Trial #40 — Recognition Potential Analysis

WEAK ALIGNMENT (66% MATCHED)

Subject	AH1 • recorded 6/18/2025 20:5 • dataset Celebrities
Stimuli	101 images: 17 clear, 84 scrambled • 16 keypresses (16 matched to clear images, median RT 407 ms)
EDF file	AH1_20250618_200458.edf
Alignment	photodiode on CH23 (positive spikes, matched to every image); clock offset 34199 ms (EDF header would give 2000 ms); 75/101 images matched; drift 115 ppm; jitter 24.9 ms
Electrodes	noise after filtering — O1 20 µV ✓, O2 13 µV ✓, T5 20 µV ✓, T6 13 µV ✓, P3 892 µV, P4 1188 µV, Pz 1214 µV, Cz 30 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 66% of images matched a photodiode spike on CH23, so the alignment may be wrong. Check the alignment plot before trusting these averages.

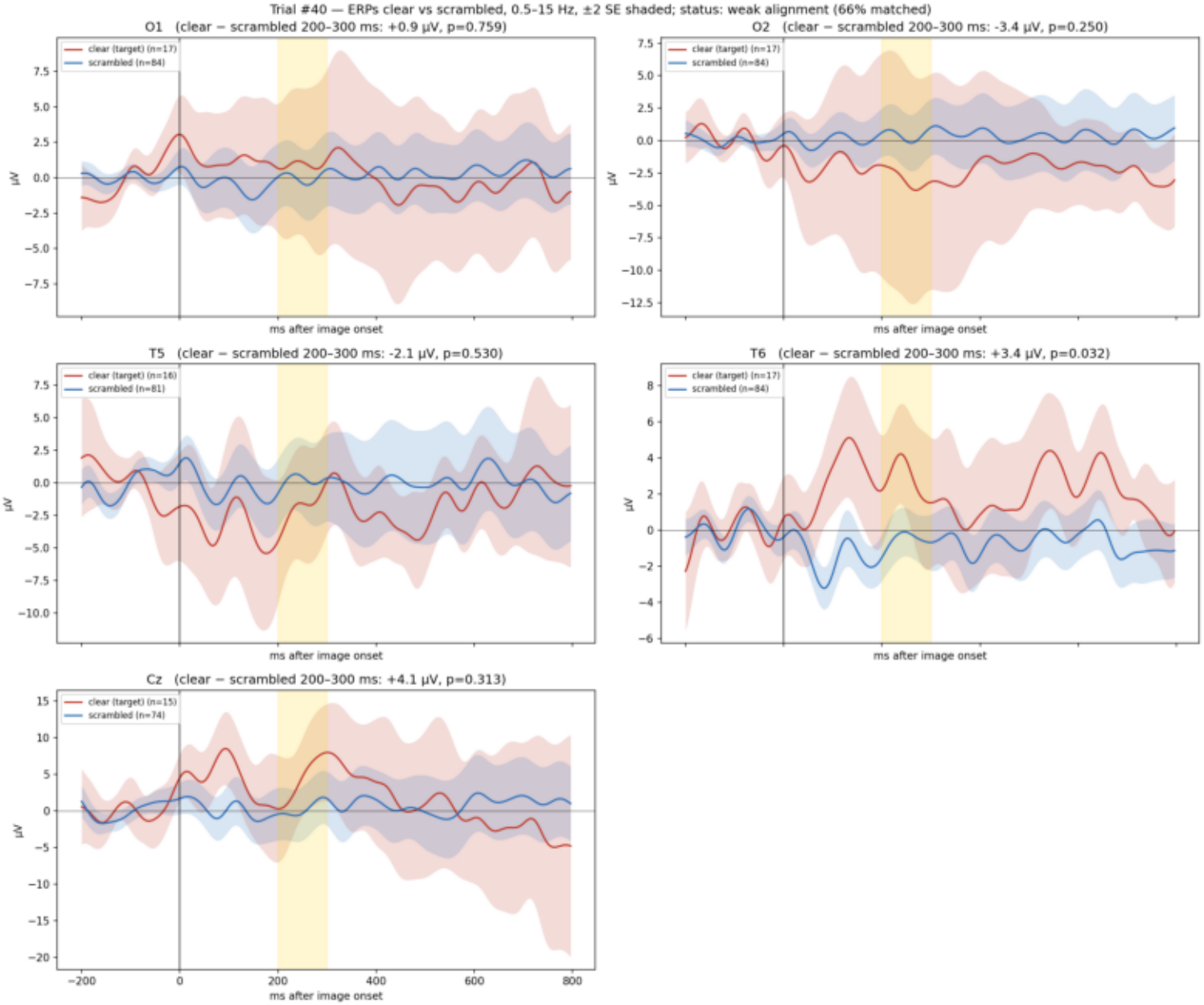
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	17 / 84	+0.87 µV	0.759	+2.8 µV @ 152 ms
O2	17 / 84	-3.38 µV	0.250	-4.3 µV @ 312 ms
T5	16 / 81	-2.08 µV	0.530	-3.9 µV @ 168 ms
T6	**17 / 84**	**+3.39 µV**	**0.032**	**+5.7 µV @ 152 ms**
Cz	15 / 74	+4.05 µV	0.313	+7.1 µV @ 320 ms

