Trial #88 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/15/2025 20:31 • dataset Celebrities
Stimuli	1001 images: 147 clear, 854 scrambled • 141 keypresses (135 matched to clear images, median RT 468 ms)
EDF file	af_20250815_203050.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 4579 ms (EDF header would give 10000 ms); 998/1001 images matched; drift -153 ppm; jitter 22.8 ms
Electrodes	noise after filtering — O1 43 µV ✓, O2 43 µV ✓, T5 42 µV ✓, T6 43 µV ✓, P3 913 µV, P4 1382 µV, Pz 695 µV, Cz 5 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

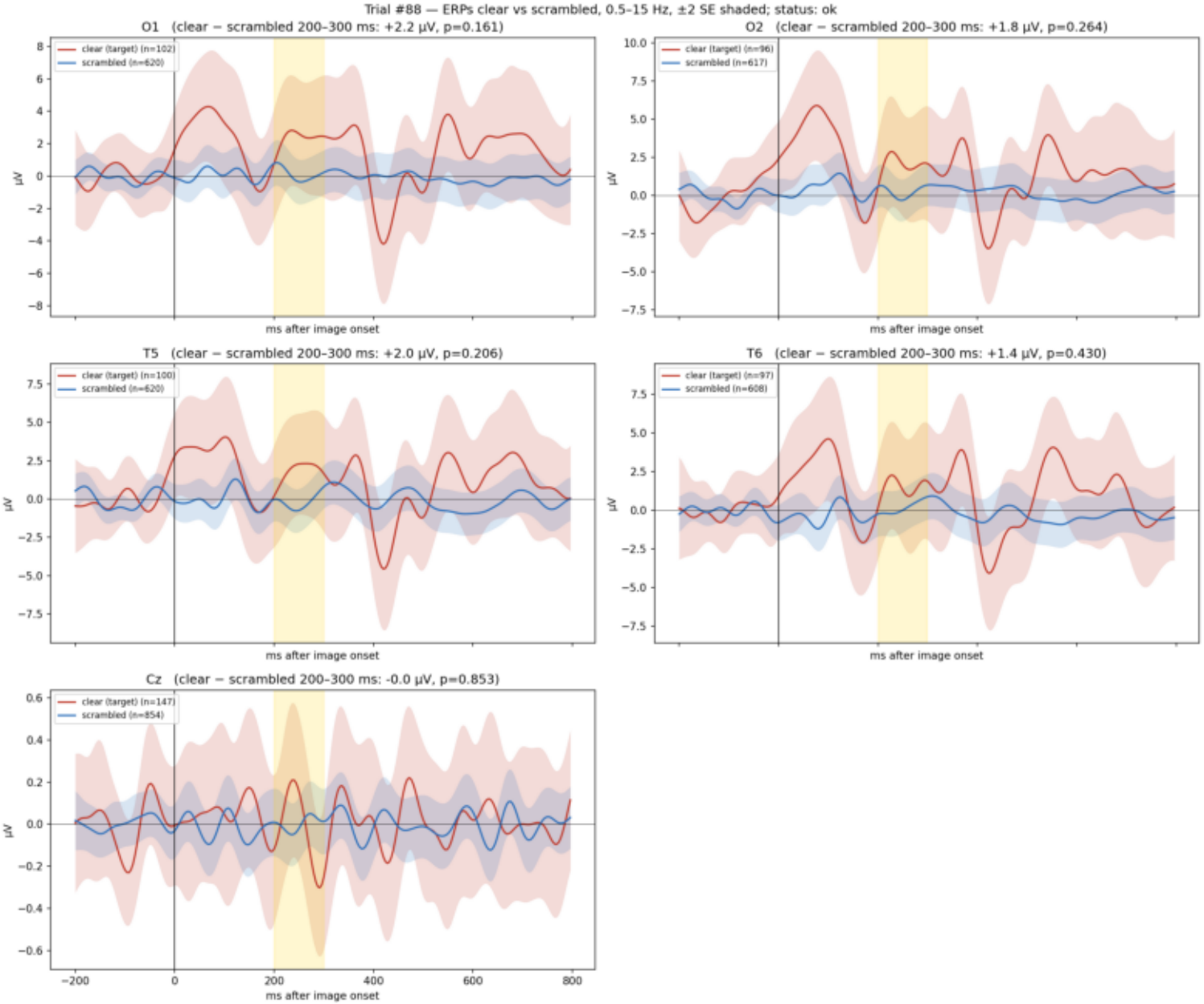
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	102 / 620	+2.22 µV	0.161	+3.0 µV @ 244 ms
O2	96 / 617	+1.83 µV	0.264	+2.9 µV @ 232 ms
T5	100 / 620	+2.02 µV	0.206	+3.0 µV @ 248 ms
T6	97 / 608	+1.36 µV	0.430	+2.5 µV @ 228 ms
Cz	147 / 854	-0.03 µV	0.853	-0.3 µV @ 288 ms

