



## Commentaries

# Negative Hallucinations [April Fool's]

Negative symptoms have attracted increasing attention in the study of schizophrenia for the past 20 years. Hughlings Jackson first categorized neurological phenomena into negative and positive classifications a century ago. Positive symptoms are generated by over-activity of a brain region, such as seizures, tremors and other involuntary movements. Negative symptoms are generated by under-activity of brain regions, as with stroke, brain tumors or other mass lesions or injuries producing weakness, reduced movement, aphasia or reduced sensation. Schizophrenia, to the unsophisticated observer, produces odd behavior caused by hallucinations, delusions, loosened and illogical associations, all considered positive phenomena because they are additional, abnormal thoughts, whereas the negative phenomena of reduced spontaneity, reduced pleasure, reduced thoughts, blunted emotions, reduced social interactivity are considered negative symptoms. Positive symptoms respond much better to antipsychotic medications, leaving the negative symptoms as the most disabling in schizophrenia, along with certain cognitive changes that have also not been amenable to therapy. One can obviously extend the same concept to bipolar disorder, with mania resulting

from positive and depression from negative emotional energy.

The concept of a negative hallucination, however, was introduced in the psychoanalytic literature with a single paper published in the last issue of a standard German analytic journal, closed by the Nazis. I see a lot of patients who have hallucinations since the drug treatment of **Parkinson's disease (PD)** causes hallucinations in about 30%, and delusions in about 10%. Sadly, I probably induce more psychotic symptoms than any other single doctor in New England. The hallucinations are quite stereotypic. The drugs typically cause visual hallucinations of people, animals or sometimes inanimate objects such as trucks, cars and statues, that are free of emotional content. However, a previously unrecognized phenomenon in the world of drug-induced hallucinations was described to me by a patient. He told me that he sometimes *didn't* see things that *really were there*. He considered these hallucinations in reverse. He would see two people when three were visiting. He would hear his children but not his wife even though he knew she was there and was yelling at him. The description was an almost verbatim copy of the von Fischenbach paper in *Der Fortschreiten Psychoanalytik*. "I very clearly saw my two adult sons, who were visiting from out of town. I then asked when their mother, my wife, was returning, which surprised them because she was standing with them."

Having never encountered this before, I explored it with the patient and his wife. She reported that he had been "ignoring" her intermittently for many months, ever since his last increase in a dopamine agonist. When we lowered the dopamine agonist, he got stiffer and slower and preferred to be more mobile and not see his wife so much, so we increased it. It was not clear that he had other negative hallucinations, although he claimed that he got a traffic ticket for going through a

red light that he said wasn't actually there.

I began to ask all my PD patients taking medications about their not seeing or hearing things that they should have. About 30% reported frequently not seeing their spouse, the most common negative hallucination, or not hearing things, again, most commonly the spouse. Many reported not seeing stop signs when driving, items at the supermarket or hearing the spouse ask them to do errands, such as picking up items at the market.

In studies outside of PD, negative hallucinations are very common, and have a gender predominance in males, starting in prepubescent boys, and increasing. They are much more common in married men than unmarried. The psychiatric literature distinguishes between "positive amnesia" and "negative amnesia." This terminology is confusing because "negative amnesia" refers to memories not made whereas "positive amnesia" refers to memories that have been suppressed. They have generally not been commented upon or much studied due to their overlap with inattention, the **confabulatory syndrome of minor memory failure (CSMMF)**, sometimes called "CRS" (can't remember sh\_\_) in the lay world, and outright lying (malinger). This wide differential diagnostic list makes epidemiological studies inaccurate. In addition certain authorities doubt the existence of negative hallucinations. The issue has been brought before the Supreme Court, but the question of whether this explanation can be invoked as a defense, has not been answered since the Court has ruled on very narrow grounds, carefully avoiding taking a stand on an issue not fully resolved by psychiatrists.

DSM V\* RT 43b (Diagnostic and Statistical Manual, Fifth revision, abbreviated version, Revised Translation, 43 rd rendition, b supplement) defines a negative hallucination as a "suppressed perception" of a clearly perceivable sensory input that is due to synchronized over-activity of the brain which is not epileptic. It is deemed a "possible but not proven symptom." Thus, a hearing-impaired person would not have a negative hallucination on not hearing a sound that is below the auditory threshold. A person who perceived a crowded intersec-

**Table. Differential diagnosis of negative hallucinations**

- Amnesia
- Inattention
- Lying
- Sensory impairment
- Sensory overload
- Conversion
- Illusion/distortion

tion while driving but did not see a stop sign might have had a negative hallucination, or might simply have been day-dreaming, or not paying attention.

