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Brain responses associated with different hierarchical effects on cues and targets during rule shifting

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Highlights

- Reversed pattern of hierarchical effects was found on cues and targets.
- High-shifting evoked increased P2, P3, LPC, and decreased N2 for cues.
- For targets, high-shifting evoked more negative N2, N3 and decreased P3.
- High-shifting needed more selective attention and proactive control on cues.
- High-shifting has a weaker association between stimulus and task-set on targets.

Abstract

Numerous studies have explored the neural mechanisms related to task switching or rule shifting, but few have revealed the neural substrates related to rule shifting at different hierarchical levels. The purpose of this study is to explore the different event-related potentials (ERPs) elicited by higher and lower hierarchical levels of rule shifting in a cue-target task. In the task, participants were presented with Arabic digits (1–9, excluding 5), and performed a parity or magnitude judgment according to the preceding cues, a letter R. The rules were constructed in a hierarchical set, and the rule was either

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