

Selective memory for reward-relevant dimensions is modulated by expertise during reward learning

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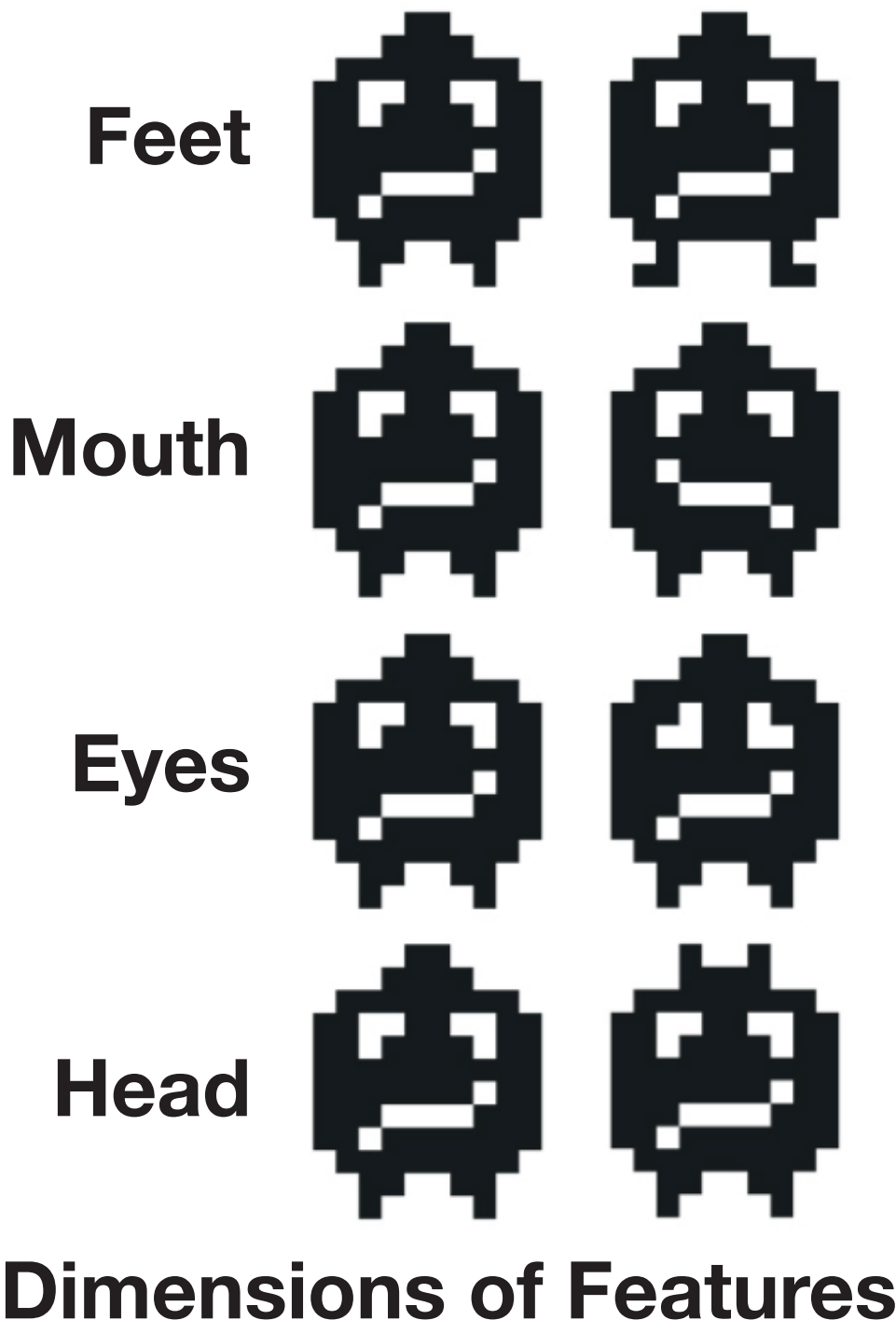


