Trial #83 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/15/2025 00:13 • dataset Celebrities
Stimuli	101 images: 17 clear, 84 scrambled • 17 keypresses (16 matched to clear images, median RT 482 ms)
EDF file	af_20250815_001343.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 12067 ms (EDF header would give -43000 ms); 90/101 images matched; drift 758 ppm; jitter 22.7 ms
Electrodes	noise after filtering — O1 14 µV ✓, O2 13 µV ✓, T5 14 µV ✓, T6 15 µV ✓, P3 1305 µV, P4 1829 µV, Pz 1366 µV, Cz 16 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

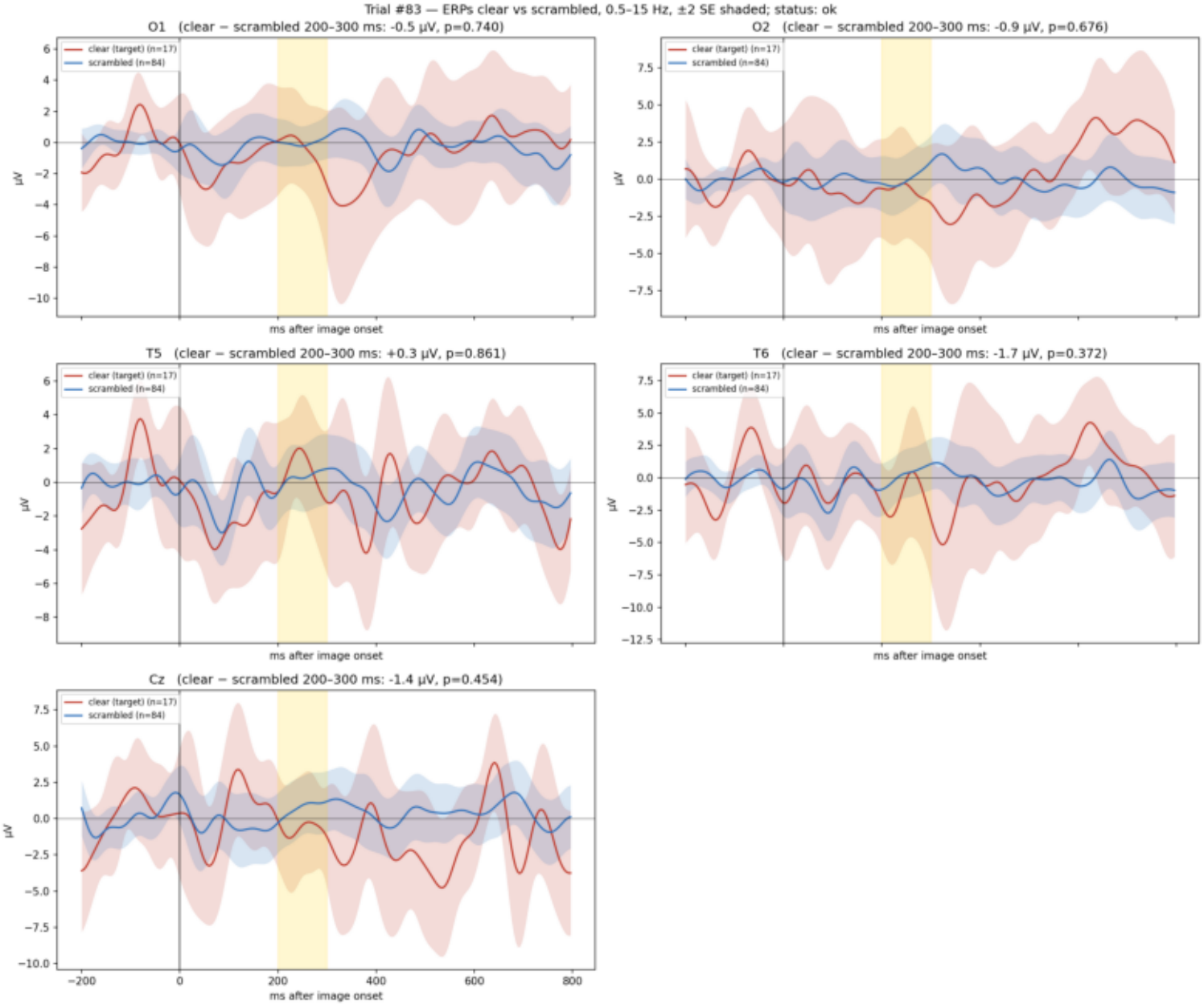
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	17 / 84	-0.47 µV	0.740	-5.0 µV @ 332 ms
O2	17 / 84	-0.85 µV	0.676	-4.5 µV @ 332 ms
T5	17 / 84	+0.28 µV	0.861	-2.5 µV @ 152 ms
T6	17 / 84	-1.68 µV	0.372	-6.2 µV @ 320 ms
Cz	17 / 84	-1.44 µV	0.454	-4.5 µV @ 332 ms

