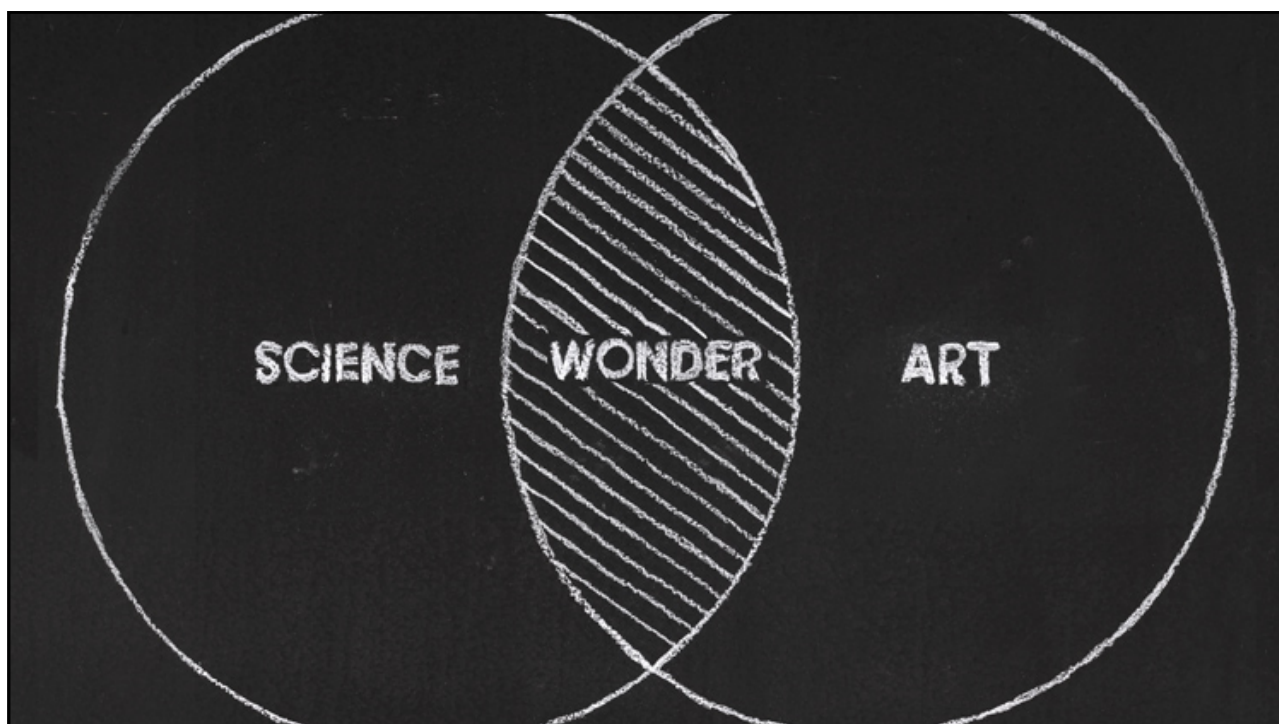
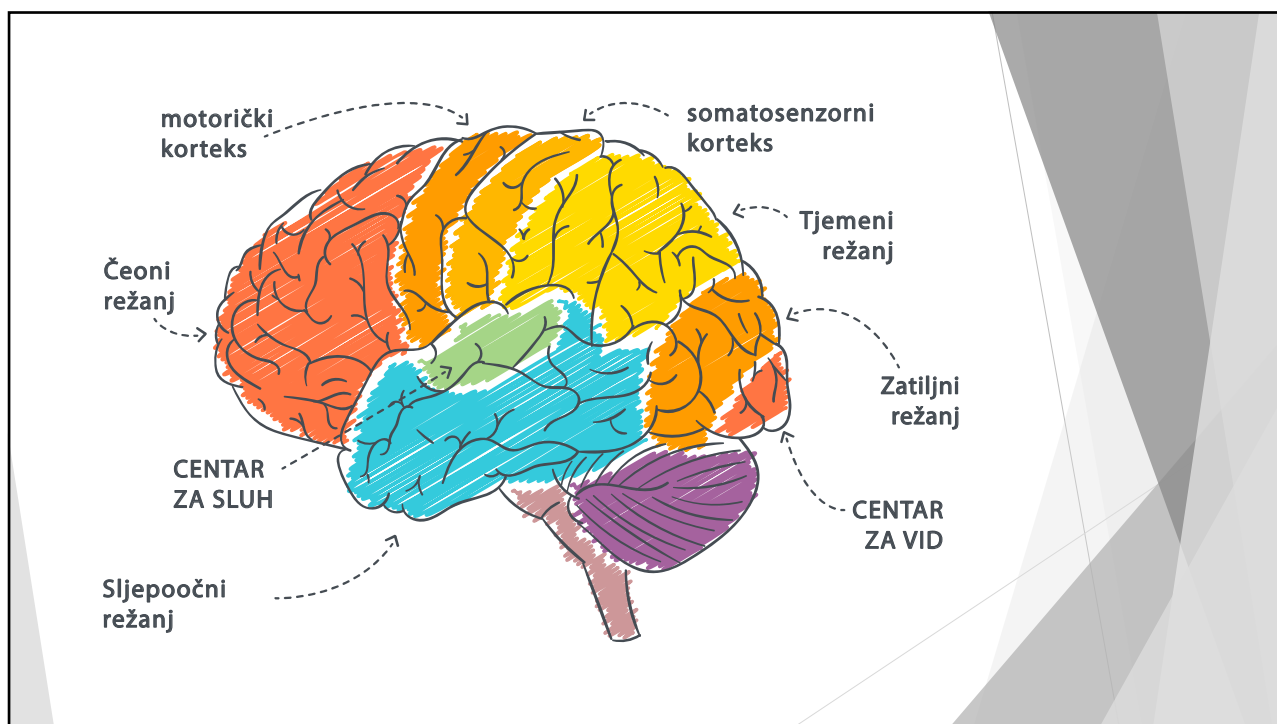
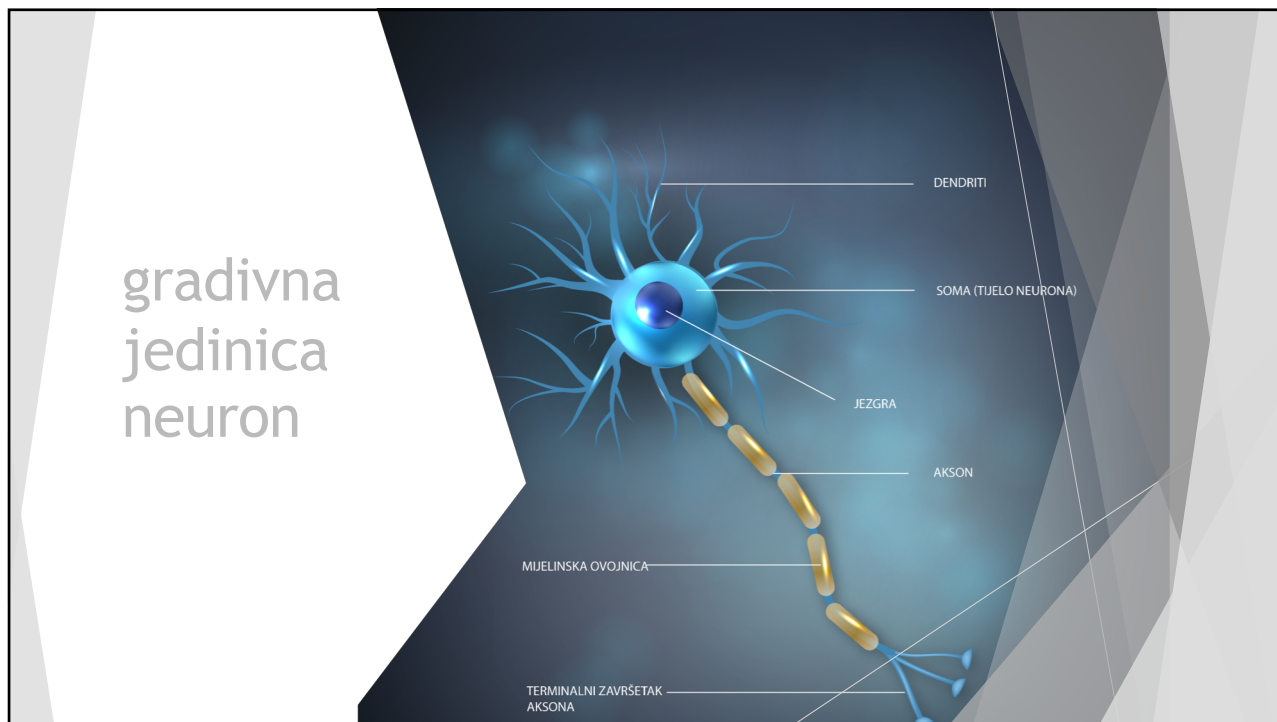