#1504

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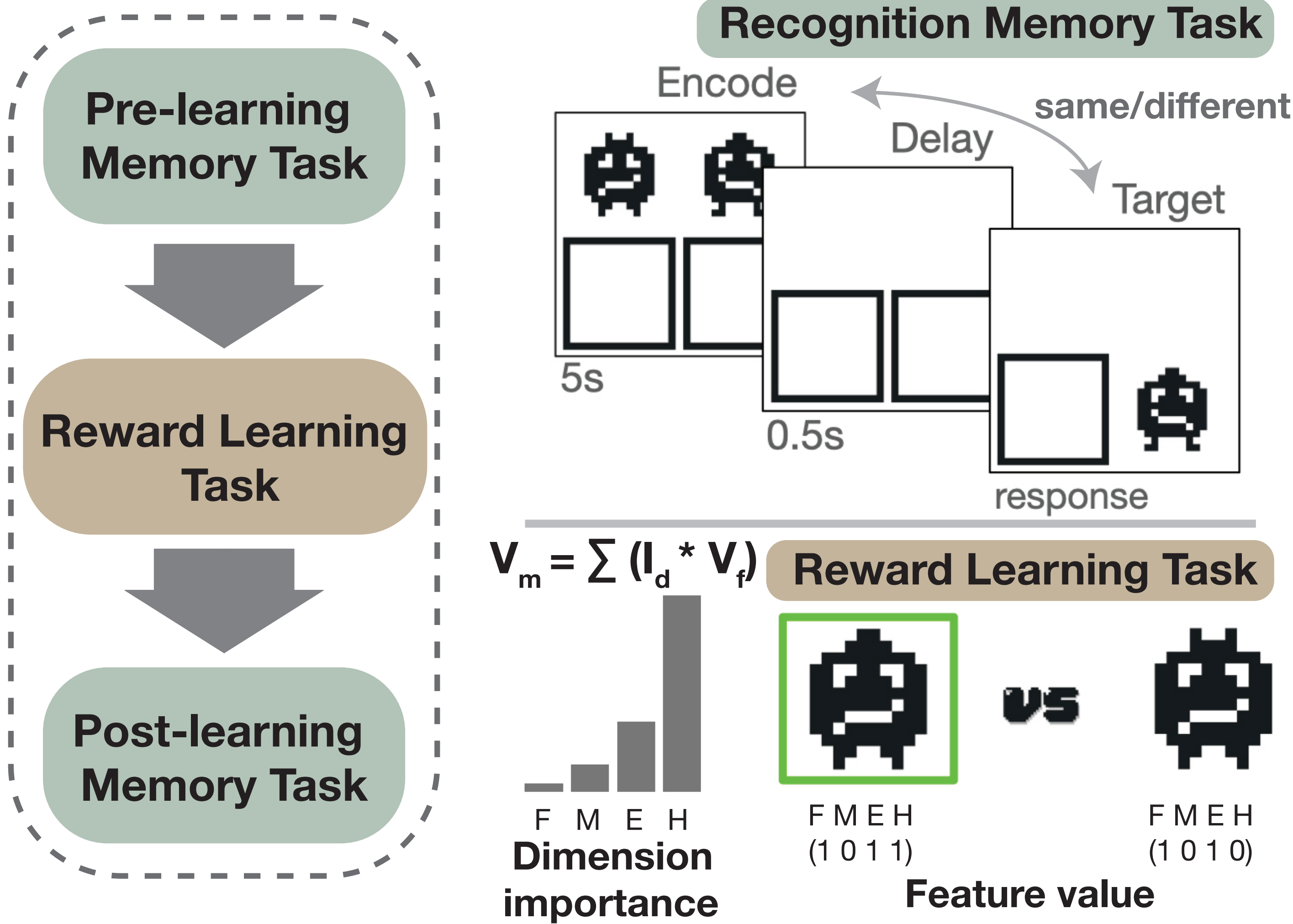
Introduction

- Efficiently prioritizing important information is crucial for human memory function.^[1]
- Previous studies have demonstrated that the value of stimuli can selectively influence memory, with humans selectively remembering reward-relevant information.^[2]
- Here, we add to this understanding by decomposing reward-relevance to different compositional features, which collectively define the value of a stimulus with differing dimension importance.

