

Miri Leaning In vs. Zoning Out EEG

Model, Brain activity - Miri

Rope, EEG – [REDACTED]

3 May 2023

[REDACTED], Sweden

Miri Leaning In vs. Zoning Out EEG	1
What we did.....	2
How to read the report.....	3
Raw EEG	4
Diagnostics	5
EEG Channel Quality	6
Movement.....	7
One Channel EEG	8
Right Frontal Electrode Time Frequency	9
Condition Averages	10
All bands, all conditions	11
Condition Average 1 - Rest (std units)	12
Condition Average 2 – Lean In / Tune In / Be Present (std units).....	13
Condition Average 3 – Zoom out / Zone Out (std units).....	14
Condition Average 4 – Be Alone while Leaning In (std units)	15
Condition Average 5 – Untie while Leaning In (std units).....	16
Condition Average 6 – Be Alone while Zoomed Out (std units)	17
Condition Average 7 – Untie while Zoomed Out (std units).....	18
Interpretation	19

What we did

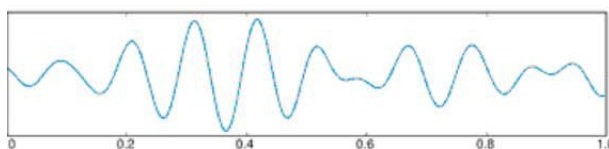
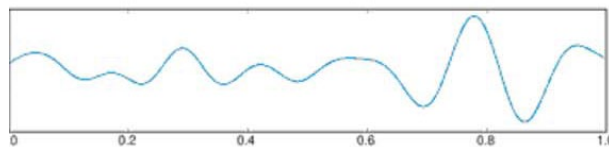
Tuesday, we tied, and found that Miri often “zoomed out” or “zoned out” to a feel-good place during rope, during which she was less reactive and more comfortable, particularly during less painful/violent ties. When asked to “stay present” or “leaned in” during rope, she was more reactive. When left alone, she specifically tended to zone out.

Wednesday we replicated this effect with a 30-minute tying session consisting of a distinct segments, acquired while Miri wore a 14-electrode wireless EEG rig. Design segments consisted of:

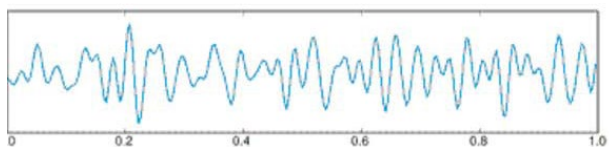
- **0-2 minutes - Rest**
- Tying with the instructions to remain “leaned in” the entire time
 - **2-9 minutes - Lean In** – tying a variant of a box tie (here, with one hand behind back, one tied to her throat)
 - **9-11 minutes - Alone Time Leaned In**
 - **11-15 minutes Untie Leaned in**
- **15-16 minutes - Rest**
- Tying with the instructions to “Zoom out” whenever she felt like it
 - **16-23 minutes - Zone out**
 - **23-25 minutes - Alone Time Zoned Out**
 - **25-29 minutes - Untie Zoned Out**
- **29-30 minutes - Rest**



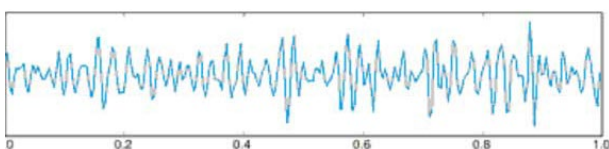
We processed the data to frequency bands with the following rough interpretation:



Lack of cognitive activity /
Idling, Relaxed state



Cognitive Processing
Attention



Arousal (including
sexual)
Thinking
Dopamine

How to read the report

The following report summarizes EEG data.

Figures:

The first figure (Raw EEG) shows the raw data as it was acquired, with minimal preprocessing.

The next two figures (Diagnostics, EEG Channel Quality, Movement) give channel information that should let you know whether you want to trust what comes after. The Movement figure, in particular, shows how much the person moved over time, where the red line shows transitions between conditions. In the last panel, if the EEG is strongly correlated with movement, you may think twice about interpreting the EEG.

The remaining figures summarize the data.

The Condition Averages slide shows the average EEG response for each condition for each electrode. Any conditions that stand out may be particularly interesting.

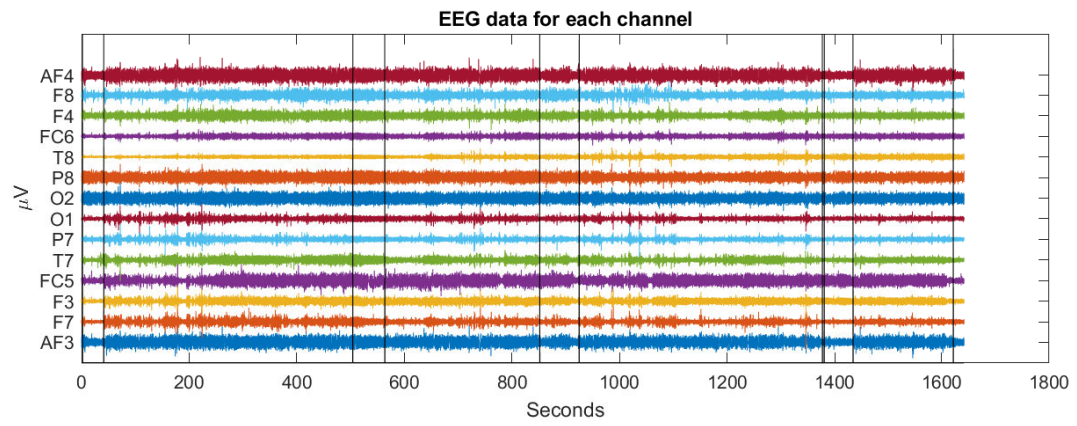
The Time Frequency plot breaks this down further for one electrode in the front of the head, with hot colors (yellow, white) representing high levels of activity at a given frequency band. Here Theta occurs in the 4-7 Hz range, alpha in 8-12 Hz, beta at 15-25 Hz, and we interpret gamma as occurring between 30 and 45 Hz. The data is filtered and should not be interpreted above 45 Hz.

