The Mental Note

FROM THE HARVARD AGING BRAIN STUDY STAFF

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SELF-AWARENESS AND MEMORY

Humans are more than just conscious; they are also self-aware. Self-awareness is an individual's capacity to recognize and understand one's own character, feelings, and experiences. When babies are born, they are conscious, but lack self-awareness: they don't yet know themselves. As we grow and mature, we develop a sense of self-awareness and an ability to understand who we are and how we fit into the world.

As individuals age and experience normal age-related memory loss, self-awareness helps us recognize our functional limitations and continue to make healthy and safe life decisions. Individuals who are aware of their own cognitive deficits can adopt compensatory strategies, such as taking notes, setting reminders, or requesting assistance from others with certain tasks. Conversely, individuals who are unaware of their cognitive deficits are less likely to implement memory strategies, making them more vulnerable, both physically and mentally. When an individual loses self-awareness, they begin to require increased supervision to stay safe and avoid risky behaviors, which can increase caregiver burden and cost of care. Without self-awareness, it becomes difficult for a person to engage in rehabilitation activities that could benefit them.

Many individuals with Alzheimer's disease (AD) dementia lack self-awareness and are unaware of their memory loss. This lack of awareness, called ***ANOSOGNOSIA***, increases as individuals progress through the Alzheimer's disease process, and makes it difficult for a person to understand or perceive their illness. The prevalence of anosognosia in mild AD dementia has been estimated to range from 21% on the low end to 81% on the high end, and may correlate with overall disease severity, though it's not entirely clear. Individuals with mild cognitive impairment (MCI) show varying degrees of insight into their cognitive dysfunction: some have clear insight and marked concern about cognitive difficulties, while others lack insight entirely. Paradoxically, very early in the AD process, individuals may experience heightened awareness of subtle changes in their memory, despite performing well on standardized memory tests (often referred to as ***SUBJECTIVE COGNITIVE DECLINE***). As the disease progresses, some individuals may begin losing awareness of their memory deficits, which can be stressful for both the individual and their caregivers.

Despite the prevalence and burden of anosognosia on patients and their caregivers, we don't yet understand why these deficits in self-awareness occur, what brain changes they're linked to, or how to halt, or potentially reverse, these disease-related changes. Dr. Vannini and colleagues at the **H**arvard **A**ging **B**rain **S**tudy are using neuroimaging techniques such as Positron Emission Tomography and ***FUNCTIONAL MAGNETIC RESONANCE IMAGING*** to investigate the pathological underpinnings of memory self-awareness and the deficits that occur as Alzheimer's disease progresses. Thanks to your participation in this study, we are hopeful that we can develop a better understanding of anosognosia and identify targets for its treatment.

FEATURED STAFF: DR. PATRIZIA VANNINI

Patrizia Vannini is a cognitive neuroscientist who has been working in aging and Alzheimer's disease research for nearly 20 years. Dr. Vannini earned her PhD training at Karolinska Institutet, the foremost and largest center for academic medical research in Sweden. She completed a postdoctoral fellowship at the University Hospital of Psychiatry, Switzerland before she joined Dr. Sperling's lab and the Harvard Aging Brain Study in 2008. Her work has garnered several honors, including a Merit Award from the European Cognitive Neuroscience Society, a Young Investigator Award at the Human Amyloid Imaging conference, and the Dan David Prize scholar for outstanding achievement. Dr. Vannini is currently an Assistant Scientist at Brigham and Women's Hospital (BWH) and Assistant Professor of Neurology at Harvard Medical School (HMS). She is also a teaching advisor for fellow researchers at the Grants Review and Support Program at the Harvard Clinical and Translational Science Center, Harvard Catalyst.

Functional Magnetic Resonance Imaging:

Functional Magnetic Resonance Imaging (fMRI) is a technique that can show changes in neural activity across the brain by detecting changes in cerebral blood flow. The strength of brain activation detected during the scan can be shown graphically in a color-coded format, which helps scientists identify specific regions of the brain that are activated during a particular task. This technique has enabled Dr. Vannini to investigate brain activity and the resulting memory functioning in regions of interest for amyloid aggregation, identified during PET scans.

Anosognosia:

Anosognosia is a deficit in self-awareness that can develop in certain neurological disorders. Individuals with this deficit are unable to recognize their own medical condition. Anosognosia is likely caused by deterioration or damage to the parietal lobe and prefrontal brain regions and is common in individuals with Alzheimer's disease (AD) dementia. Research suggests that proteins implicated in AD pathology (amyloid and tau) may accumulate in these brain regions, and perhaps further contribute to this deficit. A focus of Dr. Vannini's research is the extent of a person's self-awareness at different points of AD progression, including stages when an individual is no longer aware of their cognitive deficits.

Subjective Cognitive Decline:

Subjective Cognitive Decline (SCD) is another area of focus in the larger framework of self-awareness in AD. There may be a period in which an individual becomes hyperaware of personal cognitive deficits, even when no objective cognitive decline is detected by normal measures. SCD is currently being researched as a possible early symptom of AD, prompting development of more sensitive neuropsychological tests that are better able to detect subtle changes in cognition at the earliest stages of cognitive decline.

Interested in learning what we have discovered with HABS data?

Food for Thought

presented by:

Patrizia Vannini, Ph.D.

Friday, May 10th, 2019 at 10:00am

Our next lecture will discuss self awareness (or lack there of) in cognitive decline in aging and Alzheimer's Disease.

Reserve your seat at (617) 643-5200
Refreshments will be provided.

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