Trial #63 — Recognition Potential Analysis

OK

Subject	JW1 • recorded 06/22/2025 13:54 • dataset Celebrities
Stimuli	301 images: 49 clear, 252 scrambled • 44 keypresses (47 matched to clear images, median RT 394 ms)
EDF file	JW1_20250621_030748.edf
Alignment	photodiode on EKG1 (positive and negative spikes, matched to every image); clock offset 150954 ms (EDF header would give 125172000 ms); 301/301 images matched; drift -245 ppm; jitter 14.1 ms
Electrodes	noise after filtering — O1 19 µV ✓, O2 23 µV ✓, T5 460 µV, T6 417 µV, P3 747 µV, P4 565 µV, Pz 544 µV, Cz 24 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

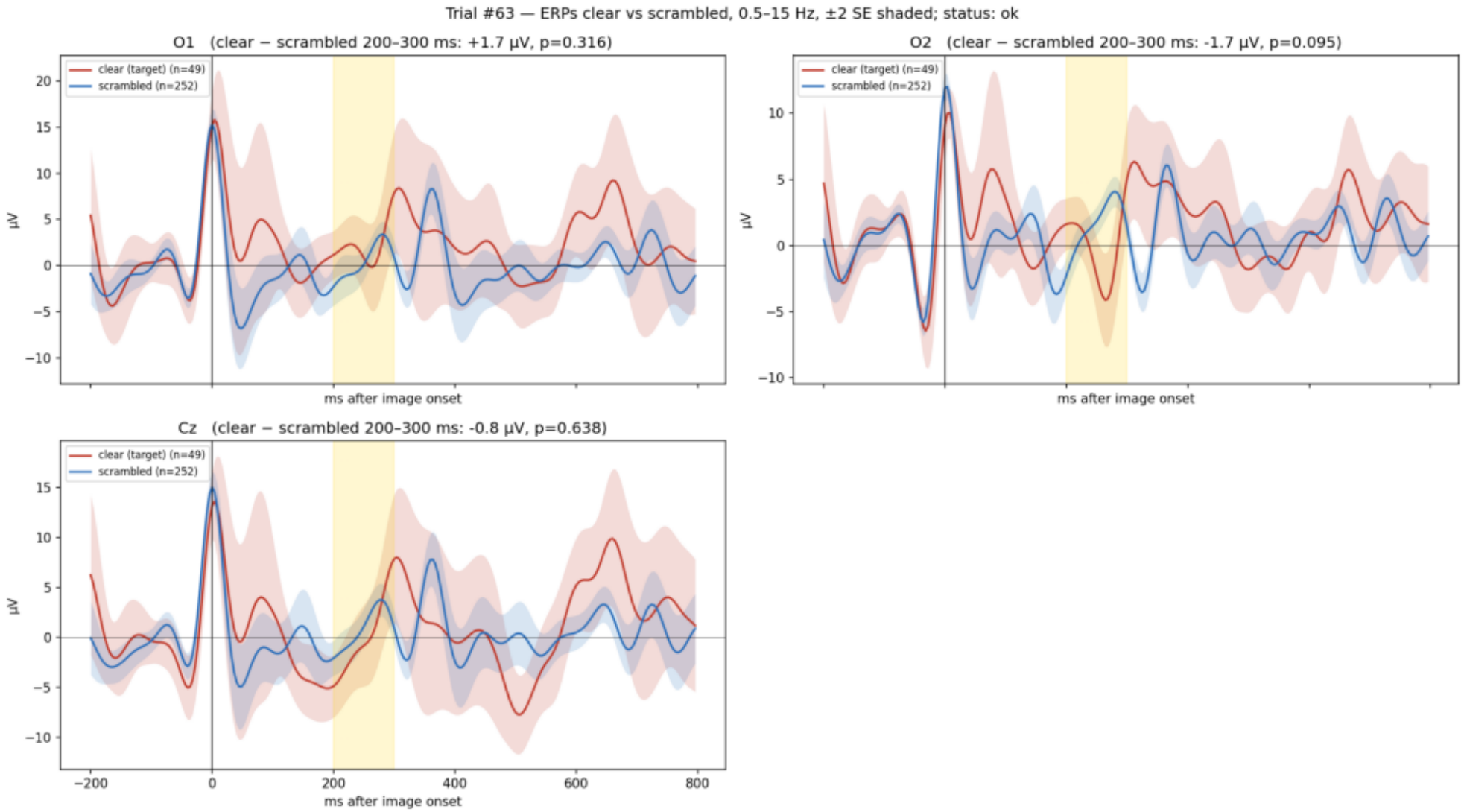
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	49 / 252	+1.72 µV	0.316	+10.1 µV @ 316 ms
O2	49 / 252	-1.75 µV	0.095	+9.2 µV @ 320 ms
Cz	49 / 252	-0.80 µV	0.638	+9.1 µV @ 312 ms