The remaining plots show average activity in each frequency band of interest for each condition in units of standard deviations across conditions and electrodes. Colors that are more towards red are more active with respect to a pre-condition-onset baseline. Colors that are more towards blue are less active.

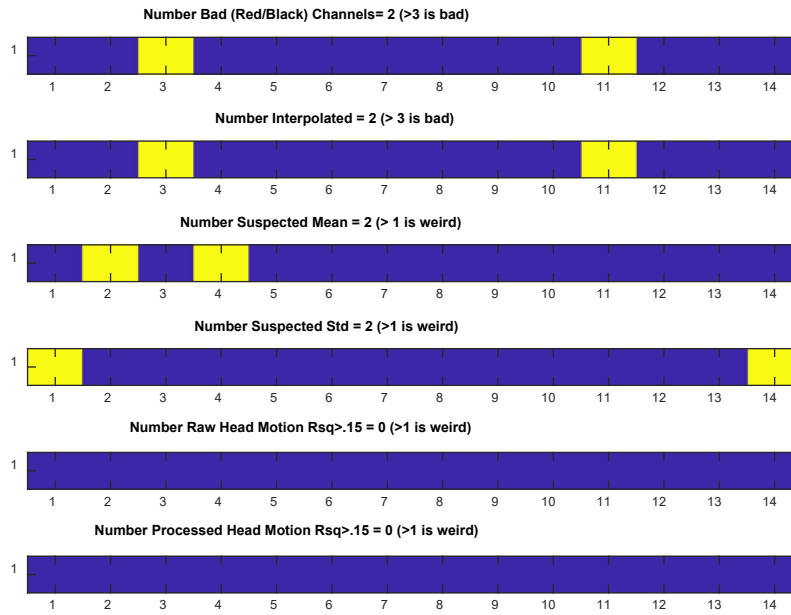
Author: This report has been prepared by [REDACTED].

COPYRIGHT AND LIABILITY: This report copyright (c) 2023, [REDACTED]. Permission to use this report is granted subject to the following restrictions and understandings: 1) There is no warrantee or statement that this report will be error free. The author is under no obligation to provide any services by way of maintenance, update or otherwise. 2) Any user of such report agrees to indemnify and hold harmless the author from all claims arising out of the use of this report or arising out of any accident, injury or damage and from all costs, counsel fees, and liabilities incurred in or about any such claim, action, or proceeding brought thereon. 3) Users are requested but not required to inform [REDACTED] of noteworthy uses of this software. [REDACTED] can be contacted at [REDACTED].