To test the hypotheses that negative hallucinations exist, and that they are caused by over-activity of particular brain regions, we performed **functional magnetic resonance imaging (fMRI)** scans on PD patients who were taking medications and thought to have negative hallucinations. Subjects were scanned while taking their medications and exposed to their spouse or a spouse stand-in, who was part of a group of three, the two others being strangers. Each read a standardized script and the patient, was asked to describe the scene visually and to recall

what was said. Only 10% of subjects with reported negative hallucinations had them during the study, so that only 4 subjects could be used. Each one of these showed increased fMRI activity in the supplementary visual cortex of Brodmann's area 121, suggesting an over-activity, as hypothesized.

While this result concerns only 4 subjects, and requires confirmation, it nevertheless should be sufficiently convincing that skeptical readers will at least consider the possibility that negative hallucinations exist. The implications of this finding are widespread.

Happy April Fool's.

– JOSEPH H. FRIEDMAN, MD

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Conflicts: In addition to the potential conflicts posed by my ties to industry that are listed, during the years 2001-2009 I was a paid consultant for: Eli Lilly, Bristol Myers Squibb, Janssen, Ovation, Pfizer, makers of each of the atypicals in use or being tested.

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## Oh, How the Mighty Have Fallen

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**Stroke remains one of the major causes of disability and death** in the United States. It is a terrifyingly sudden and unwelcome visitation. It swiftly deprives its victims of control over limb muscles and even consciousness. Speech is commonly impaired during the acute phases of the illness. Patients with stroke often identify their disease as an attack from the outside rather than a festering, internal impairment. Historically, stroke has frequently been considered by its victims as a punishment rather than a human affliction provoked by natural causes.

The United States Public Health Service estimates that about 795,000 Americans experience a new or recurrent stroke each year. In 2001 the Service initiated a broad surveillance program, enlisting 195 hospitals in Massachusetts, Georgia, North Carolina and Illinois to track the prevalence, demographic features, secular trends and risk factors preceding the disease. And in the course of these studies, some 56,969 patients with stroke, 18 years or older, were studied.

What findings did this surveillance program generate?

First, the most obvious: Stroke remains a major impediment to the health of Americans. Second, it continues to be an affliction primarily of the elderly with a median age of onset at 72 years. It is slightly more common in women (53.3%) but only because more women than men survive to live beyond the age of 70.

What prior risk factors increase the likelihood of stroke? A history of hypertension (high blood pressure) is the most predictive risk factor, encountered in 73% of stroke victims. Other past events that increase the likelihood of future stroke include a previous or transient stroke (31%), a history of diabetes mellitus (28%), a history of coronary artery heart disease (28%), a history of cigarette smoking (18%) or a history of atrial fibrillation (15%). The typical stroke patient in this study carried between two and three of these risk factors; and about one-fifth of this population of close to 57,000 patients were burdened with four or more of these risk factors.

Stroke, of course, is not a single disease but many etiologically

unrelated disorders involving, in one way or another, the arterial blood vessels leading to or within the brain. The commonest pathologic lesion causing stroke is a functional narrowing or occlusion of a major cerebral artery thus depriving brain tissue of its needed oxygen-carrying blood supply. About 56% of patients fell within this diagnostic category. An additional 22% had an insufficient blood supply but only transiently so (called a transient ischemic attack or TIA) with a strong likelihood of functional recovery. About 14% had a massive intracranial hemorrhage not caused by any preceding head injury. This disorder has sometimes been called apoplexy. The remaining 8% were clinically ill-defined.

In decades past, a diagnosis of stroke carried a dismal prognosis with hospitals providing little beyond supervised bed-rest, supportive therapy and diligent nursing care. Patients lingered for weeks and were prone to develop secondary pneumonia, other internal infections and bed sores. Inpatient medicine has advanced considerably since then and stroke patients now are routinely treated to prevent these complications. Furthermore, advanced anti-thrombotic therapies are employed to reverse some of the cerebral damage. And rehabilitation services, including speech therapy, occupational therapy and physiotherapy are diligently prescribed to speed the recovery of the patients and to hasten their resumption of a full life in the community.

And the outcome of all of these medical, nursing and rehabilitative interventions? The in-hospital stay, instead of interminable months is now measured in days: an average of 6 days in this study. And instead of an acute mortality rate of over 35% in the past and most of the survivors then relegated to nursing homes, the survey recorded a mortality rate of 6.8%, 40.2% transferred to a rehabilitation center, nursing home or hospice and the remainder, about 53%, returning to their homes. A substantial improvement over the outcome data from a half-century ago.

As educational programs in preventive medicine have influenced an increasingly large population, the prevalence of stroke is gradually diminishing. Smoking-cessation programs,