Question Asked 14th Oct, 2017

Federico Zilio
University of Padova

Is there any difference between "Resting state", "Spontaneous activity" and "Default mode network"?
Is there any difference between "**Resting state**", "**Spontaneous activity of the brain**" and "**Default mode network**"?

Neuroscience | Neuroimaging | Neurourology | Brain | Resting State fMRI

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Most recent answer

Federico Zilio
University of Padova

19th Oct, 2017

Thank you so much, Peter!

Best,

Federico

Cite

Popular answers (1)

Michael Peer
University of Pennsylvania

15th Oct, 2017

Dear Frederico,

"Resting state" is basically the state of not doing any specified task and not seeing any experimental stimuli. This is in contrast to most neuroscience experiments where the participant perceives stimuli or responds to them.

"Spontaneous activity" (also sometimes called "intrinsic activity") is the brain's activity which is not related to external factors/stimuli or to responses to them. When the participant is at resting-state, all of the activity you see using neuroimaging is "spontaneous activity". This term is also sometimes used during experimental tasks where you can separate activity that is related to the stimuli from "background" activity which is not related to the stimuli, and is therefore spontaneous/intrinsic.

The "default mode network" is a specific set of brain regions (usually including the angular gyrus, posterior cingulate cortex/precuneus, and medial prefrontal cortex) which have coordinated activity during both resting-state and task performance. This network is thought to deal with introspection, memory and other "inner" processes, in contrast to other regions responding to the environment and what happens in it. So when giving a stimulus to a subject that he/she has to respond to, the default-mode network will usually be less active, compared to during the resting-state. The default-mode network is one of the so-called "resting-state networks", along with many other sets of different regions (the visual network, the sensorimotor network, the dorsal attention network, and others).

I hope this helps,

cheers

Michael

Cite 13 Recommendations

Top contributors to discussions in this field

Vahid Rakhshan

Michael Peer
University of Pennsylvania

Vladimir A. Kulchitsky
National Academy of Sciences of Belarus

Leyla Tekul
University of British Columbia - Vancouver

Subir Bandyopadhyay
Botanical Survey of India

All Answers (4)

Michael Peer
University of Pennsylvania

15th Oct, 2017

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I hope this helps,

cheers

Michael

Cite 13 Recommendations

Federico Zilio
University of Padova
15th Oct, 2017

Dear Michael,

Thank you for the very detailed answer! Now it's clear to me.

Can you recommend me an handbook where I can find these and other information about RS, spontaneous activity and DMN?

Thank you so much.

Best,

Federico

Cite 1 Recommendation

Peter König
Universität Osnabrück
19th Oct, 2017

Dear Federico,

http://www.pnas.org/content/102/27/9673.full is a seminal paper introducing these concepts.

http://www.annualreviews.org/doi/abs/10.1146/annurev-neuro-071013-014030?journalCode=neuro is a more recent review.

Best, Peter

Cite 2 Recommendations

Federico Zilio
University of Padova
19th Oct, 2017

Thank you so much, Peter!

Best,

Federico

Cite

Similar questions and discussions

BIOPAC EMG Analysis: Does the raw EMG signal need to be filtered before deriving the RMS using BIOPAC software?

New question Be the first to answer

Asked 11th May, 2023

Robert W. Smith

I currently use the BIOPAC MP150 DAQ system to collect the raw surface EMG data during isometric forearm flexion muscle actions. My question pertains to how BIOPAC derives the RMS from the raw EMG signal. Specifically, does the raw EMG signal need to be filtered (bandpass), and then I select the derive RMS function or does BIOPAC have a filter (bandpass) built into the derive RMS function?

Typically, we collect the raw EMG signal with the BIOPAC DAQ system and filter/process the data offline using Labview software. However, I would like to see if I can do the filtering/processing with just the BIOPAC DAQ system. Any insight or help would be appreciated.

View

Twitch interpolation technique with two legs?

Question 5 answers

Asked 18th Nov, 2022

Sanghoon Yoon

Hello,

I would like to compare the neuromuscular function of the contralateral legs via twitch interpolation technique at the same time. Since the exercise will be performed with two legs concurrently, I would like to keep the time between cessation of exercise and neuromuscular function test to be the same between

the legs.

Are there any studies that have done this? Do you foresee a significant caveat?

View

Cognitive vs. motor tasks - where does this distinction come from?