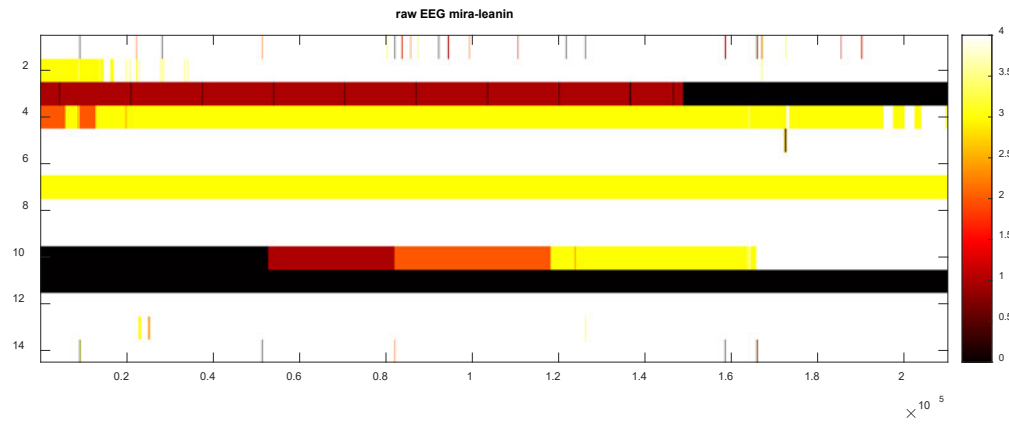
Raw EEG



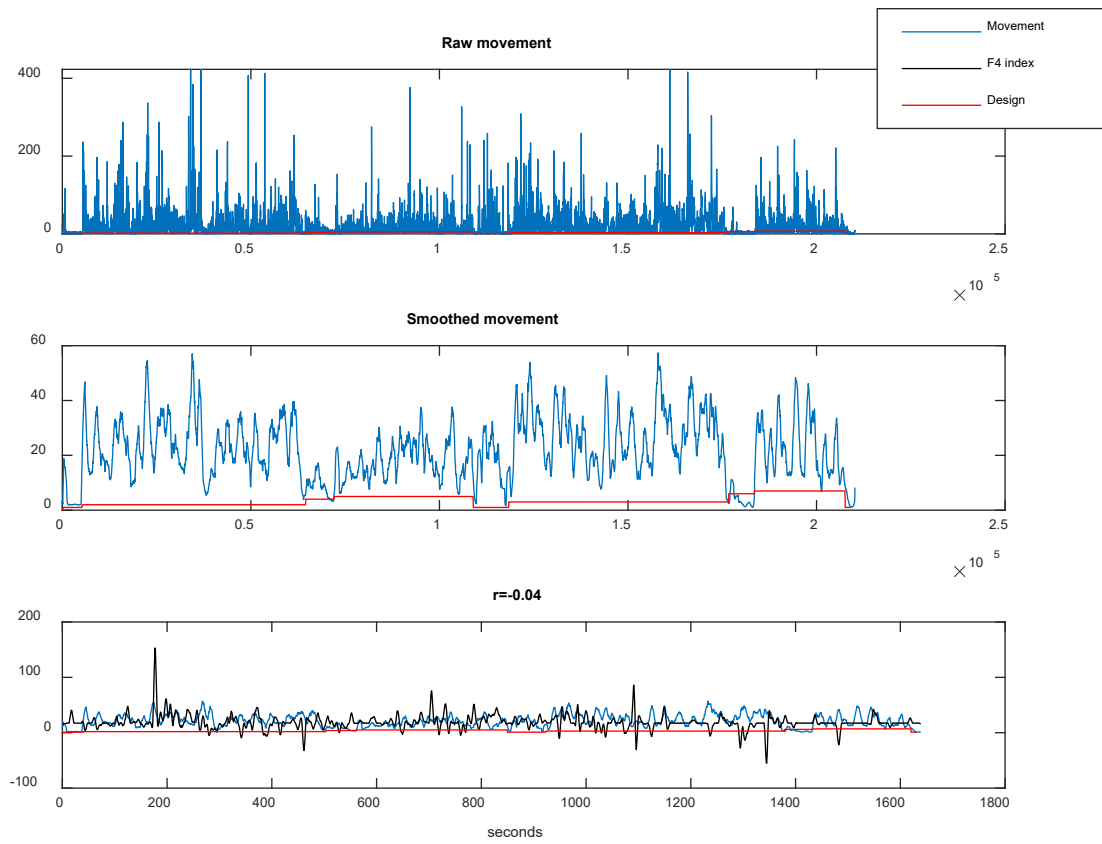
Diagnostics



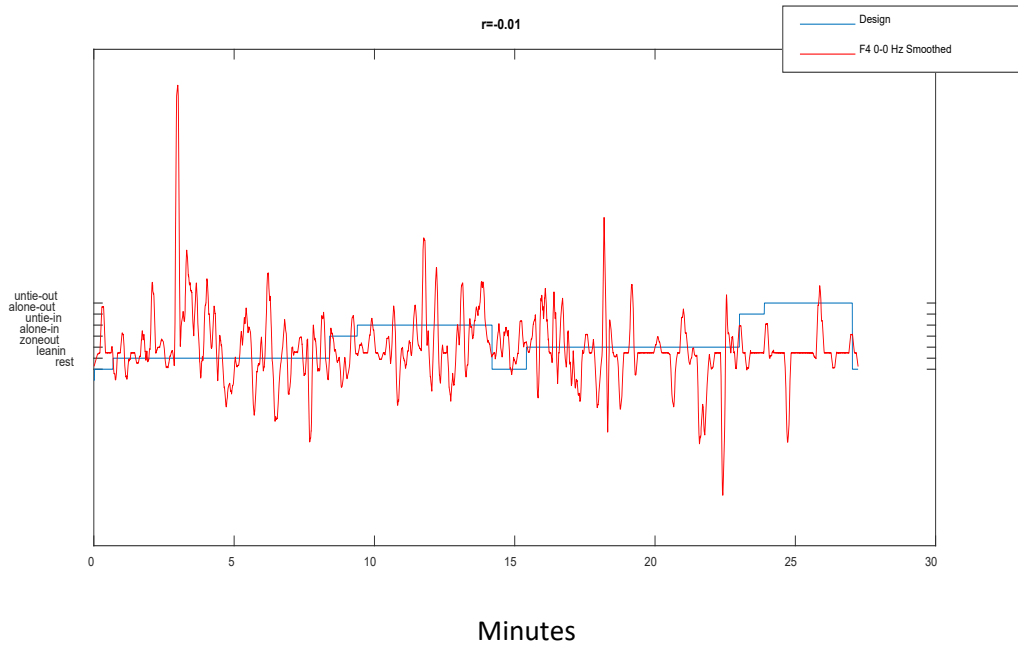
EEG Channel Quality



Movement

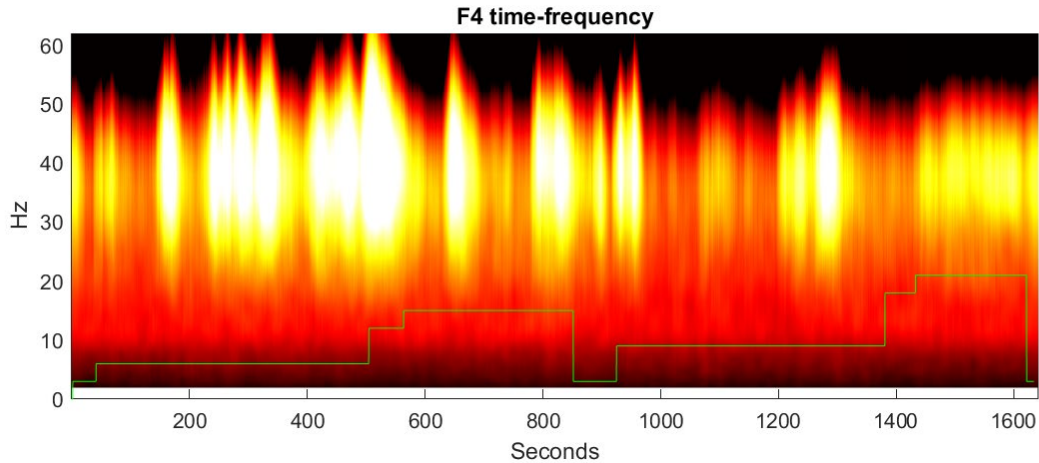


One Channel EEG



The blue line represents the design with the Y-axis labels showing what was happening at each time point. The red line represents activity at a right frontal electrode

Right Frontal Electrode Time Frequency



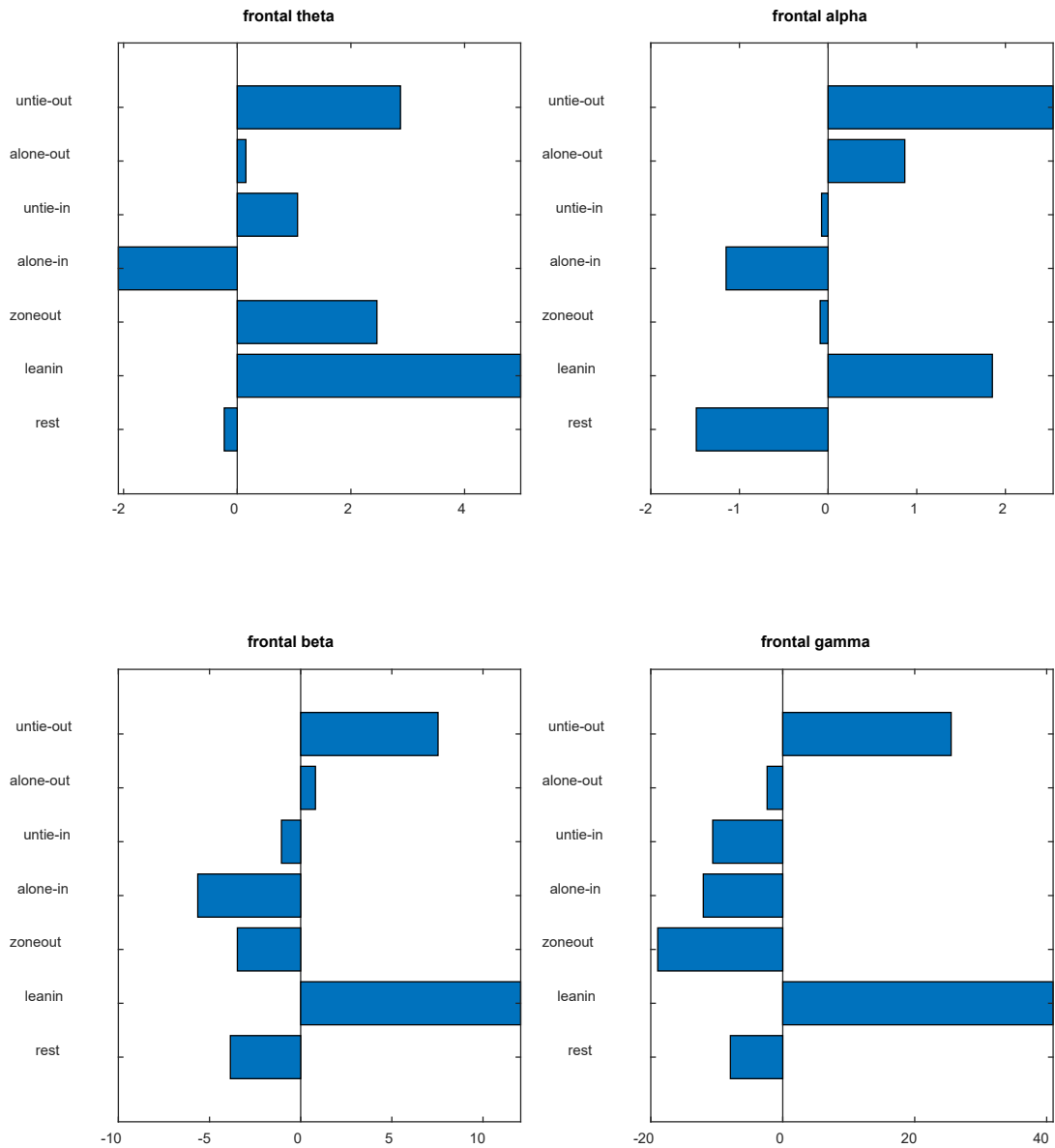
The green line represents the design segments:

- **0-2 minutes - Rest**
- Tying with the instructions to remain “leaned in” the entire time
 - **2-9 minutes - Lean In** – tying a variant of a box tie (here, with one hand behind back, one tied to her throat)
 - **9-11 minutes - Alone Time Leaned In**
 - **11-15 minutes Untie Leaned in**
- **15-16 minutes - Rest**
- Tying with the instructions to “Zoom out” whenever she felt like it
 - **16-23 minutes - Zone out**
 - **23-25 minutes - Alone Time Zoned Out**
 - **25-29 minutes - Untie Zoned Out**
- **29-30 minutes - Rest**

