

Adult Age Differences in Dynamics of Model-based Decision-making

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Introduction

Younger adults' decision-making behavior is often a combination of model-free (MF) and model-based (MB) decision strategies[1,2]. In contrast, older adults seem to rely primarily on MF strategies[3].

This age-related shift in decision strategies has been interpreted in terms of a deficit in the representation of the task structure, necessary for MB decision-making[4,5].

The aims of the current study were twofold: first, we aimed to examine if the degree of MB decision-making in older adults is sensitive to changes in demands on representing the transition structure; second, we investigated the neural dynamics underlying age-related shifts in decision strategies.

Method

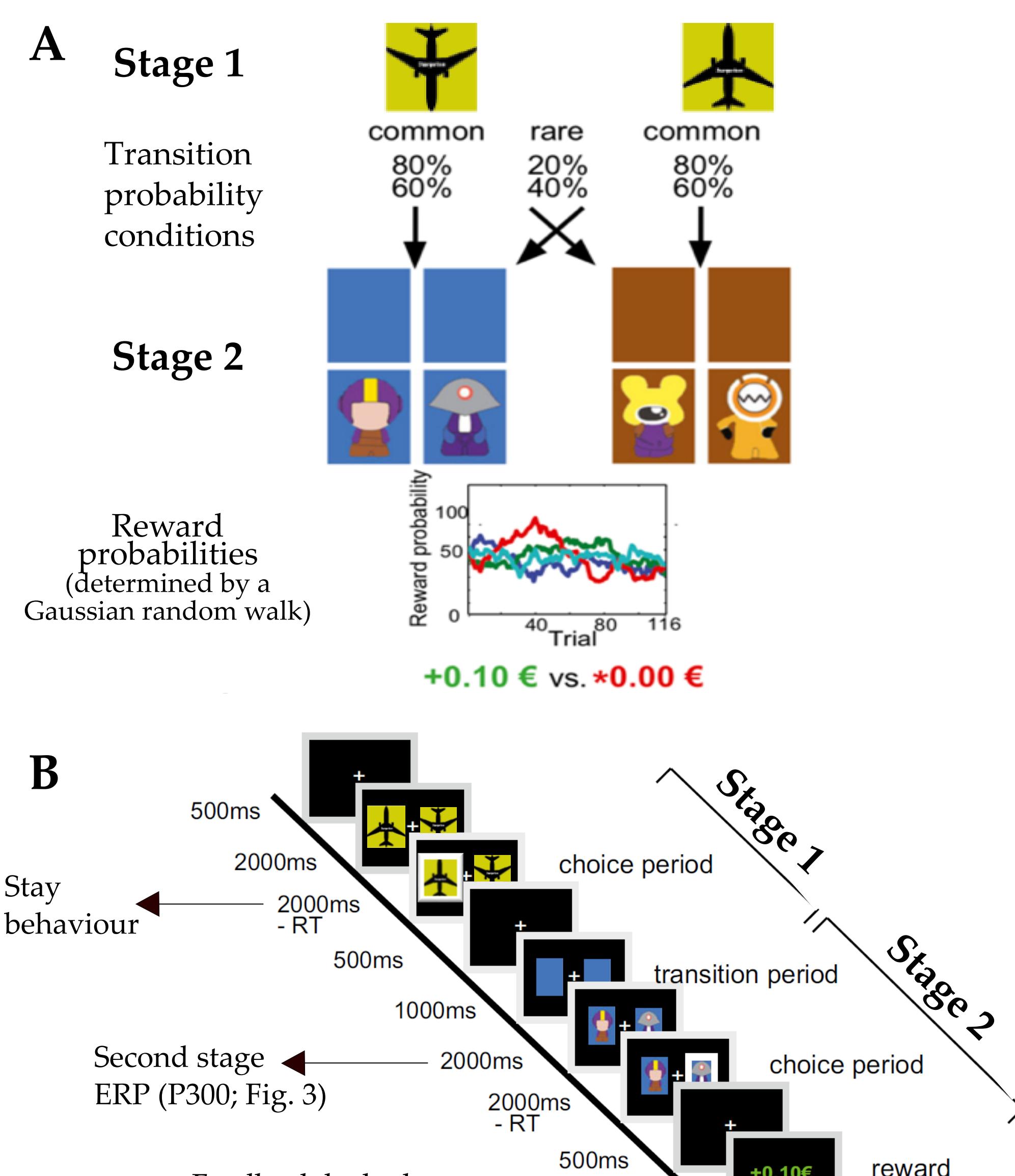


Figure 1. (A) Schematic representation of the modified two-stage Markov decision task. (B) Trial procedure of the two-stage task.



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Results

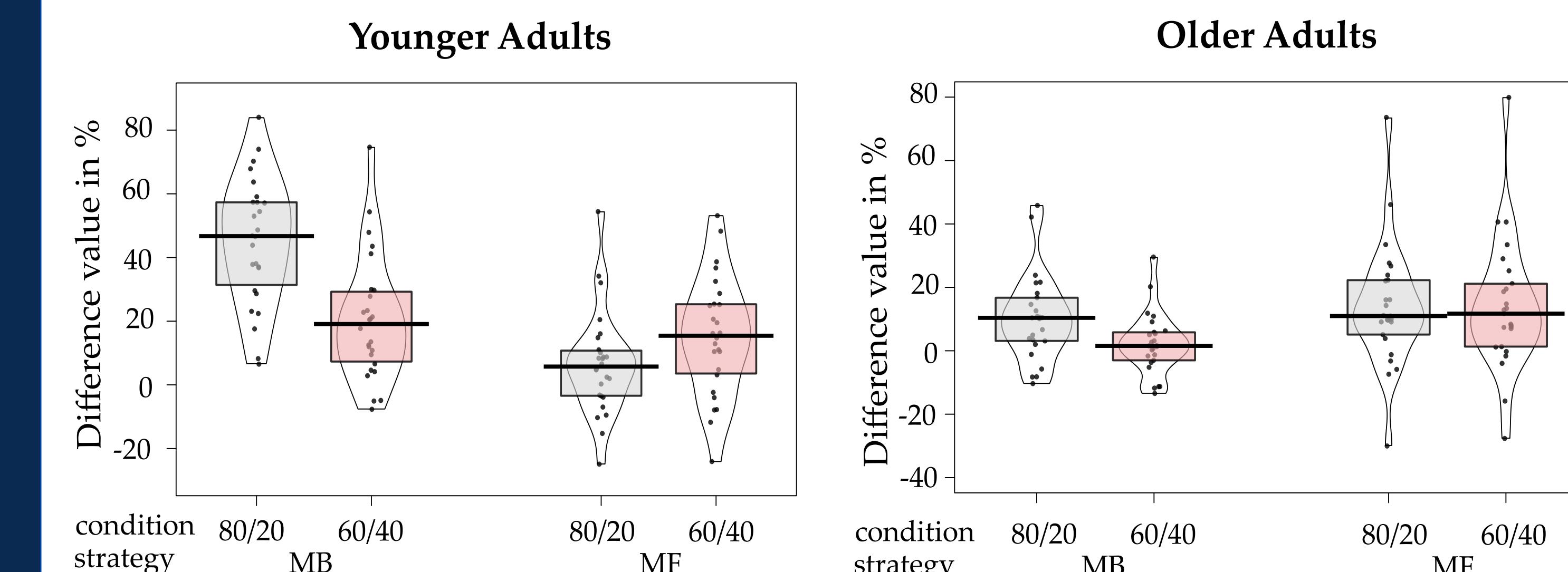


Figure 2. Difference values (stay probability) for model-based behaviour ((common reward + rare no reward) – (rare reward + common no reward)) and model-free behaviour ((common reward + rare reward) – (common no reward + rare no reward)).

