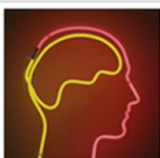CLICK PRESENT IN TOOLBAR ABOVE
TO WATCH PRESENTATION

Enhancing Creative Cognition with tDCS

Presenters:

Salma Farag
Calior Bestwick
Chinedum Ekeh
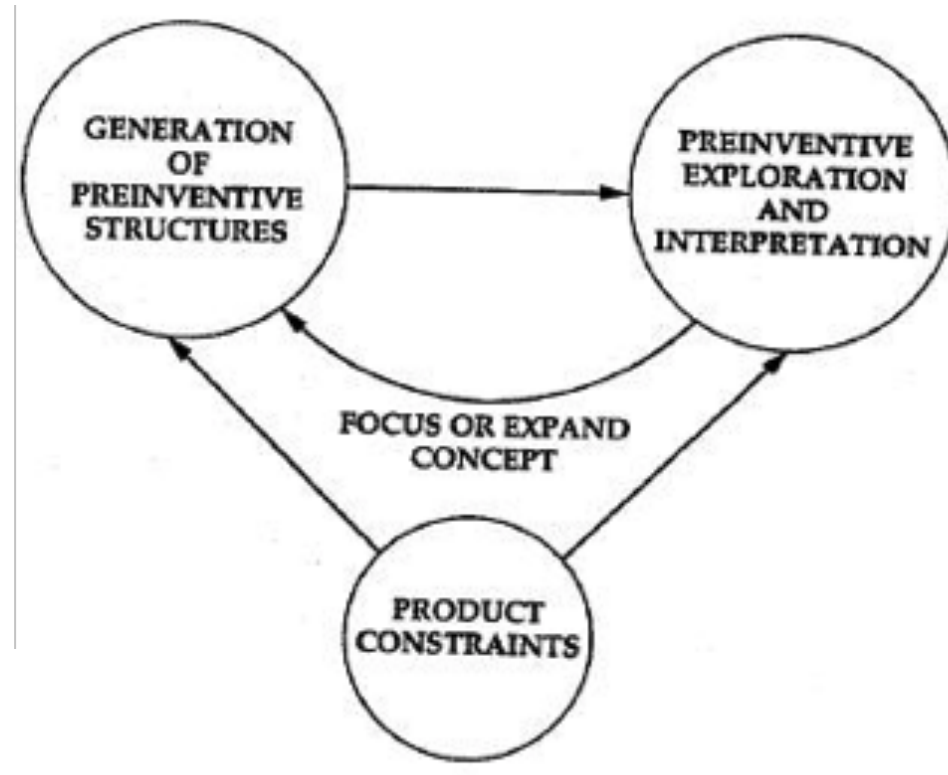
Creativity

Geneplore Model

Divergent Thinking

Alternative Uses Task (AUT; Guilford, 1967)
Think of as many creative uses for a cued object