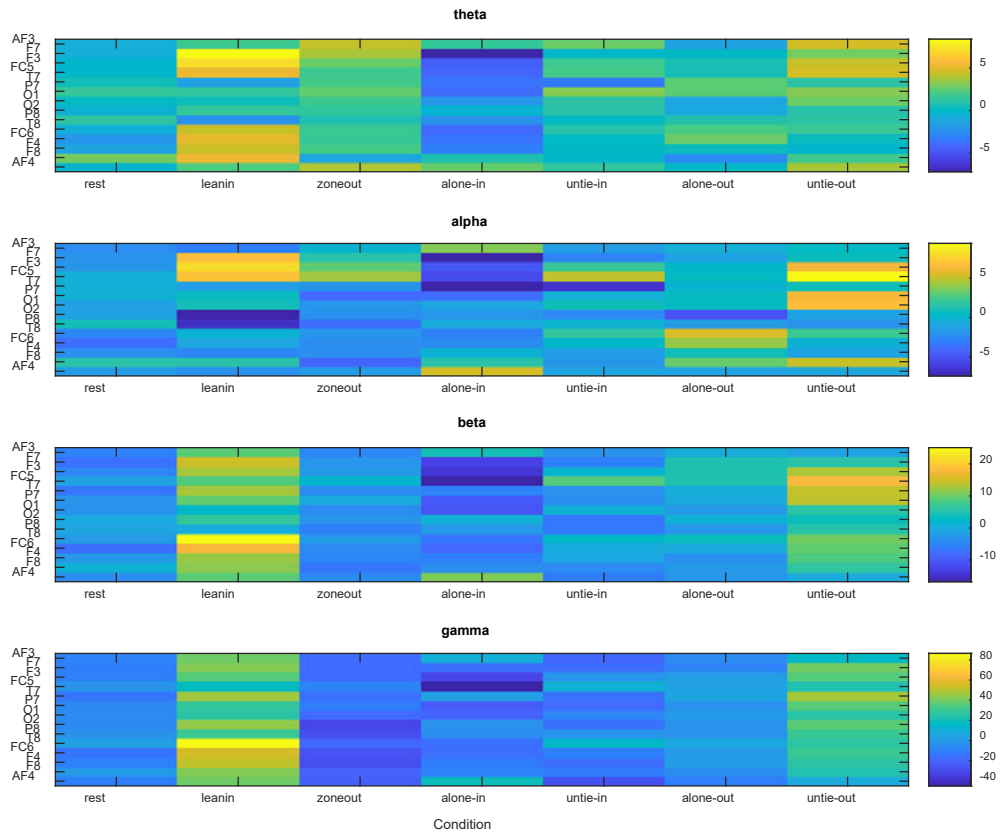
The plot shows hot colors (yellow, white) representing high levels of activity at a given frequency band. Here

- **Theta** occurs in the 4-7 Hz range,
- **Alpha** in 8-12 Hz,
- **Beta** at 15-25 Hz,
- We interpret **Gamma** as occurring between 30 and 45 Hz. The data is filtered and should not be interpreted above 45 Hz.