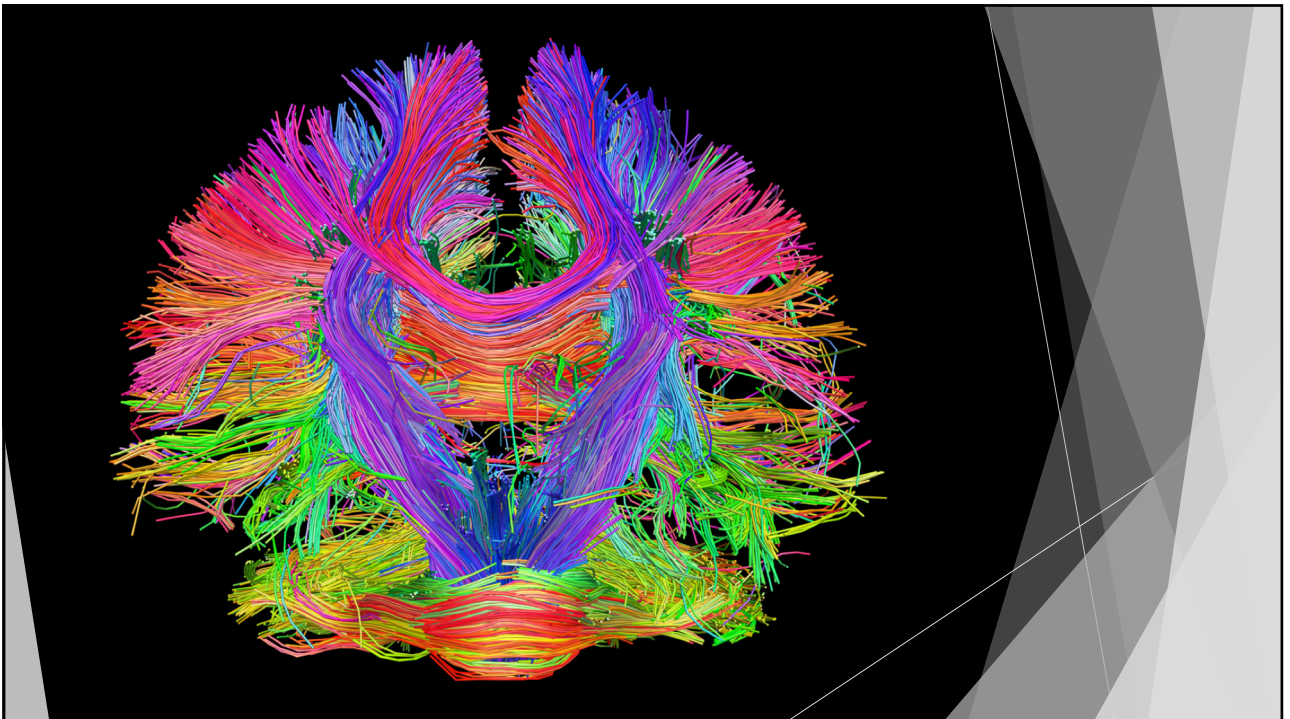
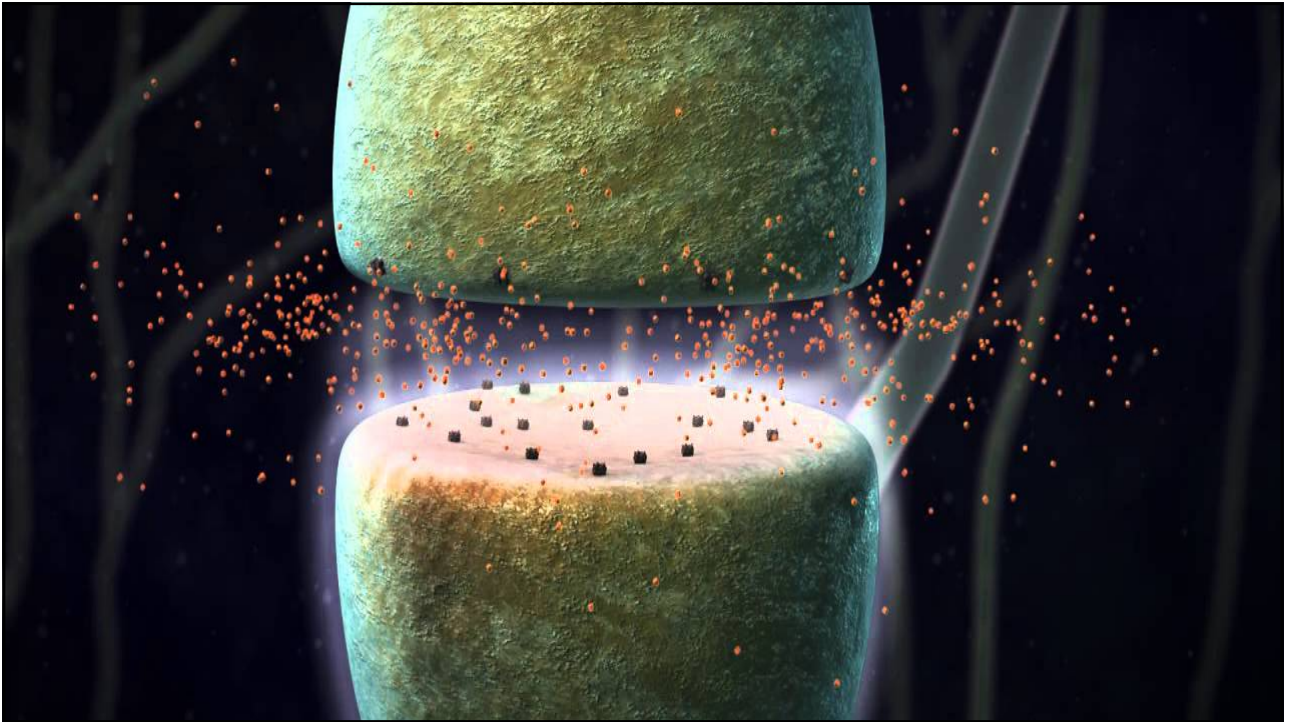
Neuroznanost i umjetnost

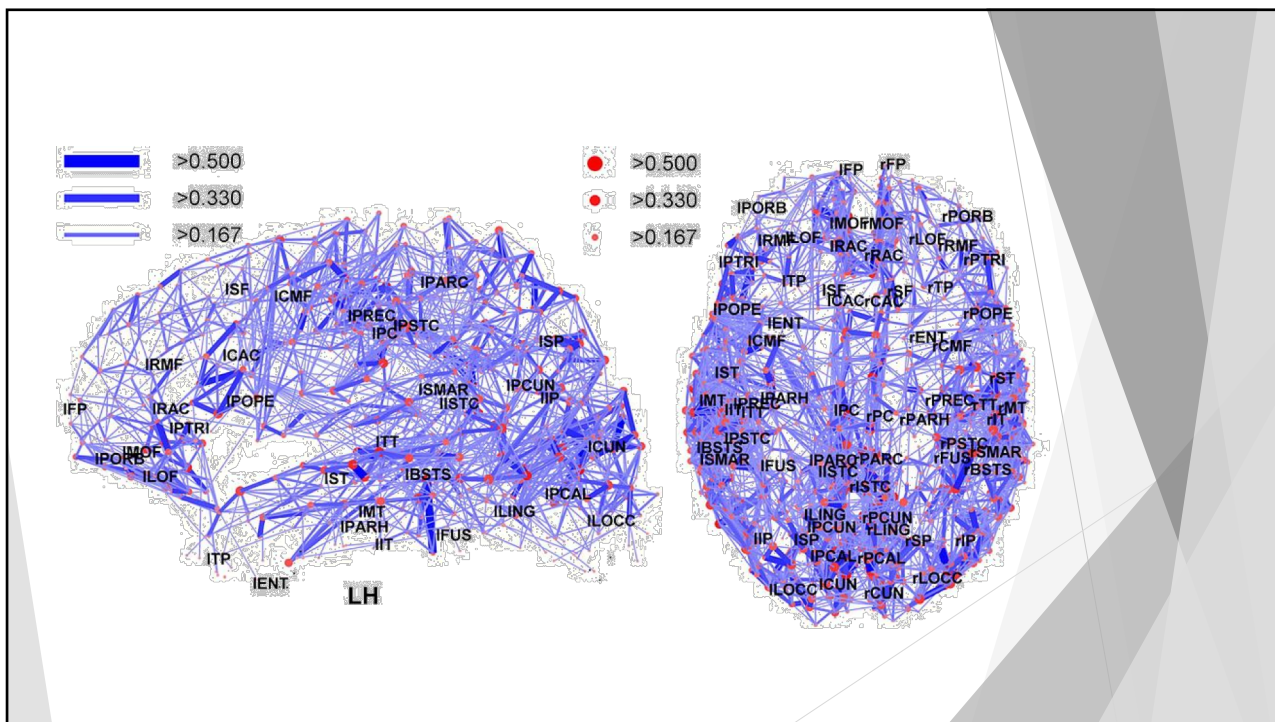
Kako mozak čuje?
Kako mozak vidi?
Neuroestetika
Klinička primjena

Filip Đerke, *dr.med.*
Dom zdravlja Zagreb Centar
Hrvatska kuća mozga









The Artistic Brain

DOING ART: Both the right and left hemispheres play integral roles in the production of art. Damage to either side of the brain, particularly in the front or temporal lobes, can result in dramatic changes in artistic style.

EMOTIONAL RESPONSES TO ART: The amygdala, prefrontal and orbitofrontal cortices, insula, and the ventral striatum are all involved in how people feel when they view works of art.

PROCESSING IMAGES: When it comes to interpreting art, in addition to the roles of the visual and motor cortices, the right parietal lobe helps people judge animacy and symbolism, while the parahippocampal gyrus and the fusiform gyrus help them recognize and evaluate places and faces, respectively.

And you will read this at the end

**You will read
this first**

And then you will read this
Then this one

Što je to
kreativnost

Kreativnost je
sposobnost
nalaženja
jedinstvenih i novih
ideja

U psihološkoj literaturi moguće je pronaći
više od 60 različitih definicija kreativnosti.

Lat. creatus - koji je narastao

Kreativnost je mentalni proces koji uključuju stvaranje novih ideja, pojmova, ili rješenja problema, ili novih poveznica između postojećih ideja ili pojmova.

Sa znanstvenog pogleda, smatra se kako proizvodi kreativnih misli (ponekad zvanih divergentnim mislima) sadrže originalnost i primjerenost.

Korisno razlučivanje napravio je Rhodes, i to između:

- ▶ kreativne osobe,
- ▶ kreativnog proizvoda,
- ▶ kreativnog procesa,
- ▶ kreativne okoline

Svaki od navedenih faktora u pravilu je prisutan u kreativnoj aktivnosti. Johnson je istu stvar kasnije razradio, predloživši tezu kako kreativna aktivnost može sadržavati nekoliko značenja uključujući osjetljivost na probleme, originalnost, ingenioznost, neobičnost, korisnost i primjerenost što se kreativnog proizvoda tiče, te intelektualno vodstvo što se kreativnog stvaraoaca tiče.

"proces odbacivanja pretpostavki"

- ▶ Neki učenjaci u polju kreativnosti ističu **ulogu slučajnosti u kreativnom procesu**.
- ▶ Linus Pauling, upitan na javnom predavanju kako pojedinac stvara i dolazi do znanstvenih teorija, odgovorio je kako pojedinac mora nastojati u stvaranju velikog broja ideja, a zatim odbaciti one beskorisne. Još jedna prikladna definicija kreativnosti jest "**proces odbacivanja pretpostavki**".
- ▶ Mnoge kreativne ideje dolaze do izražaja kada pojedinac odbaci unaprijed stvorene pretpostavke i odlučuje se na novi pristup ili metodu koja se ostalima može učiniti nezamislivom.

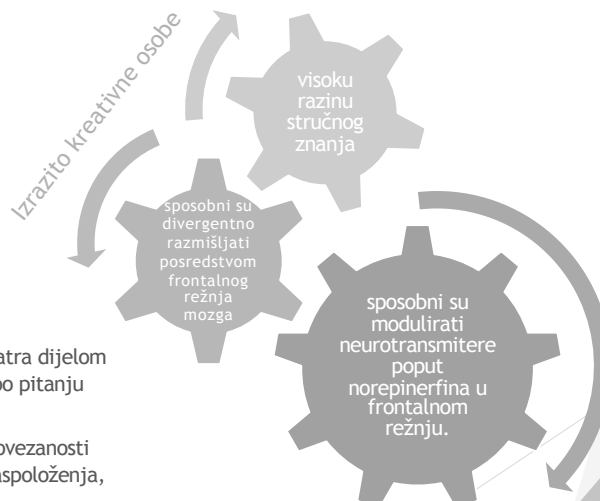
Wallas & Smith

Graham Wallas i Richard Smith, u svom djelu *Art of Thought*, objavljenom 1926. godine, predložili su jednog od prvih modela kreativnih procesa. U Wallasovom modelu, kreativne se uvide i prosvjećivanja da objasniti kroz proces koji se sastoji od 5 dijelova:

- ▶ **priprema** (pripremni rad na problemu koji usmjerava pojedinčev um na problem i istražuje dimenzije problema),
- ▶ **inkubacija** (problem je ušao u podsvijest pojedinca i izvana nije vidljiva reakcija),
- ▶ **nagovještaj** (kreativna osoba dobije 'predosjećaj' kako je rješenje na svom putu),
- ▶ **prosvjećivanje** ili uvid (kreativna ideja oslobađa se iz pojedinčeve podsvijesti u njegovu svijest),
- ▶ **potvrda** (ideja je svjesno potvrđena, promišljena, a zatim i primijenjena).