e.g. Brick

      weapon
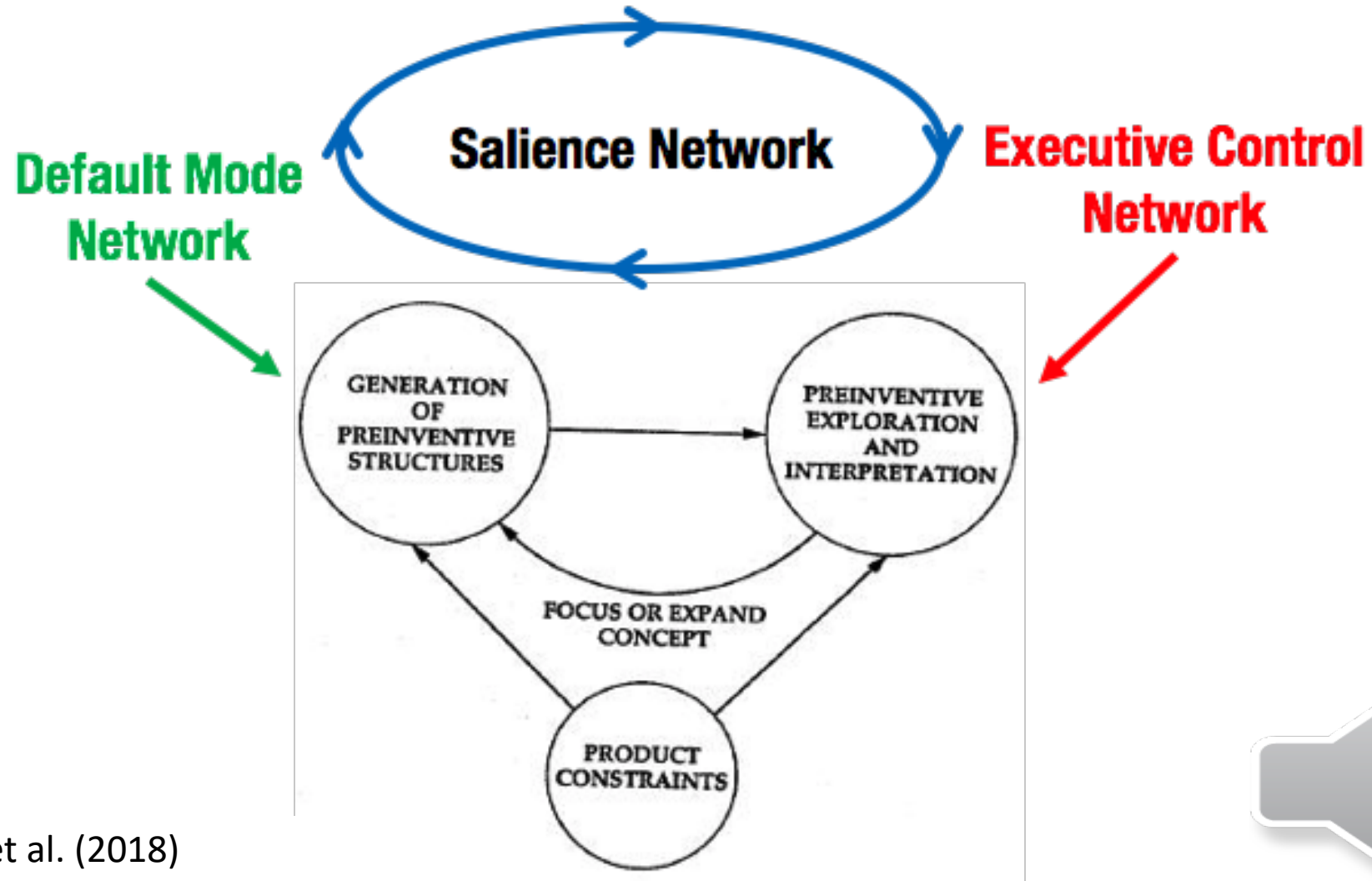   doorstop
      doll coffin
      ...

GENERATION OF PREINVENTIVE STRUCTURES

PREINVENTIVE EXPLORATION AND INTERPRETATION

FOCUS OR EXPAND CONCEPT

PRODUCT CONSTRAINTS

Finke et al. (1992)

Brain Activity (fMRI) during AUT Task

A High-creative network Low-creative network

Prefrontal
Motor
Insula
Parietal
Temporal
Occipital
Limbic
Cerebellum
Subcortical
Brainstem

