Trial #128 — Recognition Potential Analysis

OK

Subject	AF • recorded 11/03/2025 10:27:11.312 • dataset Celebrities
Stimuli	501 images: 63 clear, 438 scrambled • 61 keypresses (58 matched to clear images, median RT 446 ms)
EDF file	AF_20251103_102700.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 3645 ms (EDF header would give 11312 ms); 502/501 images matched; drift -213 ppm; jitter 7.6 ms
Electrodes	noise after filtering — O1 25 µV ✓, O2 24 µV ✓, T5 23 µV ✓, T6 65 µV, P3 230 µV, P4 974 µV, Pz 889 µV, Cz 8 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

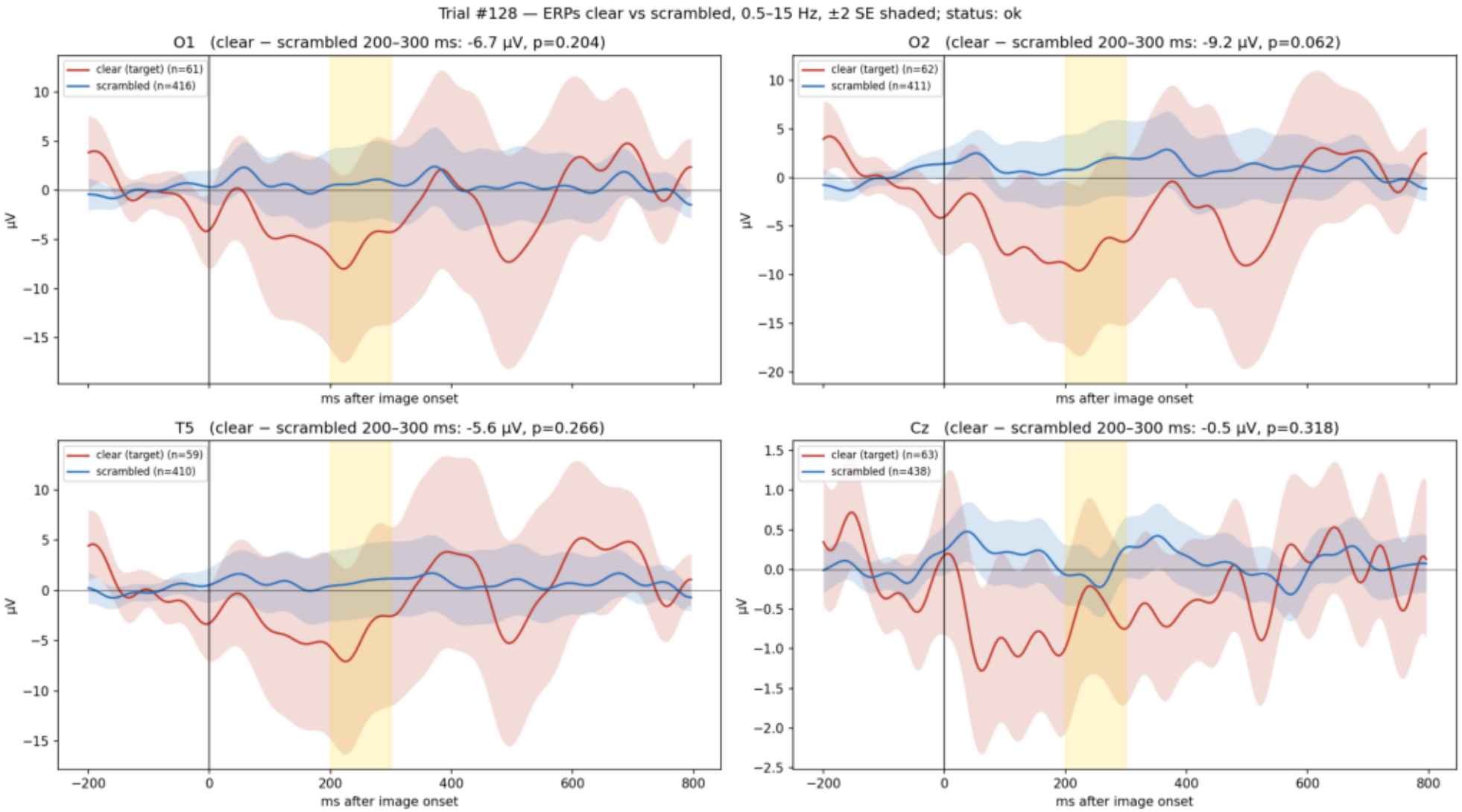
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	61 / 416	-6.70 µV	0.204	-8.6 µV @ 220 ms
O2	62 / 411	-9.21 µV	0.062	-10.4 µV @ 224 ms
T5	59 / 410	-5.59 µV	0.266	-7.6 µV @ 224 ms
Cz	63 / 438	-0.47 µV	0.318	-1.1 µV @ 180 ms

