

How does intention shape neural processing of moral conflict in borderline personality disorder?

Background

- Borderline personality disorder (BPD), is a mental disorder characterized by interpersonal problems like trust and forgiveness [1, 2].
- Numerous studies on BPD has focused on trust [3], rejection sensitivity [4], and fairness perception [5], less is known about how they attribute intentions in moral conflict.
- Medial Frontal Negativity (MFN), a neural marker of conflict monitoring [6] and moral evaluation [7], may help elucidate the mechanisms underlying these attribution biases in BPD.

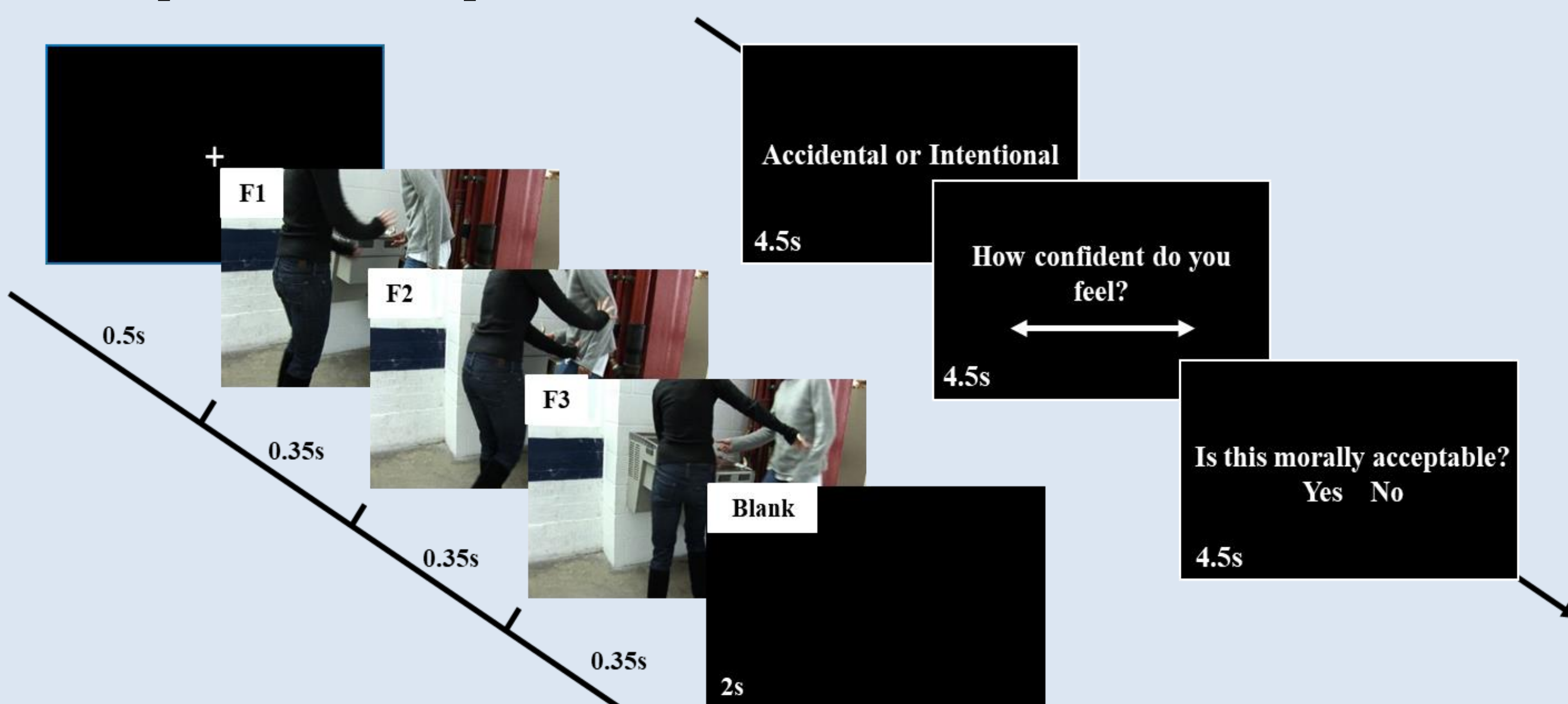
Aim

- Investigate whether BPD patients differ in intention interpretation compared to controls.
- Examine how these differences influence behavioral and neural conflict processing.

