

Creativity's Neuropsychology

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Abstract

The neuropsychological method has been critical in providing significant discoveries that have allowed for a better understanding of the human mind and its operations. Despite the potential of this technique and the distinct viewpoint it provides, it has only been used in a small number of studies on creative cognition. This paper provides a brief overview of three methodologies used in the neuropsychology of creativity: single case studies, case series investigations on neurological populations and case series investigations on psychiatric populations, as well as highlights some of the key findings from each approach. The goal is to establish a case for the usefulness of the neuropsychological method in gaining a deeper understanding of the creative mind.

Keywords: Neuropsychologist • MTL memory system • Psychiatric populations • Neuroimaging

Introduction

It is widely assumed that we and our primate cousins recognise faces, animals and things using those neurons in the inferior temporal lobe. However, for the past three to four decades, determining the particular qualities of what these neurons react to has been a difficulty for systems neuroscience [1-3]. Consider recording from a random neuron in your IT and listening to its activity when you examine several photos and discover what that neuron prefers. You look at ten various photographs of items and the neuron reacts to one of them, a picture of a stork. Is it a neuron called a "stork"? Perhaps, however you can't be certain because you only checked ten photographs. Perhaps an unproven picture stimulates that neuron even more. When you broaden your search to 100 photos, you discover that your neuron still responds to the stork, but it responds significantly more to an ostrich image from the new image collection.

Literature Review

Neuropsychology, neuroimaging and electrophysiological [4,5] research have recently uncovered the brain areas and neuronal correlates of memory responsible for the aforementioned processes. The hippocampus, for example, is a component of the medial temporal lobe (MTL) memory system and is involved in declarative memory (Squire, 2002). The perirhinal cortex is also one of the most thoroughly researched memory processing areas in the MTL memory system, particularly in relation to semantic memory. Neuropsychologists play an important role in adult epilepsy surgery facilities in this regard. We want to determine the risks and advantages of certain neurosurgery operations by using specialised techniques such as complete neuropsychological examinations, Wada testing and electrocortical stimulation [6,7] (language) mapping. The information gathered from these procedures, together with other medical data, is utilised by the surgical team to create a specific treatment plan for each patient. Several case studies are given to demonstrate how these procedures and the data they generate are applied to particular patients.

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Discussion

This ordinal approach contrasts with Burgess and Hitch's positional model, which describes order as relationships between items and states of a context signal that varies gradually over time when things are given. Recall entails rerunning the context signal, obtaining the most strongly linked item at each time step and suppressing it before proceeding. Because the states of the positional context signal used to cue retrieval are inevitably more similar for neighbouring items, mistakes in this model exhibit the locality restriction.

Conclusion

To summarise, the potential of the neuropsychological method in giving many pieces of the jigsaw in understanding the workings of the creative mind has not been seized on nearly enough by psychologists, neurologists and neuroscientists. The neuropsychological approach allows us to make significant and unique gains in knowledge that are not possible with the alternative approaches of neuroimaging and electrophysiology, which are inherently limited by several conceptual and methodological issues. The scientific literature provides us with a plethora of behavioural tasks of creative function that can be easily applied on a variety of neurological and psychiatric populations of interest.

Conflict of Interest

There are no conflicts of interest by author.

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