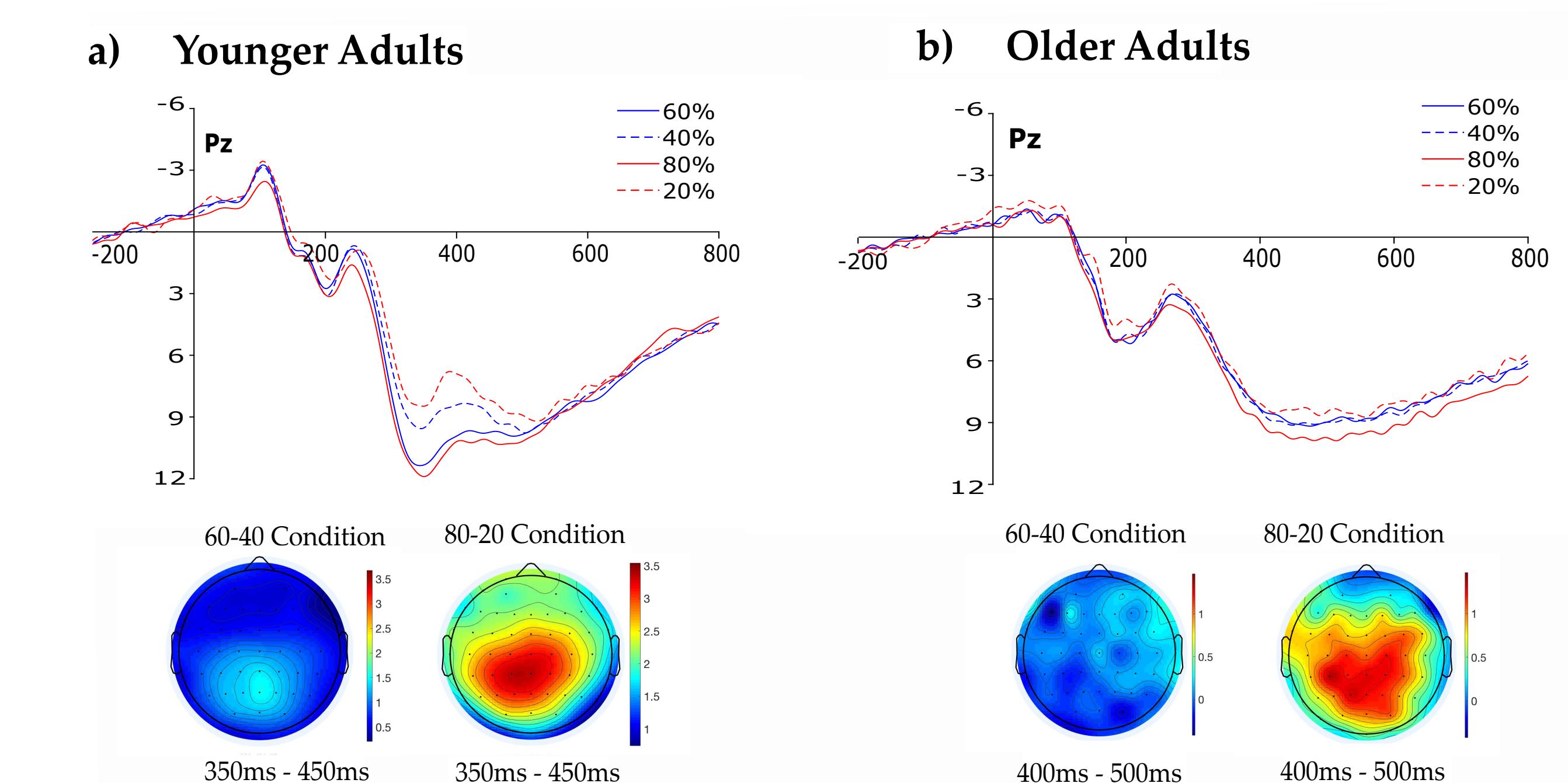


Figure 3. Top: ERPs elicited by second-stage stimuli (-200ms to 800ms) at electrode Pz. Bottom: The topographical displays of the difference between common and rare transitions.

