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The internal structure of the phenomenology of auditory verbal hallucinations

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Abstract

Background: Auditory verbal hallucinations (AVH) do not have uniform pathological significance. They affect patients with different brain disorders, and vary along multiple phenomenological dimensions. Evidence indicates that some of the phenomenological variables have specific neural substrates. Therefore, a comprehensive characterization of the phenomenological variations of AVH and the interrelationship between these variables was undertaken. *Method*: Twenty phenomenological variables were identified; on each AVH had a binary value (present or absent). Information about 11 of these variables were obtained from 30 patients. Hierarchical cluster (HC) and multidimensional scaling (MDS) analyses were performed to investigate the hidden structure and dimensions of these variables. *Results*: HC yielded two main clusters with further sub-clusters in each. The first cluster included hallucinations with low linguistic complexity, repetitive content, attributed to self, located in outer space, and associated with different kinds of control strategies. The second cluster included hallucinations with high linguistic complexity, systematized content, multiple voices, attributed to others, and located in inner space. In MDS, three dimensions were identified: linguistic complexity, self-other attribution, and inner-outer space location. *Conclusion*: The patterns of clustering and dimensional configuration of AVH characteristics were in accord with intuitive expectation and validated the patients' descriptions of their experiences. These findings could reflect aspects of the neural mechanisms of AVH. For example, the presence of neural specificity for each phenomenological variable, intermediate neural commonality for groups of variables, and a final common pathway for all subtypes of AVH. Another example is a differential level of language dysfunction according to the linguistic complexity of AVH.

Keywords: Auditory verbal hallucinations; Schizophrenia; Phenomenology; Language; Multidimensional scaling; Hierarchical cluster analysis

Auditory verbal hallucinations (AVH) refer to the auditory perception of speech in the absence of corresponding external stimuli. AVH vary along multiple phenomenological dimensions such as acoustic clarity, inner or outer space location, and presence or

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absence of insight. This variability has been recognized for a long time and has led to sub-classifications of AVH. For example, Jaspers (1959) divided hallucinations into hallucinations proper and pseudohallucinations, depending on concomitancy to normal external stimuli, location in the internal subjective or external space, and clarity. He also identified another subgroup (''sense-memory'') defined as ''subsequent, deceptive yet real hearing of words already heard.'' It is noteworthy that only the latter subgroup, known also as experiential hallucinations, could be evoked by electrical stimulation of the speech perception area (Penfield and Perot, 1963).

Claude and Ey (1932a) grouped abnormal perceptions into ''hallucinations'' and ''hallucinosis'', where the latter implied the presence of insight into the abnormality of the experience. In addition, they distinguished a pseudohallucination subgroup when hallucinations had reoccurring content without resistance from the patient (''etats obssessionels parasites'') (Claude and Ey, 1932b). Finally, Sedman (1966) grouped AVH into three categories: imagery, pseudohallucinations, and true hallucinations. In the first, the perception lacks the concrete reality of perception and is located in inner space; in the second, insight into the unreality of the perception is present; and in the third, perceptions are clear, but insight is lacking.

More recent studies have examined in more detail various characteristics of AVH. Lowe (1973) examined several variables, including frequency, inner or outer space location, similarity to the perception of external speech, loudness, constancy, effect on the patient behavior, causal attribution, affective reaction, and content. It was found that these characteristics ''can be used as discriminatory indicators for differential diagnosis among psychotics.'' Nayani and David (1996) examined additional variables, including personification (accent, gender, familiarity of the voice), coping mechanisms and degrees of control, number of voices, some aspects of linguistic complexity, and insight and reality testing. They found that over time, AVH are more likely to be experienced inside the head, and their complexity of hallucinations increases, while distress and coping improve. Finally, Junginger and Frame (1985) assessed the reliability of patients' reports on some characteristics of AVH such as loudness, clarity, location, and reality. They found that clarity was the most reliable and reality testing (insight) the least reliable characteristic.

In summary, a number of phenomenological variables of AVH have been recognized over time. However, the classifications of hallucinations according to these variables were mostly based on clinical case observations and were inconsistent. For example, pseudohallucinations were defined according to different phenomenological criterias (Hare, 1973). Furthermore, this term is used inconsistently in clinical practice and considered to constitute a premature closer to understanding hallucinations subtypes (Dening and Berrios, 1996). In our opinion these classifications lead to coining new terminology, but did not provide a useful framework for the clarification of the neural mechanisms of AVH.

One could question the need for studying the phenomenological variables of AVH. In our view, this endeavor is worthwhile. First, AVH do not have a uniform pathological significance, as they are encountered in many psychiatric and neurological illnesses as well as in substance abuse. Second, some of the phenomenological variables (i.e., anosognosia, repetitive content, and level of linguistic complexity) are usually associated with specific neural correlates. Consequently, some aspects of the underlying neural substrates of AVH will probably vary according to the presence or absence of these variables.

Anosognosia is a term originally coined by Babinski (1914) to describe non-recognition of a neurological symptom. Anosognosia is correlated with lesions of the visual associative cortex (Magitot and Hartmann, 1926), and frontal lobes (McDaniel and McDaniel, 1991) in the case of Anton Syndrome (cortical blindness), and with lesions of the minor hemisphere in the case of unawareness of left side hemiplegia (Babinski, 1914). This indicates that there are symptom specific neural substrates underlying the unawareness of symptoms. AVH is a symptom of brain disease just like blindness or hemiplegia. Therefore, the term anosognosia could also be used to describe the non-awareness of the abnormal nature of AVH (''AVH-anosognosia''). (Insight is an equivalent term, but has, commonly in psychiatry, a more general connotation such as the awareness of having a mental illness or need for treatment (Amador et al., 1991). Given the evidence from neurology mentioned above, it is reasonable to