L R L R

B
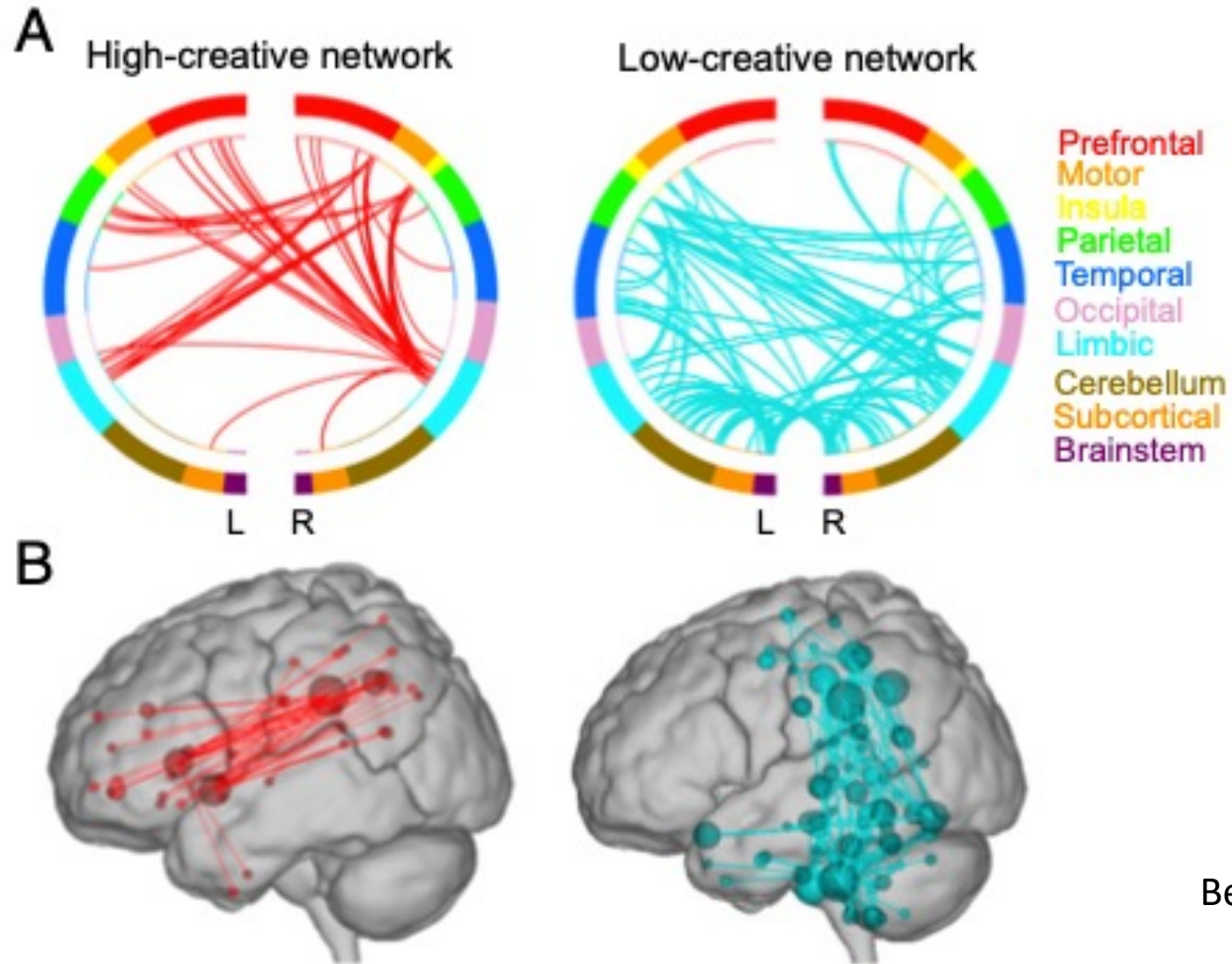
Beaty et al. (2018)

Brain Activity (fMRI) during AUT Task

Beaty et al. (2018)