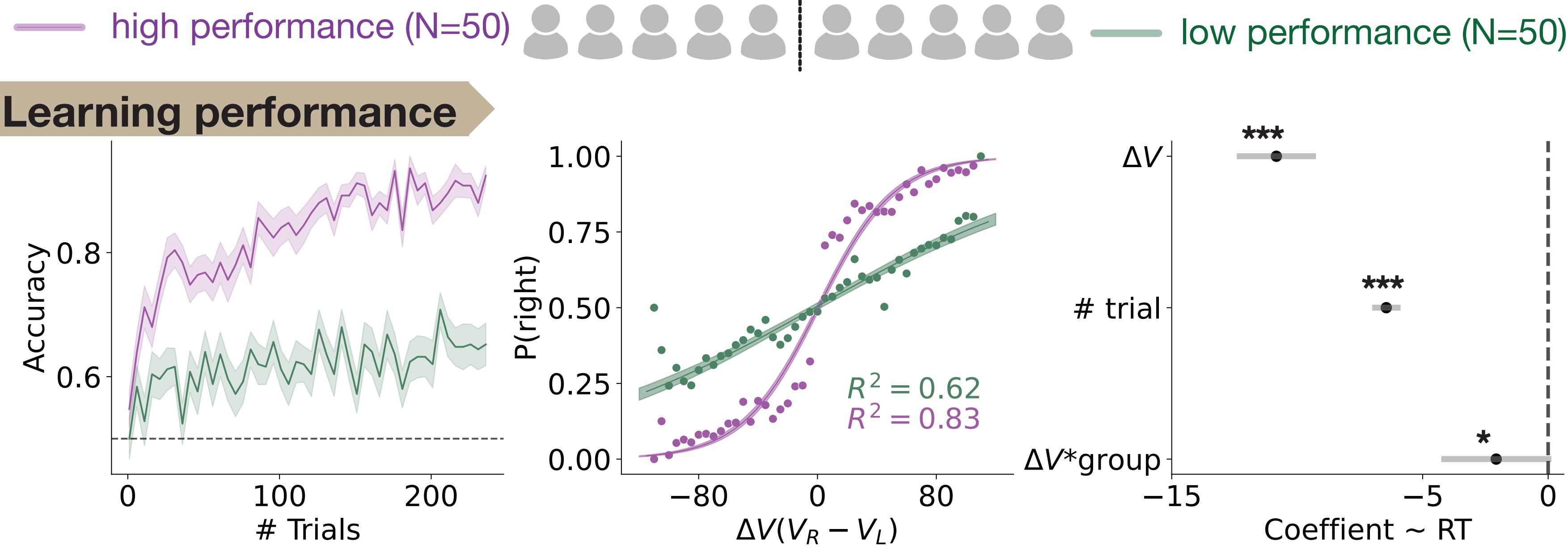


Is selective memory of stimuli influenced by dimension importance?