Methods

- Participants**
 - 15 BPD and 15 Controls (18-50 years old)
Age-sex matched (12 ♀, 3 ♂)
 - The aimed sample size is N = 126 (63 per group)
- For BPD: Stable antidepressive medication min. two weeks before the study onset

- Experimental setup**



4 blocks: randomized 20-30 trials per block
Total 100 trials (Accidental harm and Intentional harm):

- F1 - establishes scene ● F2 - presents action ● F3 - confirms intention

- EEG setup**

System: 32-channel EEG with BrainAmp amplifier
Electrode Placement: 10-20 system, focus on Cz
Impedance: Kept below 10 kΩ.

Analyses

Preprocessing

- Semi-manual ICA rejection for artifact removal
- Bandpass filter (0.1–30 Hz), epoching (-200 to 500 ms)
- Baseline subtraction: 200 ms pre-stimulus.

ERP Analysis

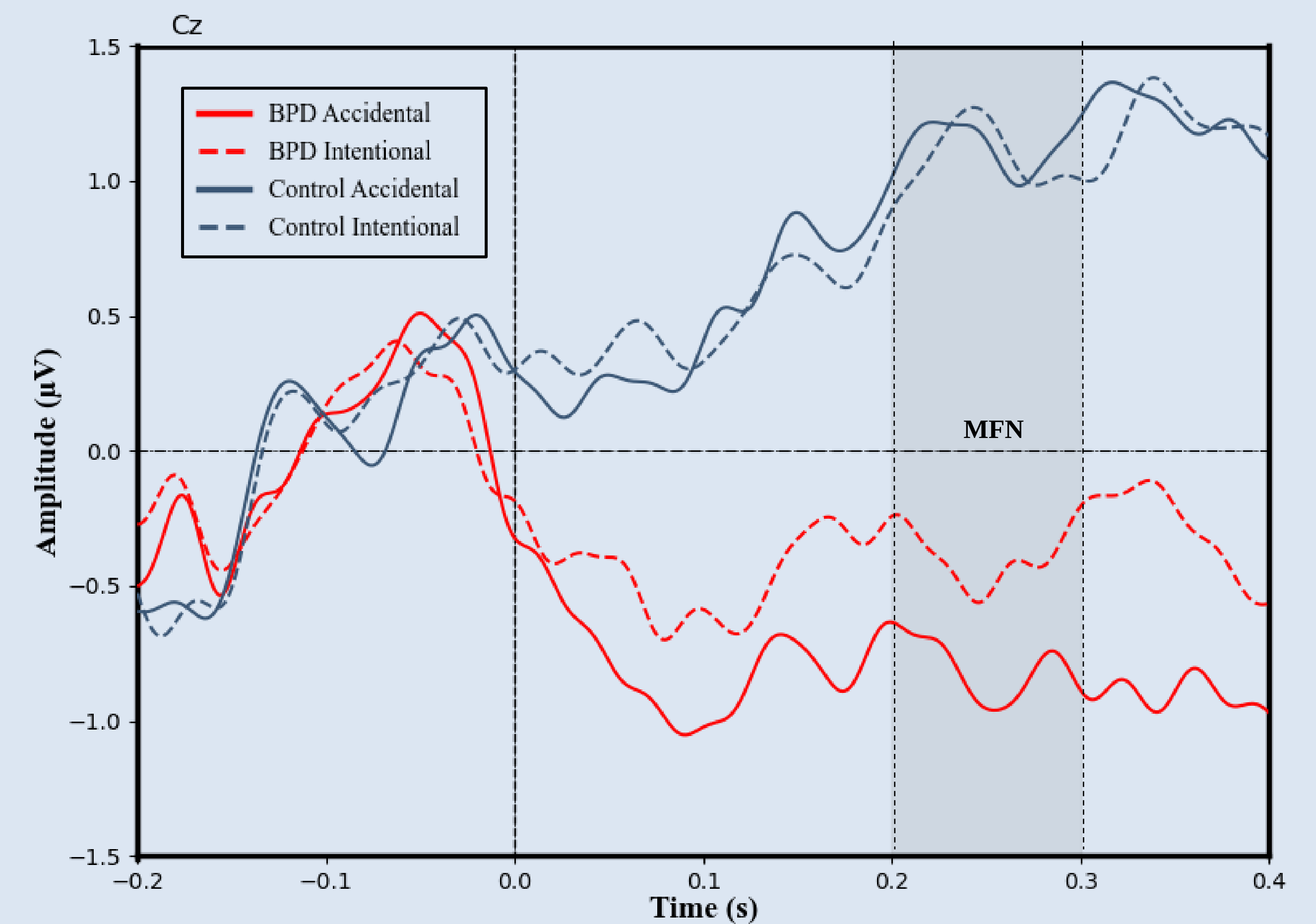
- MFN: conflict marker
- Conditions: Accidental vs. Intentional harm
- Epoch window: 200–300 ms (time-locked to F2-onset)
- Grand average computation for comparisons