Neurobiologija kreativnosti

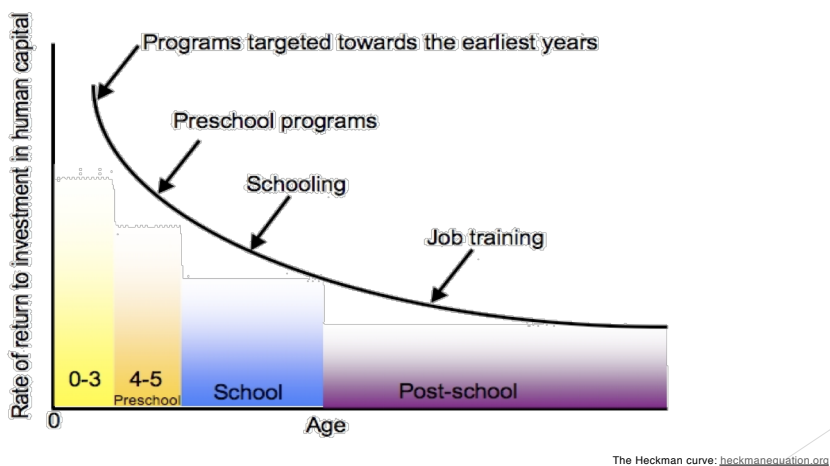
Neurobiologija kreativnosti naslovljena je u članku "Kreativna inovacija: mogući moždani mehanizmi" ("Creative Innovation: Possible Brain Mechanisms"). Autori su napisali kako *"kreativnoj inovaciji vjerojatno je potrebna koaktivacija i komunikacija između regija mozga koje obično nisu čvrsto povezane"*.



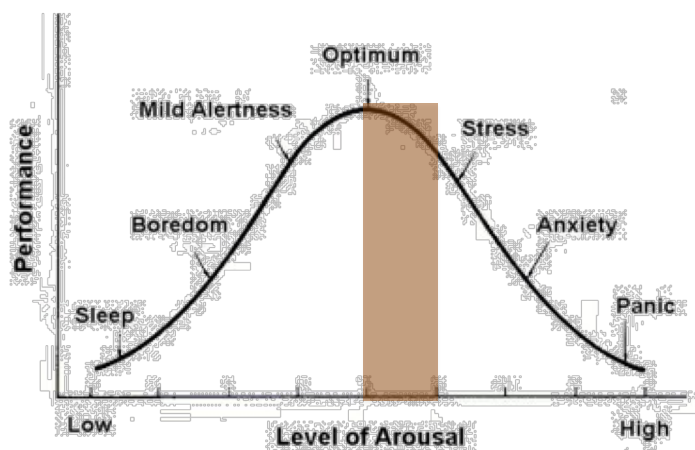
- Radi toga, frontalni se režanj smatra dijelom moždane kore koji je najvažniji po pitanju kreativnosti.
- Ovaj je članak također istražio povezanosti između kreativnosti, spavanja, raspoloženja, poremećaja ovisnosti i depresije.

- ▶ 2005. godine, Alice Flaherty predstavila je model kreativnog pogona u tri faktora.
- ▶ Crpeći dokaze iz slika mozga, proučavanja droga i analize lezija, opisala je kreativni pogon kao rezultat interakcije frontalnog režnja, temporalnog režnja te dopamina iz limbičkog sustava. **Frontalni se režanj** smatra odgovornim za stvaranje ideja, dok se **temporalni režanj** smatra odgovornim za obrađivanje, ispravljanje i procjenu ideja. Abnormalnosti u frontalnom režnju (poput depresije i tjeskobe) obično smanjuju razinu kreativnosti, dok abnormalnosti u temporalnom režnju često povisuju razinu kreativnosti.
- ▶ Visoka aktivnost temporalnog režnja obično inhibira aktivnost frontalnog režnja, i obrnuto.
- ▶ Visoka razina dopamina povisuje uzbuđenost organizma i ponašanja okrenuta nekom cilju te smanjuje latentnu inhibiciju, te sva tri djelovanja povećavaju pogon stvaranja novih ideja.

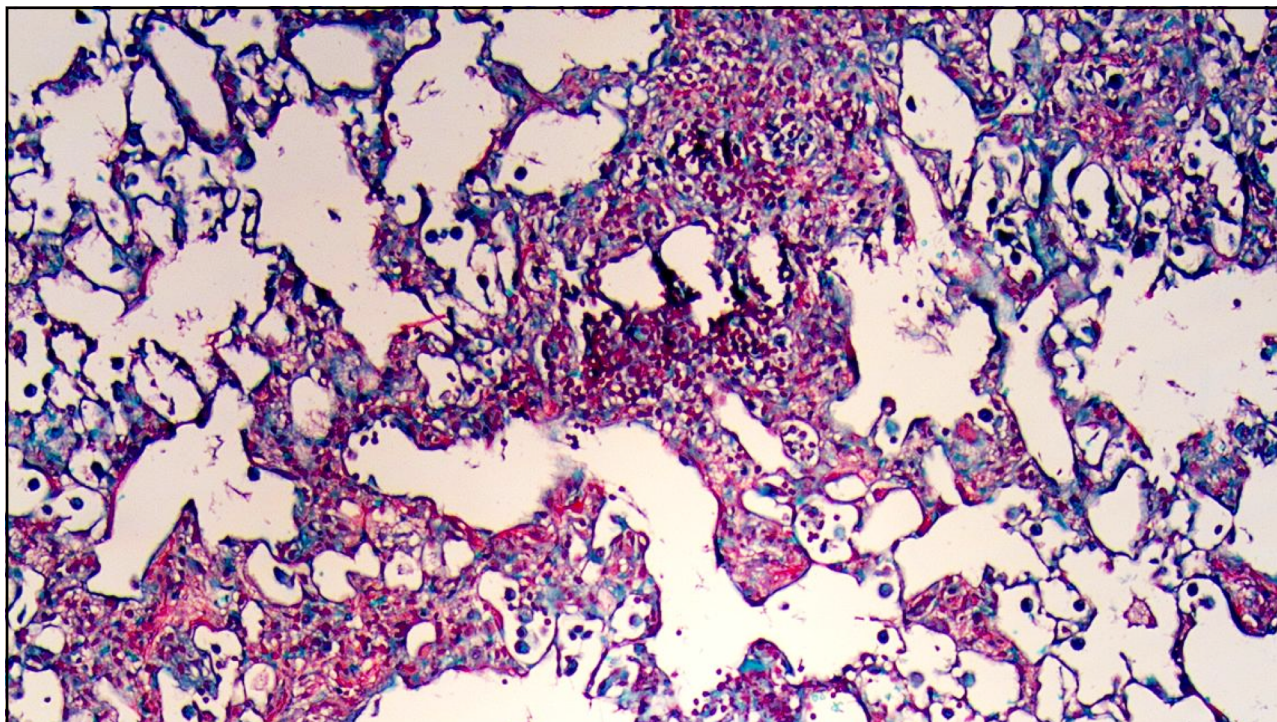
The Creativity Response: Early Intervention makes the Difference



The Creativity Response: Performance and Level of Arousal



Yerkes RM, Dodson JD (1908). "The relation of strength of stimulus to rapidity of habit-formation". Journal of Comparative Neurology and Psychology 18: 459-482.



NEUROZNANOST I UMJETNOST

KAKO MOZAK VIDI?

Što je to vid?