Forward Flow Task

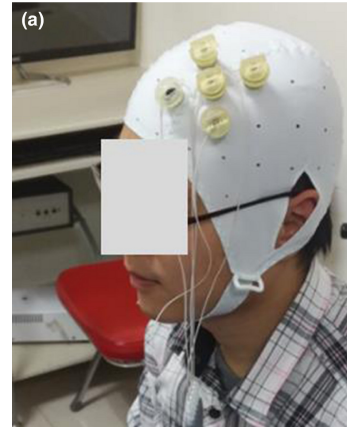Gray et al. (2019)
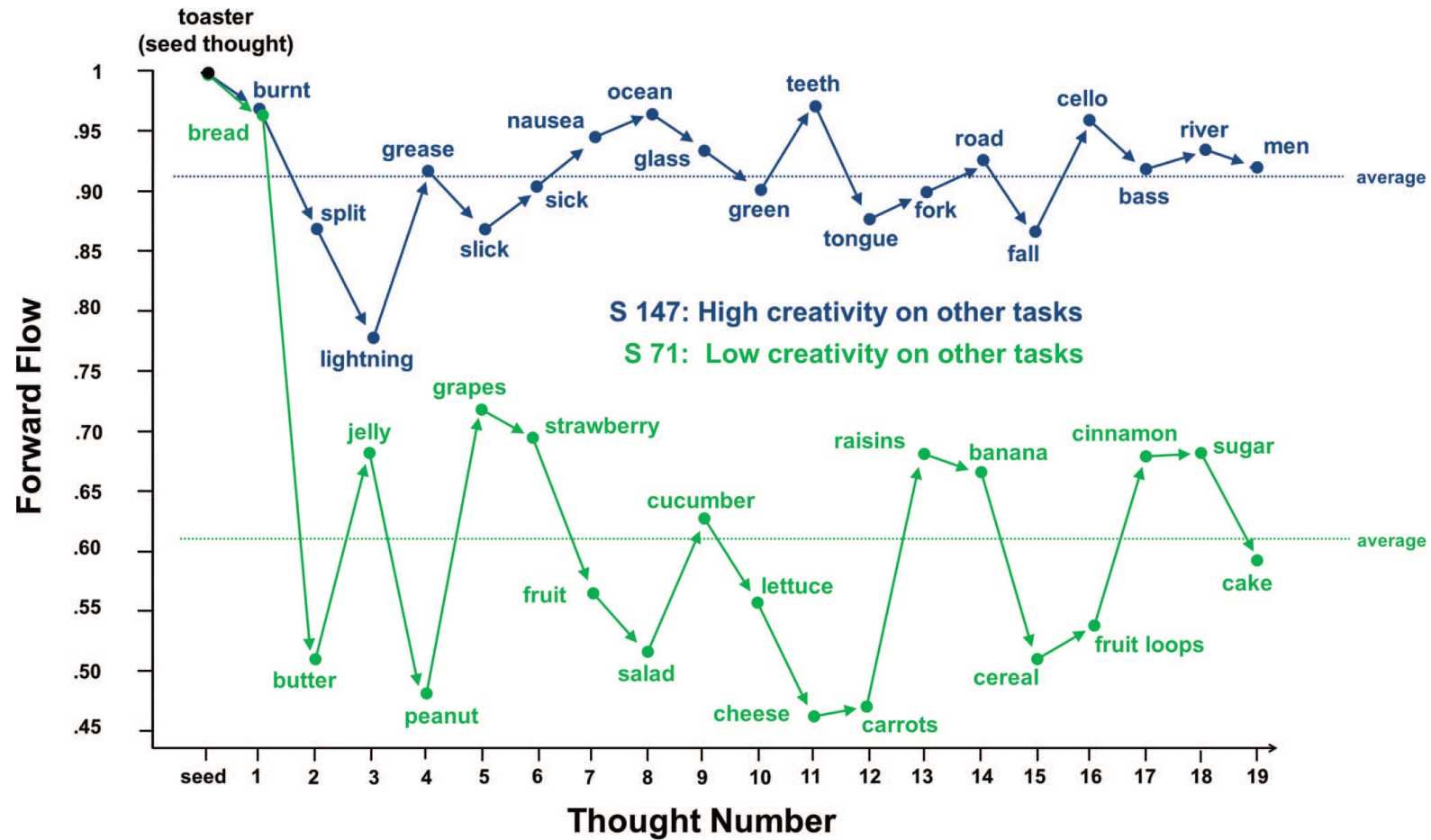
High-Definition Anodal Transcranial Direct Current Stimulation (tDCS)

