Trial #91 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/17/2025 11:05 • dataset Celebrities
Stimuli	1001 images: 141 clear, 860 scrambled • 144 keypresses (139 matched to clear images, median RT 480 ms)
EDF file	AF_20250817_110505.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 15373 ms (EDF header would give -5000 ms); 899/1001 images matched; drift -82 ppm; jitter 22.3 ms
Electrodes	noise after filtering — O1 19 µV ✓, O2 17 µV ✓, T5 18 µV ✓, T6 19 µV ✓, P3 860 µV, P4 945 µV, Pz 780 µV, Cz 5 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

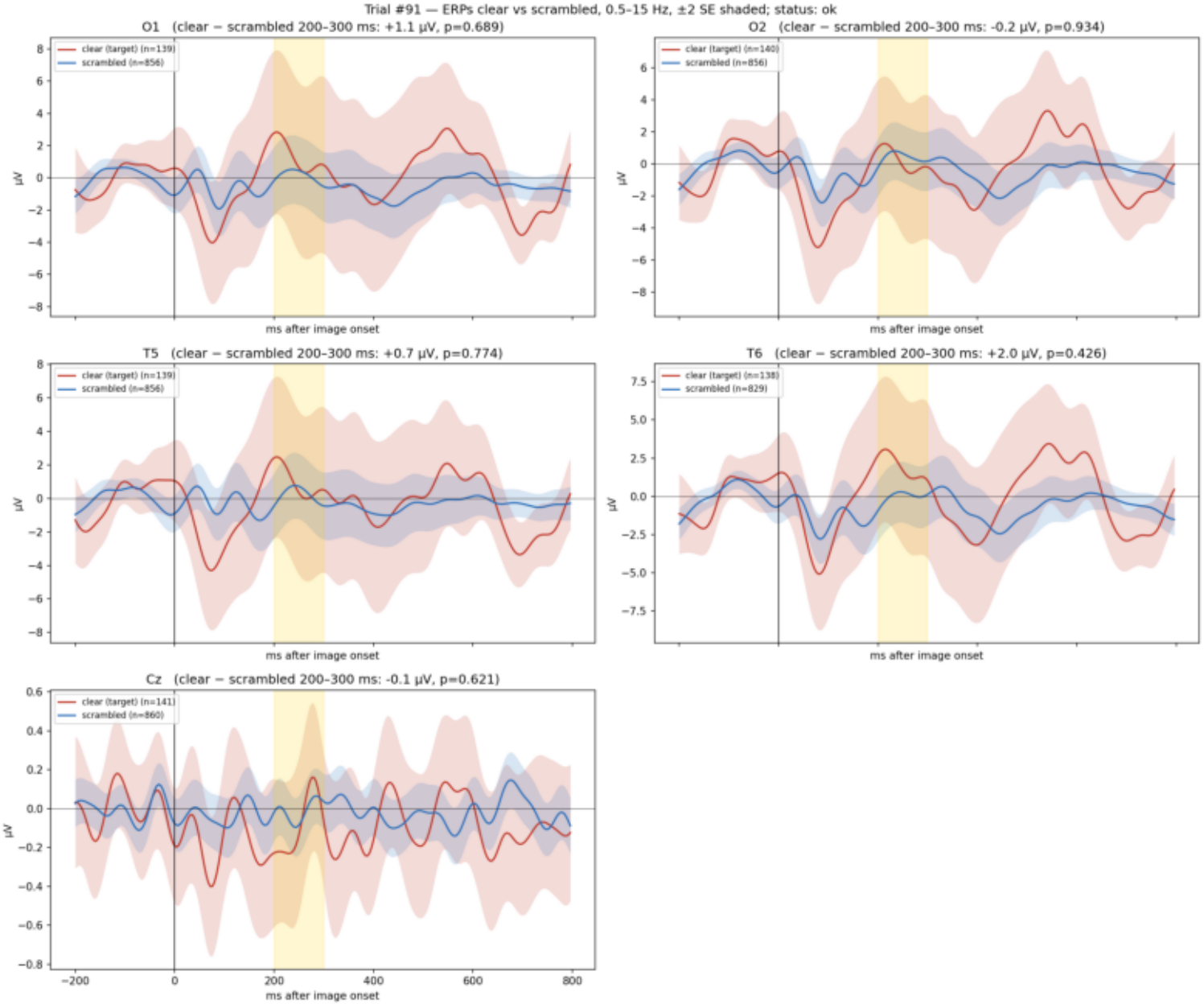
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
O1	139 / 856	+1.15 µV	0.689	+3.0 µV @ 192 ms
O2	140 / 856	-0.18 µV	0.934	-1.5 µV @ 336 ms
T5	139 / 856	+0.74 µV	0.774	+2.9 µV @ 192 ms
T6	138 / 829	+1.98 µV	0.426	+3.6 µV @ 200 ms
Cz	141 / 860	-0.07 µV	0.621	-0.3 µV @ 328 ms