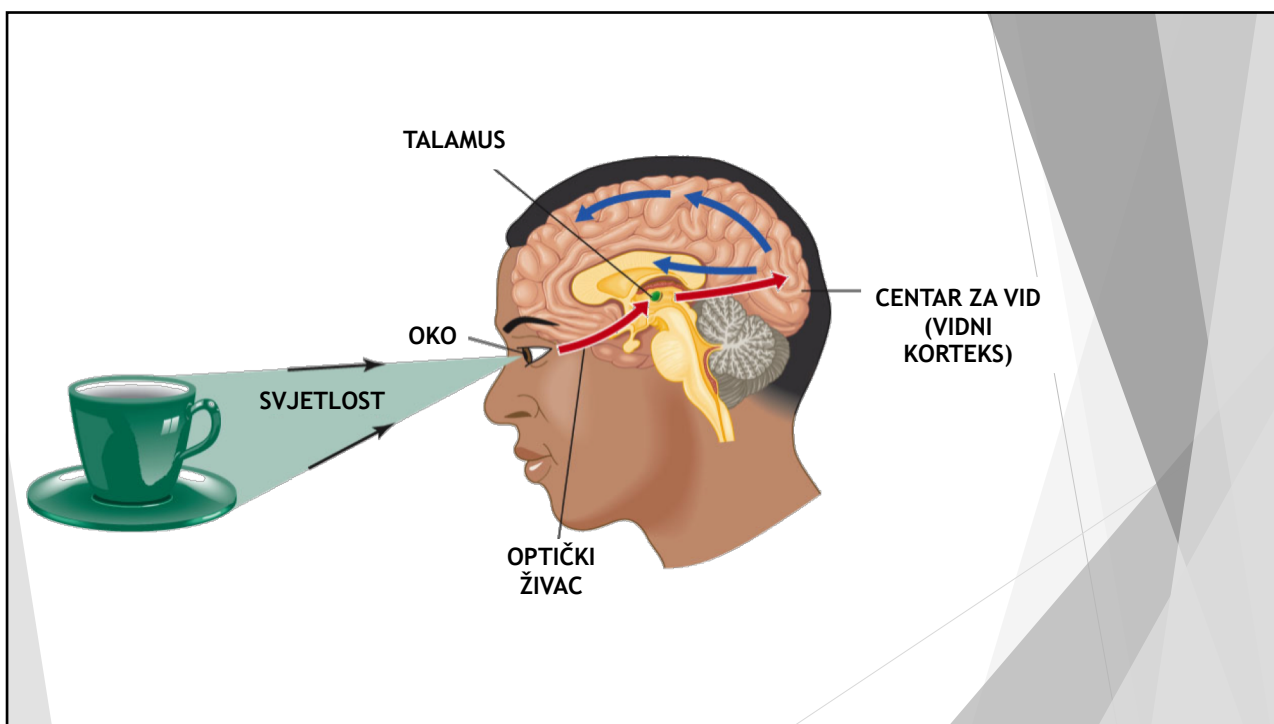
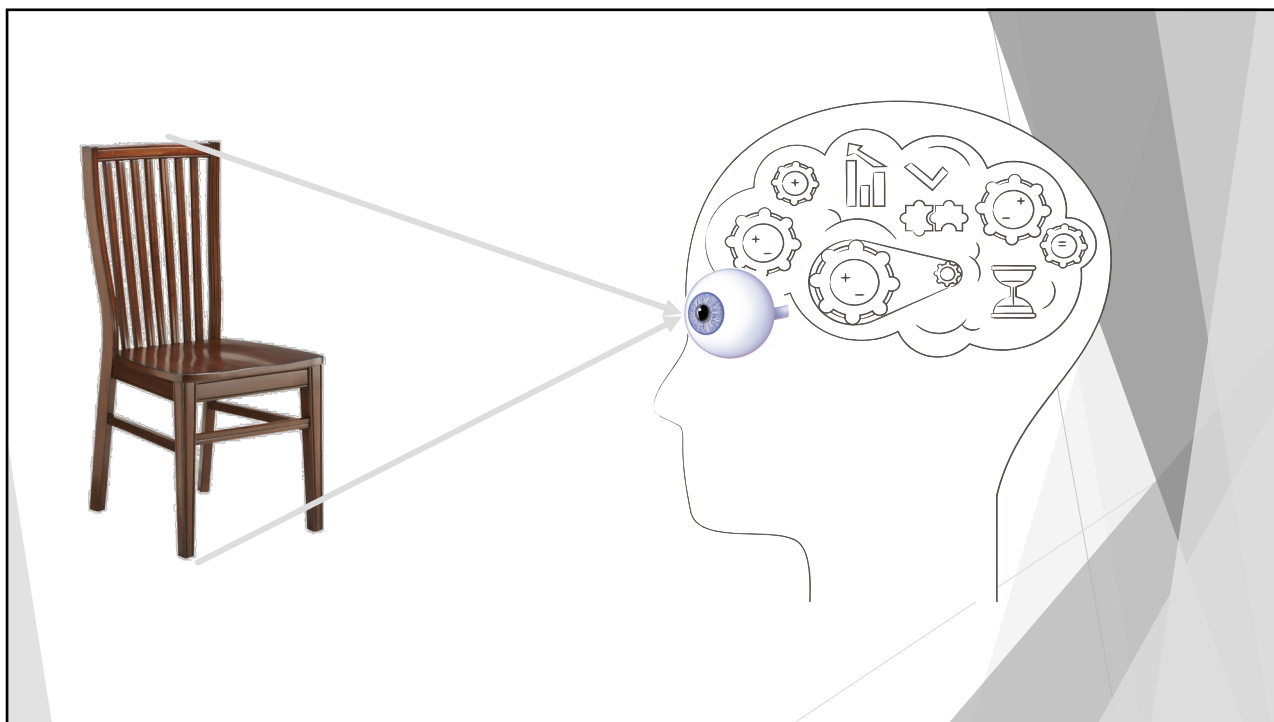
Vid je proces stvaralačkog rekonstruiranja trodimenzionalne strukture i svojstava vanjskog svijeta, što se temelji na tumačenju osjetnih podataka sadržanih u dvodimenzionalnoj slici vidnog prizora na mrežnici¹.

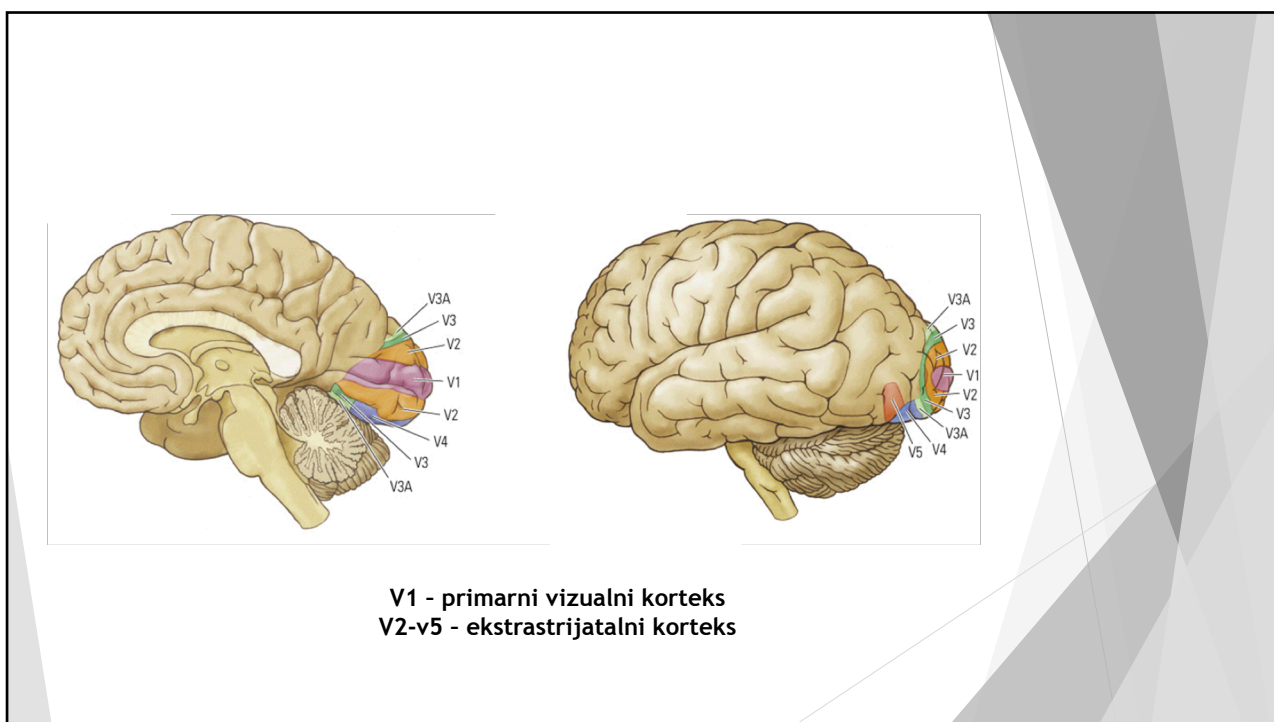
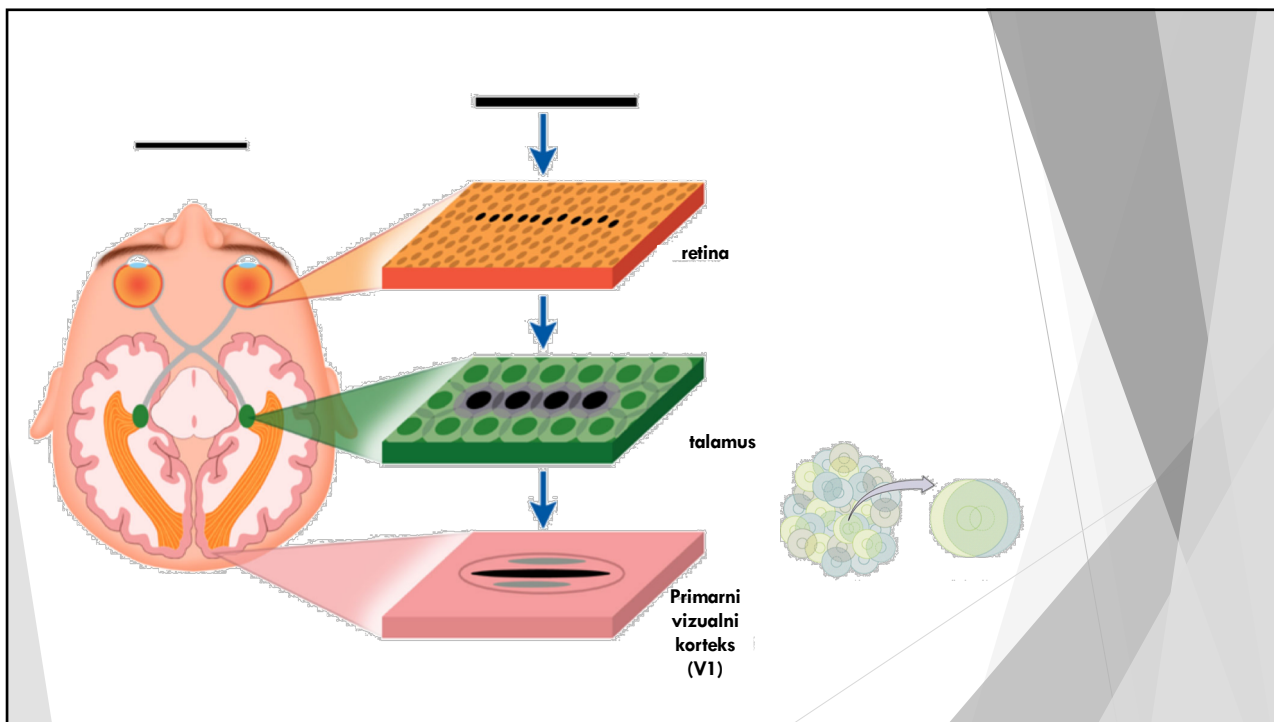
¹ Judaš M, Kostović I; Temelji neuroznanosti, udžbenik; <http://www.hiim.unizg.hr/index.php/udzbenik-temelji-neuroznanosti>; 15. veljače 2017.

