Trial #73 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/02/2025 16:58 • dataset Celebrities
Stimuli	1001 images: 135 clear, 866 scrambled • 109 keypresses (121 matched to clear images, median RT 443 ms)
EDF file	AF_20250802_165814.edf
Alignment	photodiode on CH23 (positive and negative spikes, matched to every image); clock offset 22385 ms (EDF header would give -14000 ms); 997/1001 images matched; drift -194 ppm; jitter 10.8 ms
Electrodes	noise after filtering — O1 12 µV ✓, O2 16 µV ✓, T5 11 µV ✓, T6 13 µV ✓, P3 246 µV, P4 369 µV, Pz 243 µV, Cz 13 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

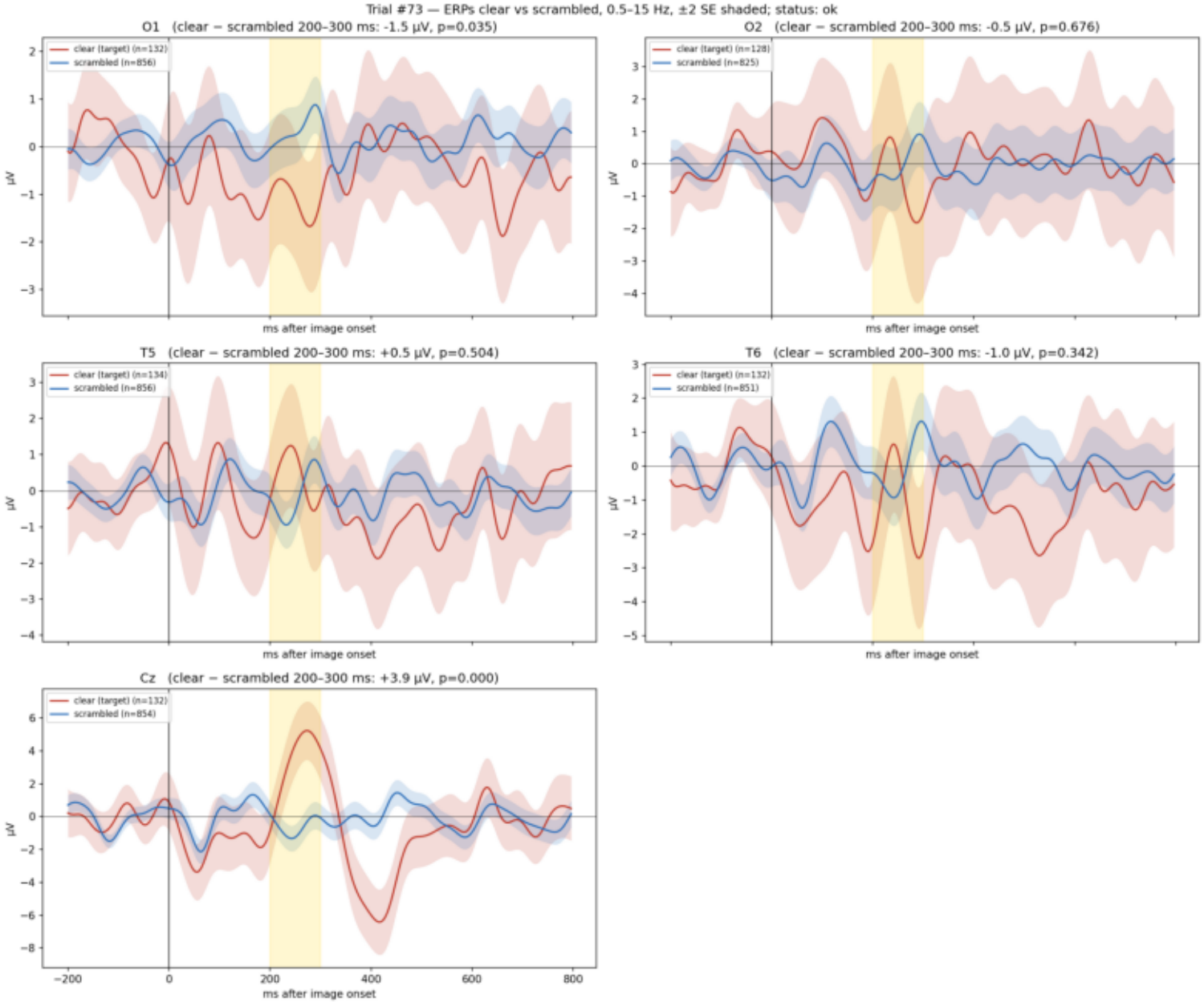
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	**132 / 856**	**-1.50 µV**	**0.035**	**-2.5 µV @ 284 ms**
O2	128 / 825	-0.50 µV	0.676	-2.7 µV @ 288 ms
T5	134 / 856	+0.51 µV	0.504	+2.1 µV @ 236 ms
T6	132 / 851	-0.97 µV	0.342	-4.0 µV @ 292 ms
Cz	**132 / 854**	**+3.94 µV**	**0.000**	**+5.9 µV @ 260 ms**

