Trial #84 — Recognition Potential Analysis

WEAK ALIGNMENT (59% MATCHED)

Subject	AF • recorded 08/15/2025 00:23 • dataset Celebrities
Stimuli	1001 images: 138 clear, 863 scrambled • 135 keypresses (122 matched to clear images, median RT 548 ms)
EDF file	af_20250815_002256.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 20362 ms (EDF header would give 4000 ms); 818/1001 images matched; drift -167 ppm; jitter 28.8 ms
Electrodes	noise after filtering — O1 10 µV ✓, O2 10 µV ✓, T5 12 µV ✓, T6 12 µV ✓, P3 1648 µV, P4 1914 µV, Pz 1621 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

⚠ Only 59% of images matched a photodiode spike on CH21, so the alignment may be wrong. Check the alignment plot before trusting these averages.

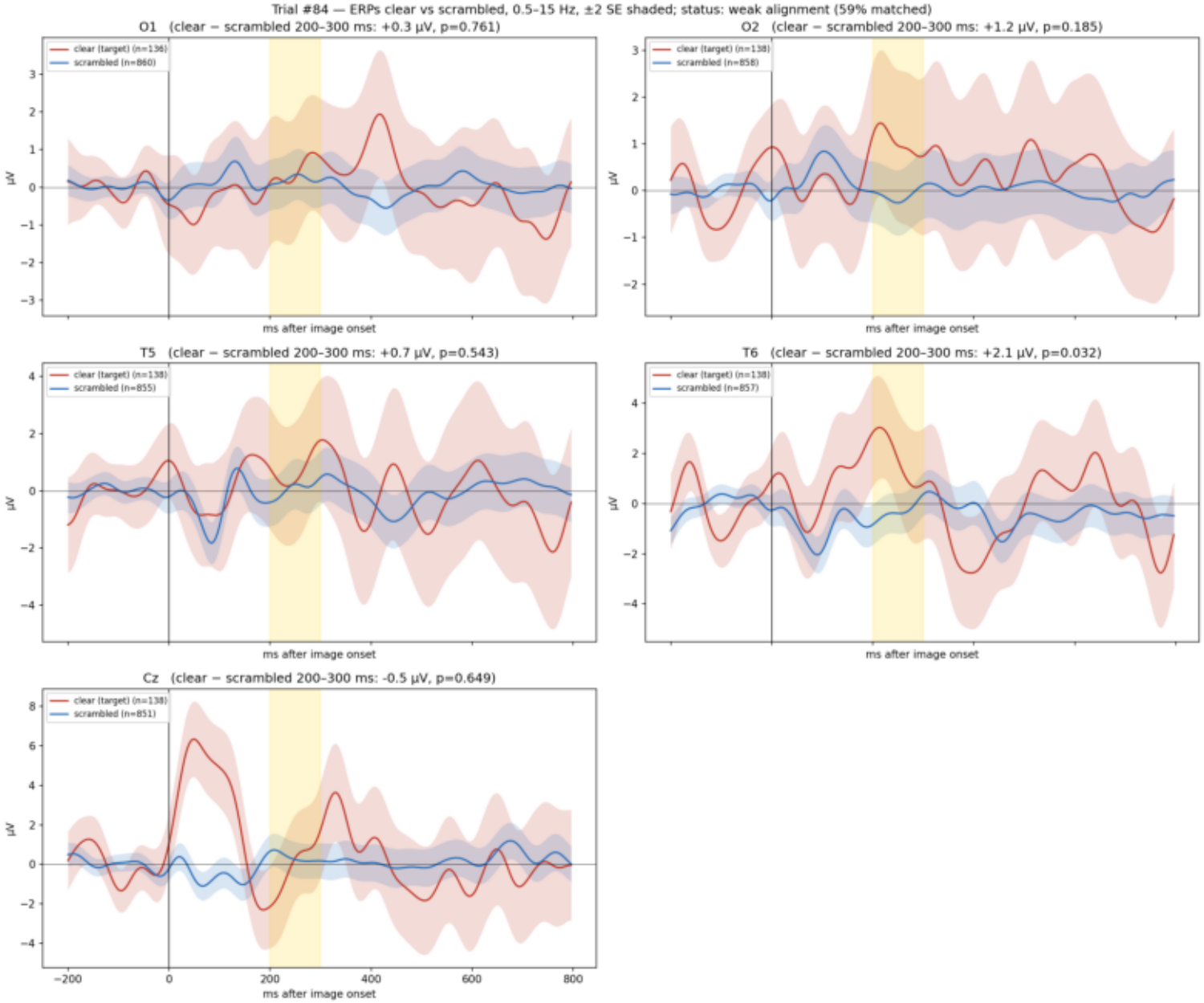
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	136 / 860	+0.26 µV	0.761	+0.8 µV @ 288 ms
O2	138 / 858	+1.15 µV	0.185	+1.5 µV @ 220 ms
T5	138 / 855	+0.66 µV	0.543	+1.6 µV @ 180 ms
T6	**138 / 857**	**+2.13 µV**	**0.032**	**+3.7 µV @ 204 ms**
Cz	138 / 851	-0.45 µV	0.649	+3.5 µV @ 328 ms