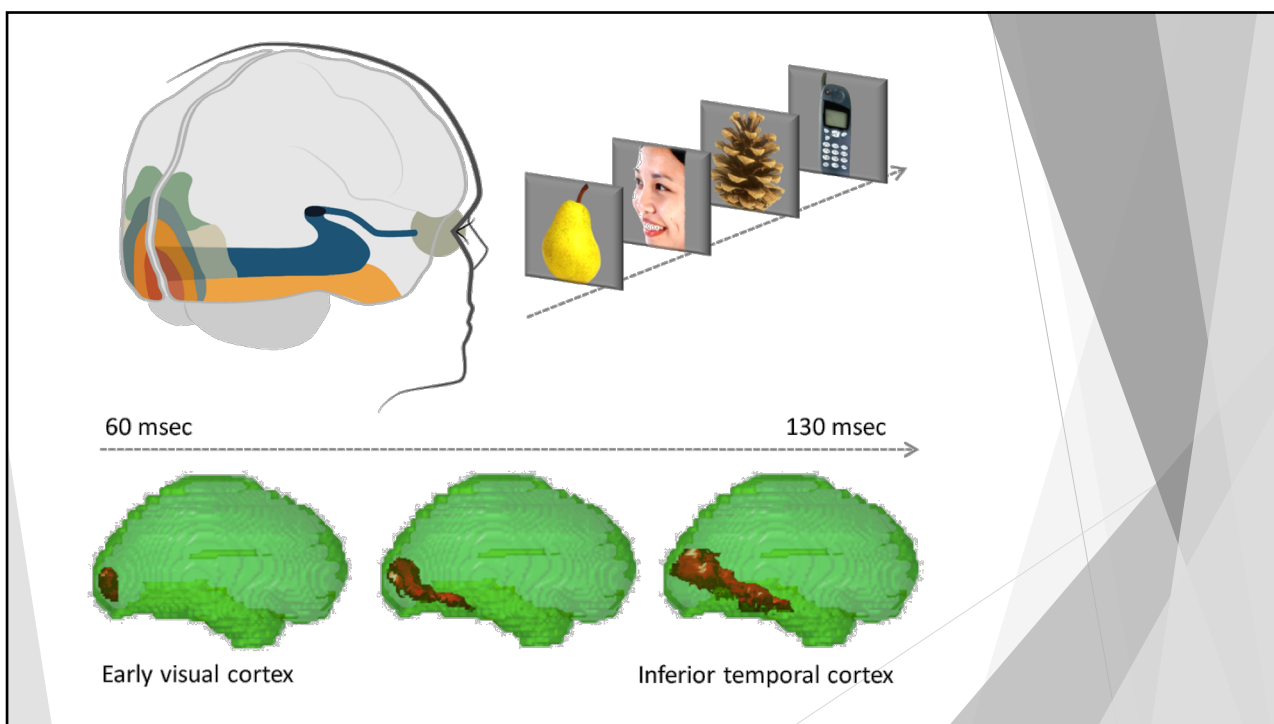
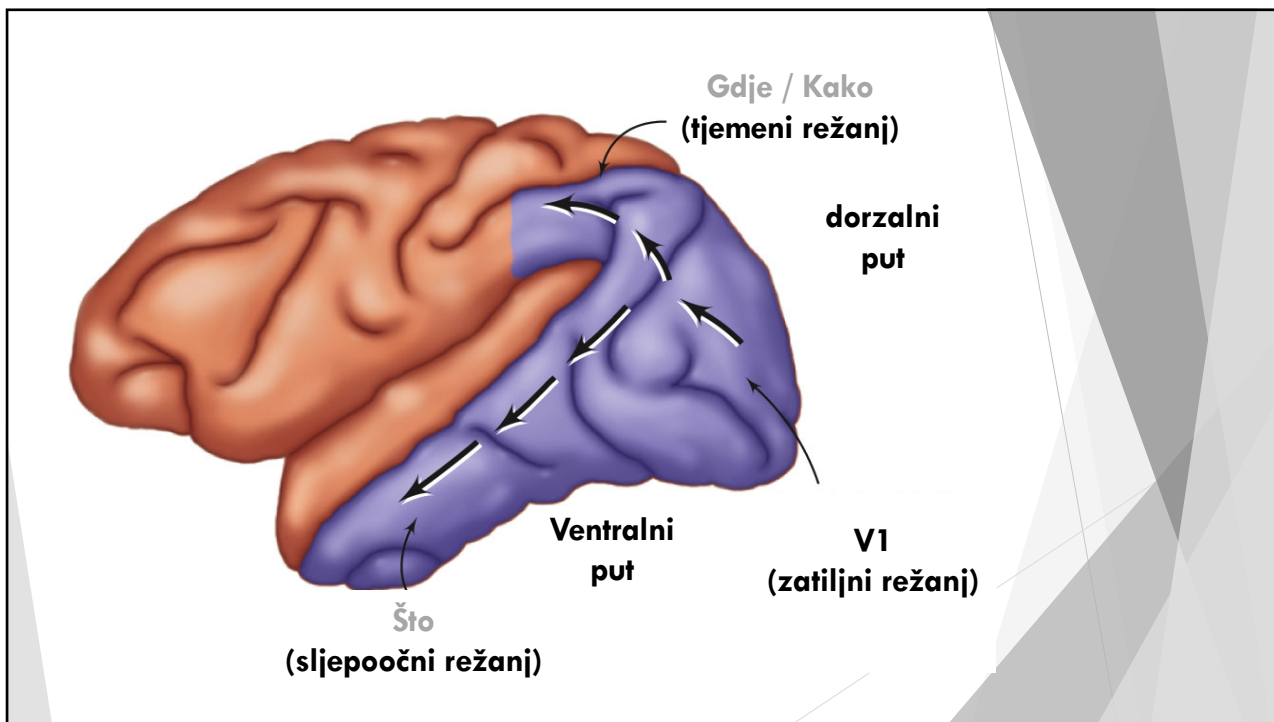


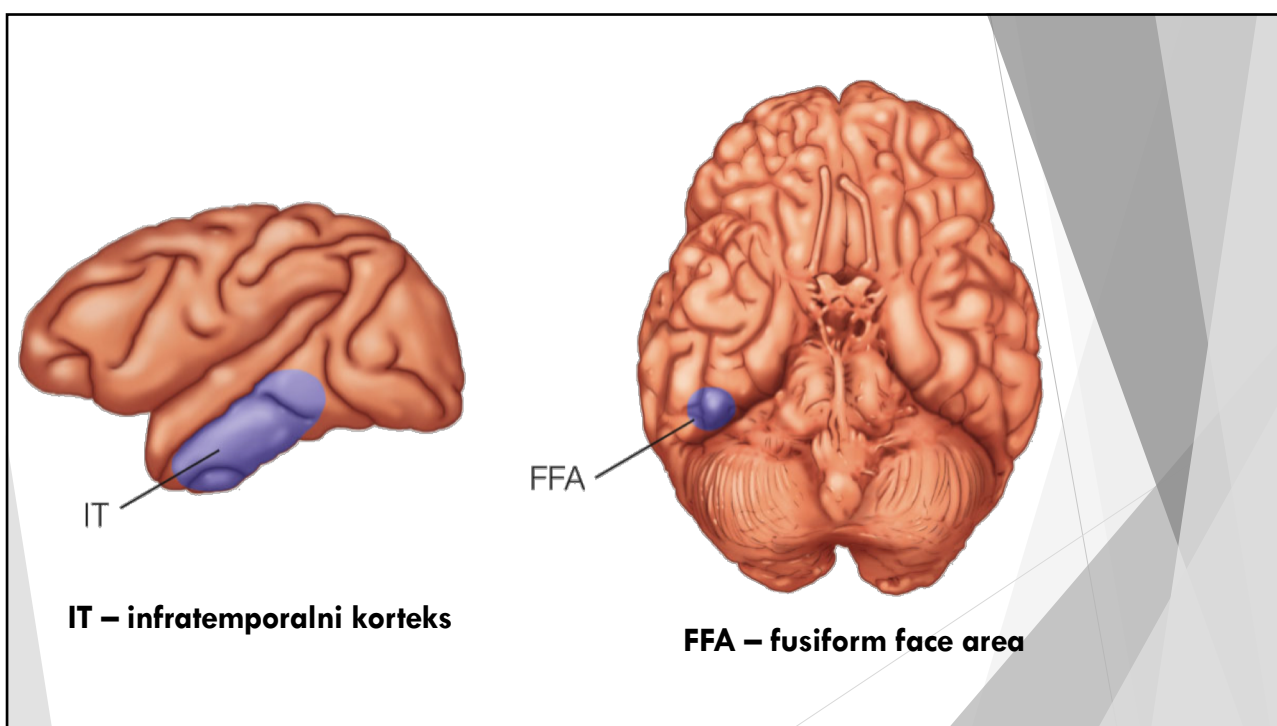
I'm a normal text

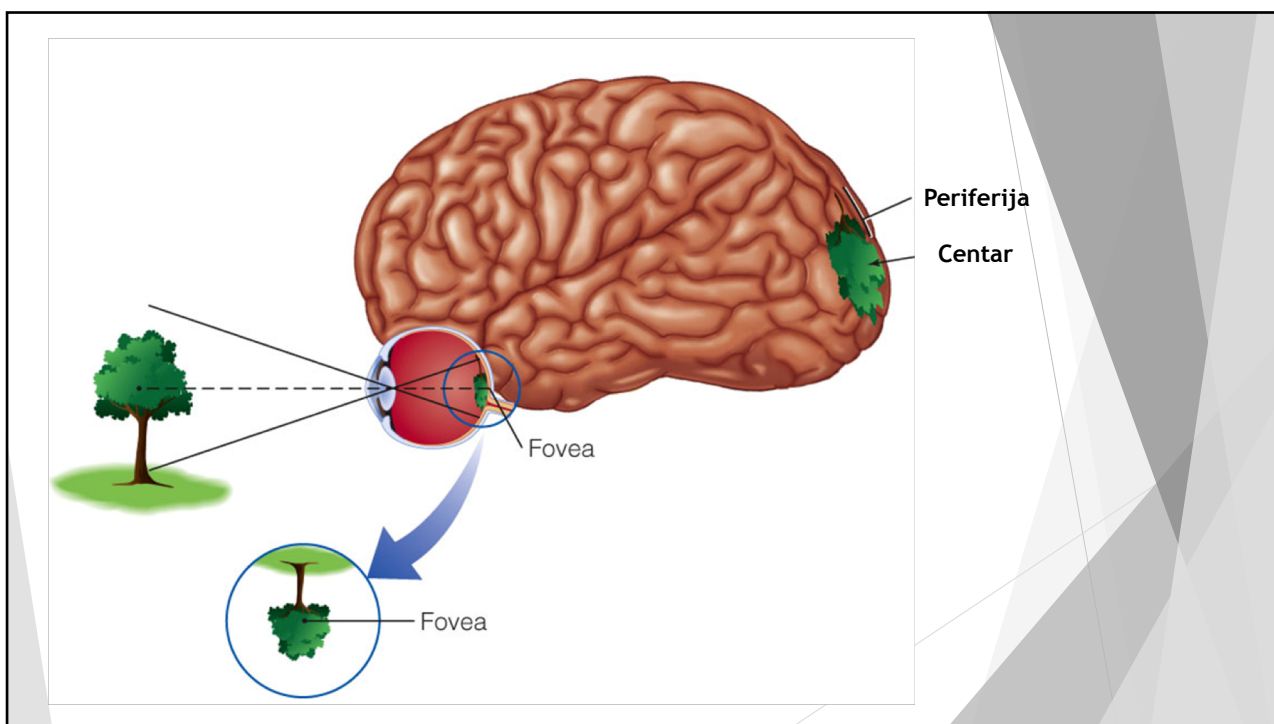
I'm a bold text







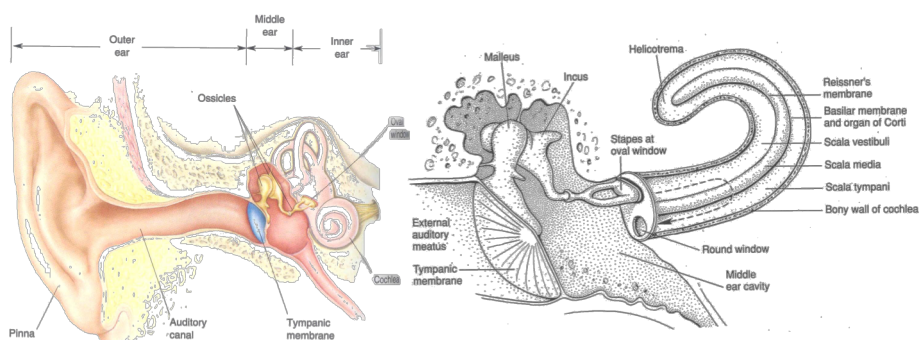




NEUROZNANOST I UMJETNOST

KAKO MOZAK ČUJE?