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

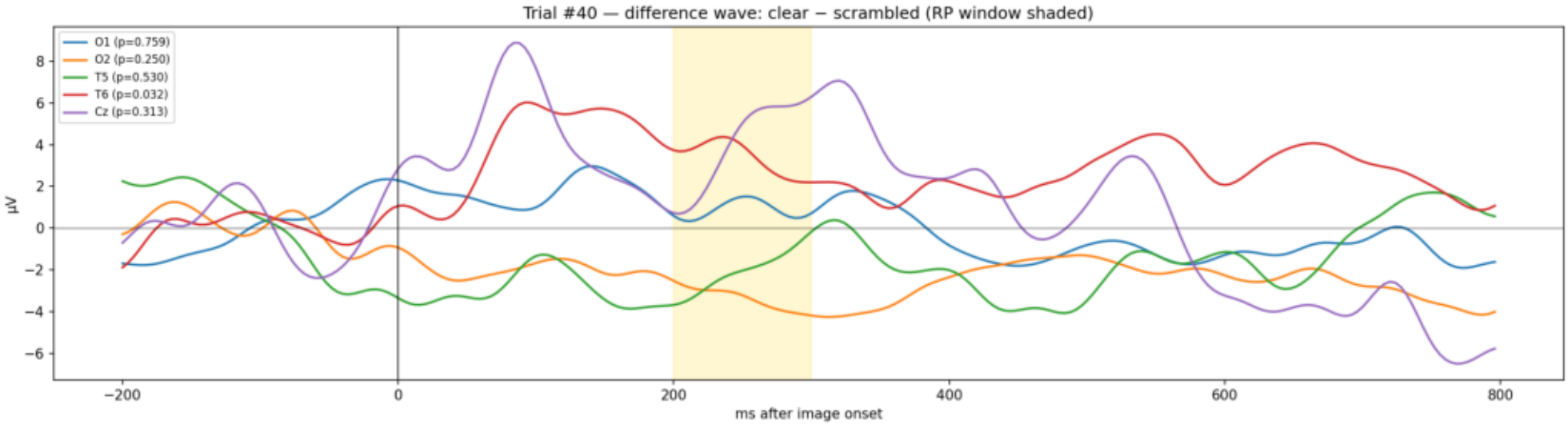
Event-related potentials: clear vs scrambled

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.



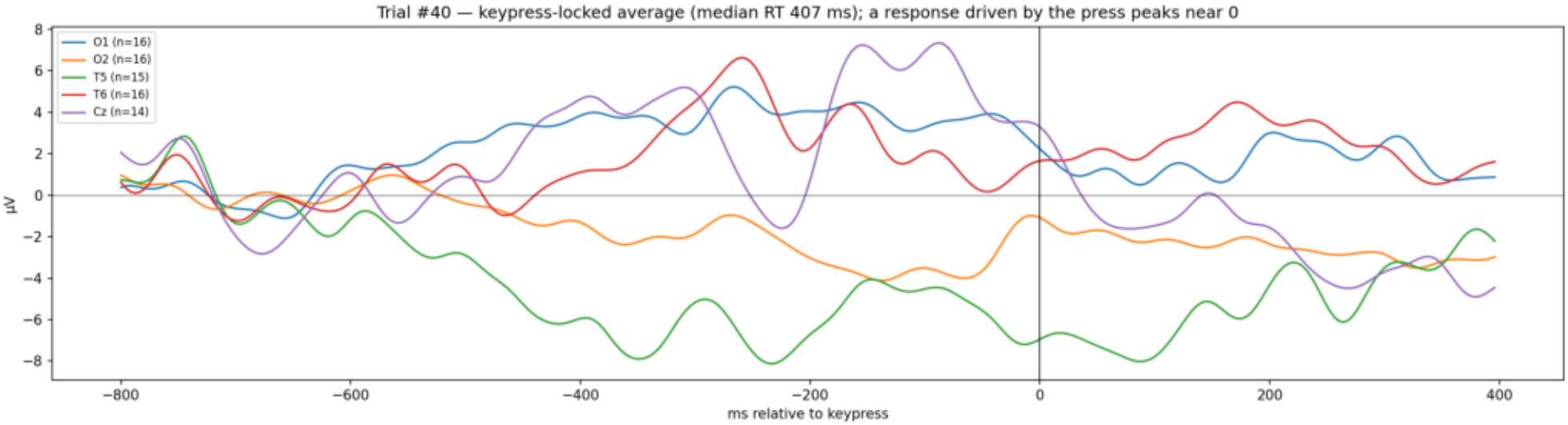
Difference wave (clear − scrambled)

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.



