in four-talker babble noise. The signal-to-noise ratio (SNR) decreases in 5 dB steps from 25 dB (extremely easy) to 0 dB (extremely difficult). The SNRs used encompass normal to severely impaired performance in noise. Administration of a single list takes approximately one minute ⁽⁵⁾.

Aims

To describe the process followed in the design and development of the lists of sentences that will form part of Portuguese QuickSin

Methods

The development of the QuickSIN test in European Portuguese was conducted in three phases:

- Firstly, a set of 165 sentences was drafted following the pattern of the original QuickSIN test, with each sentence having five keywords.
- Subsequently, each sentence was evaluated by 15 European Portuguese speakers to assess its semantic and syntactic characteristics, using a rating scale ranging from 1 to 3. Sentences with ratings above 2.5 were considered for inclusion. A final set of 120 sentences was selected and recorded in a female voice.
- In the next phase, the recorded sentences were presented to 20 normal-hearing individuals in a soundproof booth, in a free field, at 65dB. Individuals were required to repeat each sentence they heard. Sentences that achieved 100% intelligibility were then grouped into sets of 6. Bubble noise was added to all sets. Different signal-to-noise ratios ranging from 25 to 0 dB were used.

Results

Upon analyzing the median for each signal-to-noise ratio across the fifteen sets, it was found that at SNRs of 20, 15, and 10, the median was 100% across all sets. The SNR of 5 dB showed the greatest variability, with medians ranging from 0% to 80% (Table 1). At SNR of 0, the median ranged from 0% to 20%.

Table 1: Results of the different sets in the signal-to-noise ratio of 5

	N	Mean	Median	Standard Deviation	Maximum	Minimum
Set 1	15	46.67	40.00	27.95	100.00	.00
Set 2	15	18.67	20.00	20.66	60.00	.00
Set 3	15	21.33	20.00	15.98	40.00	.00
Set 4	15	45.33	60.00	37.39	100.00	.00
Set 5	15	18.67	.00	34.20	100.00	.00
Set 6	15	50.67	60.00	12.80	60.00	20.00
Set 7	15	42.67	40.00	23.74	80.00	.00
Set 8	15	41.33	40.00	38.89	100.00	.00
Set 9	15	34.67	20.00	38.15	100.00	.00
Set 10	15	73.33	60.00	19.52	100.00	40.00
Set 11	15	34.67	20.00	35.83	100.00	.00
Set 12	15	18.67	20.00	27.74	100.00	.00
Set 13	15	74.67	80.00	31.59	100.00	.00
Set 14	15	85.33	80.00	14.07	100.00	60.00
Set 15	15	72.00	80.00	19.71	100.00	20.00

In each signal-to-noise ratio, similar intelligibility results were obtained across 13 sets of six sentences, indicating the reliability and consistency of the developed QuickSINtest in European Portuguese.

Conclusion

- The development of the QuickSIN test in European Portuguese is a crucial step towards facilitating the assessment of speech perception in noise in the audiological clinic.
- The QuickSIN test is a valuable tool for assessing speech perception in noise and guiding interventions to improve communication abilities in individuals with hearing difficulties or auditory processing challenges within Portuguese-speaking populations.

References

1. Helfer, Karen S and Jesse, Alexandra. Hearing and speech processing in midlife. *Hearing research*. 2021, pp. 402, 108097.
2. Pienkowski, M. On the Etiology of Listening Difficulties in Noise Despite Clinically Normal Audiograms. *Ear and hearing*. 2017, Vol. 38, 2, pp. 135–148.
3. Mendel, L L. Objective and subjective hearing aid assessment outcomes. *American journal of audiology*. 2007, Vol. 16, 2, pp. 118–129.
4. Wilson, R H, McArdle, R A and Smith, S L. An Evaluation of the BKB-SIN, HINT, QuickSIN, and WIN Materials on Listeners With Normal Hearing and Listeners With Hearing Loss. *Journal of speech, language, and hearing research : JSLHR*. 2007, Vol. 50, 4, pp. 844–856.
5. Killion, C M, et al. Development of a quick speech-in-noise test for measuring signal-to-noise ratio loss in normal-hearing and hearing-impaired listeners. *The Journal of the Acoustical Society of America*. october 2004, Vol. 116, 4, pp. 2395–2405.