Trial #76 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/02/2025 18:03 • dataset Celebrities
Stimuli	1001 images: 144 clear, 857 scrambled • 111 keypresses (124 matched to clear images, median RT 473 ms)
EDF file	AF_20250802_180253.edf
Alignment	photodiode on CH23 (positive and negative spikes, matched to every image); clock offset 15496 ms (EDF header would give 7000 ms); 909/1001 images matched; drift 66 ppm; jitter 19.1 ms
Electrodes	noise after filtering — O1 15 µV ✓, O2 13 µV ✓, T5 14 µV ✓, T6 14 µV ✓, P3 100 µV, P4 376 µV, Pz 144 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

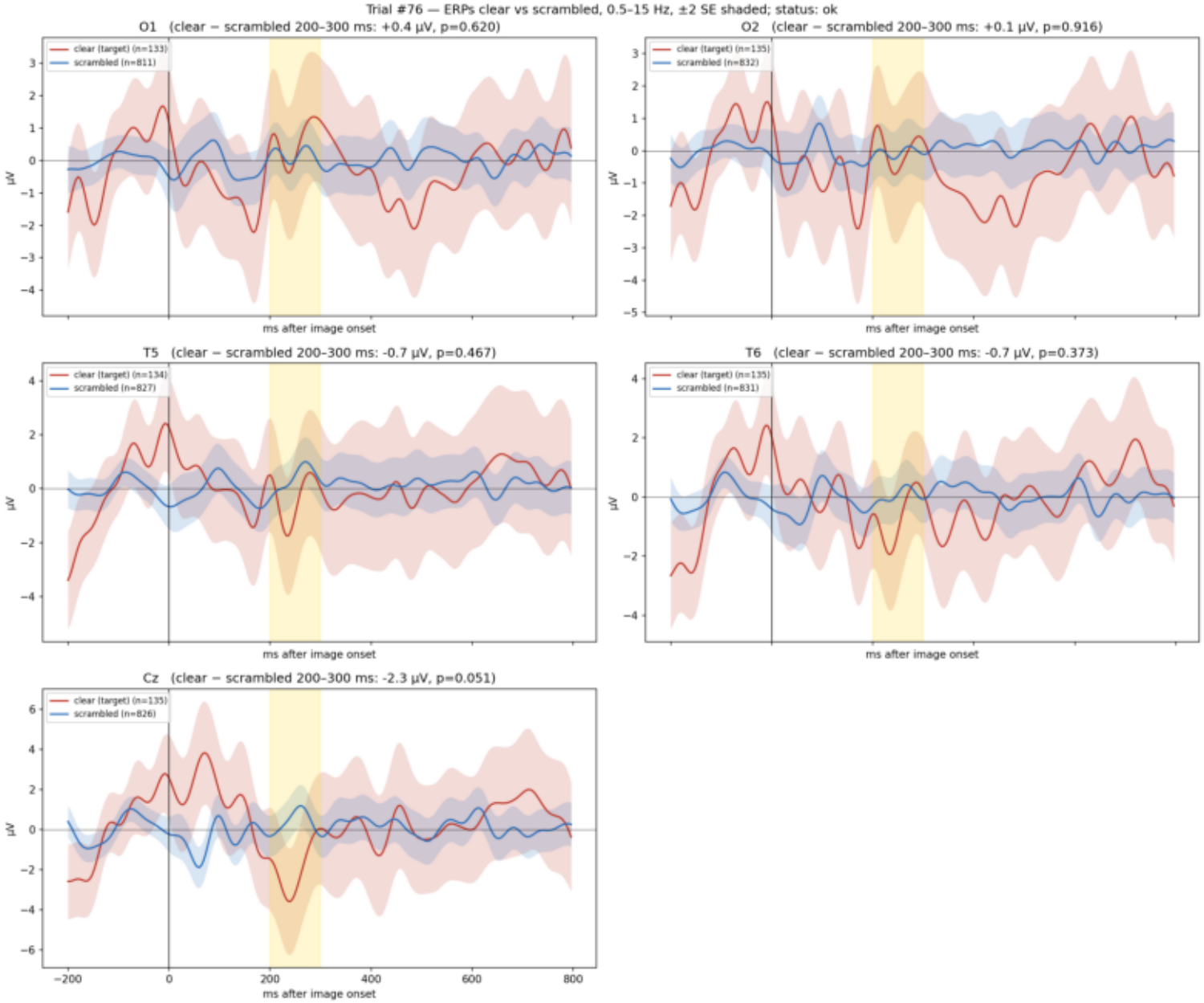
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	133 / 811	+0.43 µV	0.620	-1.7 µV @ 168 ms
O2	135 / 832	+0.09 µV	0.916	-2.0 µV @ 168 ms
T5	134 / 827	-0.71 µV	0.467	-1.9 µV @ 236 ms
T6	135 / 831	-0.69 µV	0.373	-2.2 µV @ 336 ms
Cz	135 / 826	-2.31 µV	0.051	-4.3 µV @ 244 ms

