

The neurobiology of Jeopardy! champions

As a regular viewer of Jeopardy! I find it both interesting and educational. But the psychiatric neuroscientist in me marvels at the splendid cerebral attributes embedded in the brains of Jeopardy! champions.

Back in my college days, I participated in what were then called “general knowledge contests” and won a couple of trophies, the most gratifying of which was when our team of medical students beat the faculty team! Later, when my wife and I had children, Trivial Pursuit was a game frequently played in our household. So it is no wonder I have often thought of the remarkable, sometimes stunning intellectual performances of Jeopardy! champions.

What does it take to excel at Jeopardy!?

Watching contestants successfully answer a bewildering array of questions across an extensive spectrum of topics is simply dazzling and prompts me to ask: Which neurologic structures play a central role in the brains of Jeopardy! champions? So I channeled my inner neurobiologist and came up with the following prerequisites to excel at Jeopardy!:

- A hippocampus on steroids! Memory is obviously a core ingredient for responding to Jeopardy! questions. Unlike ordinary mortals, Jeopardy! champions appear to retain and

instantaneously, accurately recall everything they have read, saw, or heard.

- A sublime network of dendritic spines, where learning is immediately transduced to biological memories, thanks to the wonders of experiential neuroplasticity in homo sapiens.

- A superlative frontal lobe, which provides the champion with an ultra-rapid abstraction ability in the dorso-lateral prefrontal cortex, along with razor-sharp concentration and attention.

- An extremely well-myelinated network of the 137,000 miles of white matter fibers in the human brain. This is what leads to fabulous processing speed. Rapid neurotransmission is impossible without very well-myelinated axons and dendrites. It is not enough for a Jeopardy! champion to know the answer and retrieve it from the hippocampus—they also must transmit the answer at lightning speed to the speech area, and then activate the motor area to enunciate the answer. Processing speed is the foundation of overall cognitive functioning.

- A first-rate Broca’s area, referred to as “the brain’s scriptwriter,” which shapes human speech. It receives the flow of sensory information from the temporal cortex, devises a plan for speaking, and passes that plan seamlessly to the motor cortex, which controls the movements of the mouth.

- Blistering speed reflexes to click the handheld response buzzer within a



Henry A. Nasrallah, MD
Editor-in-Chief

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To comment on this editorial or other topics of interest:

henry.nasrallah
@currentpsychiatry.com

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fraction of a millisecond after the host finishes reading the clue (not before, or a penalty is incurred). Jeopardy! champions always click the buzzer faster than their competitors, who may know the answer but have ordinary motor reflexes (also related to the degree of myelination and a motoric component of processing speed).

- A thick corpus callosum, the largest interhemispheric commissure, a bundle of 200 million white matter fibers connecting analogous regions in the right and left hemispheres, is vital for the rapid bidirectional transfer of bits of information from the intuitive/nonverbal right hemisphere to the mathematical/verbal left hemisphere, when the answer requires right hemispheric input.

- A bright occipital cortex and exceptional optic nerve and retina, so that champions can recognize faces or locations and read the questions before the host finishes reading them, which gives them an awesome edge on other contestants.

Obviously, the brains of Jeopardy! champions are a breed of their own,

with exceptional performances by multiple regions converging to produce a winning performance. But during their childhood and youthful years, such brains also generate motivation, curiosity, and interest in a wide range of topics, from cultures, regions, music genres, and word games to history, geography, sports, science, medicine, astronomy, and Greek mythology.

Jeopardy! champions may appear to have regular jobs and ordinary lives, but they have resplendent “renaissance” brains. I wonder how they spent their childhood, who mentored them, what type of family lives they had, and what they dream of accomplishing other than winning on Jeopardy!. Will their awe-inspiring performance in Jeopardy! translate to overall success in life? That’s a story that remains to be told.



Henry A. Nasrallah, MD
Editor-in-Chief

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283-299 Market St.
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