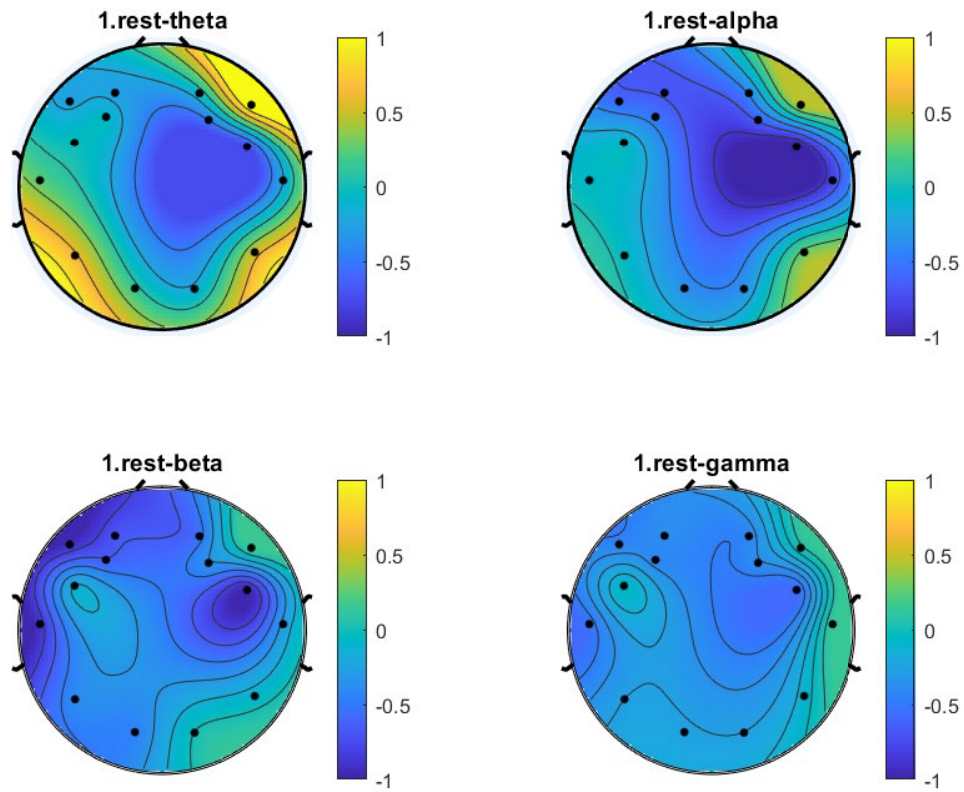
Condition Averages



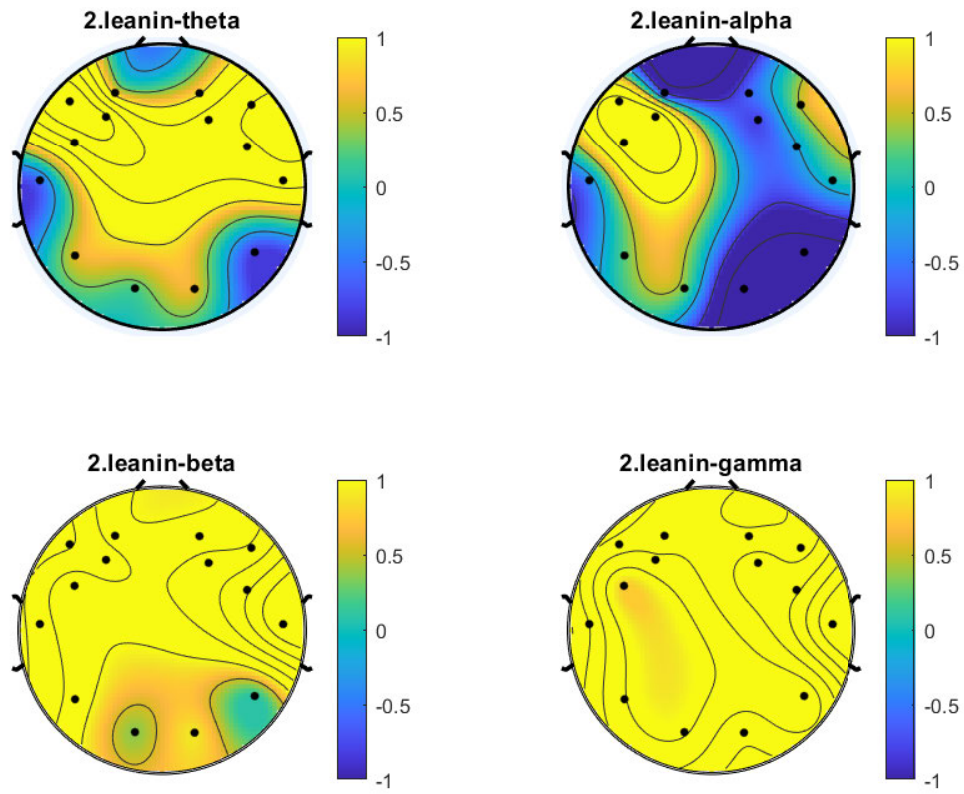
All bands, all conditions



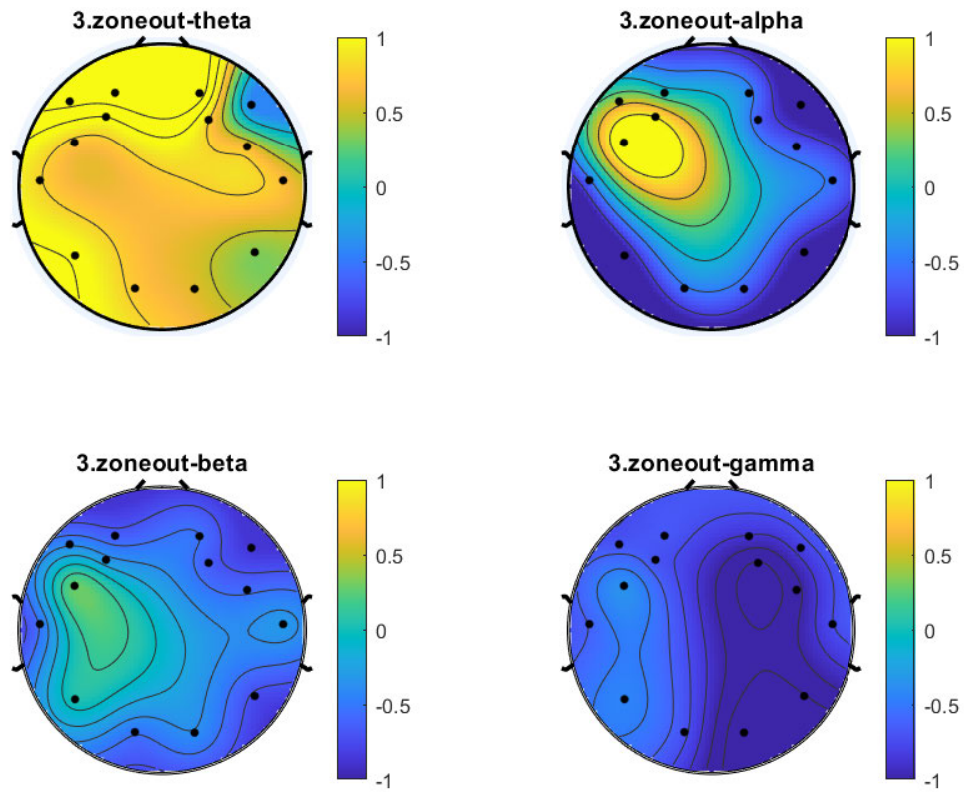
Condition Average 1 - Rest (std units)



