Trial #75 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/02/2025 17:56 • dataset Celebrities
Stimuli	1001 images: 150 clear, 851 scrambled • 118 keypresses (135 matched to clear images, median RT 441 ms)
EDF file	AF_20250802_175555.edf
Alignment	photodiode on CH23 (positive and negative spikes, matched to every image); clock offset 12769 ms (EDF header would give 5000 ms); 1000/1001 images matched; drift -278 ppm; jitter 11.2 ms
Electrodes	noise after filtering — O1 12 µV ✓, O2 12 µV ✓, T5 11 µV ✓, T6 12 µV ✓, P3 125 µV, P4 476 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

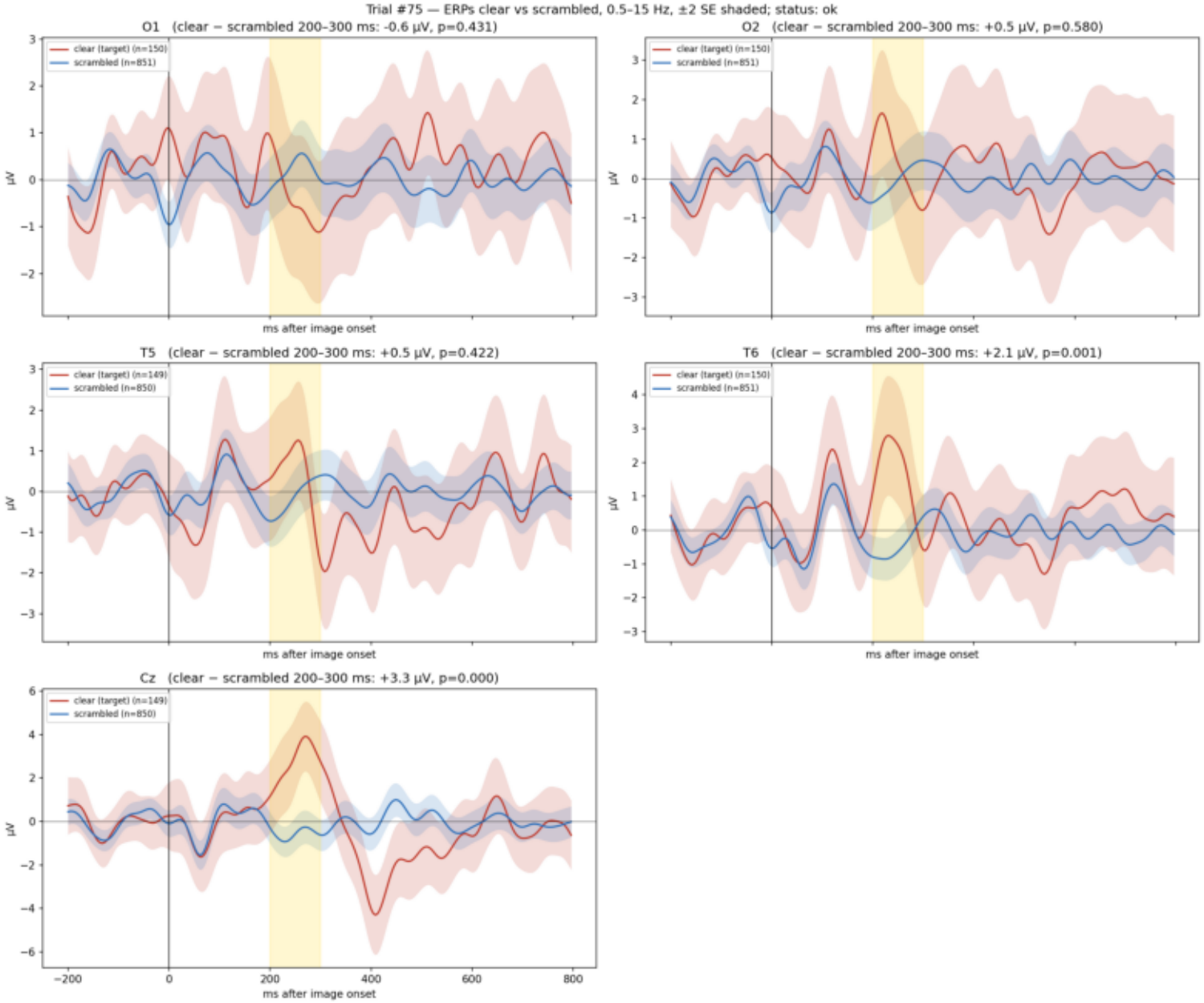
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	150 / 851	-0.59 µV	0.431	-1.3 µV @ 280 ms
O2	150 / 851	+0.48 µV	0.580	+2.1 µV @ 216 ms
T5	149 / 850	+0.53 µV	0.422	-2.4 µV @ 308 ms
T6	**150 / 851**	**+2.12 µV**	**0.001**	**+3.6 µV @ 228 ms**
Cz	**149 / 850**	**+3.32 µV**	**0.000**	**+4.2 µV @ 272 ms**