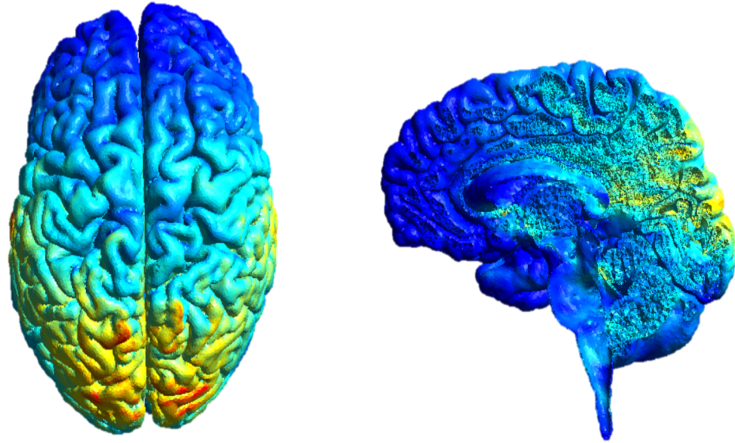Computer-Based Experiment
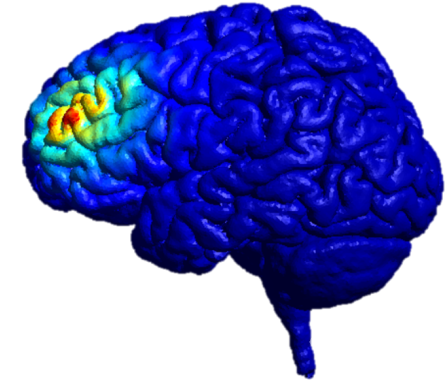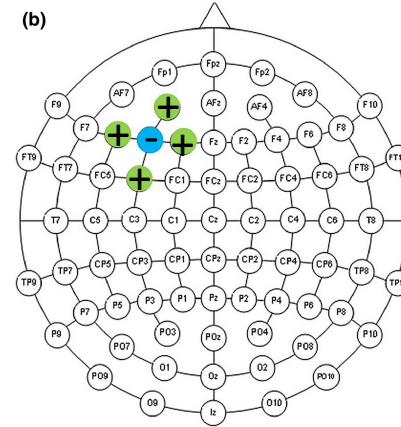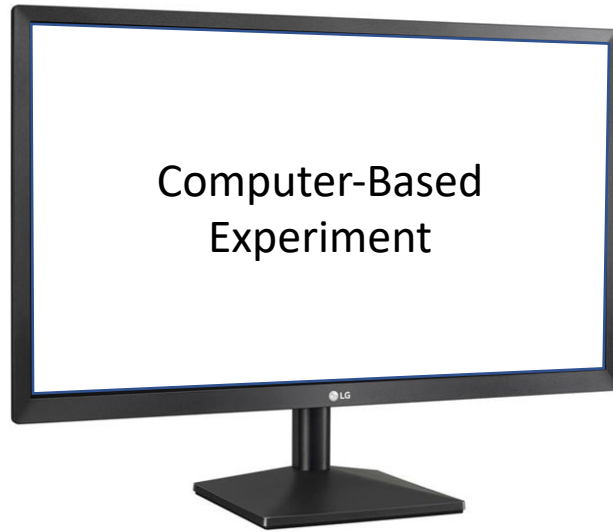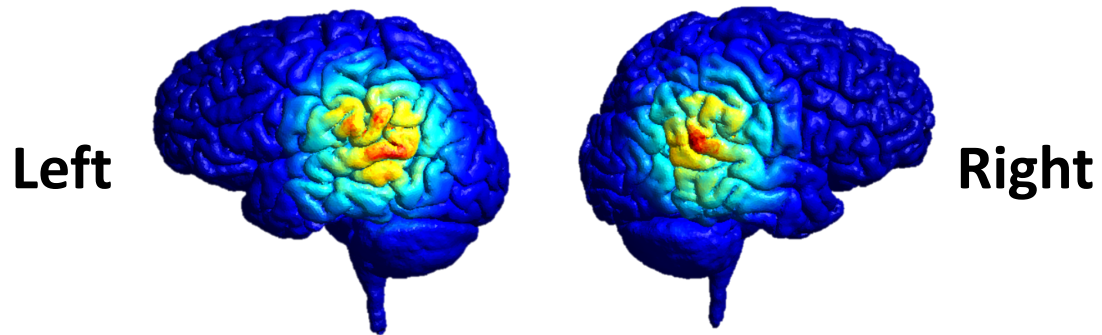
Datta et al (2009)
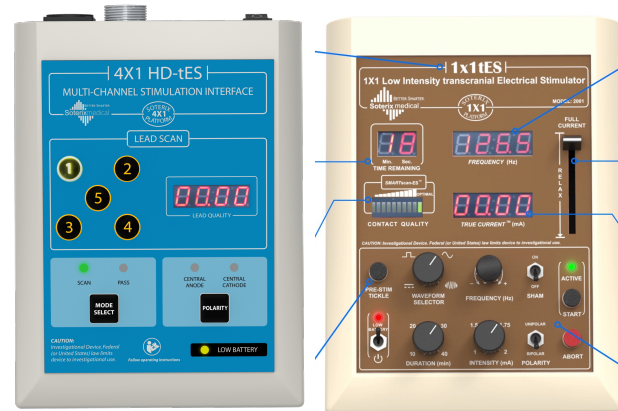
Default Mode Network