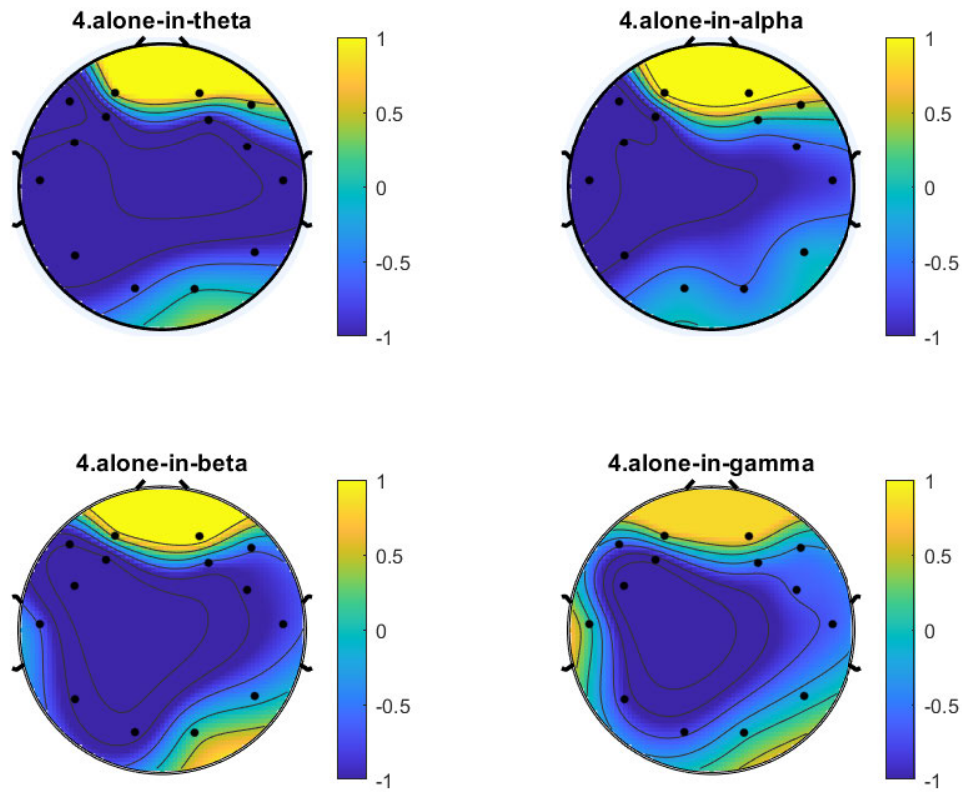
Condition Average 2 – Lean In / Tune In / Be Present (std units)



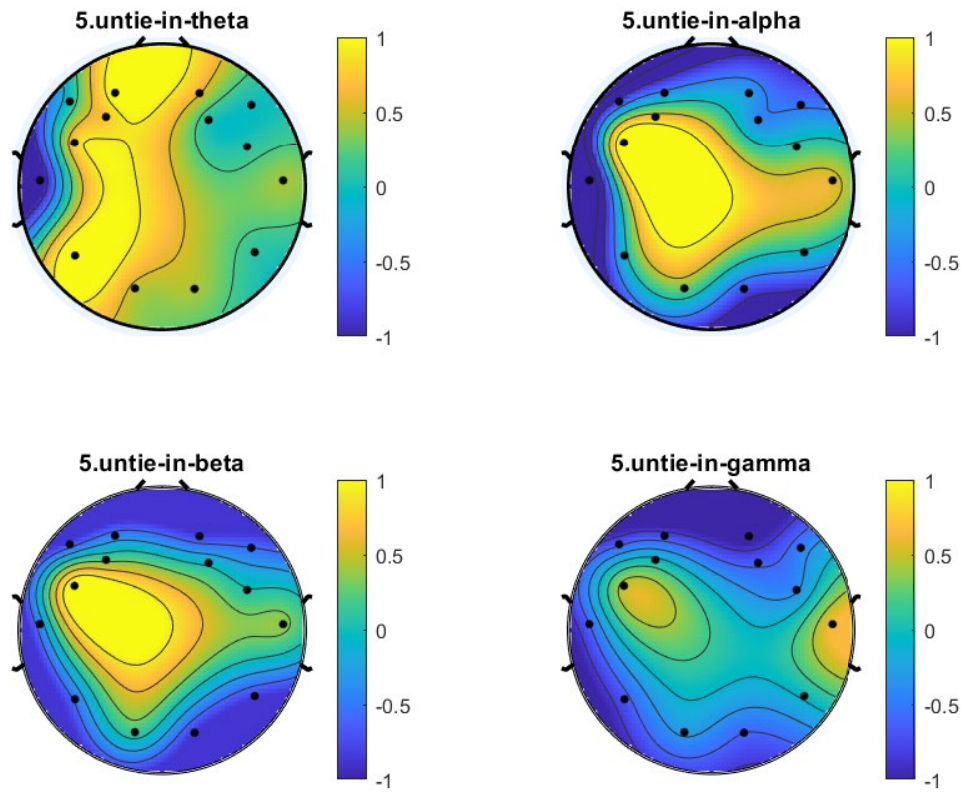
Condition Average 3 – Zoom out / Zone Out (std units)



