Do experimental pain individuals have special attention on pain words? The critical role of P2

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Research

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Abstract

Background

Attention bias is believed to be one of the important reasons for the generation, persistence and development of chronic pain. Though chronic pain patients are generally found to have attention bias towards pain words or pain faces, there is no consistent conclusion about experimental pain subjects.

Methods

This study was conducted to test whether experimental pain subjects have attention bias towards pain words and at which stage pain bias takes place. Twenty healthy adults (female=11) aged between 18 to 27 were recruited and sprayed 10% capsaicin paste to mimic a sense of acute pain. We accessed behavioral results and event-related data with repeated measure ANOVAs with IBM SPSS 20 in cognitive tasks that had pain words and other word categories as interfering factors.

Results

Response time was longer under high cognitive load compared with low cognitive load($P<0.001$). The accuracy rate for low cognitive load was higher compared with high cognitive load($P<0.001$). P2 amplitude in pain words has the largest positive wave than other words($P<0.005$), while N3 amplitude in neutral words has the largest negative wave than other words($P<0.005$). P2 appears in the whole brain but has the largest power on posterior brain regions, while N3 has the largest negative power on anterior brain regions.

Conclusion

Our study provided evidence for attention bias toward pain words in experimental pain subjects and suggested an early bias with P2 as a stable differentiator. Further researches into neuroscience should be conducted to ascertain activated and responsible brain regions and networks.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

