Trial #85 — Recognition Potential Analysis

OK

Subject AF • recorded 08/15/2025 00:59 • dataset Celebrities

Stimuli 1001 images: 138 clear, 863 scrambled • 105 keypresses (83 matched to clear images, median RT 566 ms)

EDF file af_20250815_005909.edf

Alignment photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 9574 ms (EDF header would give -9000 ms); 880/1001 images matched; drift -27 ppm; jitter 15.7 ms

Electrodes noise after filtering — O1 14 µV ✓, O2 13 µV ✓, T5 14 µV ✓, T6 14 µV ✓, P3 2501 µV, P4 2696 µV, Pz 2473 µV, Cz 15 µV ✓ (✓ = used, threshold 50 µV)

Processing 60 Hz notch, 0.5–15 Hz bandpass, epochs -200 to 800 ms, baseline -200 to 0 ms, reject > 100 µV peak-to-peak

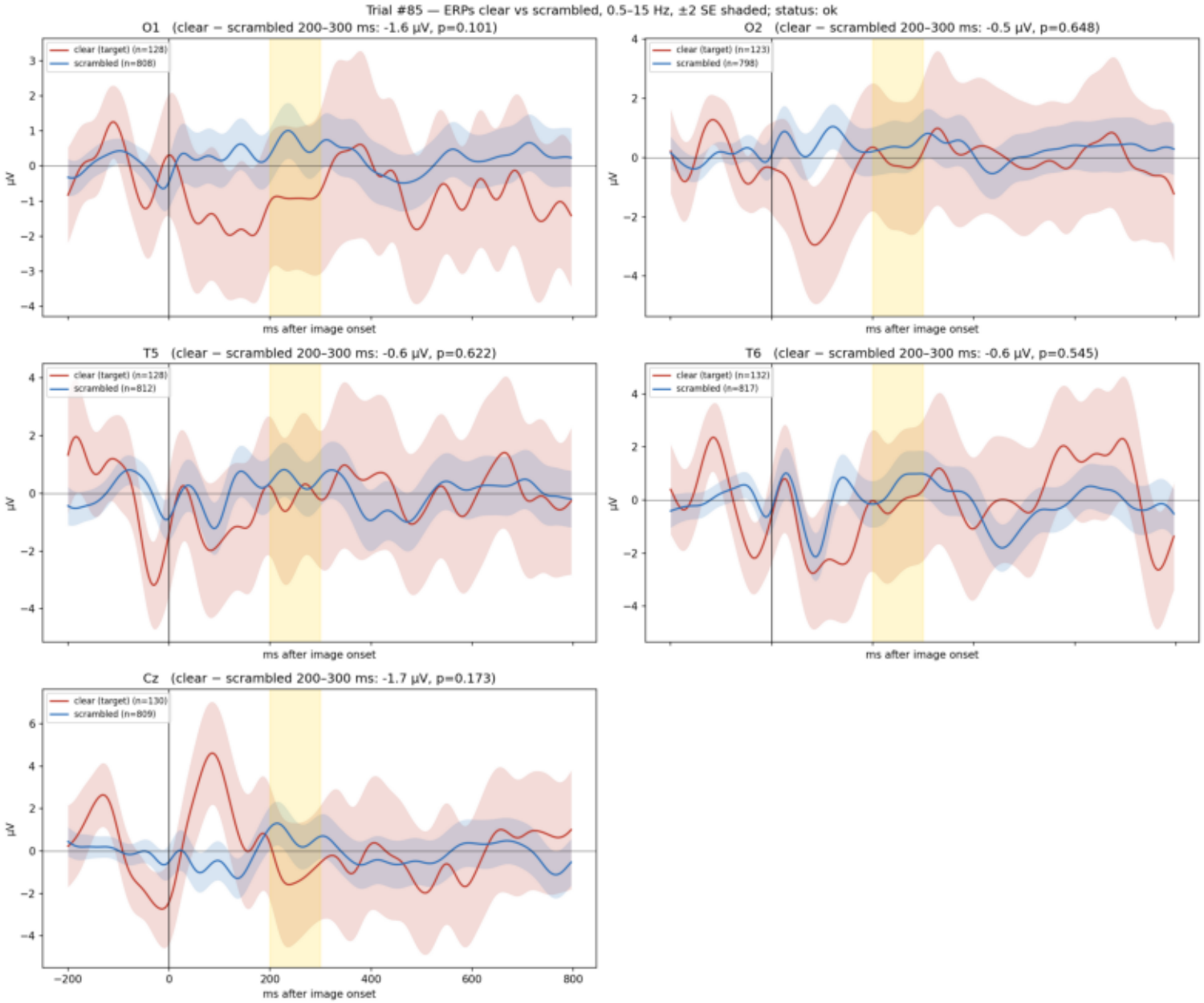
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	128 / 808	-1.57 µV	0.101	-2.4 µV @ 152 ms
O2	123 / 798	-0.49 µV	0.648	-1.5 µV @ 152 ms
T5	128 / 812	-0.58 µV	0.622	-1.9 µV @ 152 ms
T6	132 / 817	-0.64 µV	0.545	-3.0 µV @ 152 ms
Cz	130 / 809	-1.73 µV	0.173	-2.6 µV @ 228 ms

Bold = $p < 0.05$. Not corrected for testing several channels.