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

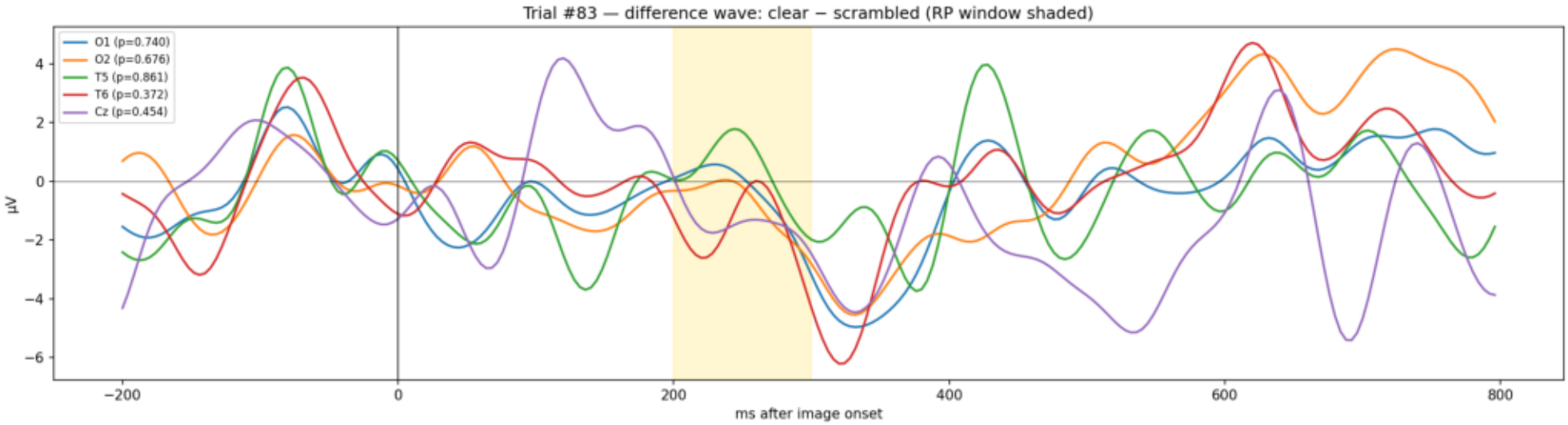
Event-related potentials: clear vs scrambled

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.



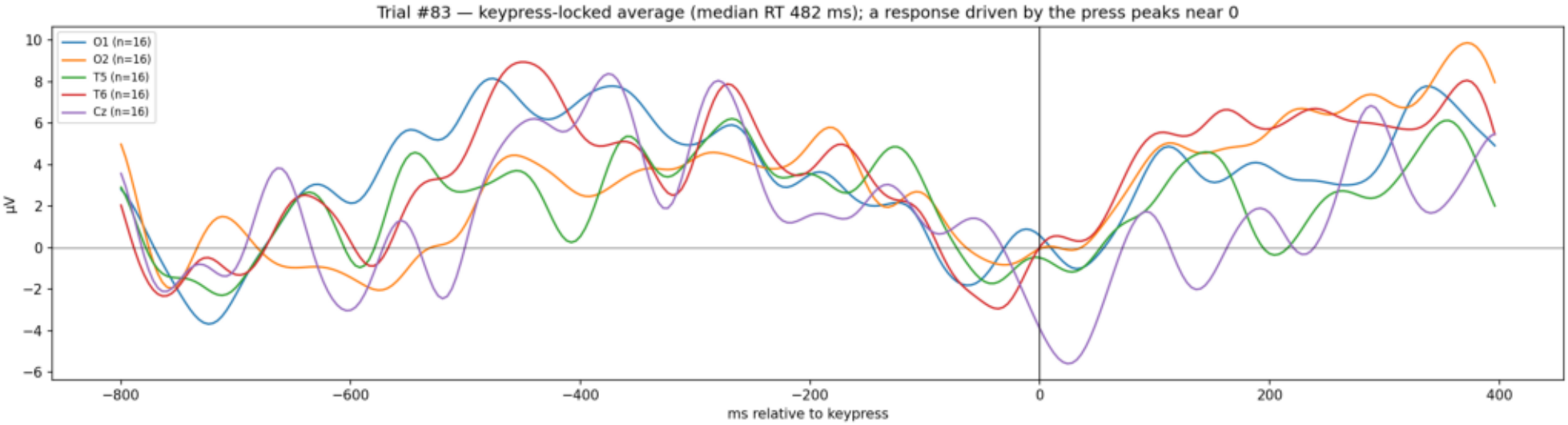
Difference wave (clear − scrambled)

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.