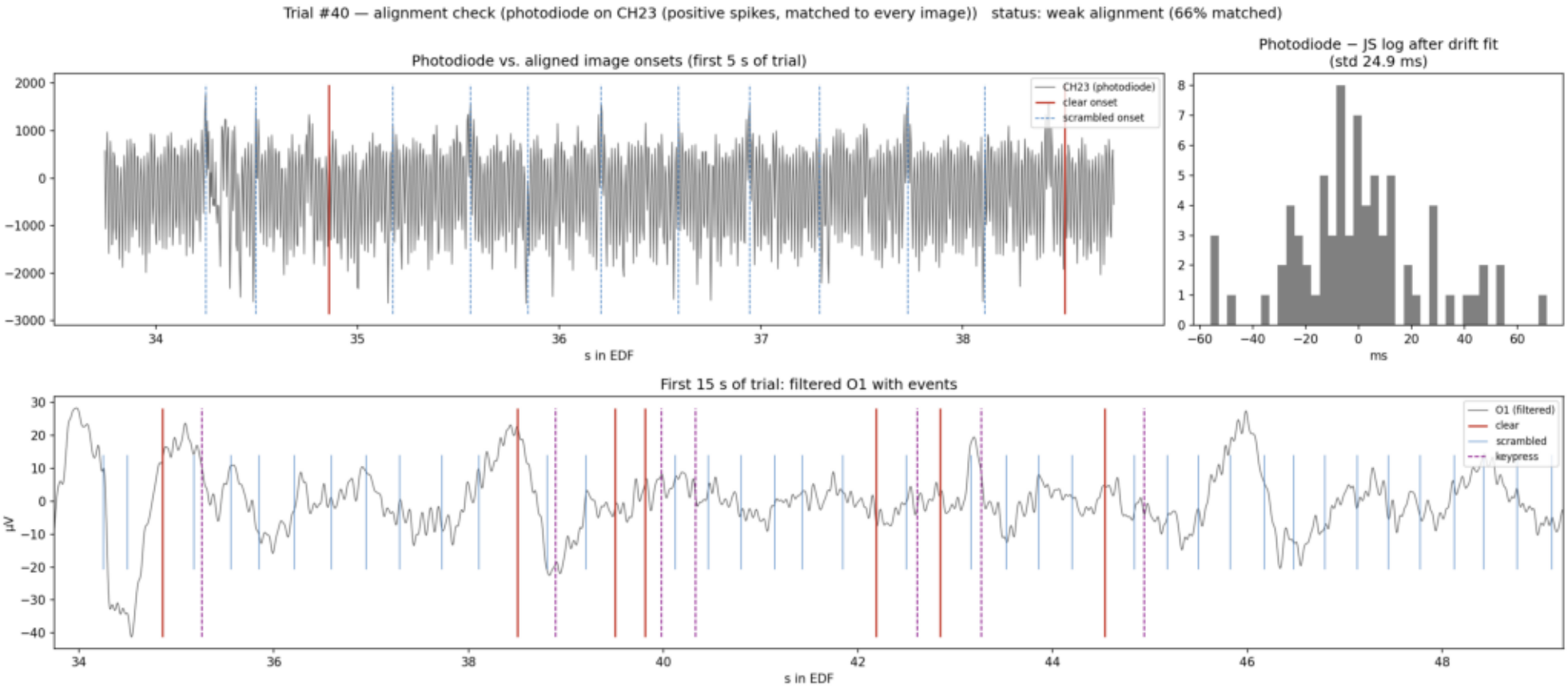
Keypress-locked average

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 #40 — subject AH1, 6/18/2025 20:5
  EDF: /home/japhy/eegdata/media/trialData/AH1_20250618_200458.edf
  250 Hz, 98 s; 101 images (17 clear, 84 scrambled); 16 presses
  alignment: photodiode on CH23 (positive spikes, matched to every image)
    offset 34199 ms (EDF header says 2000); 66% of images matched (typical 21%); drift 115 ppm; jitter 24.9 ms
  electrode noise (µV): O1 20, O2 13, T5 20, T6 13, P3 892, P4 1188, Pz 1214, Cz 30
  using: O1, O2, T5, T6, Cz
  16 of 17 clear images followed by a keypress (median RT 407 ms)
  O1: clear−scrambled 200–300 ms = +0.87 µV, p=0.759, peak +2.8 µV @ 152 ms
  O2: clear−scrambled 200–300 ms = -3.38 µV, p=0.250, peak -4.3 µV @ 312 ms
  T5: clear−scrambled 200–300 ms = -2.08 µV, p=0.530, peak -3.9 µV @ 168 ms
  T6: clear−scrambled 200–300 ms = +3.39 µV, p=0.032, peak +5.7 µV @ 152 ms
  Cz: clear−scrambled 200–300 ms = +4.05 µV, p=0.313, peak +7.1 µV @ 320 ms
  status: weak alignment (66% matched)
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