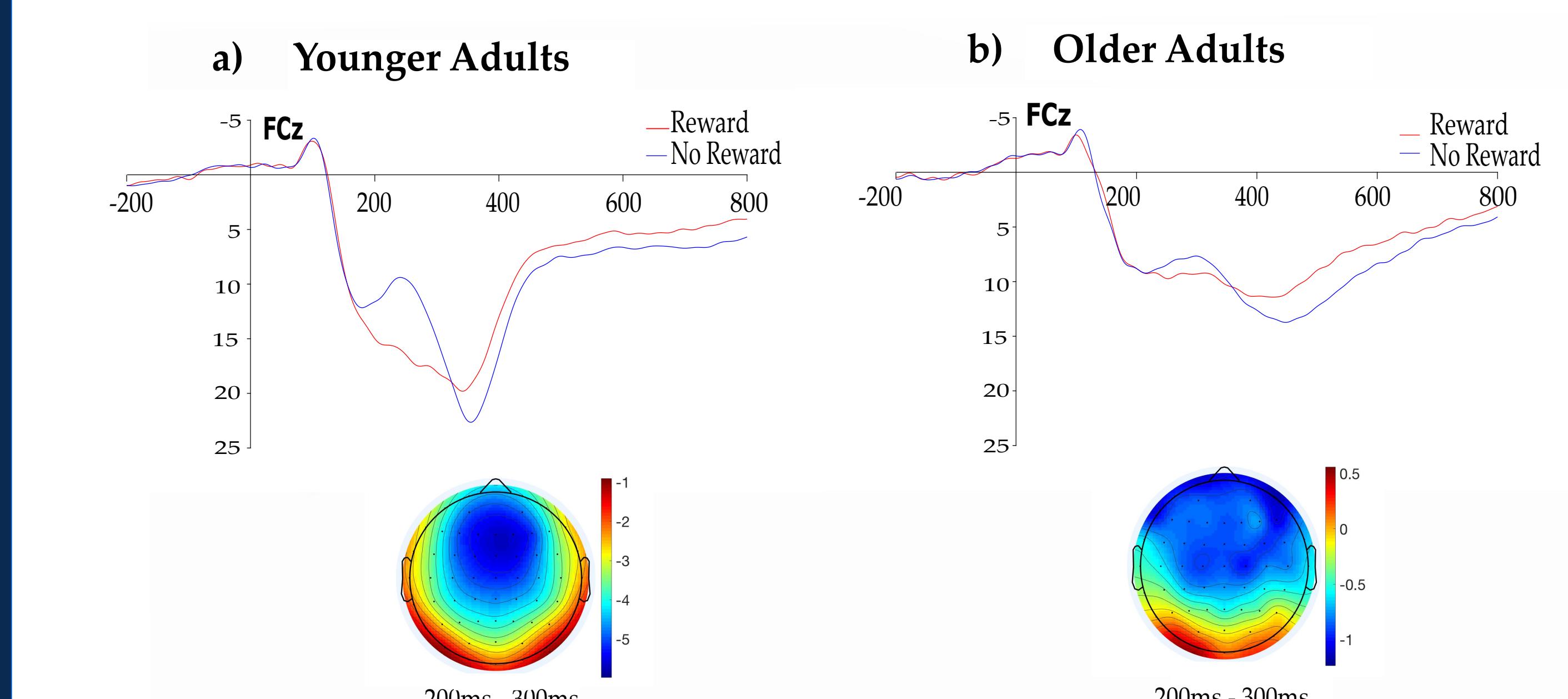


Figure 4. Top: Feedback locked ERPs (-200ms to 800ms) at electrode FCz for rewards and no rewards. Bottom: The topographical map displays of the difference between no reward and reward feedback.

References

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