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

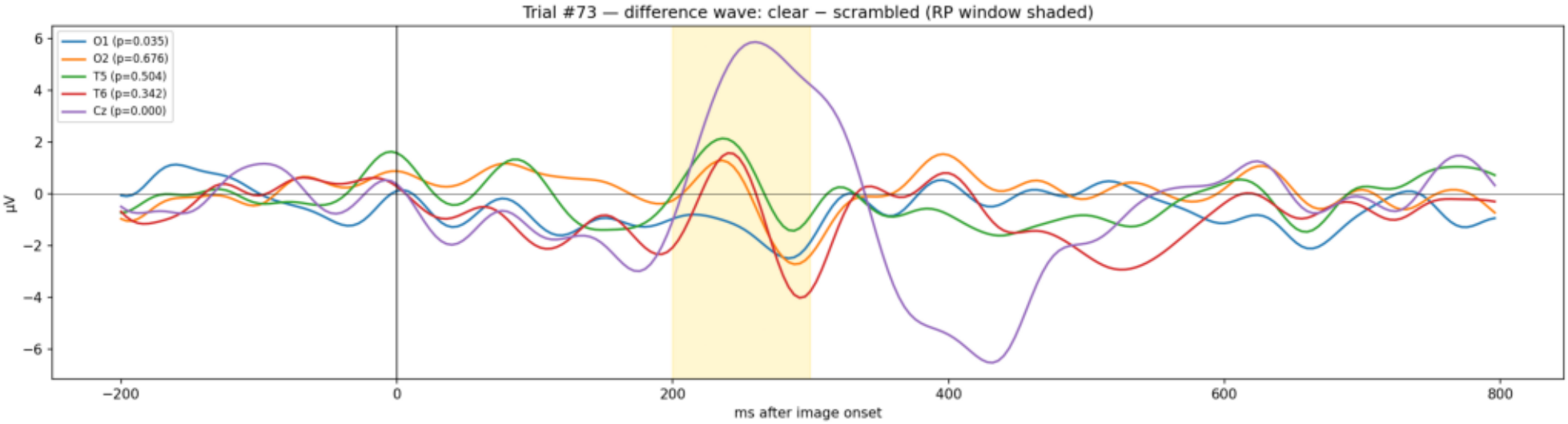
Event-related potentials: clear vs scrambled

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.



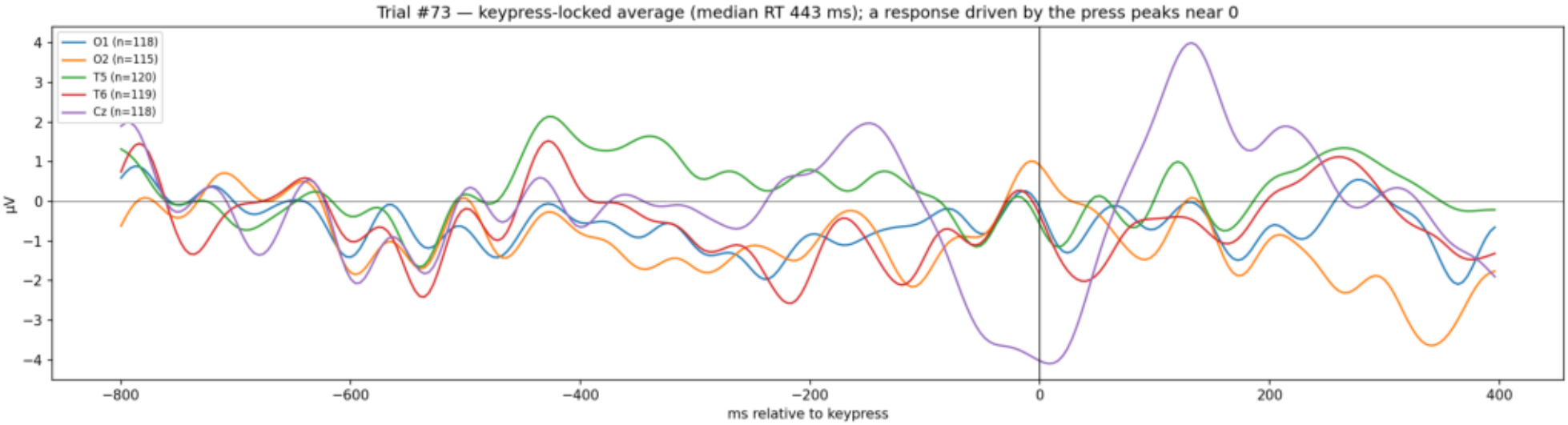
Difference wave (clear − scrambled)

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.