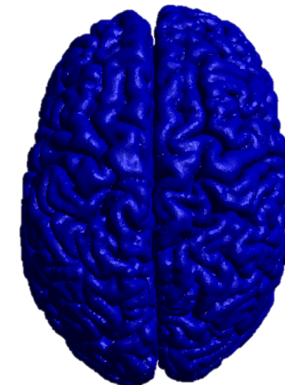## Posterior Cingulate Cortex (PCC)

Angular Gyrus (AG)

Left

Right

Executive Control Network

Dorsolateral Prefrontal Cortex (DLPFC)
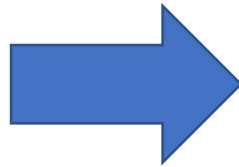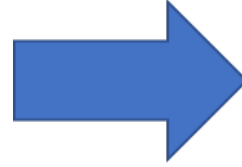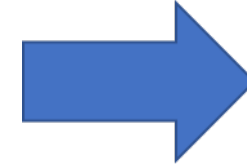
Left

Right
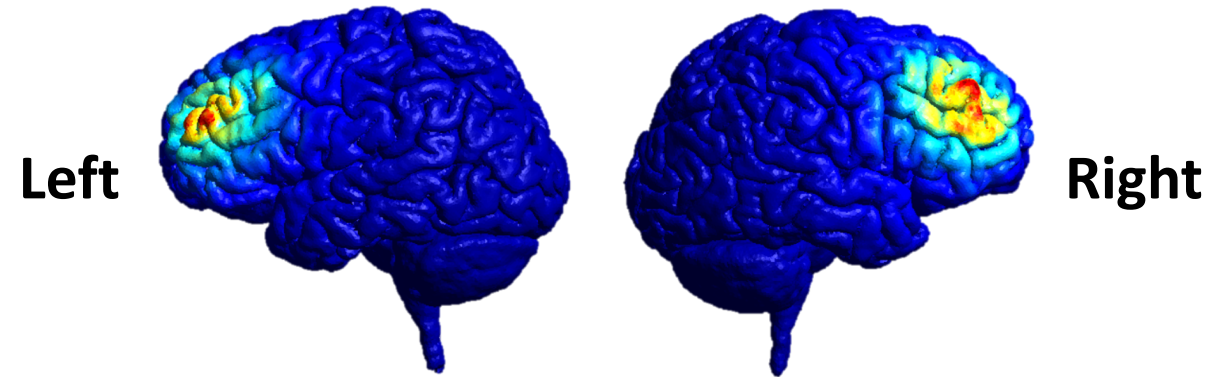
Sham

Study Design

1. Consent
2. Eligibility