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

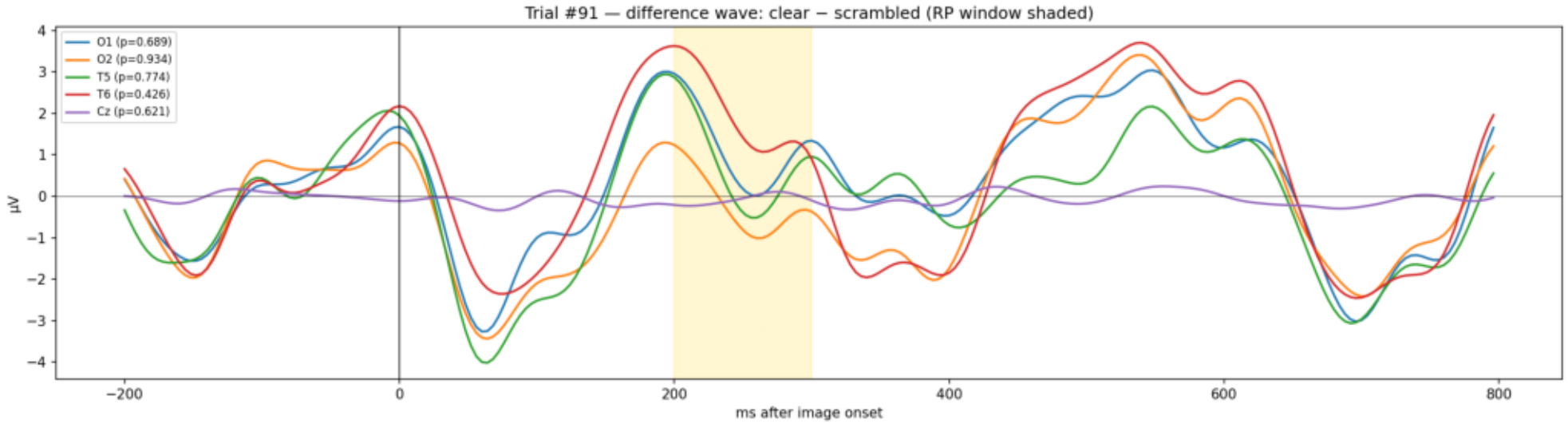
Event-related potentials: clear vs scrambled

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.



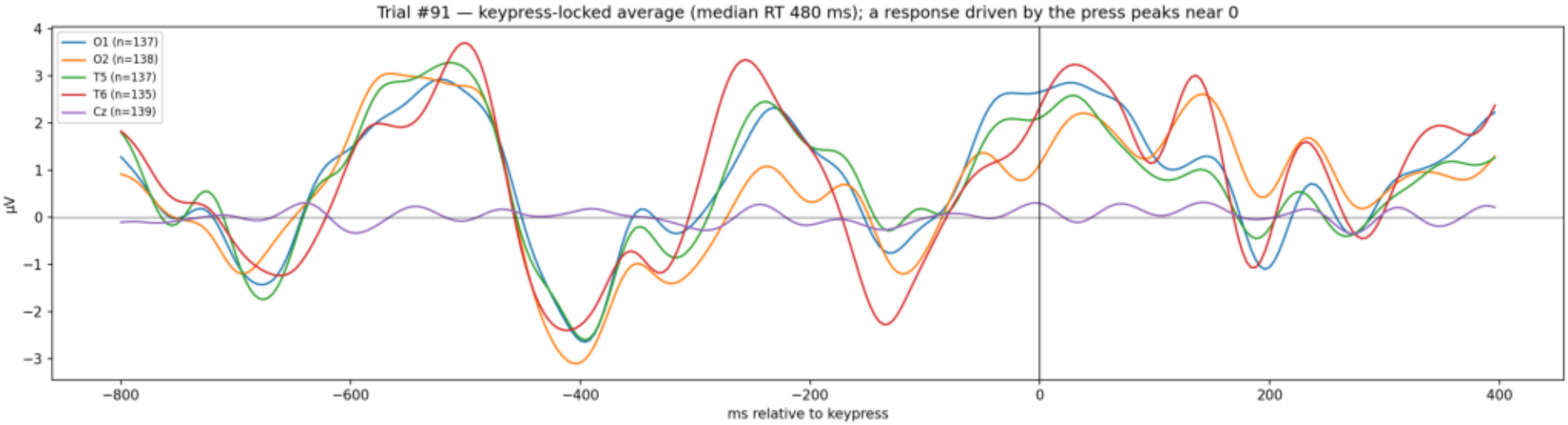
Difference wave (clear − scrambled)

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.