Statistical

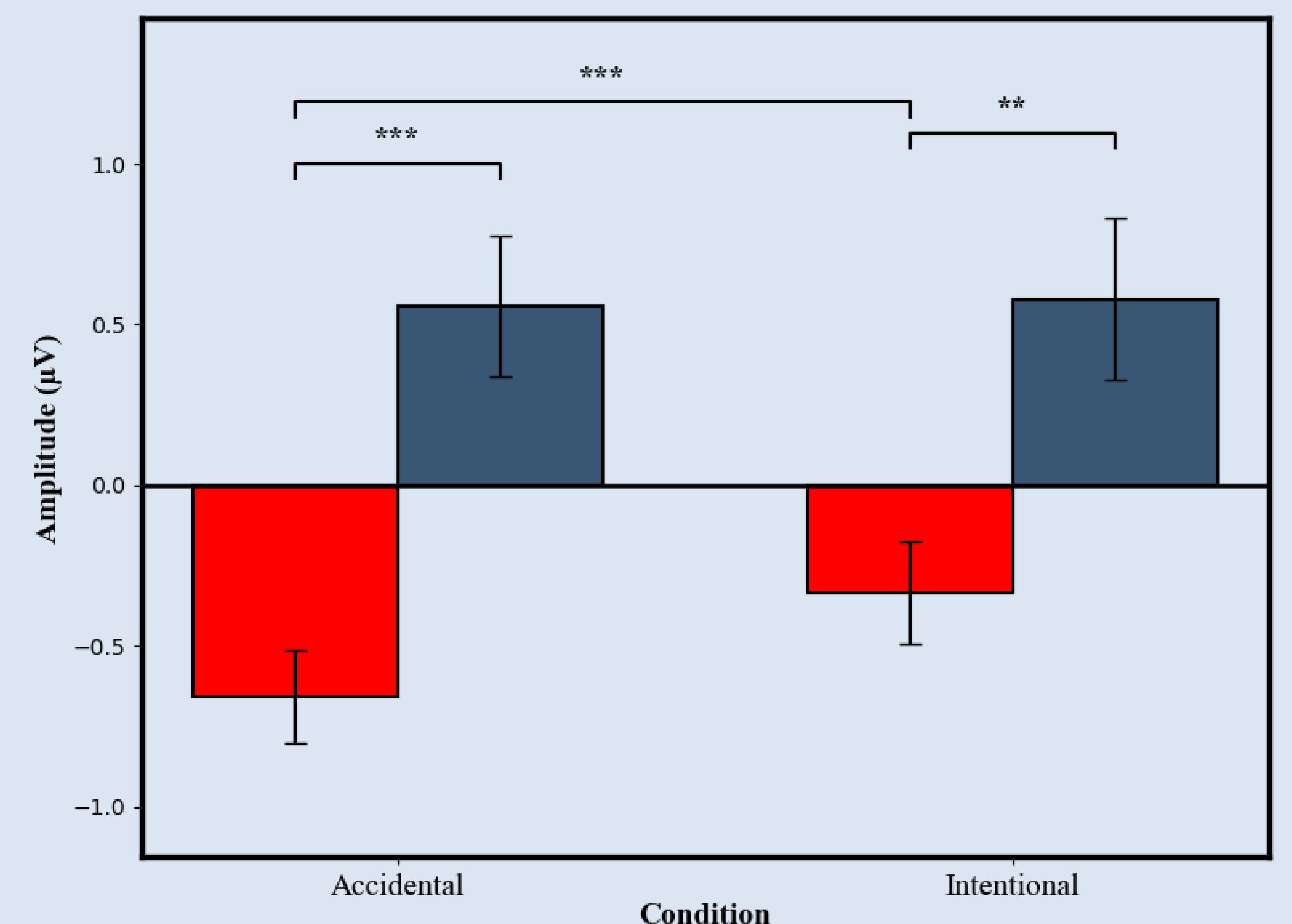
- Amplitude:** 2×2 mixed ANOVA (Group × Condition) + post-hoc t-tests
- Behavioral:** Independent one-tailed t-test