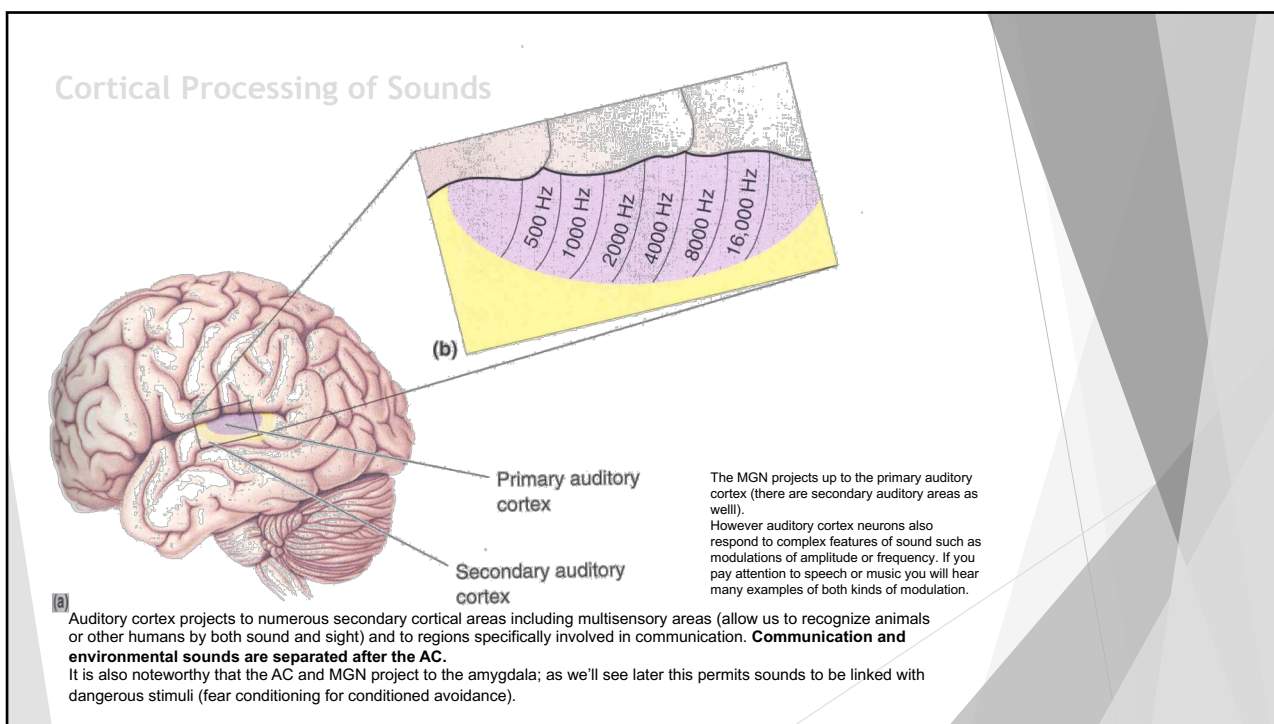
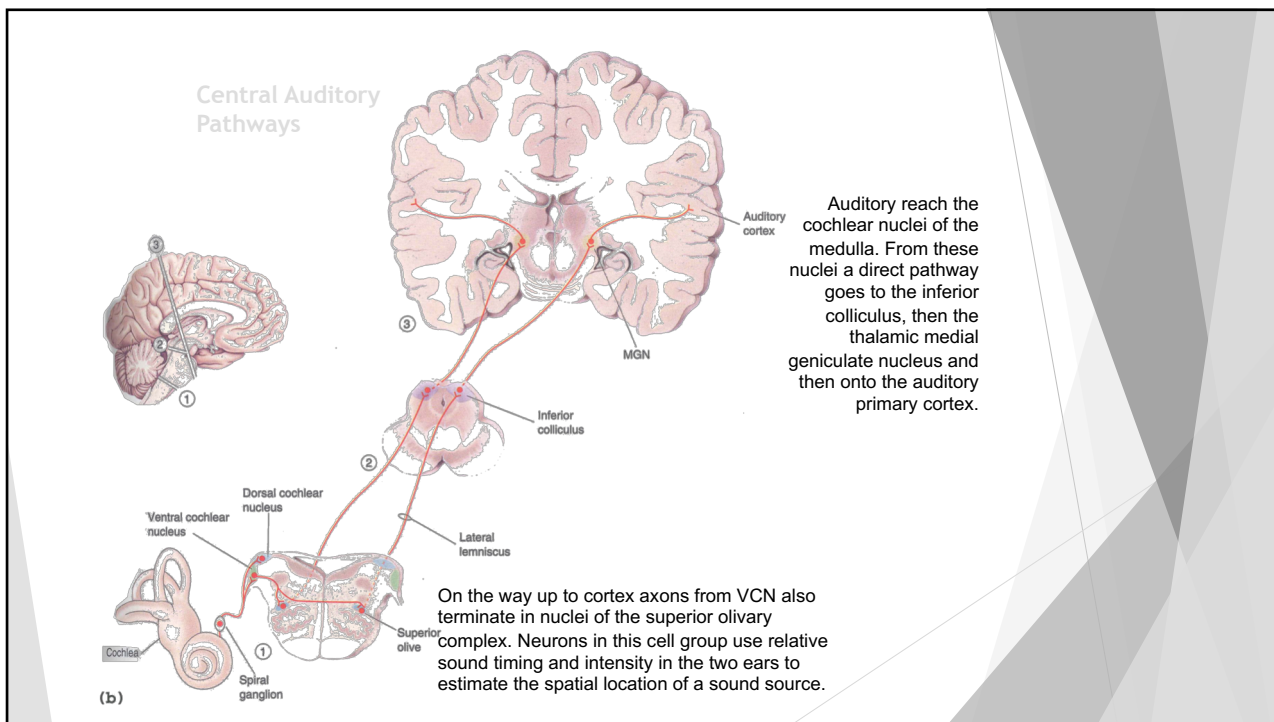
The Auditory Periphery



Bear et al.

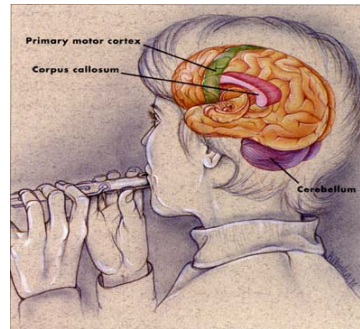
Kandel et al.

The outer ear and canal guide and filter sound. The tympanic membrane and ossicles transmit the vibrations to the cochlea itself; the vibrations enter the cochlea via the round window and exit via the round window. As they pass through the endolymph of the scala vestibuli and tympani, sound waves cause the basilar membrane to vibrate. This is the key to auditory function.



Music and the Brain

- ▶ Familiar music activates **Broca's area** (left hemisphere)
- ▶ Rhythm notes are activated in **Broca's area** and the cerebellum
- ▶ Harmony activates the left side of the brain more than the right in the **inferior temporal cortex**.
- ▶ Timbre activated the **right hemisphere** (the only musical element that did)
- ▶ Pitch activated an area on the left back of the brain - **the precuneus**.
- ▶ Melody activated **both sides** of the brain.
- ▶ Composite listening - Left and Right Hemisphere - **Auditory Cortex**
- ▶ Understanding lyrics - **Wernicke's Area**