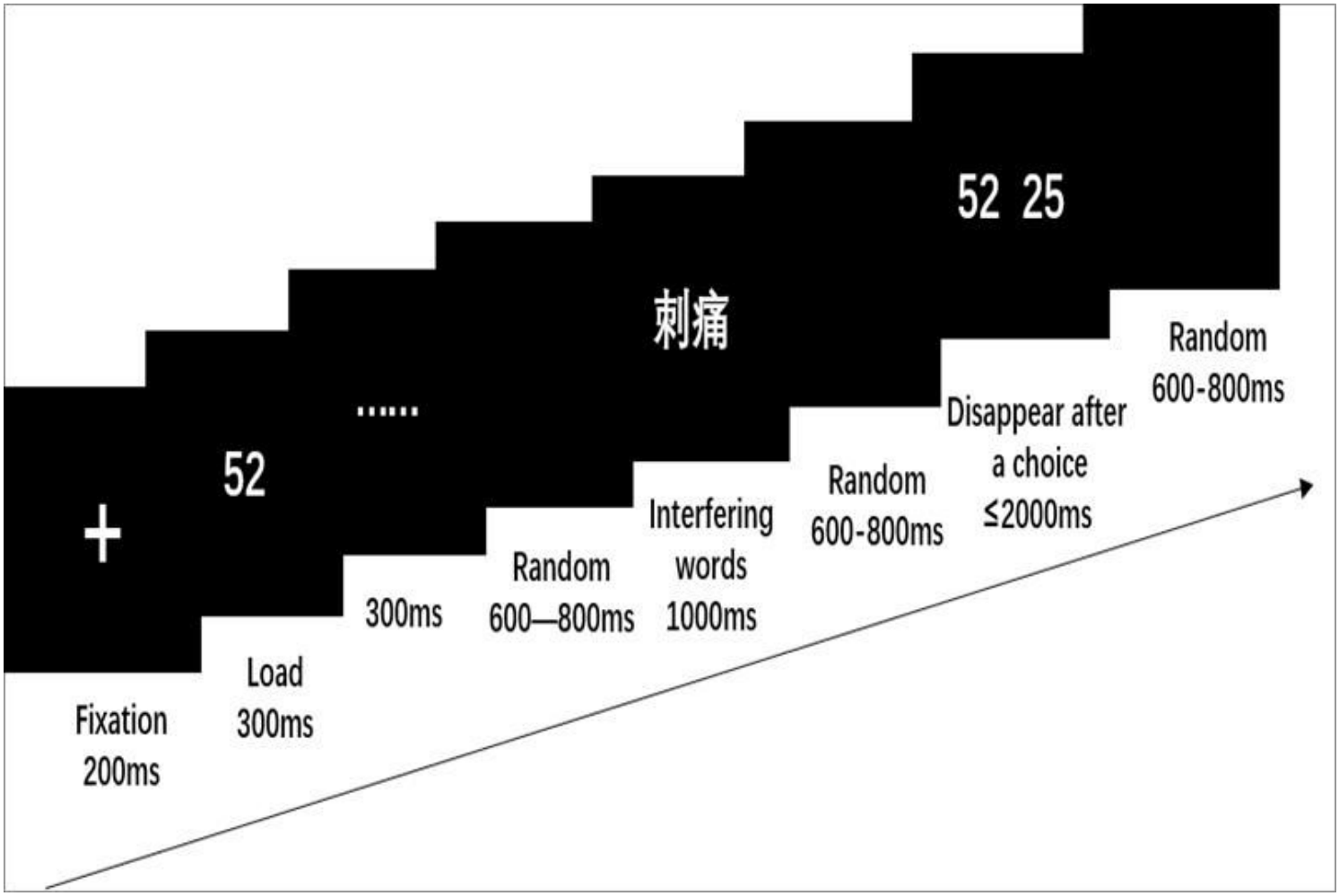

Figure 1

A trail for attention bias testing[10]

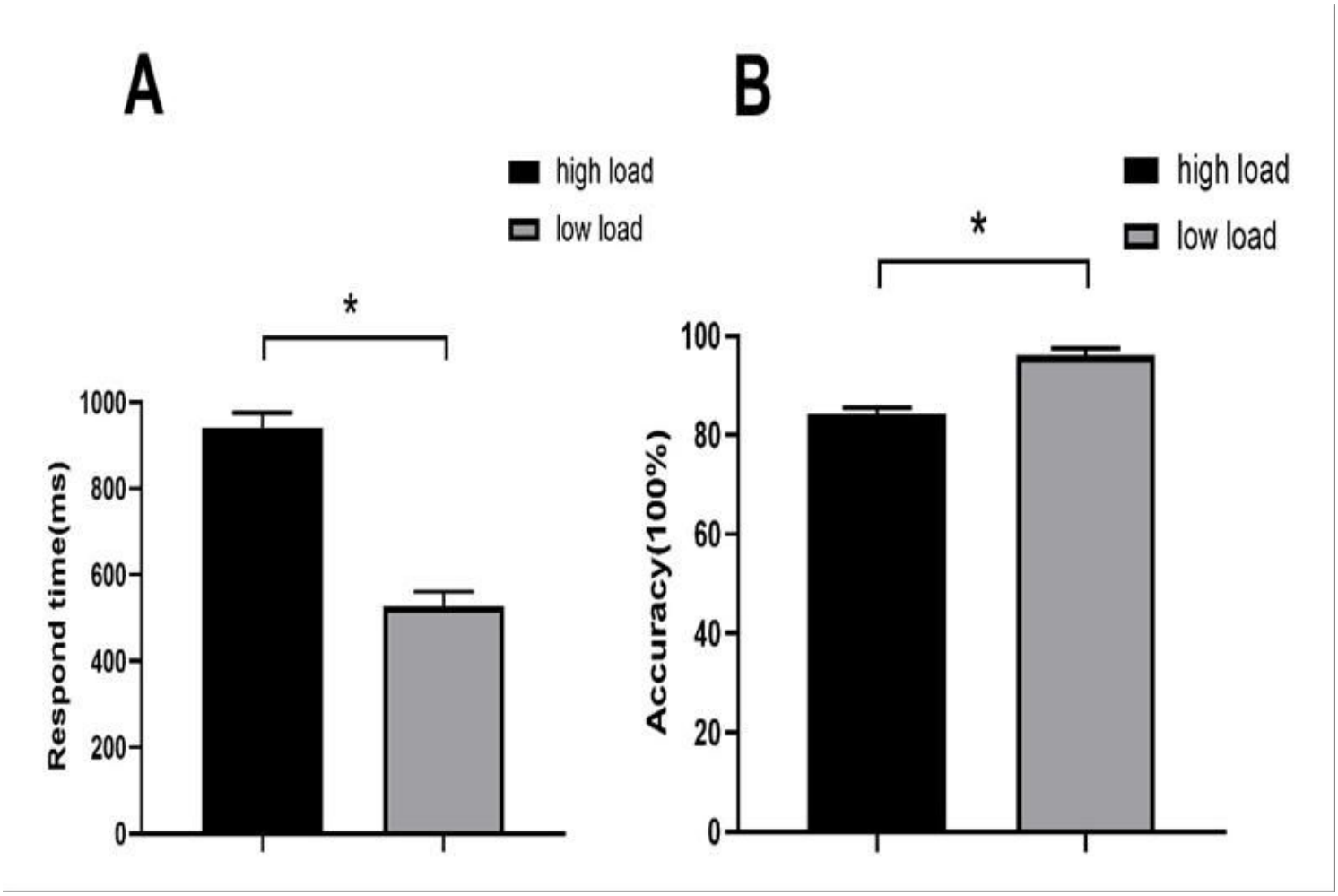

Figure 2

Behavioral results. (A)RT was longer under high cognitive load compared with low cognitive load. (B)AC for low cognitive load was higher compared with high cognitive load.'*' Indicates significant difference.

