Trial #87 — Recognition Potential Analysis

OK

Subject	AF • recorded 08/15/2025 20:21 • dataset Celebrities
Stimuli	1001 images: 143 clear, 858 scrambled • 136 keypresses (134 matched to clear images, median RT 505 ms)
EDF file	af_20250815_202140.edf
Alignment	photodiode on CH21 (positive and negative spikes, matched to every image); clock offset 9675 ms (EDF header would give -40000 ms); 929/1001 images matched; drift -121 ppm; jitter 22.7 ms
Electrodes	noise after filtering — O1 60 µV, O2 60 µV, T5 59 µV, T6 60 µV, P3 669 µV, P4 833 µV, Pz 644 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

⚠ No occipital or posterior-temporal electrode (O1, O2, Oz, T5, T6) was connected; the recognition potential is normally largest there.

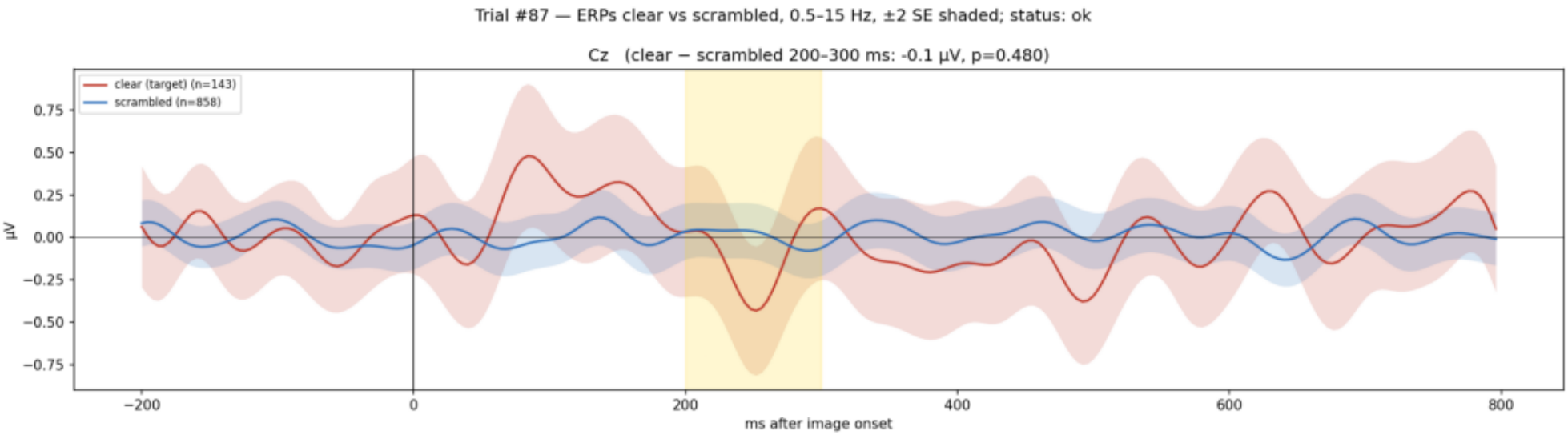
Clear − scrambled, 200–300 ms RP window

Channel	Epochs (clear / scrambled)	Mean difference	p (permutation, 2000)	Largest difference 150–350 ms
Cz	143 / 858	-0.12 µV	0.480	-0.5 µV @ 252 ms