ERP Results

B. Grand average MFN results across groups



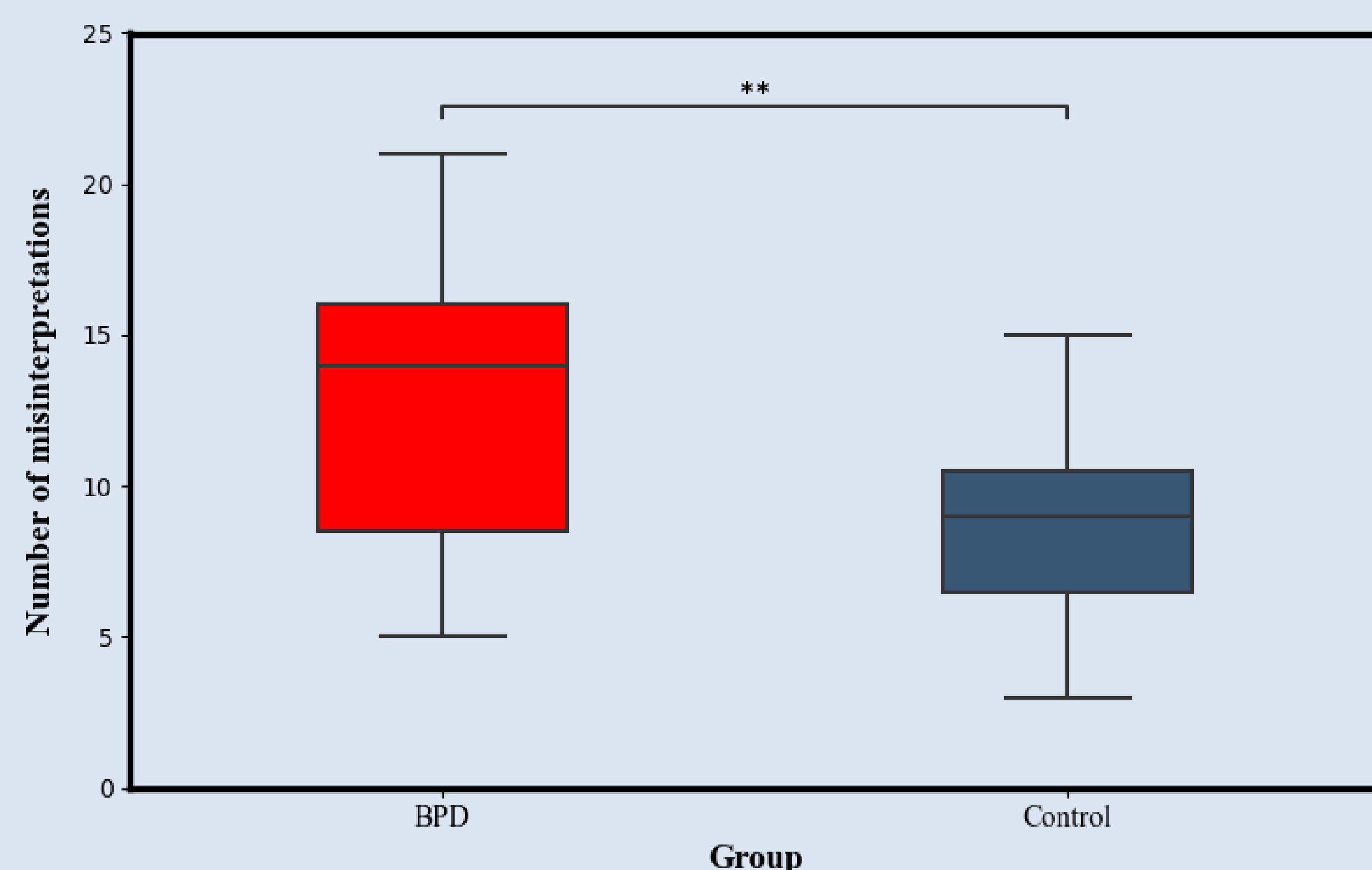
C. MFN Amplitude group differences



Group: $F = 40.66, p < 0.001$; **Condition:** $F = 7.73, p = 0.009$; **Interaction:** $F = 5.94, p = 0.021$

Behavioral Results

A. Accidental harm perceived as intentional: Group comparison



BPD patients more often misinterpret accidental harm as intentional than controls ($p < 0.001$)

Discussion

- BPD patients exhibit heightened neural sensitivity to both harm conditions and increased behavioral misinterpretation of accidental intent, suggesting a broader difficulty in moral reasoning beyond just intention attribution, potentially linked to **emotional dysregulation** and **increased threat perception**.
- Future work will expand the dataset and examine MFN-behavior correlations, potentially provide insights into disrupted intention interpretation, conflict detection, and social cognition deficits in BPD.