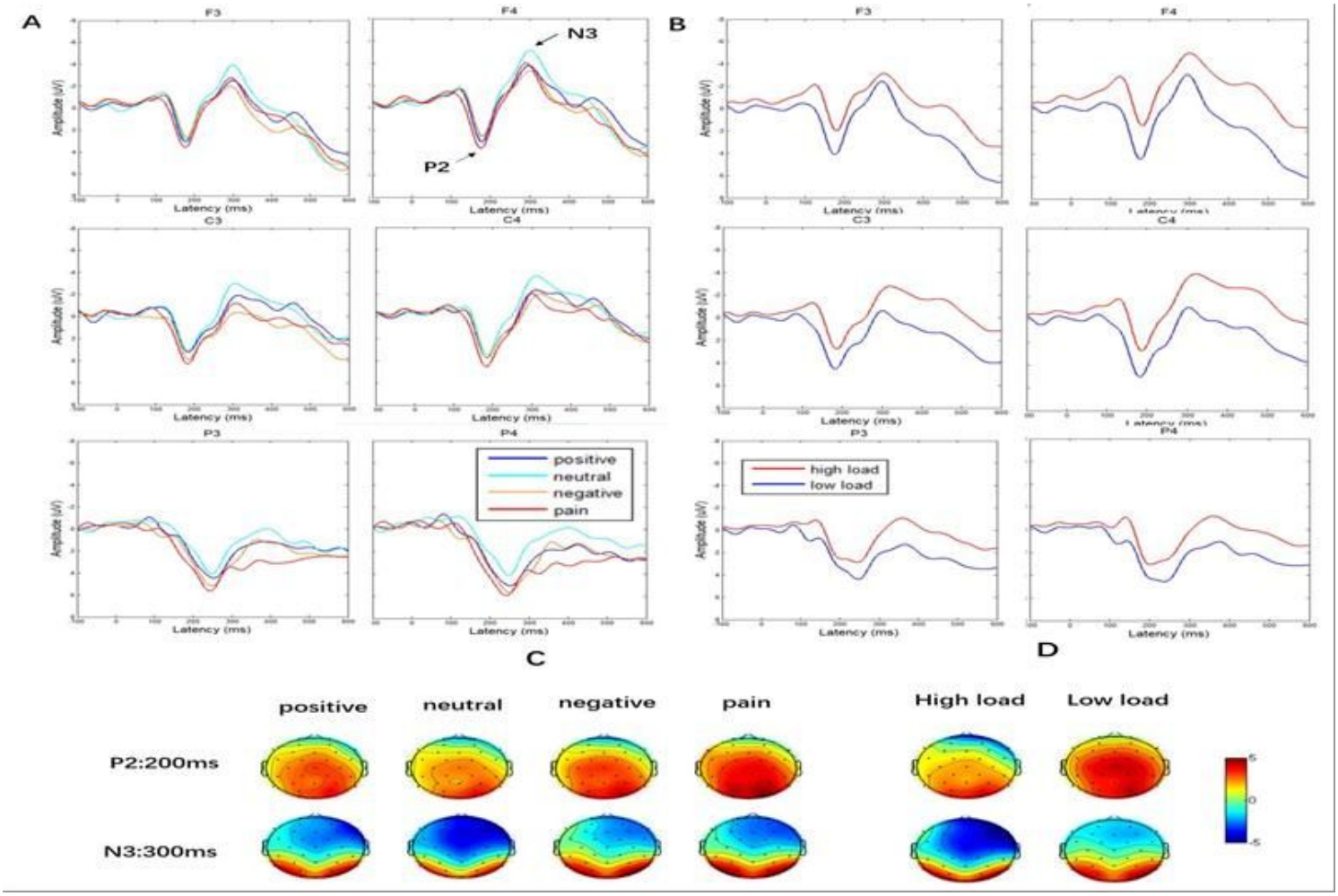

Figure 3

Grand-averaged ERPs and topographic maps according to words and loads. (A) P2 amplitude in pain word has a largest positive wave than other words, while N3 amplitude in neutral word has a largest negative wave than other words. (B) P2 amplitude in low load task has a larger positive wave than high load task, while N3 amplitude in high load task has a larger negative wave than low load task. (C) and (D) P2 appears in the whole brain but has a largest power on posterior brain regions, while N3 has a largest negative power on anterior brain regions.