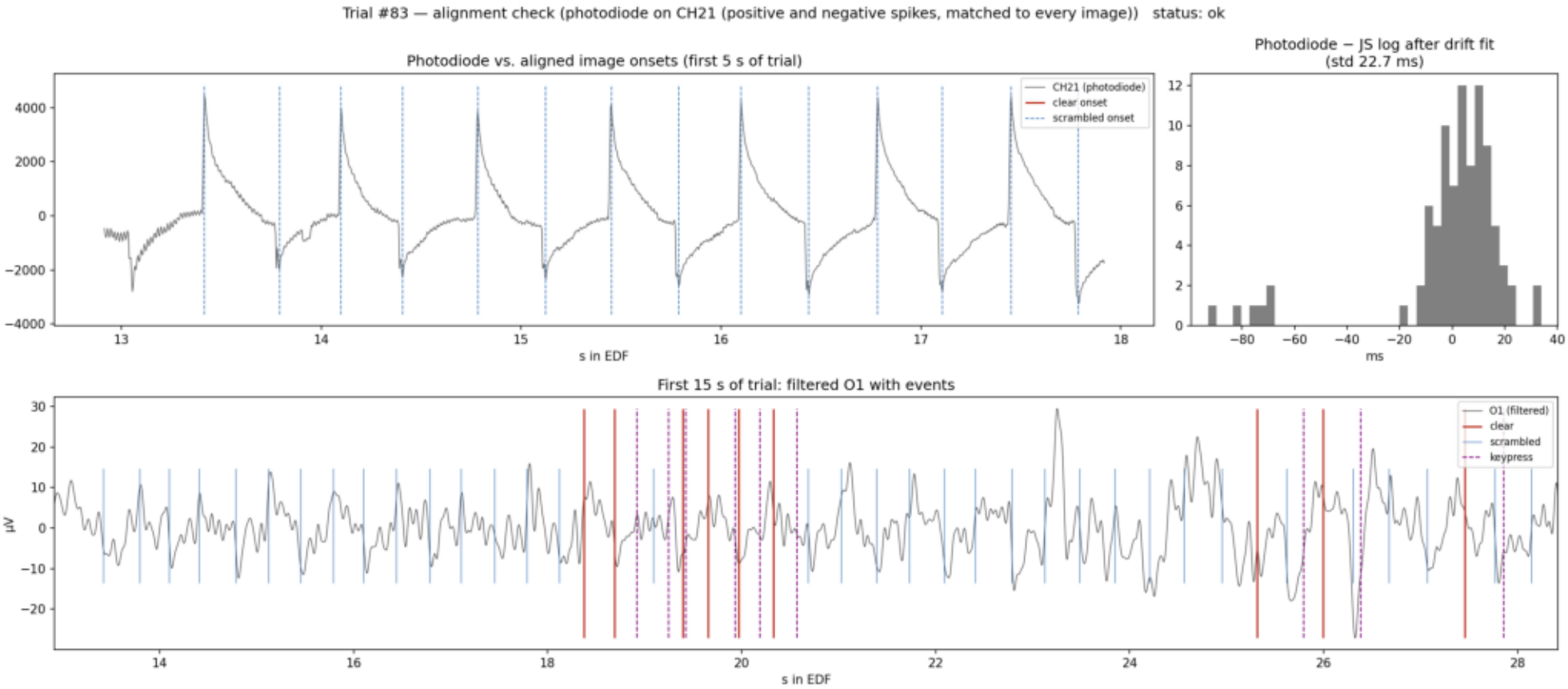
Keypress-locked average

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 #83 — subject AF, 08/15/2025 00:13
  EDF: /home/japhy/eegdata/media/trialData/af_20250815_001343.edf
  250 Hz, 58 s; 101 images (17 clear, 84 scrambled); 17 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 12067 ms (EDF header says -43000); 83% of images matched (typical 16%); drift 758 ppm; jitter 22.7 ms
  electrode noise (µV): O1 14, O2 13, T5 14, T6 15, P3 1305, P4 1829, Pz 1366, Cz 16
  using: O1, O2, T5, T6, Cz
  16 of 17 clear images followed by a keypress (median RT 482 ms)
  O1: clear−scrambled 200–300 ms = -0.47 µV, p=0.740, peak -5.0 µV @ 332 ms
  O2: clear−scrambled 200–300 ms = -0.85 µV, p=0.676, peak -4.5 µV @ 332 ms
  T5: clear−scrambled 200–300 ms = +0.28 µV, p=0.861, peak -2.5 µV @ 152 ms
  T6: clear−scrambled 200–300 ms = -1.68 µV, p=0.372, peak -6.2 µV @ 320 ms
  Cz: clear−scrambled 200–300 ms = -1.44 µV, p=0.454, peak -4.5 µV @ 332 ms
  status: ok
```