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

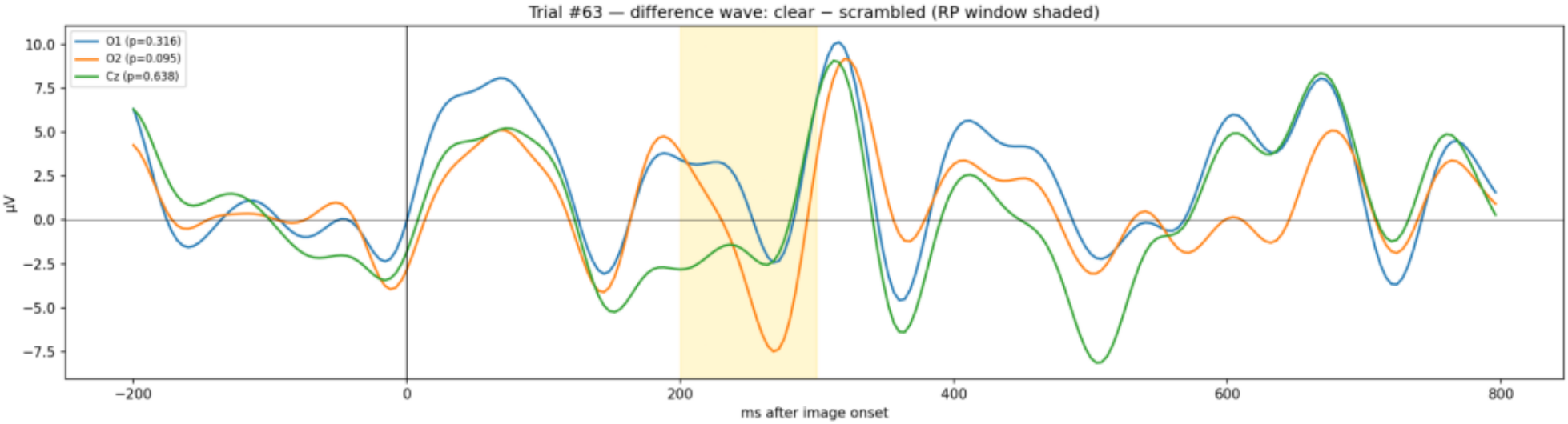
Event-related potentials: clear vs scrambled

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.



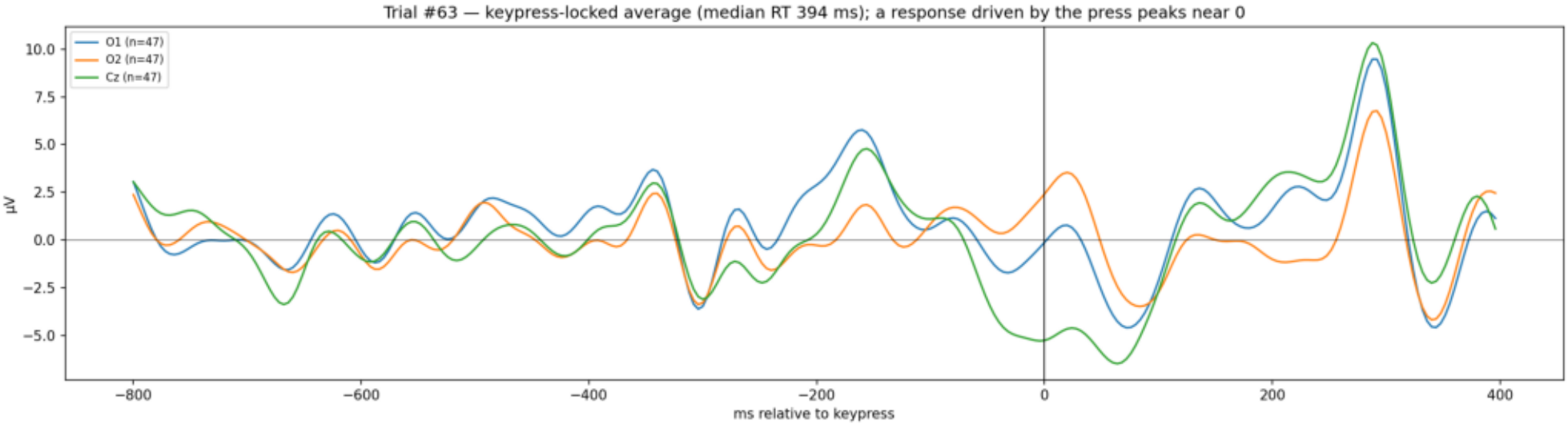
Difference wave (clear − scrambled)

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.