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

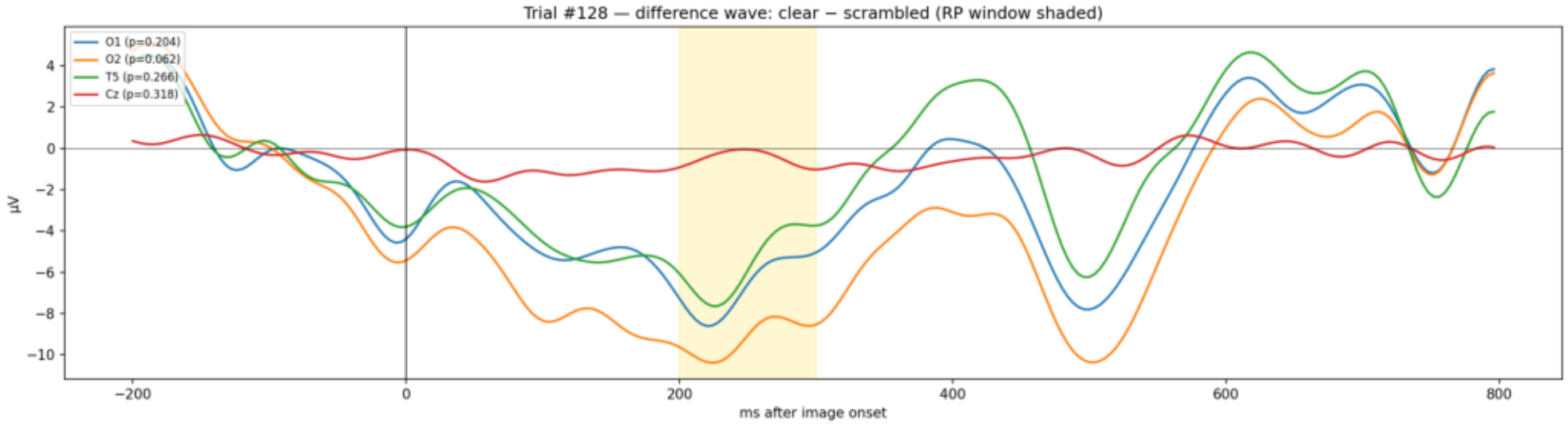
Event-related potentials: clear vs scrambled

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.



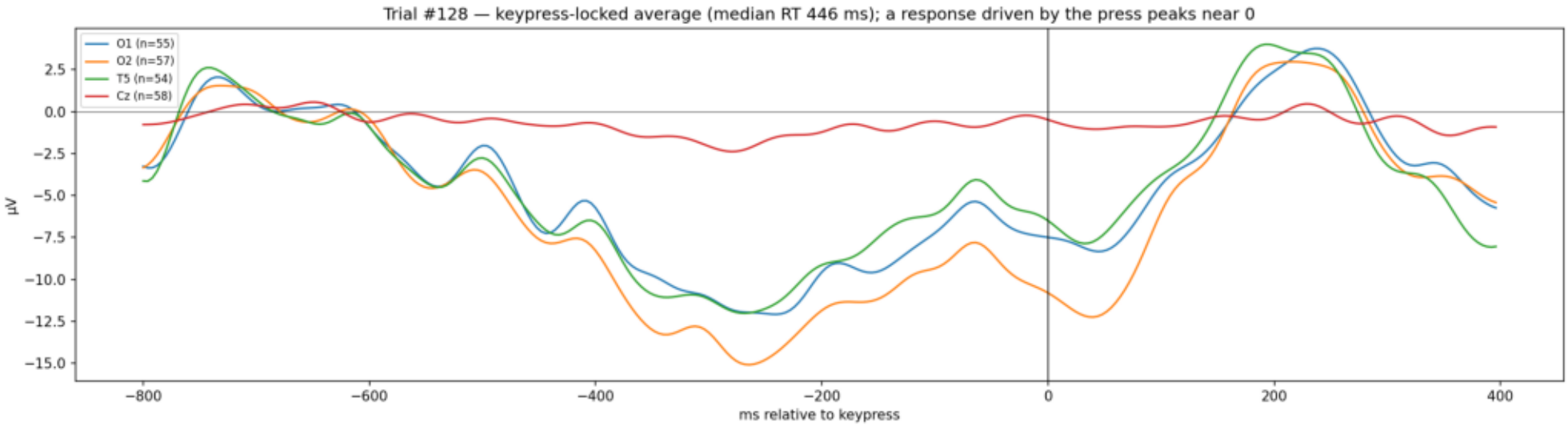
Difference wave (clear − scrambled)

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.