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

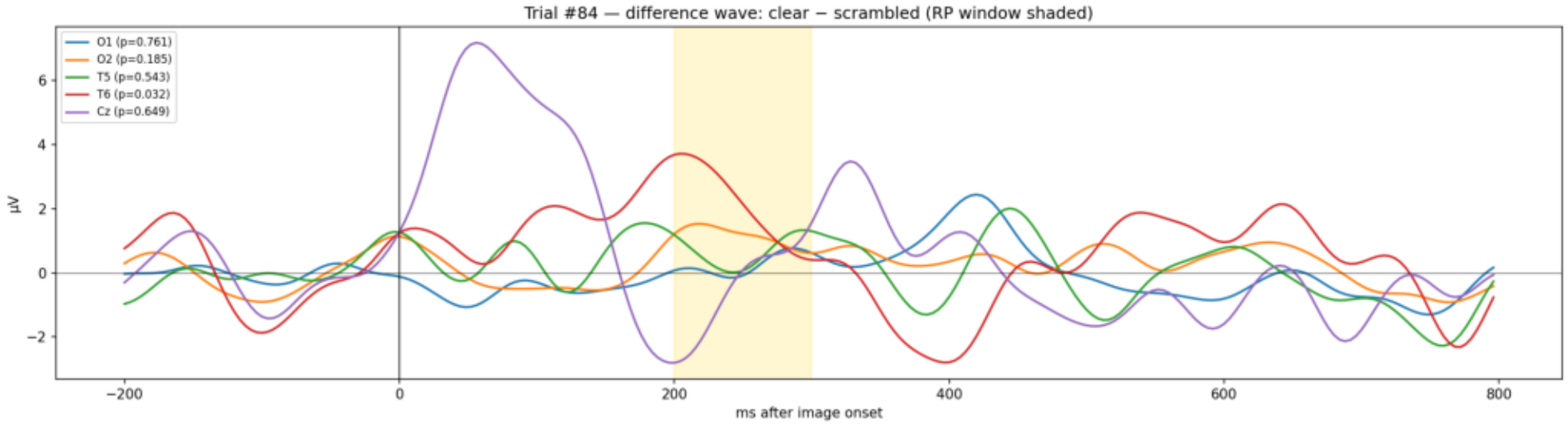
Event-related potentials: clear vs scrambled

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.



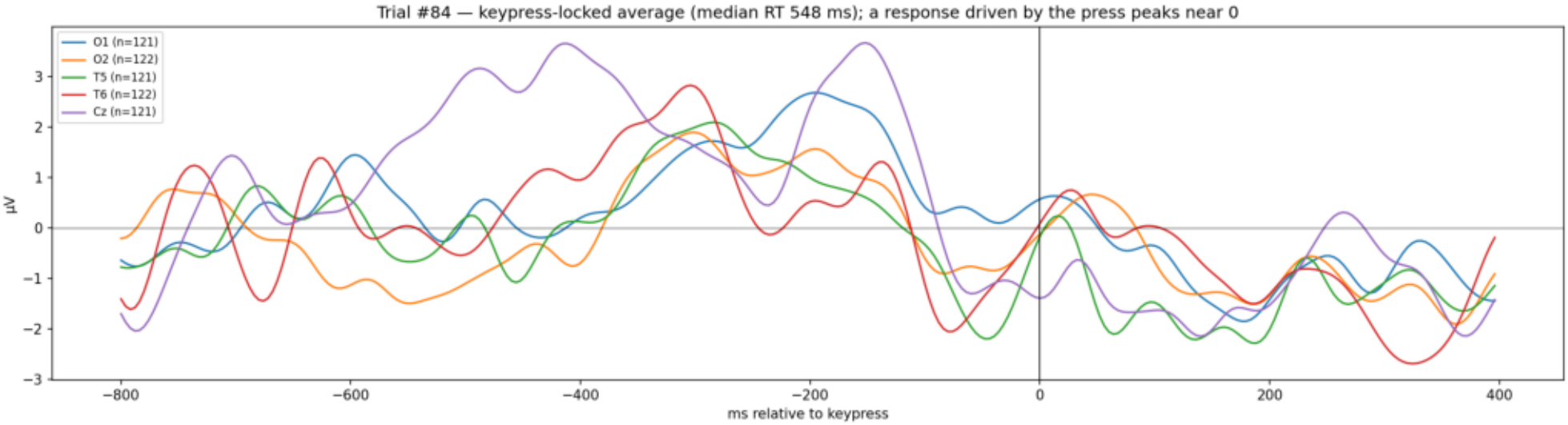
Difference wave (clear − scrambled)

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.