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

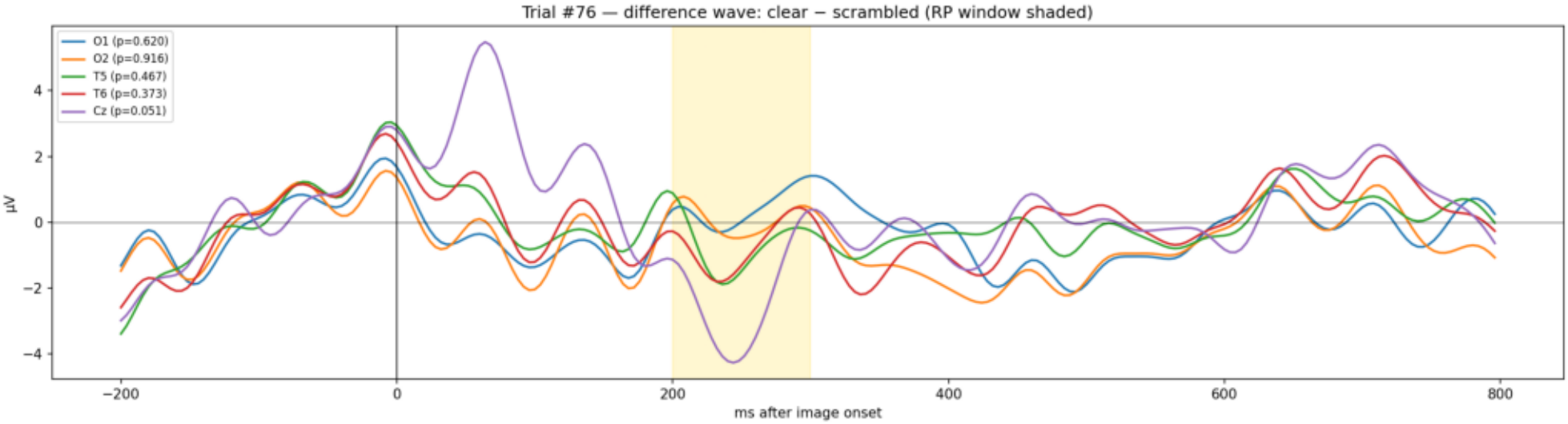
Event-related potentials: clear vs scrambled

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.



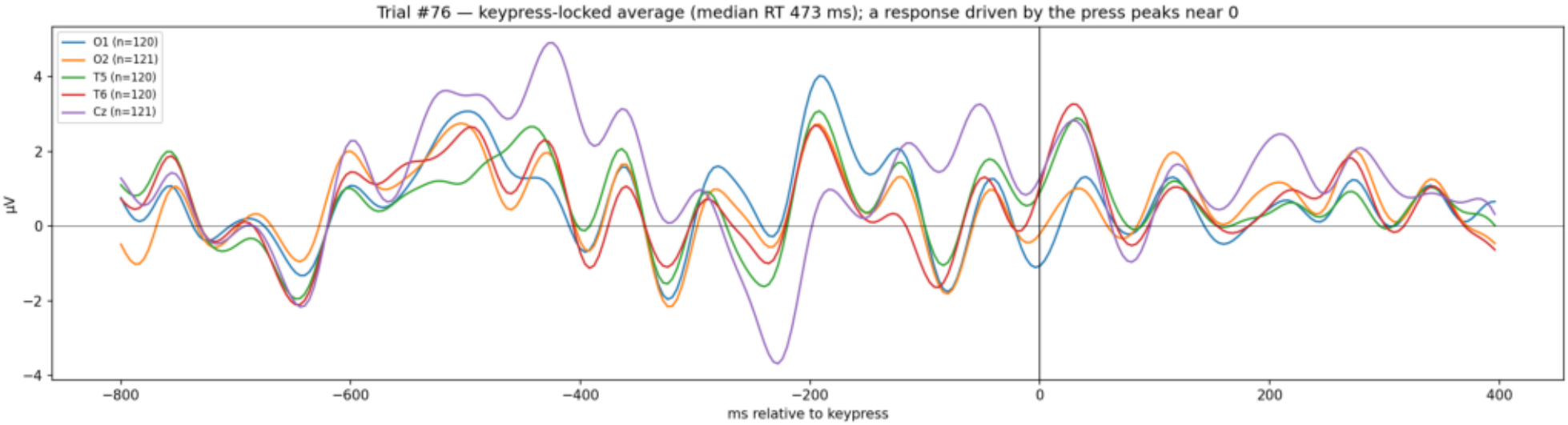
Difference wave (clear − scrambled)

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.