3. Baseline Cognitive Measures

→

Assigned to tDCS condition and outfitted with electrodes

→

1. 20 min Anodal HD-tDCS or Sham
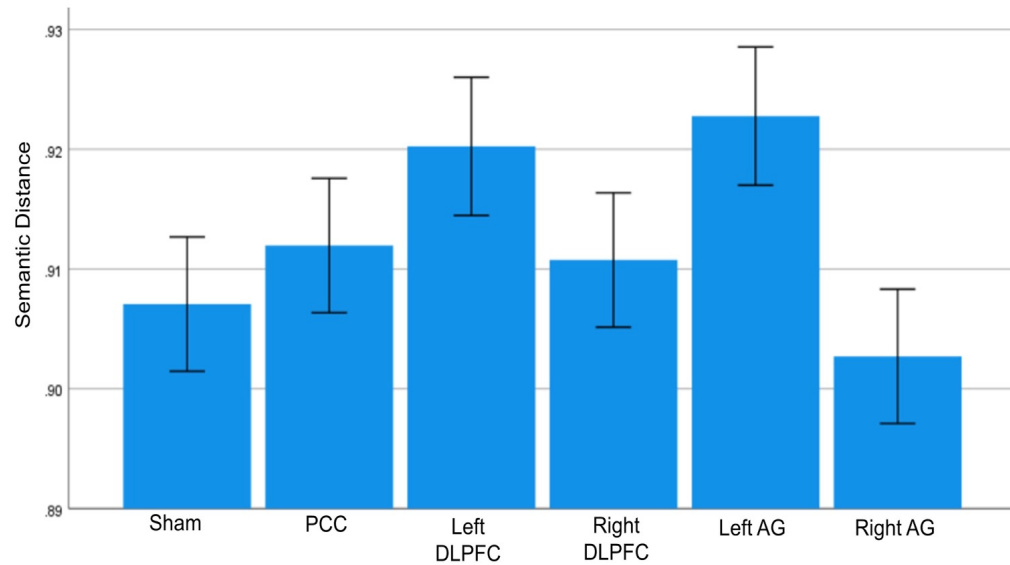2. participants complete the AUT and Forward Flow

→

1. AUT: calculated fluency, semantic distance and rated creativity
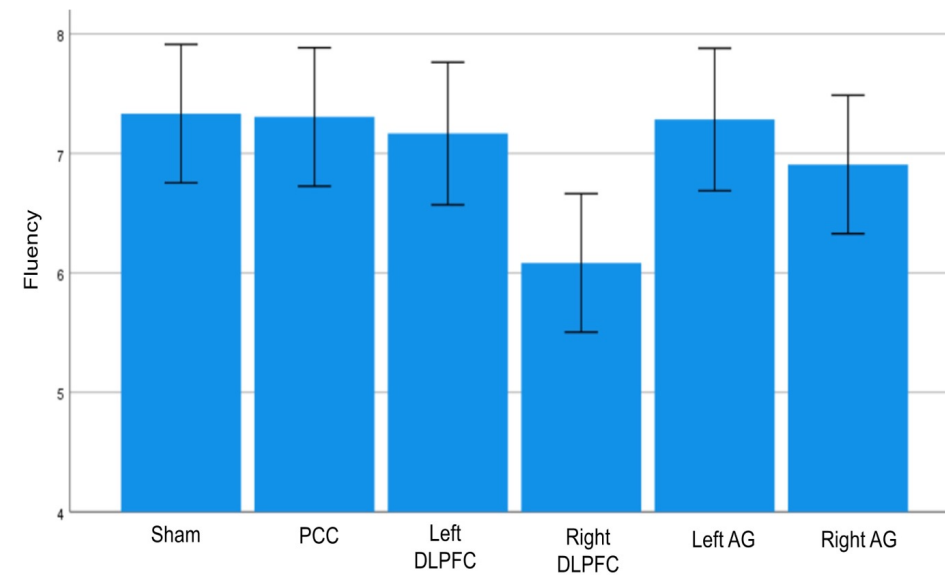2. Forward Flow: calculate Average Semantic Distance