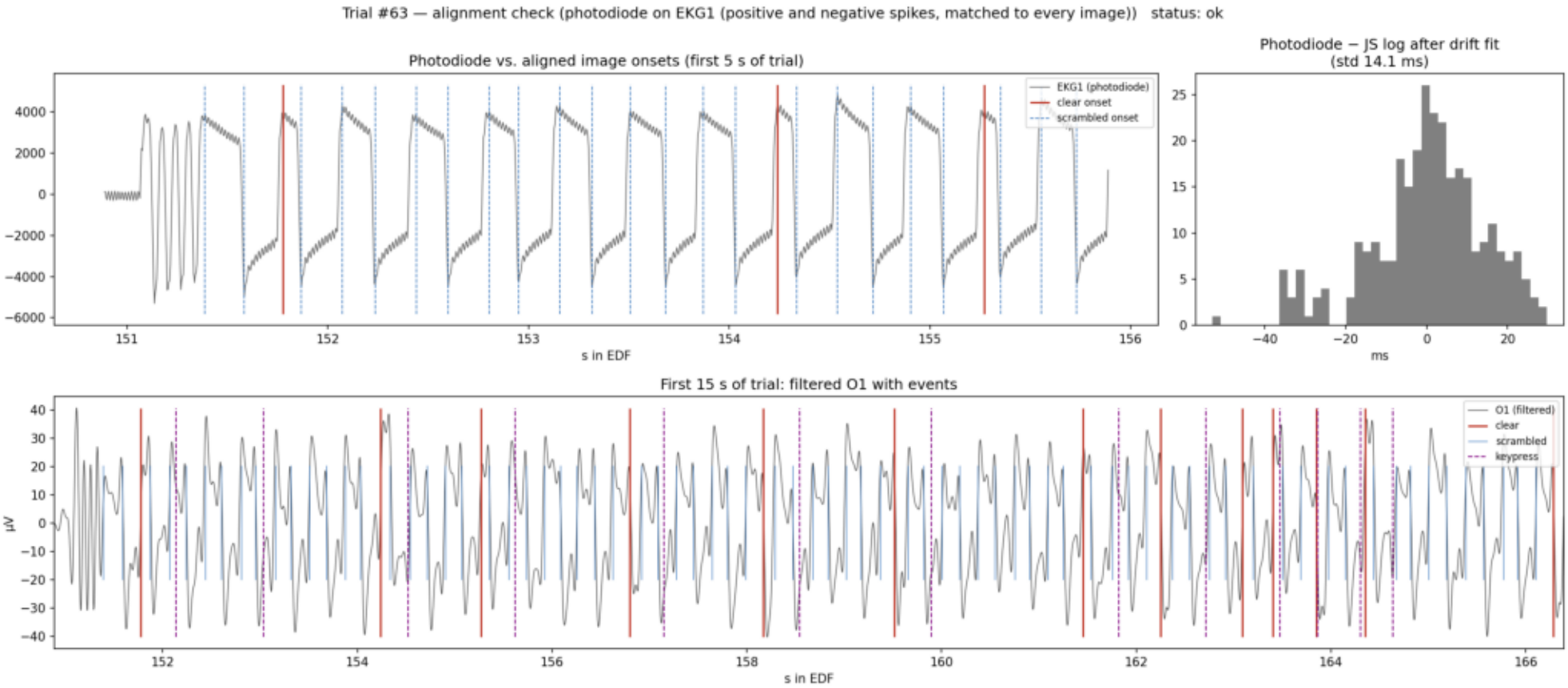
Keypress-locked average

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 #63 — subject JW1, 06/22/2025 13:54
  EDF: /home/japhy/eegdata/media/trialData/JW1_20250621_030748.edf
  250 Hz, 279 s; 301 images (49 clear, 252 scrambled); 44 presses
  alignment: photodiode on EKG1 (positive and negative spikes, matched to every image)
    offset 150954 ms (EDF header says 125172000); 99% of images matched (typical 1%); drift -245 ppm; jitter 14.1 ms
  electrode noise (µV): O1 19, O2 23, T5 460, T6 417, P3 747, P4 565, Pz 544, Cz 24
  using: O1, O2, Cz
  47 of 49 clear images followed by a keypress (median RT 394 ms)
  O1: clear−scrambled 200–300 ms = +1.72 µV, p=0.316, peak +10.1 µV @ 316 ms
  O2: clear−scrambled 200–300 ms = -1.75 µV, p=0.095, peak +9.2 µV @ 320 ms
  Cz: clear−scrambled 200–300 ms = -0.80 µV, p=0.638, peak +9.1 µV @ 312 ms
  status: ok
```