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

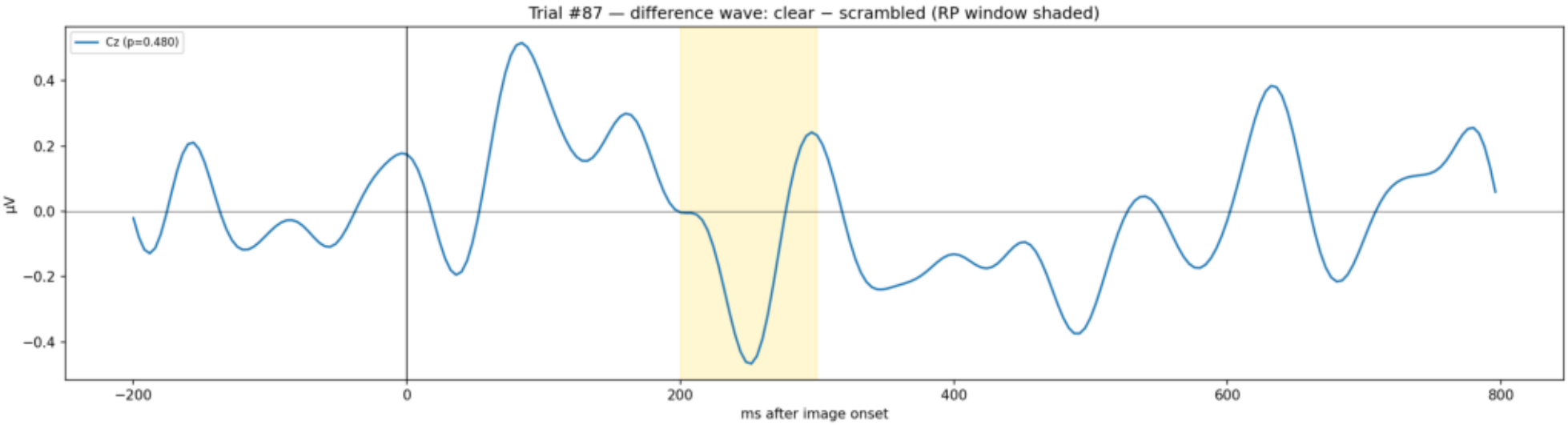
Event-related potentials: clear vs scrambled

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.



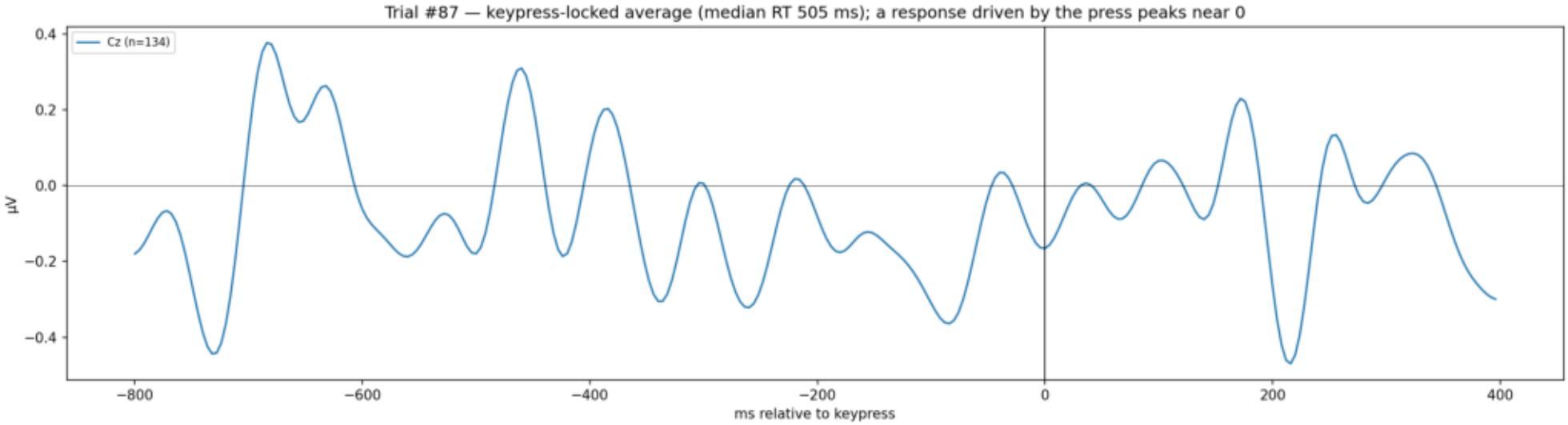
Difference wave (clear − scrambled)

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.