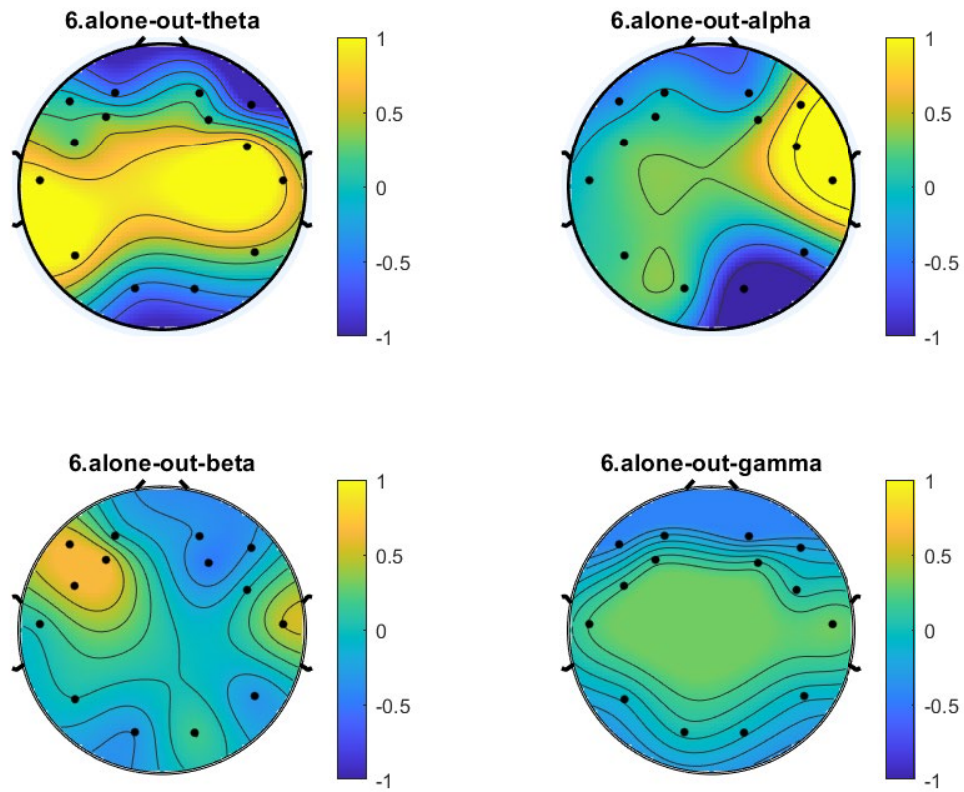
Condition Average 4 – Be Alone while Leaning In (std units)



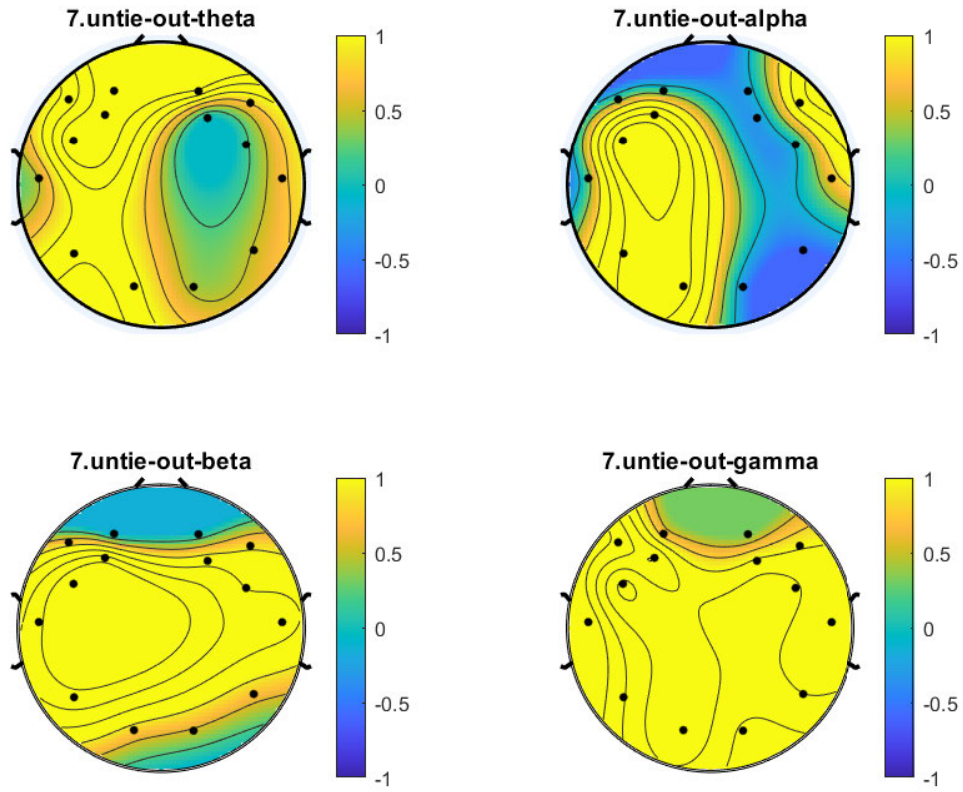
Condition Average 5 – Untie while Leaning In (std units)



Condition Average 6 – Be Alone while Zoomed Out (std units)



Condition Average 7 – Untie while Zoomed Out (std units)



Interpretation

The data suggest that during tying, Miri is often in a theta-rich (trancy) state. When asked to remain present, she also brings on-line a great deal of gamma-band reactivity, consistent with higher arousal, engagement, and cognitive / emotional processing of the tie.

When asked to remain alone, without being touched, but stay present, this is a predominantly frontal (cognitive) process. When asked to remain alone but allowed to zone out, she goes to an entirely trancy (theta-throughout the head) state.

During untying, Miri is largely trancy, with predominantly theta-band activity. When allowed to zoom out, she adds gamma band activity, potentially due to anticipation of her “happy time” being over – what she describes as a “grief” reaction.