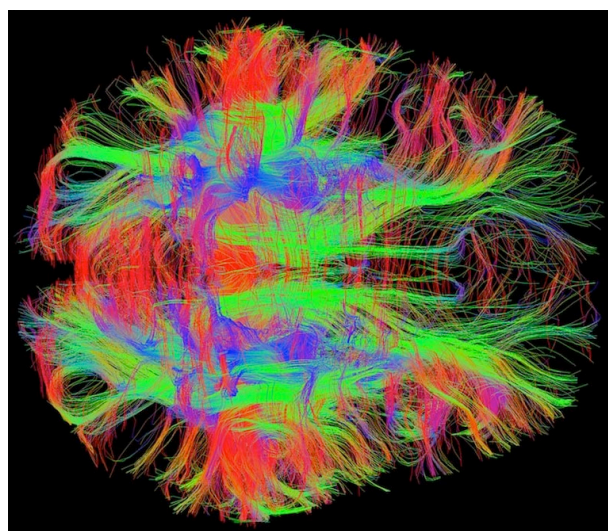


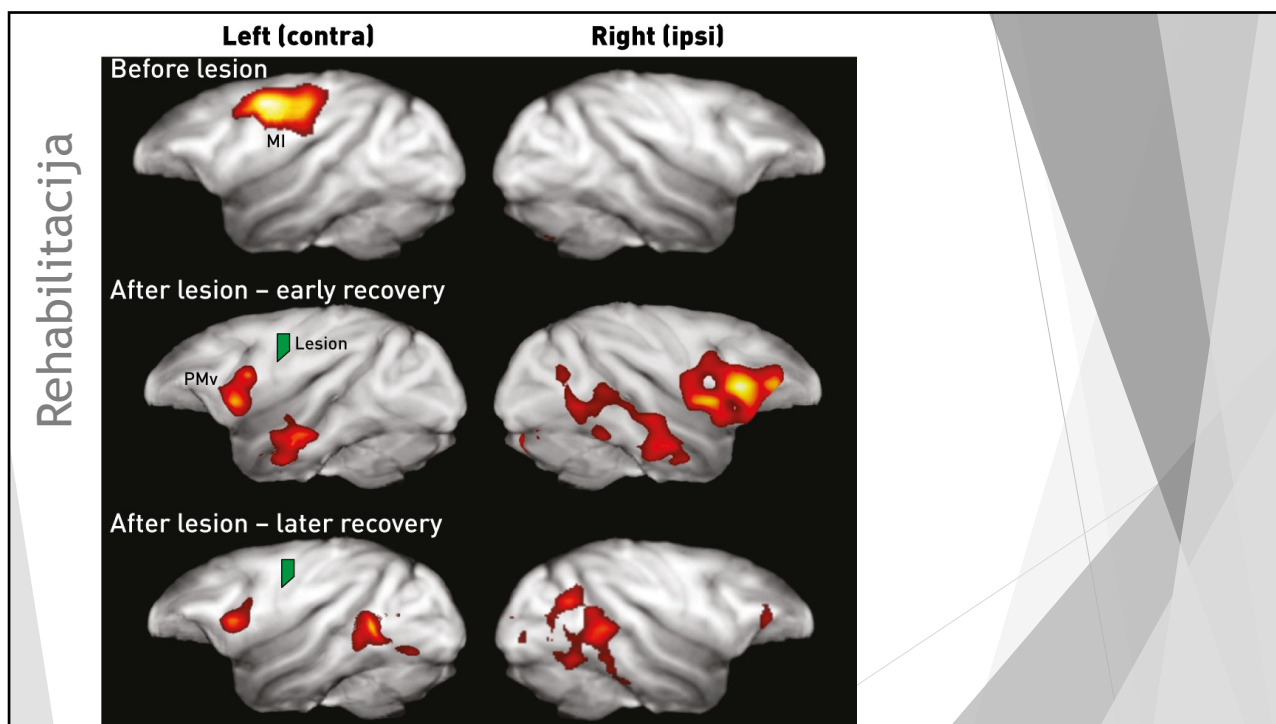
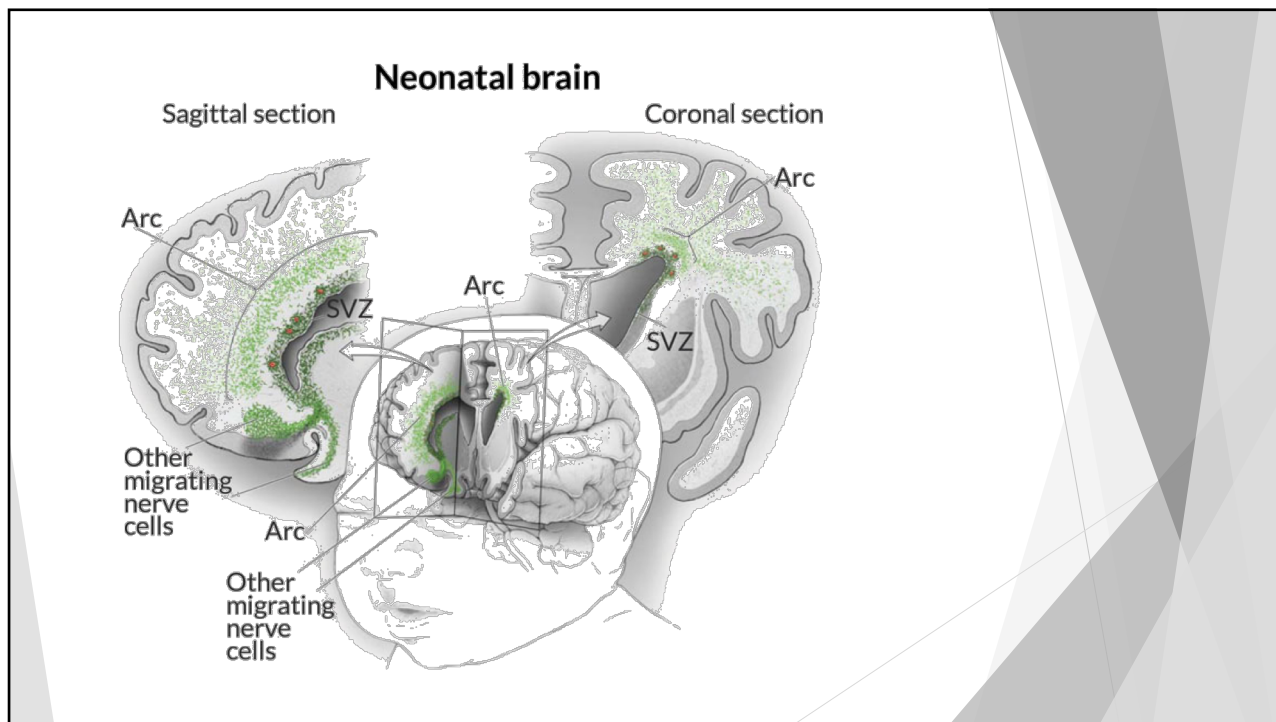
Music is processed differently for different people depending on kind of music and musical background.

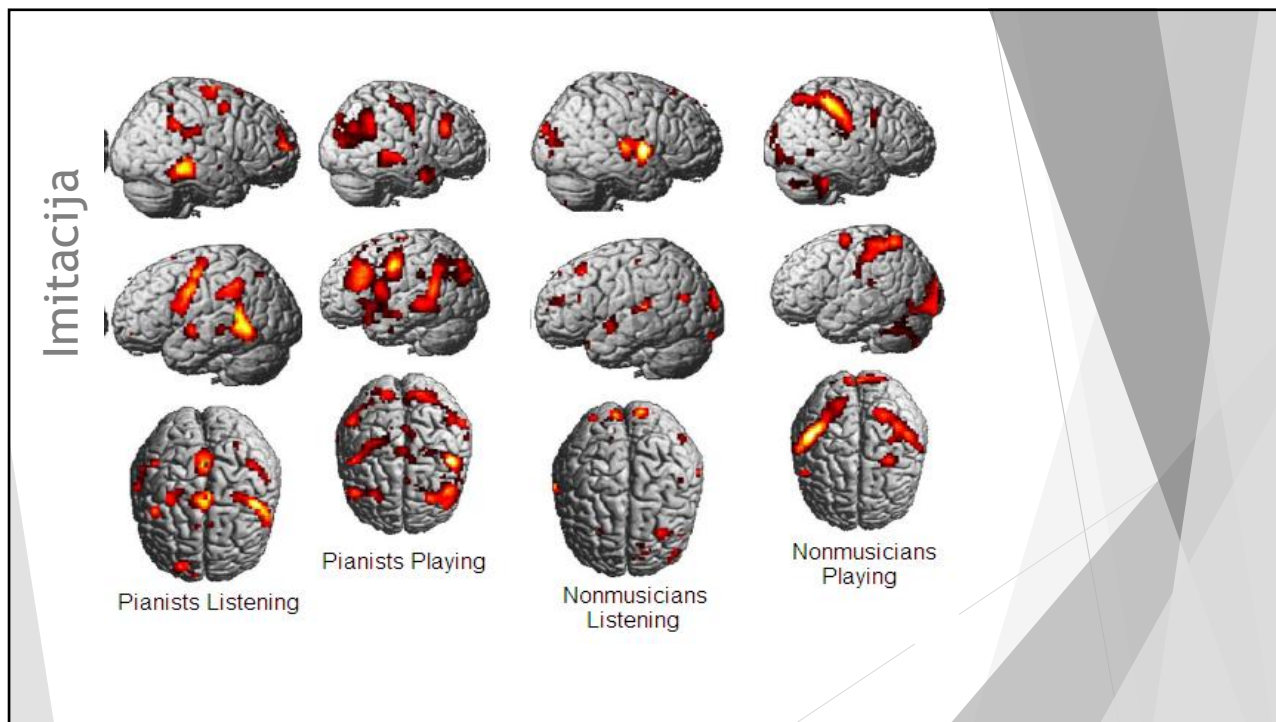


Plastičnost je svojstvo modulacije

- ▶ Neuronska
- ▶ Sinaptička









Populations

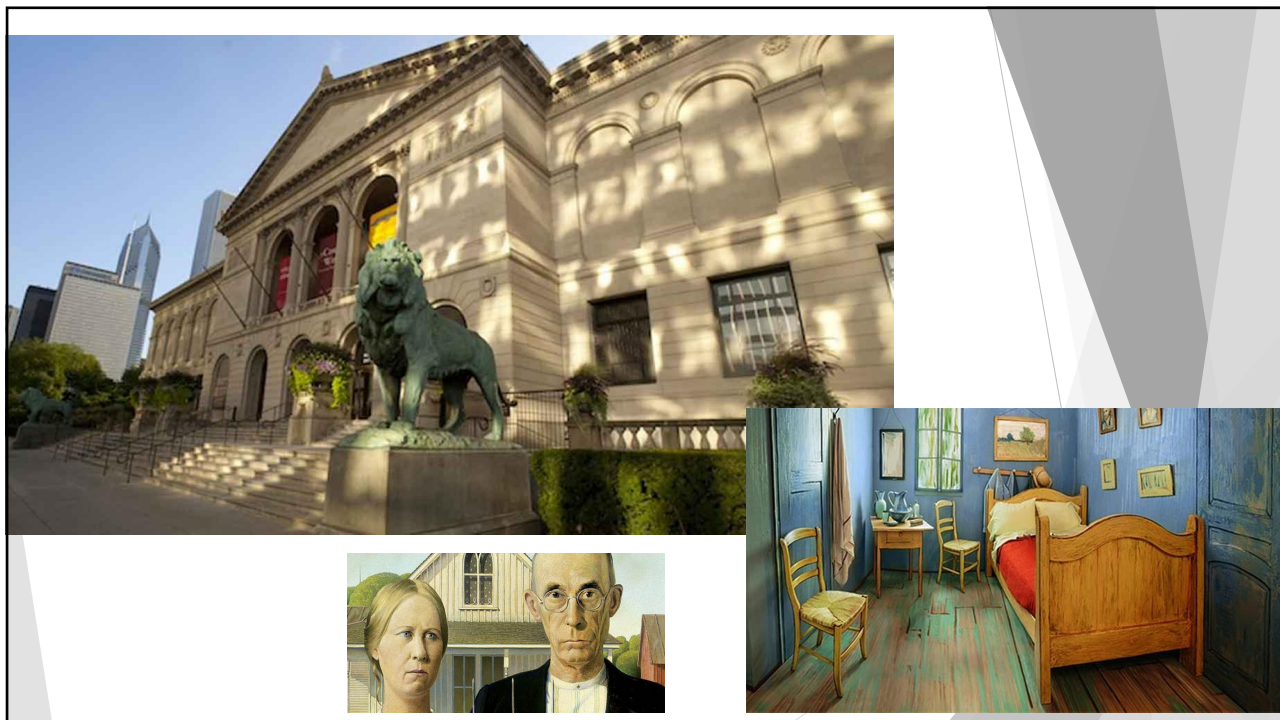
- ▶ Abuse
- ▶ ADHD
- ▶ Asperger's / Autism
- ▶ Aging, Elderly, Geriatric
- ▶ Caretakers
- ▶ Chemical Dependency / Substance Abuse
- ▶ Grief / Bereavement
- ▶ Learning disabilities
- ▶ Medical
- ▶ Mentally Retarded / Developmentally Delayed
- ▶ Normal & Outpatient
- ▶ Phase of life / transitions
- ▶ Pre and Postnatal
- ▶ Post Traumatic Stress Disorder & Trauma
- ▶ Prison / Incarceration
- ▶ Psychiatric
- ▶ Relationship Issues
- ▶ School / Academic
- ▶ Traumatic Brain Injury
- ▶ You, me, them, and us . . .