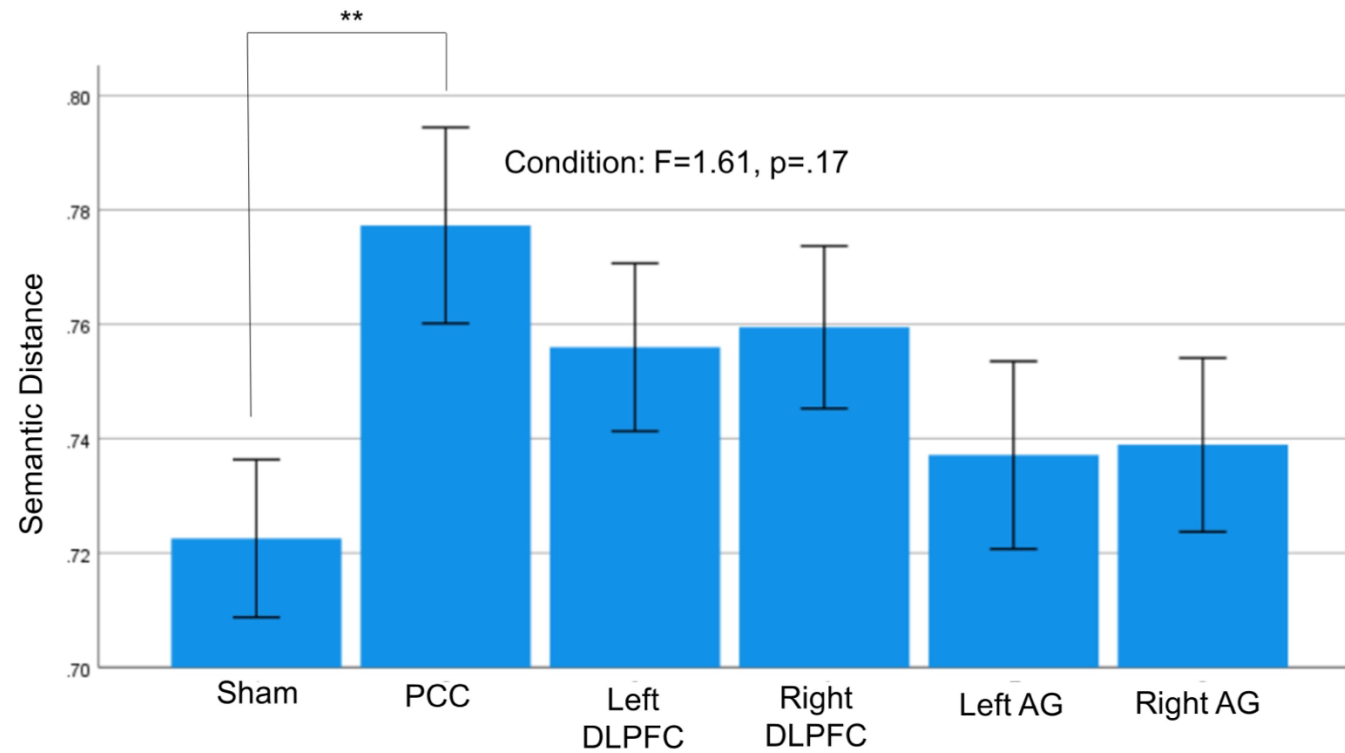# Results – Alternative Uses Task (AUT)

Cue to Response Semantic Distance

Response Fluency

Results – Forward Flow

Average Semantic Distance

Future Directions

- Collect human rated creativity scores for AUT

- Replicate study with larger sample size

- Use tACS which was recently show to stimulate connectivity in DMN

- Measure EEG during stimulation to show that changes in neural correlates mediate changes in creativity

Thank you

- Dr. Robert Morrison
- Dr. Rob Cortes (Georgetown)
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- Dr. Adam Green (Georgetown)
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- CURA Scholars