S2: Questionnaire

Thank you for participating in the survey regarding the evaluation of the novel virtual reality brain connectivity visualization. Please answer the following questions:

Do you have any experience with virtual reality (VR)?

Yes ☐ No ☐

What is your scientific background? (multiple answers allowed):

Psychology ☐

Neuroscience ☐

Statistics ☐

Brain Connectivity ☐

Data Visualization ☐

Other ☐

Please rate the extent to which you agree/disagree with the following statements by marking one of the options with a cross. Certain components of the application are marked and numerated in the survey. They can be identified with the additional images provided.

Questions for participants with a related neuropsychological background are marked with an asterix **(*)**.

General		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
1	I liked the overall experience.					
2*	The VR visualization motivated me to analyze and explore the data further.					
3*	The visualization is not suited for analyzing effective connectivity data in a professional context.					

Comparison to non-VR Time-Frequency-OD-Matrix[9]		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
4	Identifying the spatial context of a connectivity after seeing an interesting color-value is easier in the VR visualization.					
5*	Time-Frequency-OD-Matrix shows the information in more temporal detail.					
6*	The new application gives a better complete overview of the data.					
7*	I felt less motivated to keep exploring the data than with the Time-Frequency-OD-Matrix.					

The following questions are regarding the **main graph[1]** of the application. This includes the two brain disks and the edges (tubes) itself, not the time-pick-layer and the 2d graph.

Main Graph[1]		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
8	I could distinguish well between the edges.					
9	It was difficult to determine the origin and destination electrodes of an edge when seeing **a few edges** (approximately below 20, without 2D graph).					
10	It was easy to determine the origin and destination electrodes of an edge when seeing **many edges** (approximately above 50, without 2d graph).					
11	I could distinguish between left and right hemisphere.					
12*	The color scheme of the edges represents the connectivity values well.					

The **time-pick-layer[2]** is the movable layer between the brain disks.

Time-Pick-Layer[2]		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
13	It feels intuitive to grab and move the time-pick-layer.					
14	I can precisely move the time-pick-layer to a certain point in time					
15	I fully understand the meaning/purpose of the time-pick-layer and the effect it has on the other views.					
16	I did not feel encouraged to make use of the time-pick-layer.					

The **2D graph[3]** is positioned above the time-pick-layer and shows a 2D representation of the connectivities at a certain point in time.

2D Graph[3]		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
17	I find the 2D graph useful.					
18	The 2D graph improves identifying the spatial relations of the connectivities.					

Heatmap Panel[4]		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
19	The heatmap panel is positioned well.					
20*	I like the selection-dependent **One-Electrode-Heatmap[5]**					
21*	Seeing the full **Time-Frequency-Heatmap[8]** for a single selected edge is not useful.					
22*	The **OD-Matrix-All-Frequencies[6]** is well-suited for the exploration of multiple frequencies.					
23*	The **OD-Matrix-One-Frequency[7]** is unnecessary.					

System Usability		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
24	I think that I would like to use this system frequently.					
25	I found the system unnecessarily complex.					
26	I thought the system was easy to use.					
27	I think that I would need the support of a technical person to be able to use this system.					
28	I found the various functions in this system were well integrated.					
29	I thought there was too much inconsistency in this system.					
30	I would imagine that most people would learn to use this system very quickly.					
31	I found the system very cumbersome to use.					
32	I felt very confident using the system.					
33	I needed to learn a lot of things before I could get going with this system.					

Please answer the following questions in written form:

36) How do you like the positioning of the components of the application (Heatmap Panel, 2D Graph, elements on the panel, etc.)? What would you position differently?

37) Do you use other visualization forms to analyze and explore effective brain connectivities? If yes, what are advantages/disadvantages compared to the new VR visualization.

38) What are your general thoughts on this new Visualization? Do you have ideas for improvement, etc.?