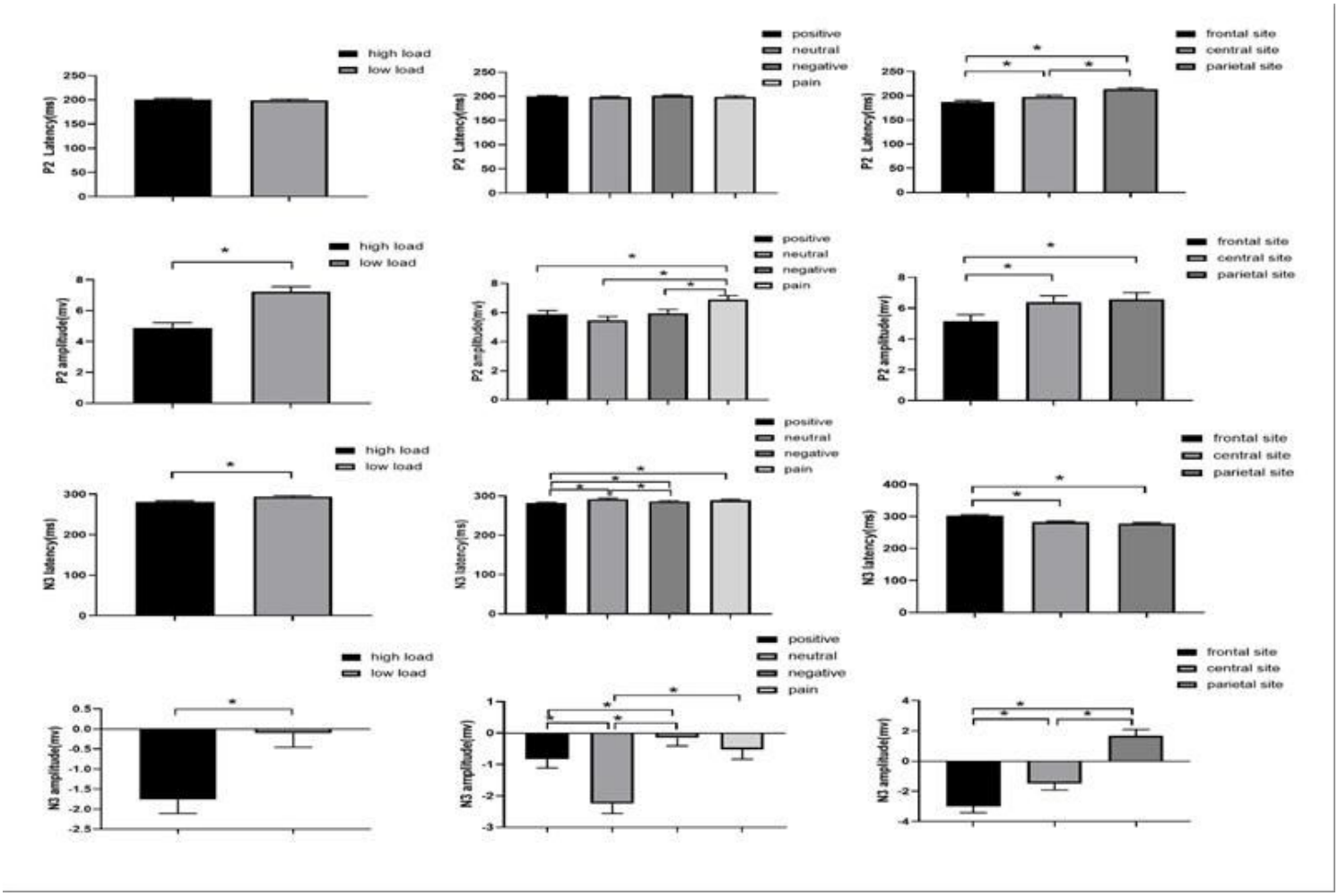

Figure 4

T-bar plots of the latencies and amplitudes of P2 and N3