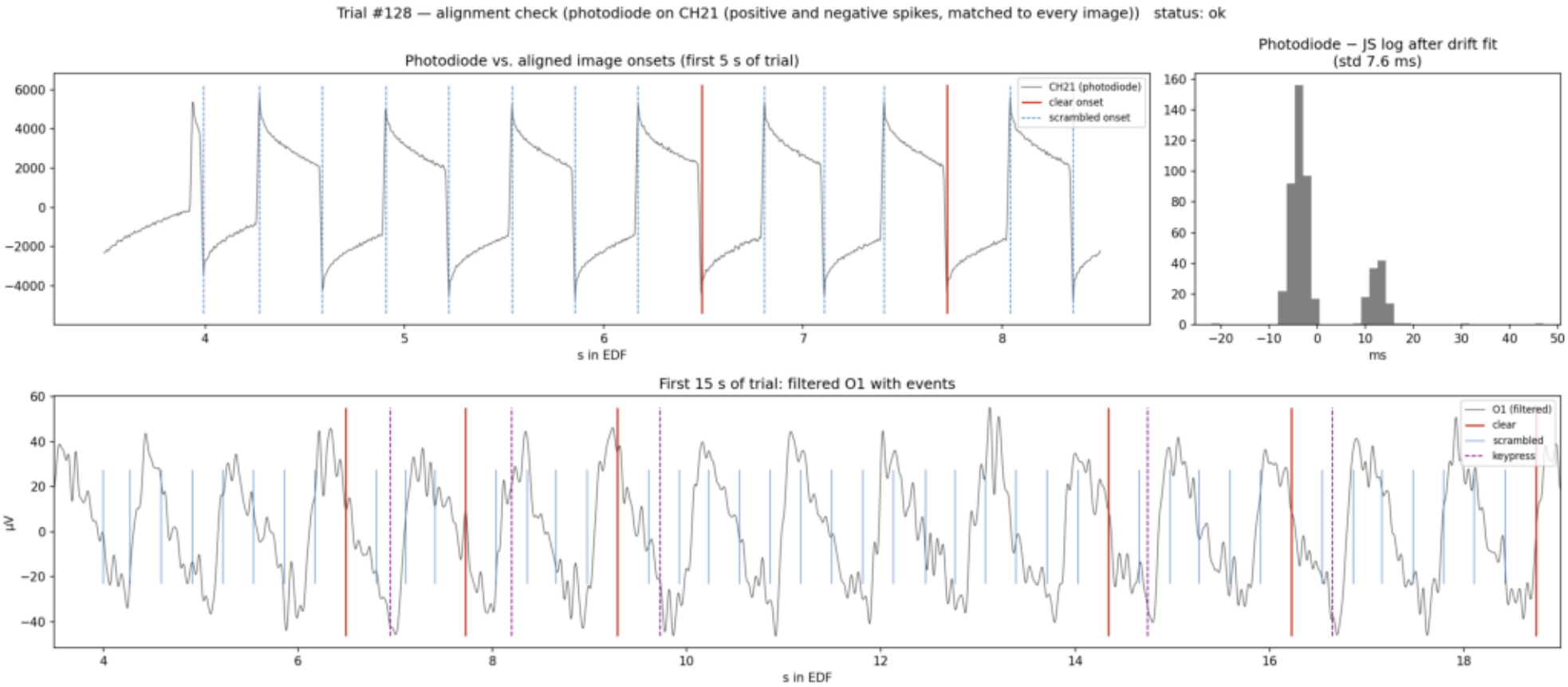
Keypress-locked average

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 #128 — subject AF, 11/03/2025 10:27:11.312
  EDF: /home/japhy/eegdata/media/trialData/AF_20251103_102700.edf
  250 Hz, 167 s; 501 images (63 clear, 438 scrambled); 61 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 3645 ms (EDF header says 11312); 100% of images matched (typical 18%); drift -213 ppm; jitter 7.6 ms
  electrode noise (µV): O1 25, O2 24, T5 23, T6 65, P3 230, P4 974, Pz 889, Cz 8
  using: O1, O2, T5, Cz
  58 of 63 clear images followed by a keypress (median RT 446 ms)
  O1: clear−scrambled 200–300 ms = -6.70 µV, p=0.204, peak -8.6 µV @ 220 ms
  O2: clear−scrambled 200–300 ms = -9.21 µV, p=0.062, peak -10.4 µV @ 224 ms
  T5: clear−scrambled 200–300 ms = -5.59 µV, p=0.266, peak -7.6 µV @ 224 ms
  Cz: clear−scrambled 200–300 ms = -0.47 µV, p=0.318, peak -1.1 µV @ 180 ms
  status: ok
```