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**INNOVATIVE METHODOLOGIES:
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Academy of Dramatic Art, University of Zagreb
Trg Republike Hrvatske 5, Zagreb, Croatia
(ADU Velika scena / ADU Big Stage)
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NEUROSCIENCE OF CREATIVITY: INSIGHTS FROM MINDS OF AUTISTIC GENIUSES

Savant syndrome is a rare condition in which a person with serious mental disability and low IQ exhibit remarkable abilities or brilliance in some domains of knowledge. Such a skill emerges spontaneously and is not derived from practice. Besides being attracted to numbers, especially prime numbers and calendars, individuals with savant syndrome are often fascinated by art and music and have extraordinary memory capacity and visuospatial abilities. Synesthesia and absolute pitch are also more commonly found in savants than in the general population. About half of the individuals with savant syndrome have an autism spectrum disorder, while the other half have some other form of central nervous system damage or disease. Only about 10% of the autistic people are savant.

It is believed that savant syndrome is associated with a left-hemisphere dysfunction. Almost all savants are male. The cerebral lateralization theory proposes that due to delayed maturation of the left hemisphere it is more susceptible to prenatal influences such as circulating testosterone in the developing male fetus. In turn, this can trigger recruitment of the right hemisphere, which is compensating the left-hem-

isphere dysfunction by recruiting lower-level memory capacities as well as automatic and rigid, simple rule-based processing. Consequently, it seems that savants have privileged access to low-level, unprocessed information, before it is “packaged” by meaningful processing of the left hemisphere. Typically, they concentrate more on the parts than on the whole, which is a characteristic of so-called autistic geniuses. This association was raised in a recent movie “Magnus” (2016), chronicling the life of world chess champion Magnus Carlsen, who became a grandmaster at age 13.

One of the most incredible manifestations of savant syndrome is that of the “acquired” savant. Here, prodigious skill, especially in art or music, or the enhanced memory capacity, emerges unexpectedly in some people who have suffered a head injury, stroke, and in patients with e.g. frontotemporal dementia with predominant left hemisphere involvement. Similarly, it can also be induced in normal people by creating a virtual injury of the left temporal lobe using repetitive transcranial magnetic stimulation.

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BIOGRAPHY

Goran Šimić is a tenured Professor of Neuroscience and Anatomy, and the Head of Neuroscience Department at the Croatian Institute for Brain Research of the University of Zagreb Medical School. In the department, prof. Šimić also leads the Laboratory for Developmental Neuropathology. He graduated from the University of Zagreb Medical School in 1992, where he, after three research fellowships from Karolinska Institute in Stockholm, also received PhD

in 1998. His laboratory has extensive expertise in the neuropathology of developmental and neurodegenerative disorders and has established an international cooperation on biomarkers for brain diseases, especially Alzheimer's disease. Prof. Šimić was the Editor-in-Chief and Managing Editor of Translational Neuroscience journal from 2010-2016. For his work on etiopathogenesis of spinal muscular atrophy he received The Kurt Jellinger Prize from Acta Neuropathologica and Springer-Verlag in 2008.