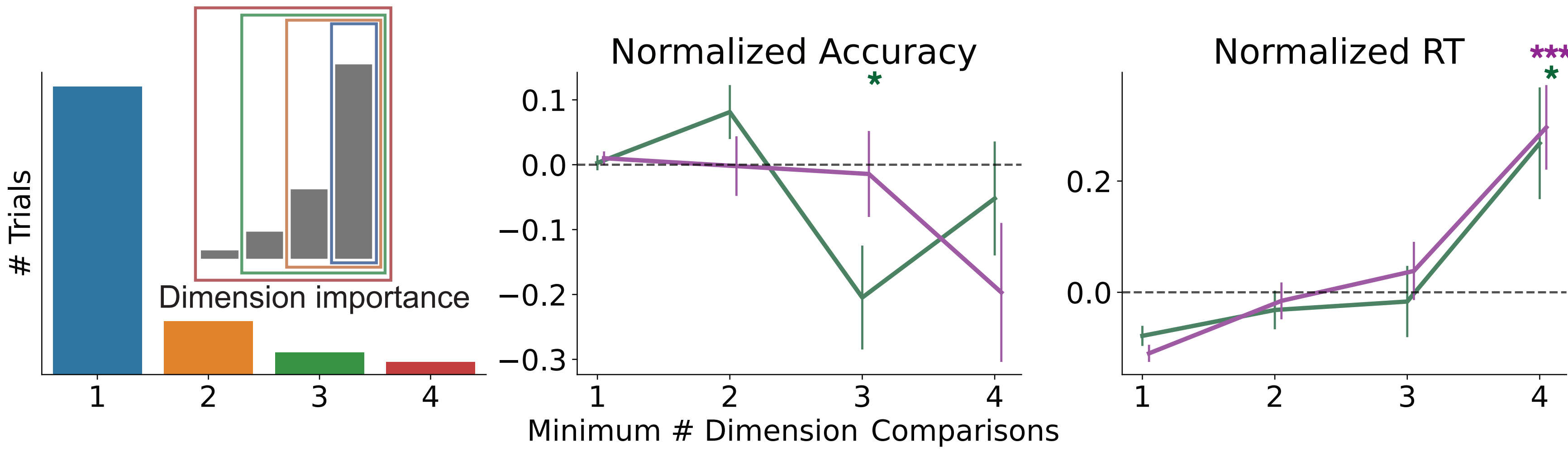
Tasks



Results



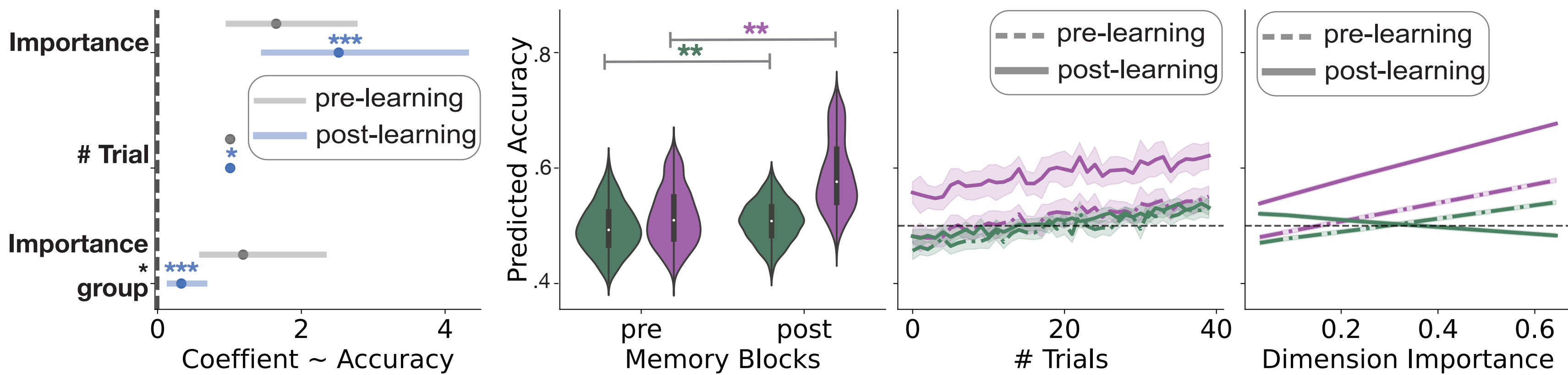
Dimension comparisons ~ Accuracy/RT



Reward Learning Task

- Learning accuracy increased over trials for both groups.
- High performance group was more sensitive to value differences.
- RTs for both groups was influenced by the minimum number of dimension comparison.

Dimension importance ~ memory performance



Recognition Memory Task

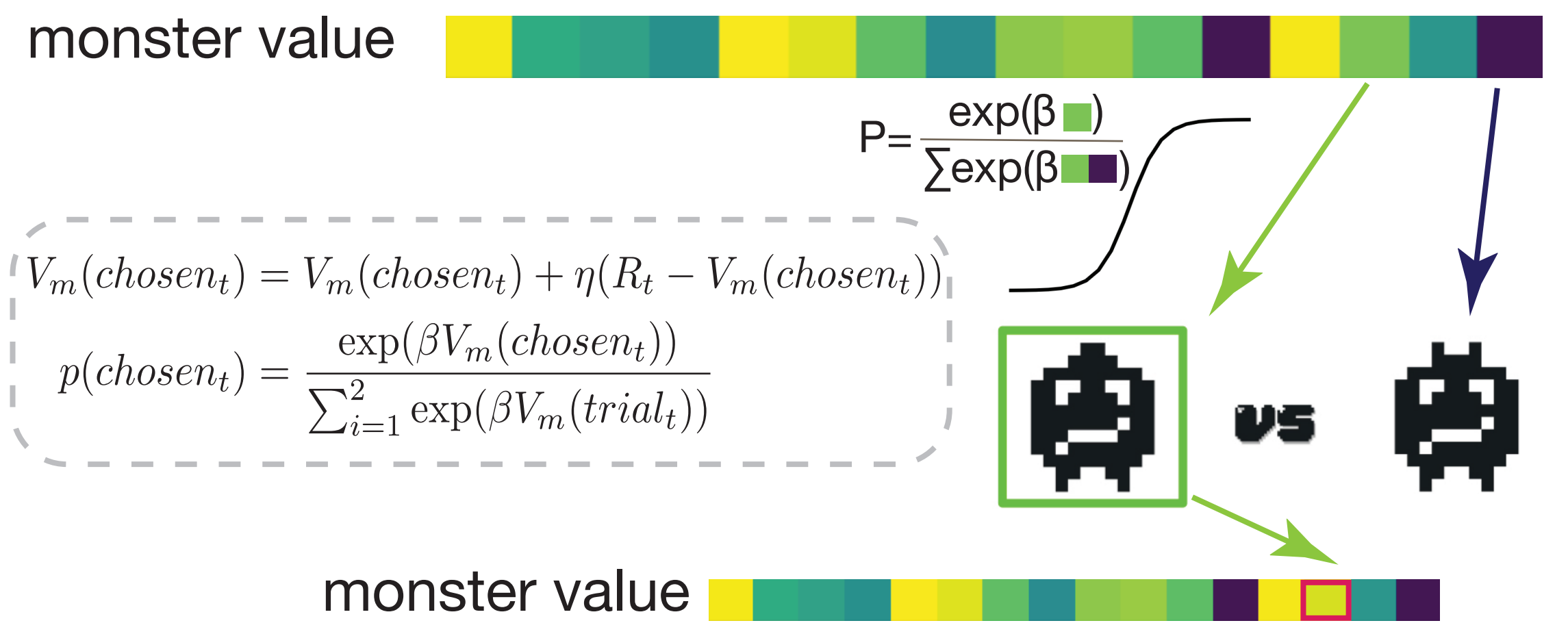
- Recognition performance was improved after learning task for both groups.
- Recognition accuracy increased over trials for both group in post-learning block.
- The high performance group selectively remembered the important dimensions more.