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

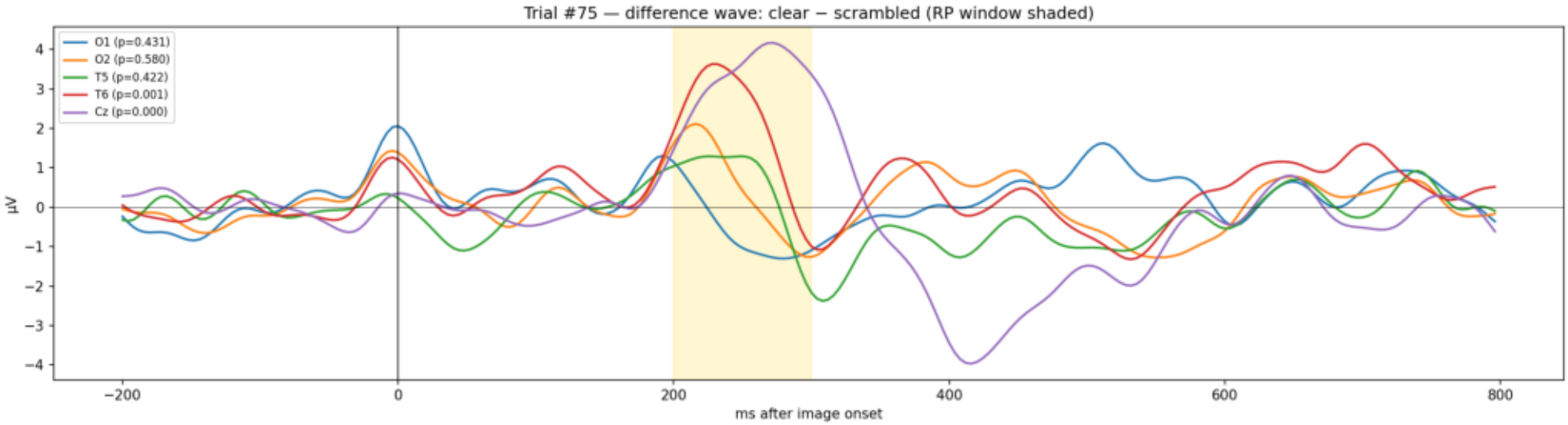
Event-related potentials: clear vs scrambled

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.



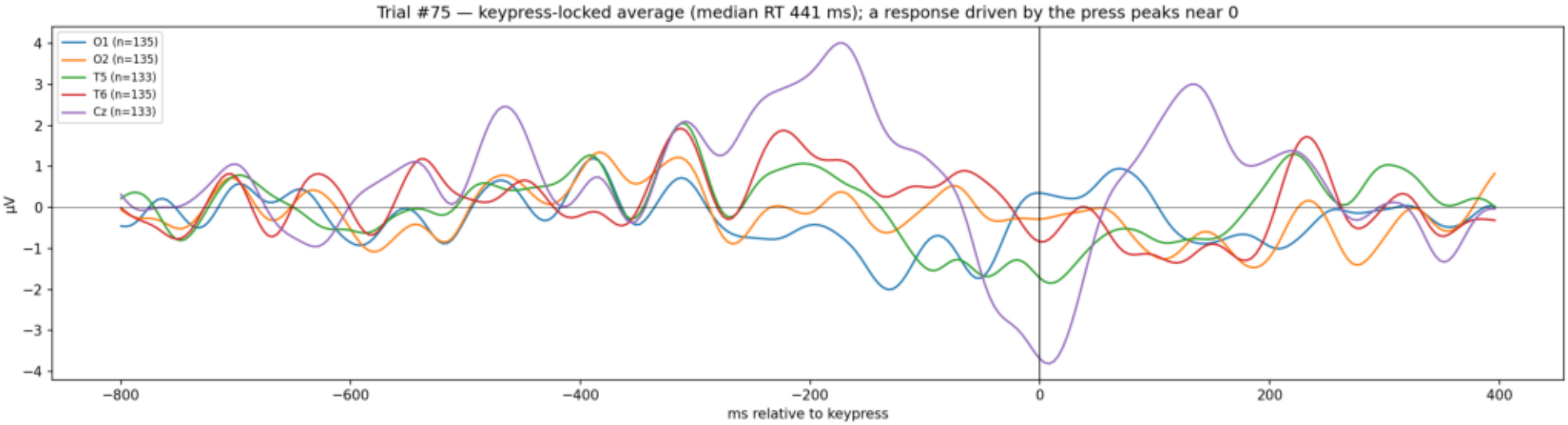
Difference wave (clear − scrambled)

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.