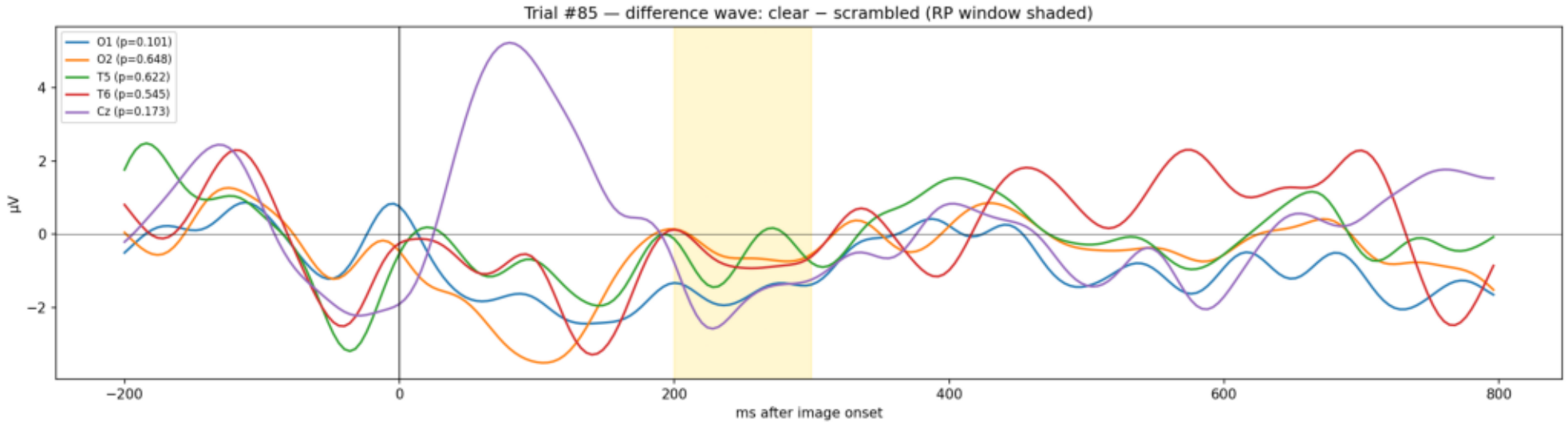
Event-related potentials: clear vs scrambled

The recognition potential (RP) appears about 200–300 ms after a recognisable (clear) image as a deflection that is absent for scrambled images; its sign depends on the reference. The RP window is shaded; bands are ±2 standard errors.



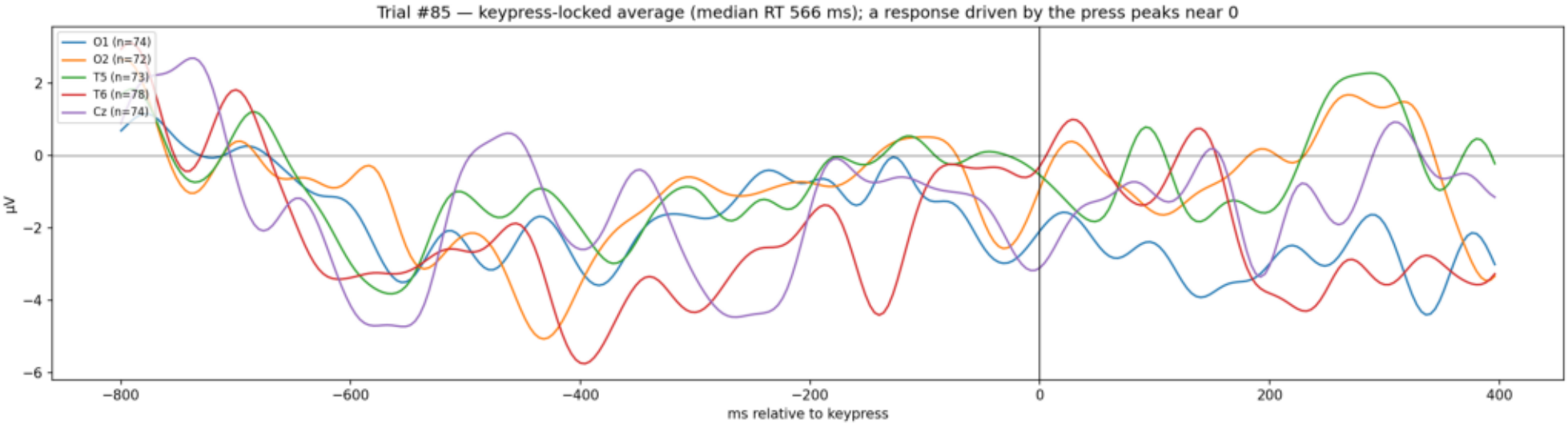
Difference wave (clear − scrambled)

Images arrive every ~330 ms, so each epoch also contains responses to neighbouring images. Subtracting the scrambled average removes that shared part and isolates the RP.