Discussion 7 replies

Asked 20th Oct, 2022

Cornelia Frank

Guten Tag allerseits, hello everyone,

in search of an answer I decided to post my question in this forum and hope to gather lots of different thoughts:

I've been wondering about the origin of the cognitive vs. motor tasks distinction - historically, what are the roots of separating so-called 'cognitive' from 'motor' tasks? Who was the first to talk about it? Which disciplines used this separation for their research?

(I have some answers in my mind, that I will add later in the discussion; don't want to direct readers' thoughts already.)

Looking forward to reading your ideas - and: warm thanks for contributing to this question

Cornelia

View

Is there a validated stroop task app for smartphones (Apple/Android)?

Question 2 answers

Asked 3rd Aug, 2022

Thomas Romeas

I am looking for a Stroop task app that can work on both Apple and Android smartphones for a research experiment. Found the encephal app (https://encephalapp.com/) but validation is limited and the test itself presents some limitations in comparison to what is typically used in the litterature (e.g. only 3 colors, blocks of 4 trials, inhibition function only, etc.). I would also like to have access to both the inhibition and switching modes. Didn't find anything on Github either. Data workflow also need to be secured. Should I consider progamming it?

Thanks!

Thomas

View

Physiological Data Acquisition: BioPac or . Powerlabs?

Discussion 4 replies

Asked 6th May, 2022

Wynn Thein

Hello researchers,

I am trying to collect the physiological data (especially ECG, respiratory rate, skin temperature, and skin conductance) together with EEG recording. Our EEG system is 256-channel EGI (electric geodesics Inc.).

I am trying to get the data acquisition hardware systems (mostly BioPac MP150 and PowerLabs).

I will send physiological data recording from BioPac or Powerlabs to the EEG device via TTL (transister to transister logic) signal.

Some of the researchers said TTL signal from BioPac is more stable than PowerLabs.

Can I know which hardware system you are using in your lab for those physiological data recordings.

Best regards,

View

Can One Include Covariates in a Kruskal-Wallis Rank Sum Test?

Question 7 answers

Asked 17th Nov, 2021

Connor Esterwood

I've got a non-normally distributed set of data and would like to run a non-parametric version of an ANCOVA. I've found some good support for using a Kruskal-Wallis for this purpose with a post-hoc Dunn test. The issue I'm running into is if I can add in a covariate and if so, how.

For context, I'm using R and the data looks like the attached sheet.

View

Dear Authors. Please who can give me an information aboutEuropean Society of Medicine, with thanks

Discussion 45 replies

Asked 26th Oct, 2021

Rafi Al-Ani

European Society of Medicine invited me to particitate My article in their conference

View

About the Systematic Review - where do you publish you review protocol

Discussion 10 replies

Asked 21st Jun, 2021

Sandra Invernizzi

Hello everyone,

among the different existing possibilities, what is the best approach for the prior publication of a protocol in order to carry out a systematic review of the literature? Cochrane? Prospero? OSF ? Many possibilities exist and it is sometimes tricky to make a choice.

In advance, thank you for your help.

View

Related Publications

Corrigendum to “Resting-state fMRI correlations: From link-wise unreliability to whole brain stability” [NeuroImage 157 (2017 Aug 15) 250–262]

Article

Dec 2017

Mario Pannunzi · Rikkert Hindriks · Ruggero G. Bettinardi · [...] · Gustavo Deco

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Significance tests for Leave-One-Out Inter-Subject Correlations in fMRI

Preprint Full-text available

Jul 2020

Lorenzo De Angelis · Valeria Gazzola · Christian Keysers

The inter-subject correlation of fMRI data of different subjects performing the same fMRI task (ISC) is in principle a powerful way to localize and differentiate neural processes caused by a presented stimulus from those that spontaneously or idiosyncratically take place in each subject. The wider adoption of this method has however been impeded by...

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Informatics and Data Mining Tools and Strategies for the Human Connectome Project

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Jun 2011

Daniel Marcus · John Harwell · Timothy Olsen · [...] · David Van Essen

The Human Connectome Project (HCP) is a major endeavor that will acquire and analyze connectivity data plus other neuroimaging, behavioral, and genetic data from 1,200 healthy adults. It will serve as a key resource for the neuroscience research community, enabling discoveries of how the brain is wired and how it functions in different individuals....

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