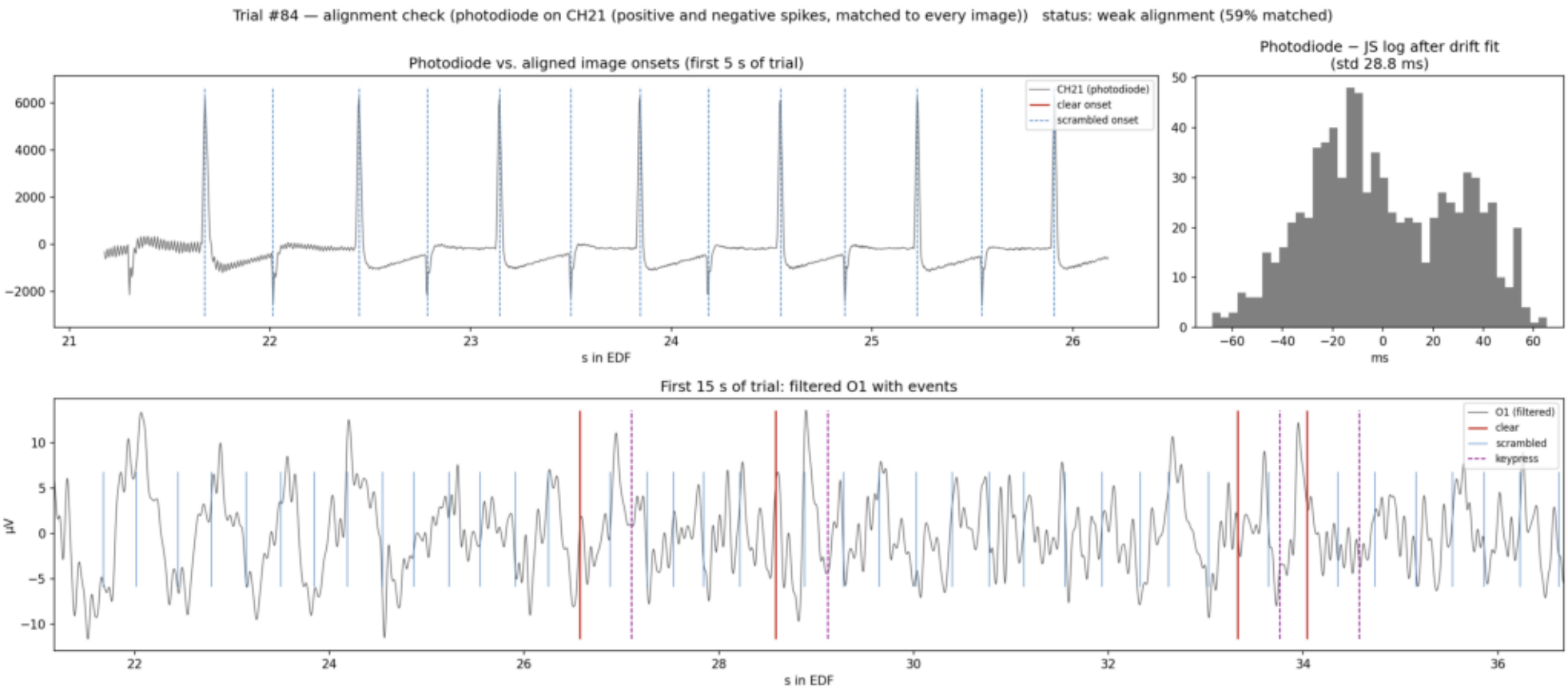
Keypress-locked average

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 #84 — subject AF, 08/15/2025 00:23
  EDF: /home/japhy/eegdata/media/trialData/af_20250815_002256.edf
  250 Hz, 398 s; 1001 images (138 clear, 863 scrambled); 135 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 20362 ms (EDF header says 4000); 59% of images matched (typical 20%); drift -167 ppm; jitter 28.8 ms
  electrode noise (µV): O1 10, O2 10, T5 12, T6 12, P3 1648, P4 1914, Pz 1621, Cz 13
  using: O1, O2, T5, T6, Cz
  122 of 138 clear images followed by a keypress (median RT 548 ms)
  O1: clear−scrambled 200–300 ms = +0.26 µV, p=0.761, peak +0.8 µV @ 288 ms
  O2: clear−scrambled 200–300 ms = +1.15 µV, p=0.185, peak +1.5 µV @ 220 ms
  T5: clear−scrambled 200–300 ms = +0.66 µV, p=0.543, peak +1.6 µV @ 180 ms
  T6: clear−scrambled 200–300 ms = +2.13 µV, p=0.032, peak +3.7 µV @ 204 ms
  Cz: clear−scrambled 200–300 ms = -0.45 µV, p=0.649, peak +3.5 µV @ 328 ms
  status: weak alignment (59% matched)
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