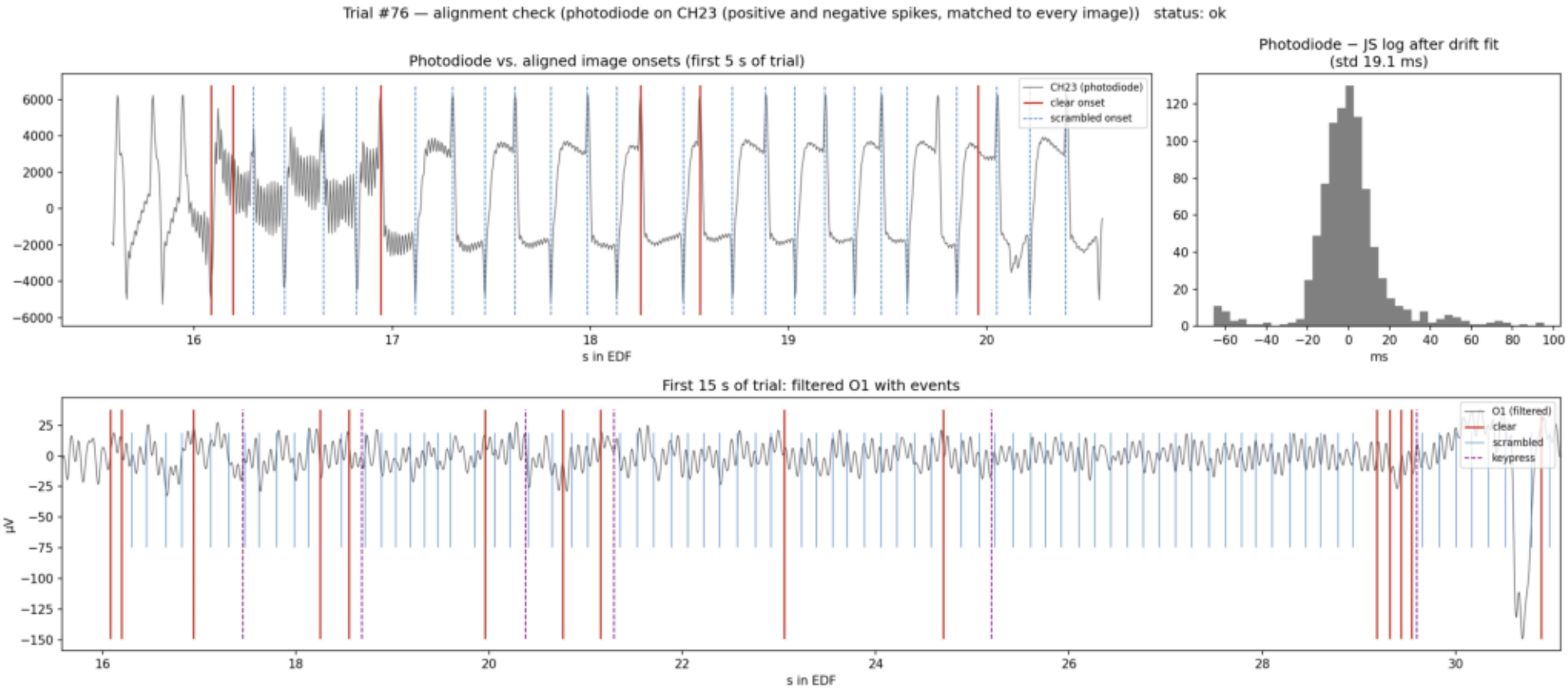
Keypress-locked average

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 #76 — subject AF, 08/02/2025 18:03
  EDF: /home/japhy/eegdata/media/trialData/AF_20250802_180253.edf
  250 Hz, 201 s; 1001 images (144 clear, 857 scrambled); 111 presses
  alignment: photodiode on CH23 (positive and negative spikes, matched to every image)
    offset 15496 ms (EDF header says 7000); 84% of images matched (typical 36%); drift 66 ppm; jitter 19.1 ms
  electrode noise (µV): O1 15, O2 13, T5 14, T6 14, P3 100, P4 376, Pz 144, Cz 15
  using: O1, O2, T5, T6, Cz
  124 of 144 clear images followed by a keypress (median RT 473 ms)
  O1: clear−scrambled 200–300 ms = +0.43 µV, p=0.620, peak -1.7 µV @ 168 ms
  O2: clear−scrambled 200–300 ms = +0.09 µV, p=0.916, peak -2.0 µV @ 168 ms
  T5: clear−scrambled 200–300 ms = -0.71 µV, p=0.467, peak -1.9 µV @ 236 ms
  T6: clear−scrambled 200–300 ms = -0.69 µV, p=0.373, peak -2.2 µV @ 336 ms
  Cz: clear−scrambled 200–300 ms = -2.31 µV, p=0.051, peak -4.3 µV @ 244 ms
  status: ok
```