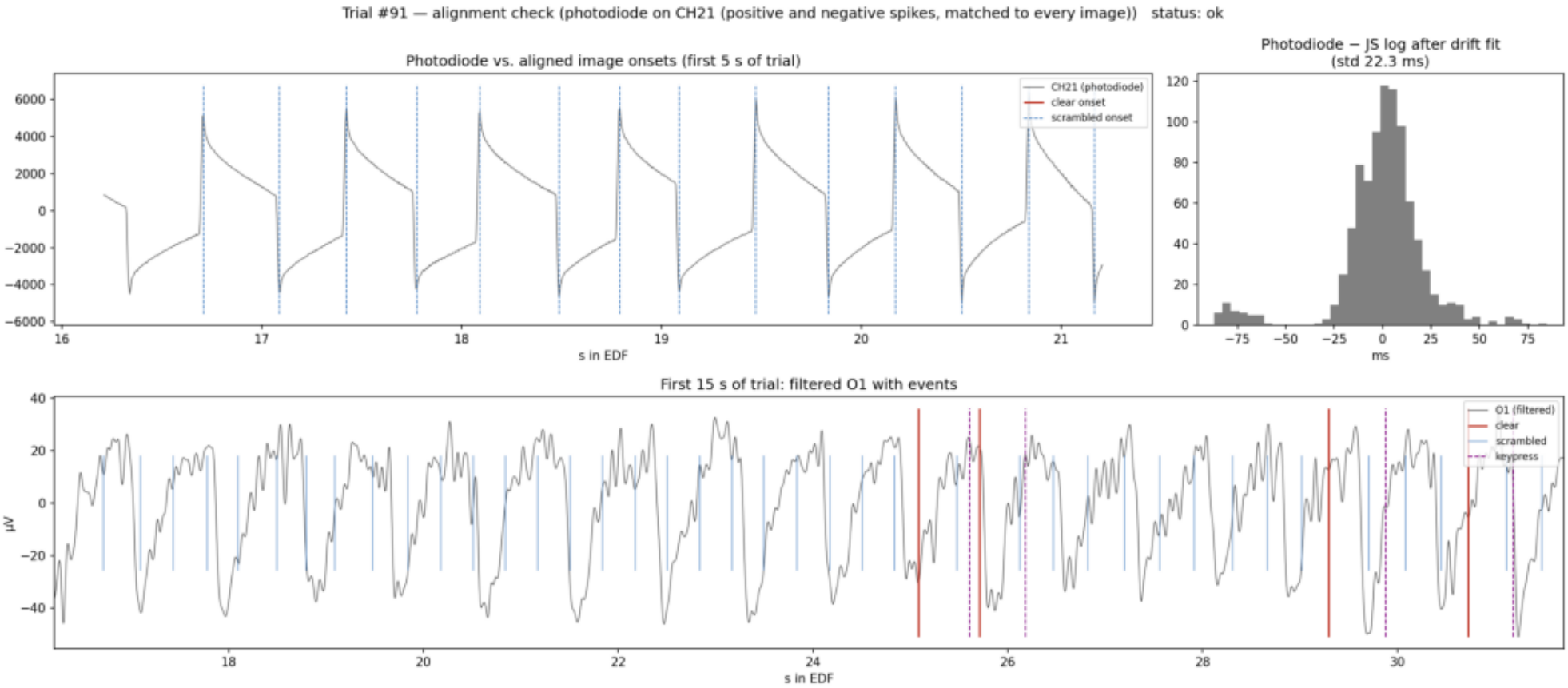
Keypress-locked average

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 #91 — subject AF, 08/17/2025 11:05
  EDF: /home/japhy/eegdata/media/trialData/AF_20250817_110505.edf
  250 Hz, 384 s; 1001 images (141 clear, 860 scrambled); 144 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 15373 ms (EDF header says -5000); 83% of images matched (typical 20%); drift -82 ppm; jitter 22.3 ms
  electrode noise (µV): O1 19, O2 17, T5 18, T6 19, P3 860, P4 945, Pz 780, Cz 5
  using: O1, O2, T5, T6, Cz
  139 of 141 clear images followed by a keypress (median RT 480 ms)
  O1: clear−scrambled 200–300 ms = +1.15 µV, p=0.689, peak +3.0 µV @ 192 ms
  O2: clear−scrambled 200–300 ms = -0.18 µV, p=0.934, peak -1.5 µV @ 336 ms
  T5: clear−scrambled 200–300 ms = +0.74 µV, p=0.774, peak +2.9 µV @ 192 ms
  T6: clear−scrambled 200–300 ms = +1.98 µV, p=0.426, peak +3.6 µV @ 200 ms
  Cz: clear−scrambled 200–300 ms = -0.07 µV, p=0.621, peak -0.3 µV @ 328 ms
  status: ok
```