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

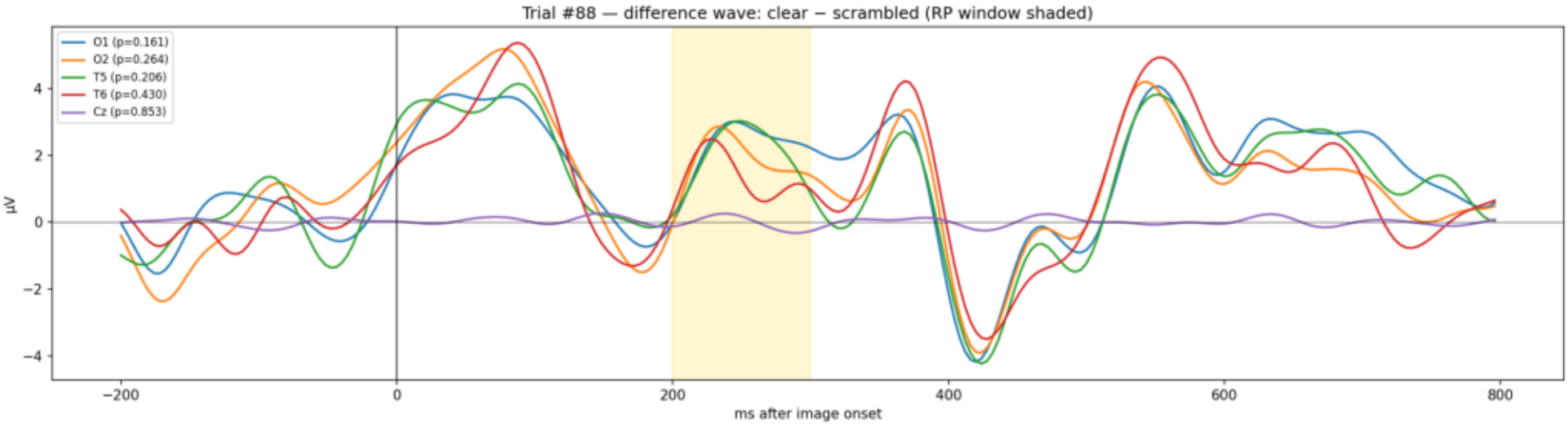
Event-related potentials: clear vs scrambled

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.



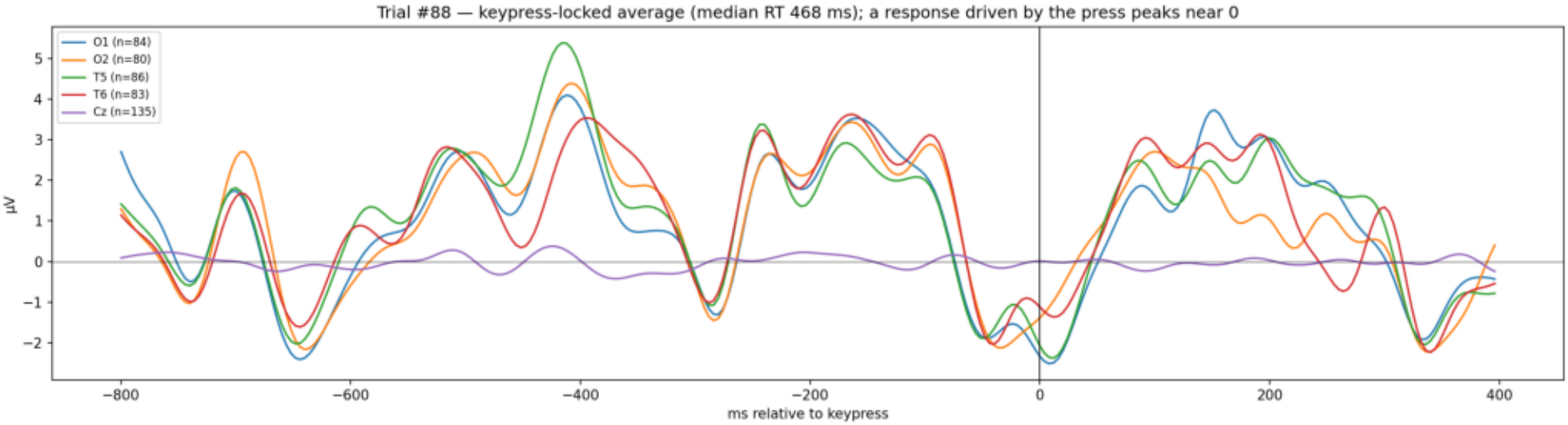
Difference wave (clear − scrambled)

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.