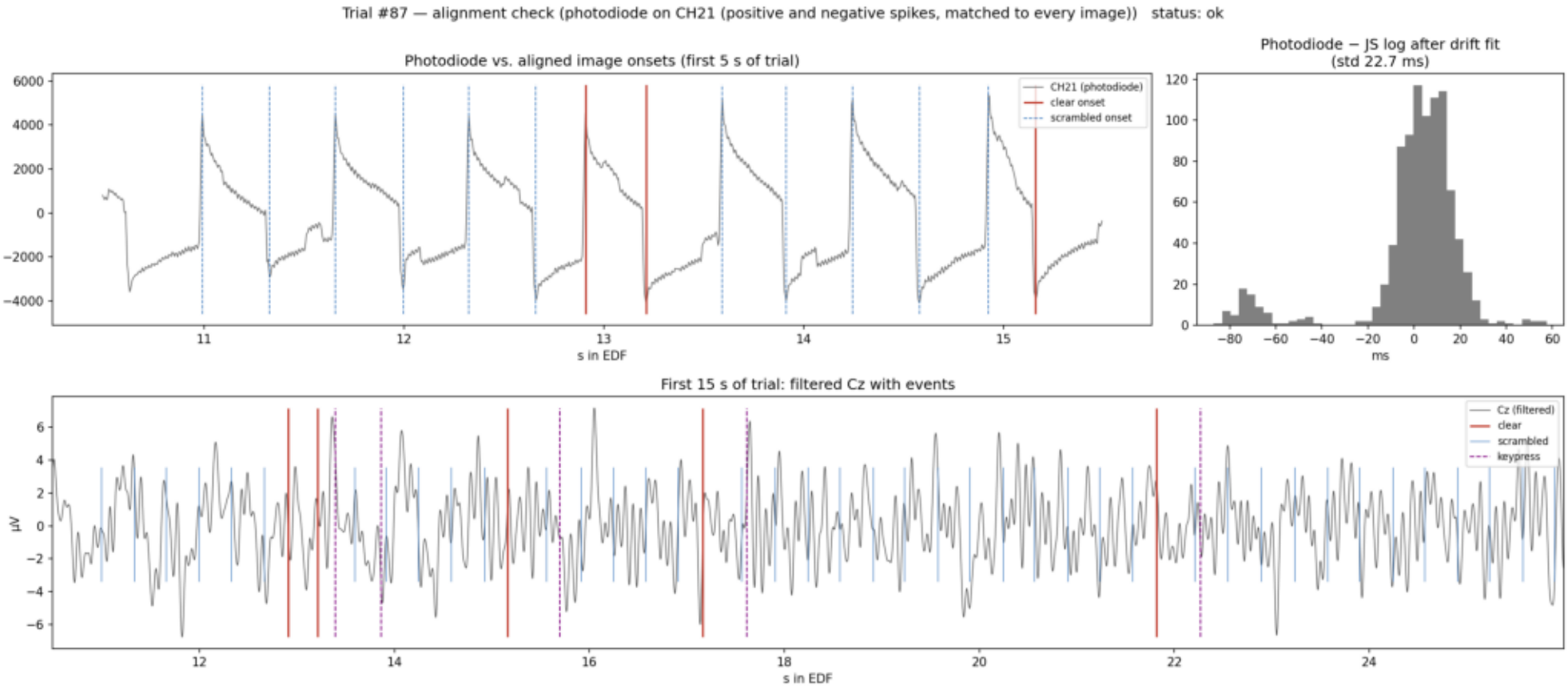
Keypress-locked average

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 #87 — subject AF, 08/15/2025 20:21
  EDF: /home/japhy/eegdata/media/trialData/af_20250815_202140.edf
  250 Hz, 370 s; 1001 images (143 clear, 858 scrambled); 136 presses
  alignment: photodiode on CH21 (positive and negative spikes, matched to every image)
    offset 9675 ms (EDF header says -40000); 85% of images matched (typical 21%); drift -121 ppm; jitter 22.7 ms
  electrode noise (µV): O1 60, O2 60, T5 59, T6 60, P3 669, P4 833, Pz 644, Cz 5
  using: Cz
  134 of 143 clear images followed by a keypress (median RT 505 ms)
  Cz: clear−scrambled 200–300 ms = -0.12 µV, p=0.480, peak -0.5 µV @ 252 ms
  status: ok
```