What is the goal of Art therapy?

"Using their skills in evaluation and psychotherapy, art therapists choose materials and interventions appropriate to their clients' needs and design sessions to achieve therapeutic goals and objectives."

- ▶ Assessing developmental level, progress, insight, etc.
- ▶ Attunement with self / others
- ▶ Building Mastery
- ▶ Catharsis
- ▶ Clarifying/teaching feelings
- ▶ Commemorating / Remembering
- ▶ Creating new narratives
- ▶ Describing experience
- ▶ Distraction
- ▶ Experimenting with new behaviors
- ▶ Expressing impulses safely
- ▶ Facilitating identity development
- ▶ Generating alternatives
- ▶ Gratification delay
- ▶ Improving self-observation
- ▶ Increasing attention & frustration tolerance
- ▶ Pain assessment / Pain relief
- ▶ Supporting creative strengths / characteristics
- ▶ Taking risks
- ▶ Teaching stress relieving tools





Virtual Reality Environment Assisting Post Stroke Hand Rehabilitation: Case Report

Daria TSOUPIKOVA^{a,1}, Nikolay STOYKOV^b, Derek KAMPER^c, Randy VICK^d

^a*School of Art and Design, University of Illinois at Chicago (UIC)*

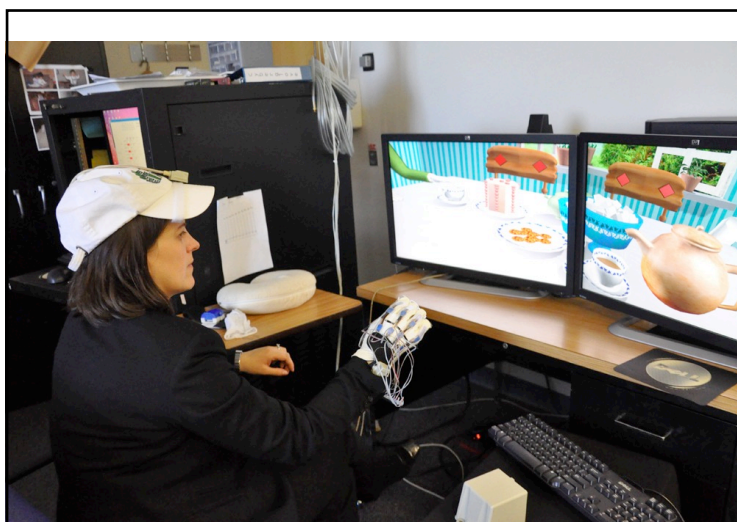
^b*Rehabilitation Institute of Chicago (RIC)*

^c*Biomedical Engineering, Illinois Institute of Technology (IIT)*

^d*Art Therapy, School of the Art Institute of Chicago (SAIC)*

Abstract. We describe a novel art-empowered Virtual Reality (VR) system designed for hand rehabilitation therapy following stroke. The system was developed by an interdisciplinary team of engineers, art therapists, occupational therapists, and VR artist to improve patient's motivation and engagement. We describe system design, development, and user testing for efficiency, subject's satisfaction and clinical feasibility. We report initial results following use of the system on the first four subjects from the ongoing clinical efficacy trials as measured by standard clinical tests for upper extremity function. These cases demonstrate that the system is operational and can facilitate therapy for post stroke patients with upper extremity impairment.

Keywords. Stroke rehabilitation, virtual reality, interactive environments, 3D art, occupational therapy, engineering



Original Article

<http://dx.doi.org/10.3349/ymj.2013.54.1.15>
pISSN: 0513-5796, eISSN: 1976-2437

Yonsei Med J 54(1):15-20, 2013

YMJ

Effects of Art Therapy Using Color on Purpose in Life in Patients with Stroke and Their Caregivers

Mi Kyoung Kim¹ and Sung Don Kang²¹Art Institute, Sungshin Women's University, Seoul;²Department of Neurosurgery, School of Medicine, Wonkwang University, Iksan, Korea.

Received: December 7, 2011

Revised: February 10, 2012

Accepted: February 13, 2012

Corresponding author: Dr. Sung Don Kang,

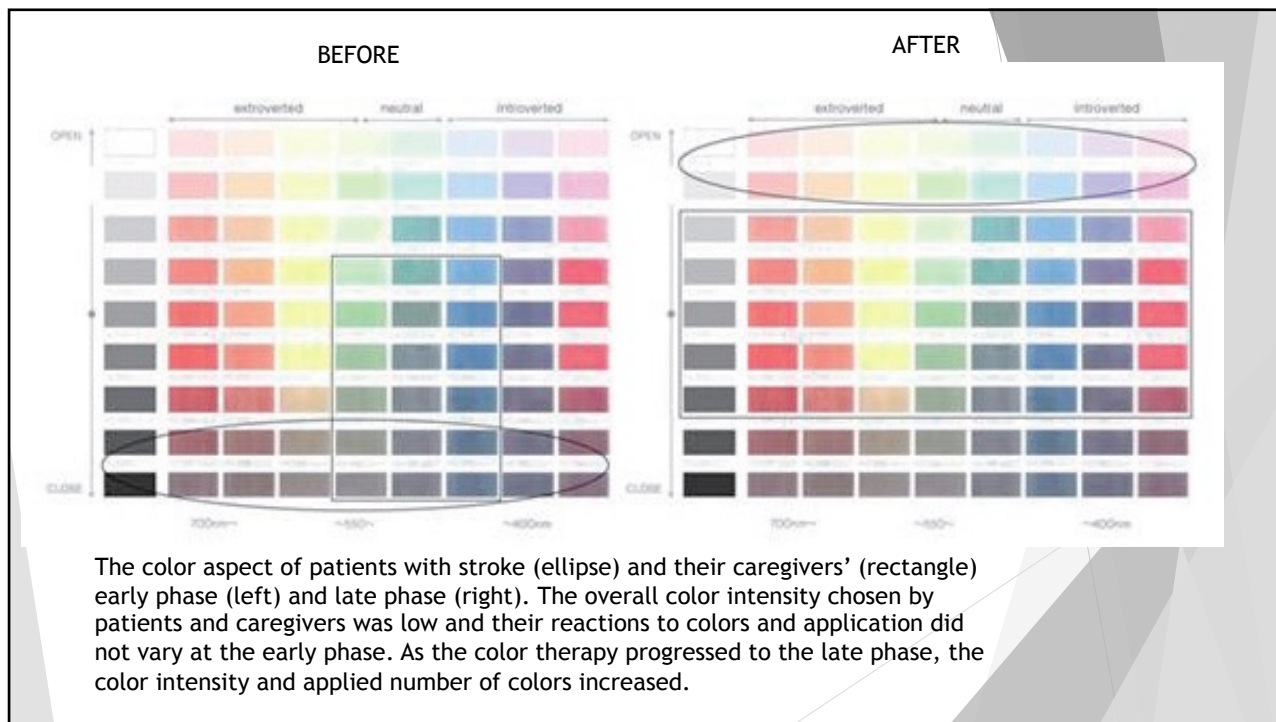
Department of Neurosurgery, Wonkwang





















University Hospital, 805 Muwang-ro

Purpose: Patients with stroke suffer from physical disabilities, followed by mental instability. Their caregivers also suffer from mental instability. The present study attempted to address the degree and the change of the level of Purpose in Life (PIL) in patients with stroke and caregivers by applying art therapy using colors.

Materials and Methods: Twenty-eight stroke patients with a good functional re-





 <p>The Orange ribbon is the symbol for kidney cancer awareness. The orange ribbon is also a symbol of leukemia, ADHD, and self injury awareness. Kidney cancer information</p>	 <p>The Periwinkle ribbon color signifies stomach cancer awareness, pulmonary hypertension, and eating disorders. Stomach cancer information</p>	 <p>The Blue awareness ribbon is a symbol for prostate cancer as well as Hydranencephaly, and child abuse awareness. Prostate cancer information</p>
 <p>A Gold ribbon signifies childhood cancer awareness and includes cancers such as the types of leukemia. Childhood cancers</p>	 <p>Violet ribbon is the sign for Hodgkin's Disease or Lymphoma a malignancy starting in the lymphatic tissues. Hodgkin's Disease</p>	 <p>The Silver awareness ribbon denotes ovarian cancer (Australia) which can take four different forms. Ovarian cancer</p>
 <p>The Purple ribbon is awareness for Pancreatic cancer, Sarcoidosis, cystic fibrosis, Fibromyalgia, Lupus, and Alzheimer's disease.</p>	 <p>The Pink ribbon denotes breast cancer awareness. A cancer formed in the tissues of the breast. Breast cancer</p>	 <p>The Gray awareness ribbon is for brain cancer, asthma, and diabetes awareness. Brain cancer</p>
 <p>The Pink and Blue colored awareness ribbon is associated with Inflammatory breast cancer. Inflammatory Breast Cancer</p>	 <p>The Jade Ribbon awareness is for hepatitis B and liver cancer in Asia and Pacific communities. Liver Cancer</p>	 <p>The Teal Ribbon awareness stands for agoraphobia, anxiety disorders and ovarian cancer. Agoraphobia</p>
 <p>The Red Ribbon awareness ribbon was created by the New York Visual AIDS Artists Caucus in 1991. HIV and AIDS</p>	 <p>The Green Awareness ribbon is the symbol for organ transplantation and Lyme Disease.</p>	 <p>The Puzzle Awareness ribbon is for awareness of Autism, a development disorder with impaired social communication.</p>
 <p>The White awareness ribbon stands for Multiple Hereditary Exostoses a rare condition when exostoses develop on bones.</p>	 <p>The Blue Purple ribbon denotes childhood or pediatric stroke and rheumatoid arthritis awareness.</p>	 <p>The Cloud Colored Ribbon denotes awareness for the childhood condition Congenital Diaphragmatic Hernia.</p>
 <p>The Pearl awareness ribbon is the color designated for lung cancer awareness.</p>	 <p>The Yellow awareness ribbon denotes suicide awareness and Endometriosis Awareness.</p>	

	NO COLOR. TRANSPARENT.
	PALE STRAW COLOR.
	TRANSPARENT YELLOW.
	DARK YELLOW.
	AMBER OR HONEY.
	SYRUP OR BROWN ALE.
	PINK TO REDDISH.

You're drinking a lot of water. You may want to cut back.

You're normal, healthy and well-hydrated.

You're normal.


Normal. But drink some water soon.

Your body isn't getting enough water. Drink some now.

You could have liver disease. Or severe dehydration. Drink water and see your doctor if it persists.


Have you eaten beets, blueberries or rhubarb recently? If not, you may have blood in your urine. It could be nothing. Or it could be a sign of kidney disease, tumors, urinary tract infections, prostate problems or something else. Maybe even lead or mercury poisoning. Contact your doctor.

B



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H



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