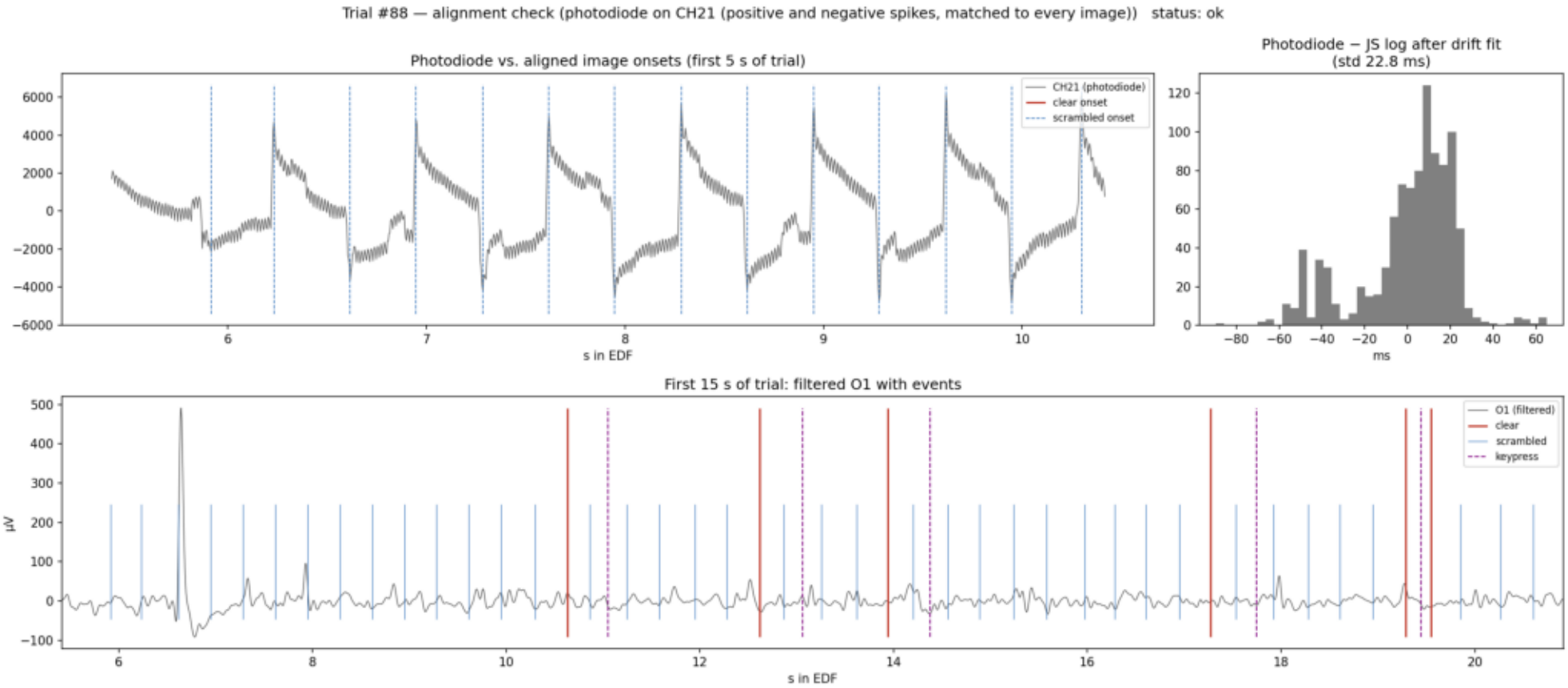
Keypress-locked average

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 #88 — subject AF, 08/15/2025 20:31
  EDF: /home/japhy/eegdata/media/trialData/af_20250815_203050.edf
  250 Hz, 359 s; 1001 images (147 clear, 854 scrambled); 141 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 4579 ms (EDF header says 10000); 86% of images matched (typical 21%); drift -153 ppm; jitter 22.8 ms
  electrode noise (µV): O1 43, O2 43, T5 42, T6 43, P3 913, P4 1382, Pz 695, Cz 5
  using: O1, O2, T5, T6, Cz
  135 of 147 clear images followed by a keypress (median RT 468 ms)
  O1: clear−scrambled 200–300 ms = +2.22 µV, p=0.161, peak +3.0 µV @ 244 ms
  O2: clear−scrambled 200–300 ms = +1.83 µV, p=0.264, peak +2.9 µV @ 232 ms
  T5: clear−scrambled 200–300 ms = +2.02 µV, p=0.206, peak +3.0 µV @ 248 ms
  T6: clear−scrambled 200–300 ms = +1.36 µV, p=0.430, peak +2.5 µV @ 228 ms
  Cz: clear−scrambled 200–300 ms = -0.03 µV, p=0.853, peak -0.3 µV @ 288 ms
  status: ok
```