



LETTERS TO THE EDITOR

A model for the diagnosis of schizophrenia in speech perception



While there has been much work on speech perception in typically developing individuals and some work in individuals with mild impairments (e.g.,¹), less work has included individuals with severe disorders, such as schizophrenia. Schizophrenia is a serious mental disorder that affects tens of millions of individuals worldwide and these individuals usually are characterized with inhibited language and communication functions.²

The language comprehension profiles of people with schizophrenia were not investigated much. For instance, it has been shown that individuals with schizophrenia struggle to interpret long and grammatically complex sentences. Some other studies indicate that these individuals cannot easily discriminate lexically ambiguous words within sentences.² In the phonological domain, Cienfuegos et al.³ concluded that schizophrenic patients could discriminate the endpoint of the /ba/-/da/ continuum equally as the typical controls, but they differed in the perception of the intermediate forms of the continuum which were close to the center. This clearly demonstrates a perceptual deficit for the group of schizophrenic patients. Hinzen and Rosselló⁴ argued that the left hemispheric dominance of phonology is impaired in schizophrenia and, thus, linguistic sound processing is damaged to some extent.

The question that arises is what kind of phonological deficit patients with schizophrenia are characterized with. We still need more information about how speech is understood and particularly how phones are perceived by individuals with schizophrenia. Given that schizophrenia leads to comprehension dysfunctions and that a phonological deficit might be apparent, we hypothesize that individuals with schizophrenia might experience more difficulties than typically developing individuals in identifying acoustic cues. This difficulty might appear in i. native language phones that differ only in a small set of acoustic cues (e.g., allophones), or ii. nonnative language phones which are pronounced with similar acoustic characteristics to native phones. We also propose that the identification accuracy might differ according to phone type (e.g., consonants, vowels), phone position within the word, speaking rate, language, etc.

First, we should investigate the kind of difficulties that individuals with schizophrenia might encounter with respect

to the identification of speech. This will allow us to better understand and classify these difficulties. The participants will be called to complete psychoacoustic tests on speech processing software such as Praat, which will run on a PC. They will be listening to a phone embedded in word context and they will have to decide whether the phone is acoustically similar to one of the labels presented on the script; by clicking on the appropriate label that will contain orthographical representation of the target phone. The protocol will be similar to those applied in studies that investigated first or second language phone identification (e.g.,⁵). This tool will rely on *identification patterns*. That is, if a specific native or nonnative phone will be incorrectly matched with a particular phone by the majority of participants and if this matching differs from that of typically developing individuals, this will constitute a specific pattern. The identification of patterns can be based on the formula 'if X pattern in schizophrenic individuals = TRUE, and if X pattern in typical individuals = FALSE, then X might be a pattern of schizophrenia'. They will be examined consonants that differ in the place and manner of articulation and voicing, and vowels that differ in height, backness, and roundness. This model will be based on the notion that the representation of speech categories in the mind of individuals with schizophrenia is characterized with specific acoustic patterns.

Concluding, such investigation may be helpful as a criterion for the diagnosis of schizophrenia. By developing a detailed corpus with phone identification patterns that are present in patients with schizophrenia, individuals can participate in diagnostic psychoacoustic tests to check if their patterns match those of the corpus.

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Ethical considerations

This paper does not involve the use of human participants.

Conflict of interest

None.

References

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