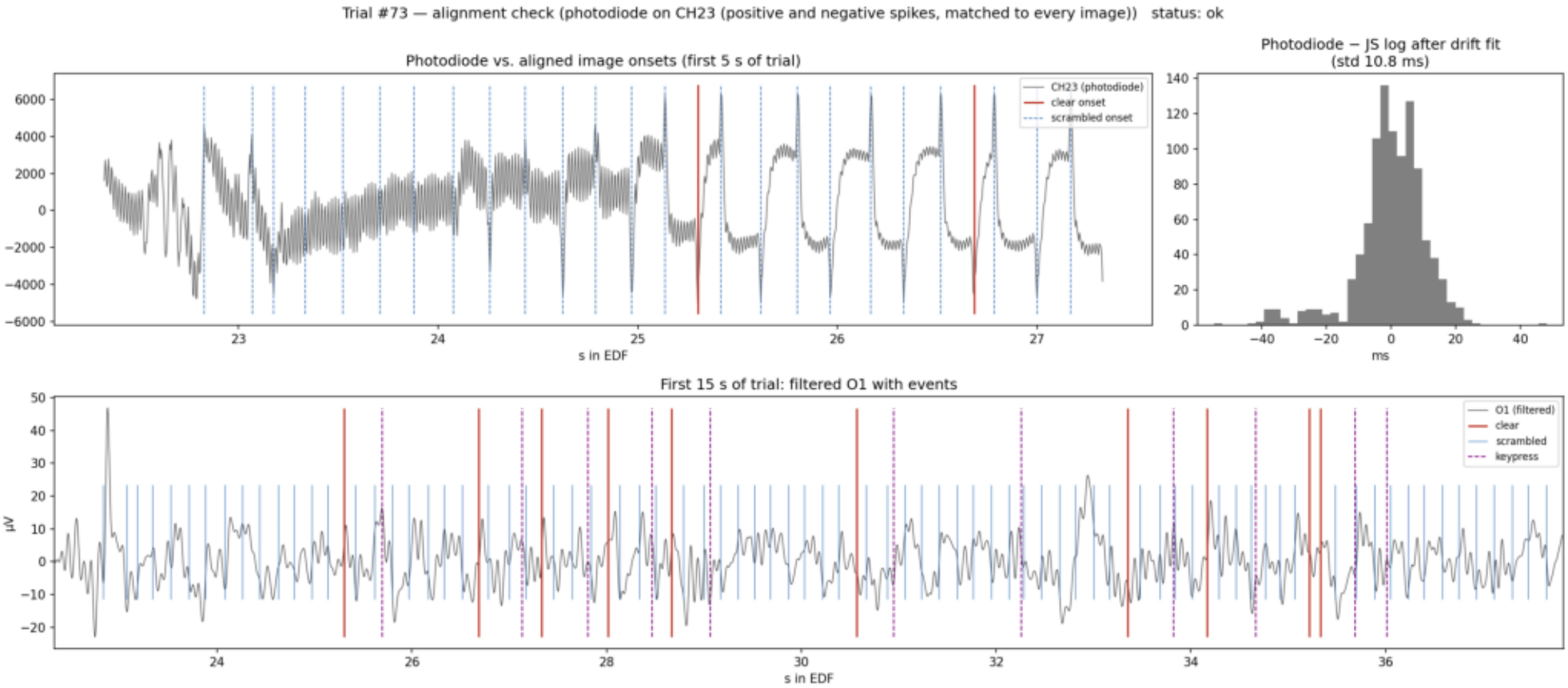
Keypress-locked average

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 #73 — subject AF, 08/02/2025 16:58
  EDF: /home/japhy/eegdata/media/trialData/AF_20250802_165814.edf
  250 Hz, 209 s; 1001 images (135 clear, 866 scrambled); 109 presses
  alignment: photodiode on CH23 (positive and negative spikes, matched to every image)
    offset 22385 ms (EDF header says -14000); 99% of images matched (typical 41%); drift -194 ppm; jitter 10.8 ms
  electrode noise (µV): O1 12, O2 16, T5 11, T6 13, P3 246, P4 369, Pz 243, Cz 13
  using: O1, O2, T5, T6, Cz
  121 of 135 clear images followed by a keypress (median RT 443 ms)
  O1: clear−scrambled 200–300 ms = -1.50 µV, p=0.035, peak -2.5 µV @ 284 ms
  O2: clear−scrambled 200–300 ms = -0.50 µV, p=0.676, peak -2.7 µV @ 288 ms
  T5: clear−scrambled 200–300 ms = +0.51 µV, p=0.504, peak +2.1 µV @ 236 ms
  T6: clear−scrambled 200–300 ms = -0.97 µV, p=0.342, peak -4.0 µV @ 292 ms
  Cz: clear−scrambled 200–300 ms = +3.94 µV, p=0.000, peak +5.9 µV @ 260 ms
  status: ok
```