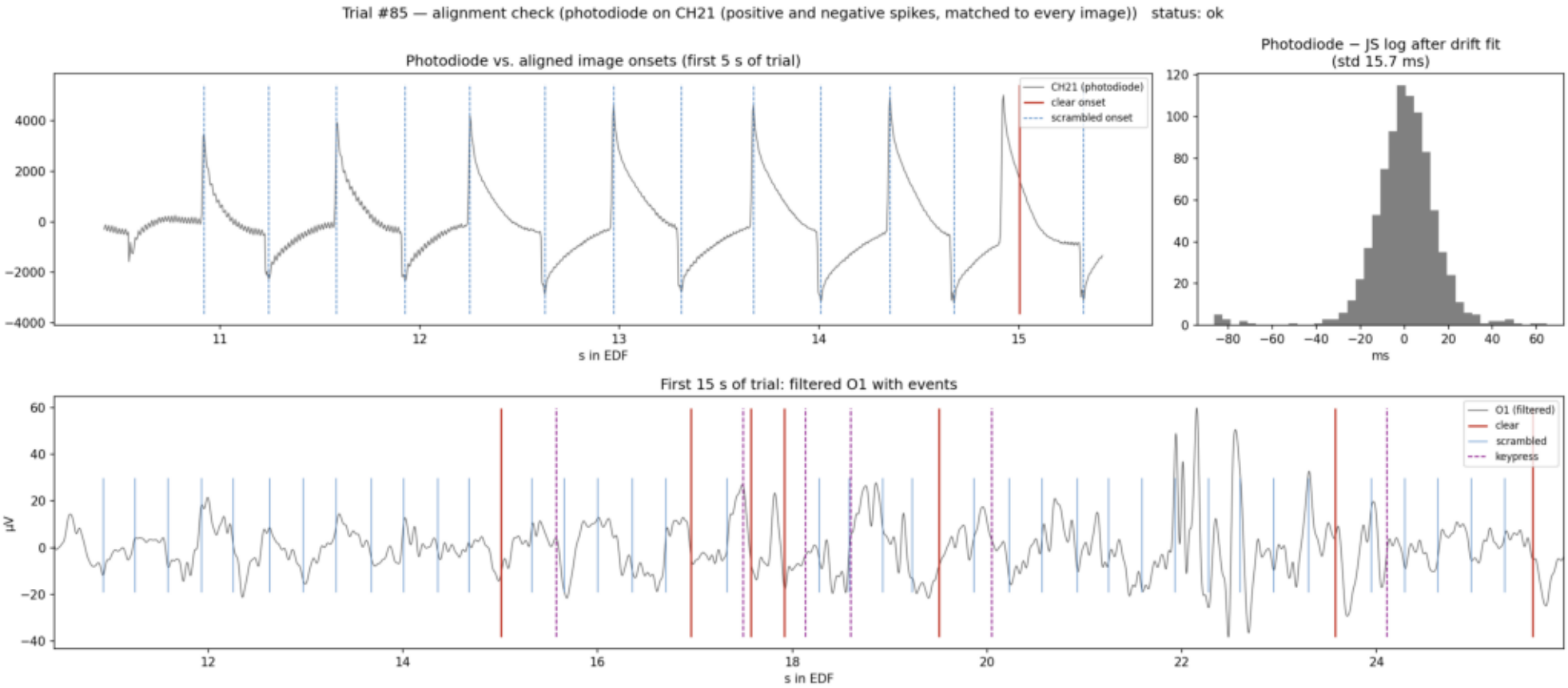
Keypress-locked average

Checks whether activity tied to the button press, rather than recognition, drives the difference between clear and scrambled images.



Alignment check and signal overview

Each image onset is snapped to its photodiode spike. Bottom: the first 15 s of the filtered signal with image onsets and keypresses.



Analysis log

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Trial #85 — subject AF, 08/15/2025 00:59
  EDF: /home/japhy/eegdata/media/trialData/af_20250815_005909.edf
  250 Hz, 383 s; 1001 images (138 clear, 863 scrambled); 105 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 9574 ms (EDF header says -9000); 85% of images matched (typical 19%); drift -27 ppm; jitter 15.7 ms
  electrode noise (µV): O1 14, O2 13, T5 14, T6 14, P3 2501, P4 2696, Pz 2473, Cz 15
  using: O1, O2, T5, T6, Cz
  83 of 138 clear images followed by a keypress (median RT 566 ms)
  O1: clear−scrambled 200–300 ms = -1.57 µV, p=0.101, peak -2.4 µV @ 152 ms
  O2: clear−scrambled 200–300 ms = -0.49 µV, p=0.648, peak -1.5 µV @ 152 ms
  T5: clear−scrambled 200–300 ms = -0.58 µV, p=0.622, peak -1.9 µV @ 152 ms
  T6: clear−scrambled 200–300 ms = -0.64 µV, p=0.545, peak -3.0 µV @ 152 ms
  Cz: clear−scrambled 200–300 ms = -1.73 µV, p=0.173, peak -2.6 µV @ 228 ms
  status: ok
```