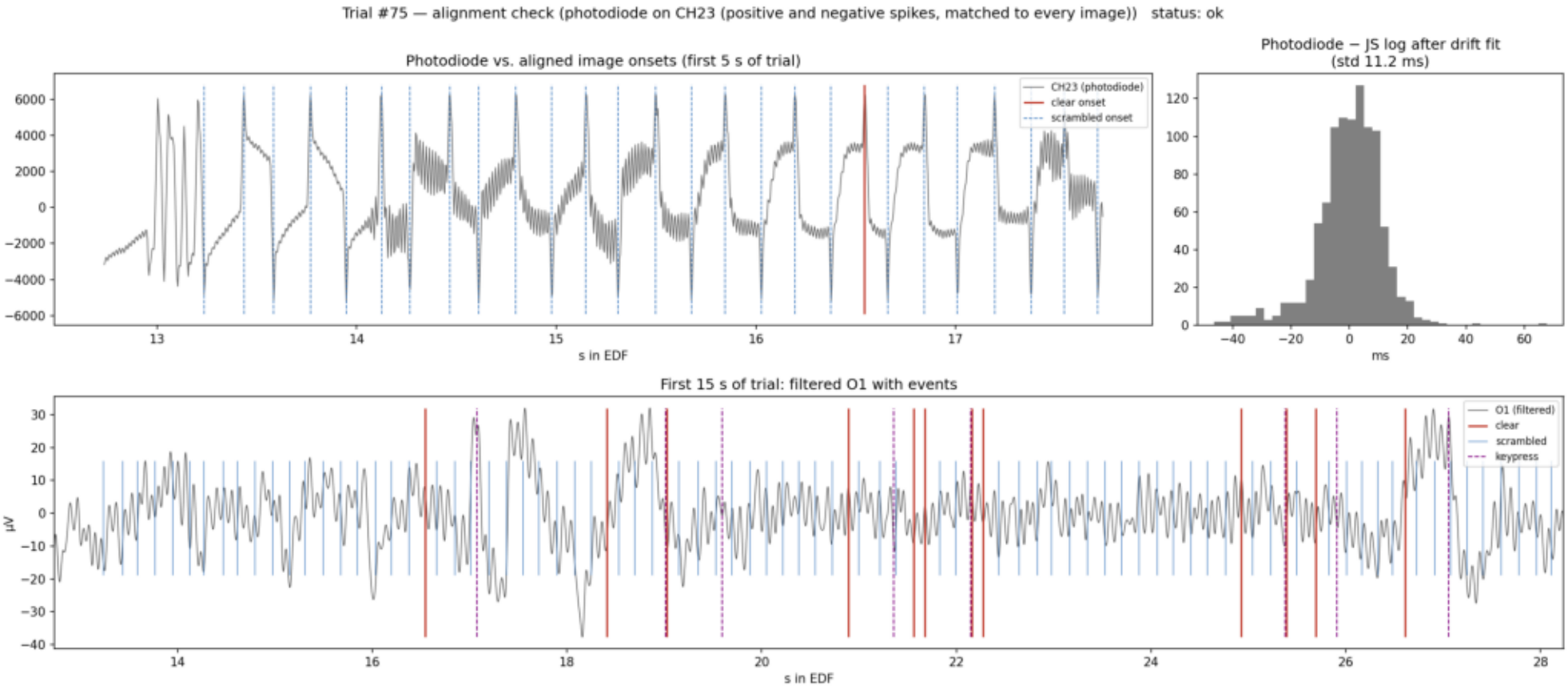
Keypress-locked average

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 #75 — subject AF, 08/02/2025 17:56
  EDF: /home/japhy/eegdata/media/trialData/AF_20250802_175555.edf
  250 Hz, 199 s; 1001 images (150 clear, 851 scrambled); 118 presses
  alignment: photodiode on CH23 (positive and negative spikes, matched to every image)
    offset 12769 ms (EDF header says 5000); 98% of images matched (typical 40%); drift -278 ppm; jitter 11.2 ms
  electrode noise (µV): O1 12, O2 12, T5 11, T6 12, P3 125, P4 476, Pz 243, Cz 13
  using: O1, O2, T5, T6, Cz
  135 of 150 clear images followed by a keypress (median RT 441 ms)
  O1: clear−scrambled 200–300 ms = -0.59 µV, p=0.431, peak -1.3 µV @ 280 ms
  O2: clear−scrambled 200–300 ms = +0.48 µV, p=0.580, peak +2.1 µV @ 216 ms
  T5: clear−scrambled 200–300 ms = +0.53 µV, p=0.422, peak -2.4 µV @ 308 ms
  T6: clear−scrambled 200–300 ms = +2.12 µV, p=0.001, peak +3.6 µV @ 228 ms
  Cz: clear−scrambled 200–300 ms = +3.32 µV, p=0.000, peak +4.2 µV @ 272 ms
  status: ok
```