Take-home message

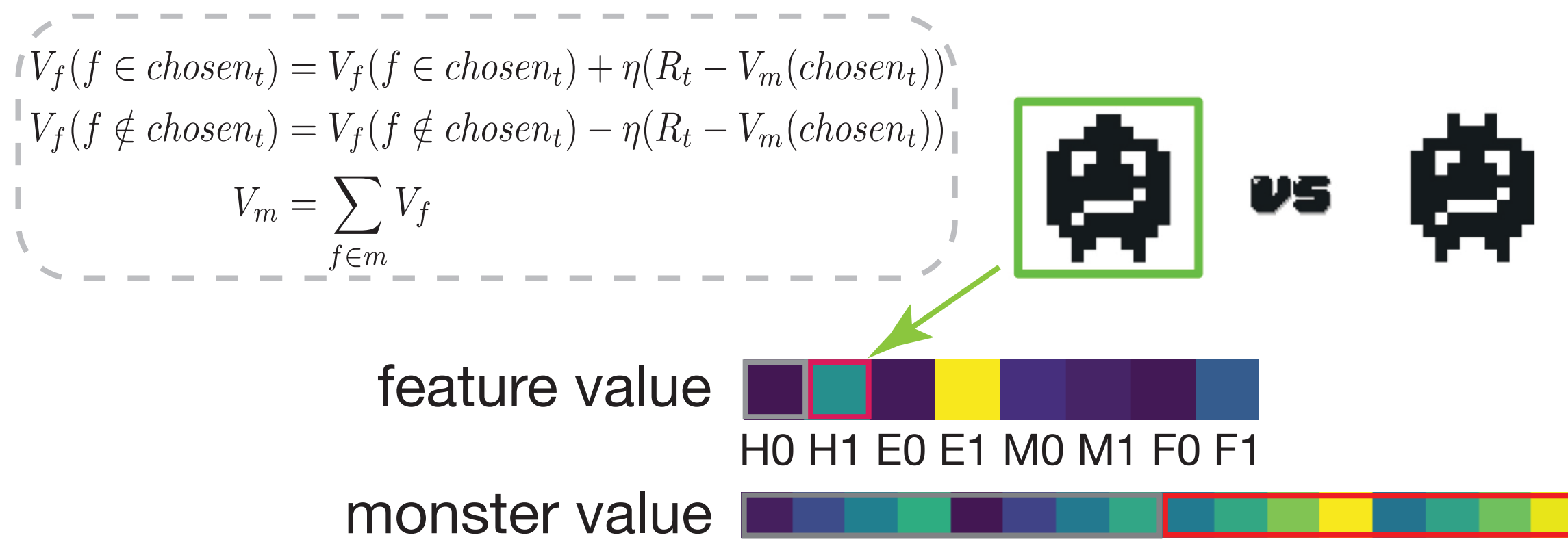
- Selective memory for reward-relevant dimensions is modulated by expertise during reward learning.
- Dimension importance influenced attention allocation during learning.
- The impact of attention allocation during learning on working memory is modulated by expertise.

Models

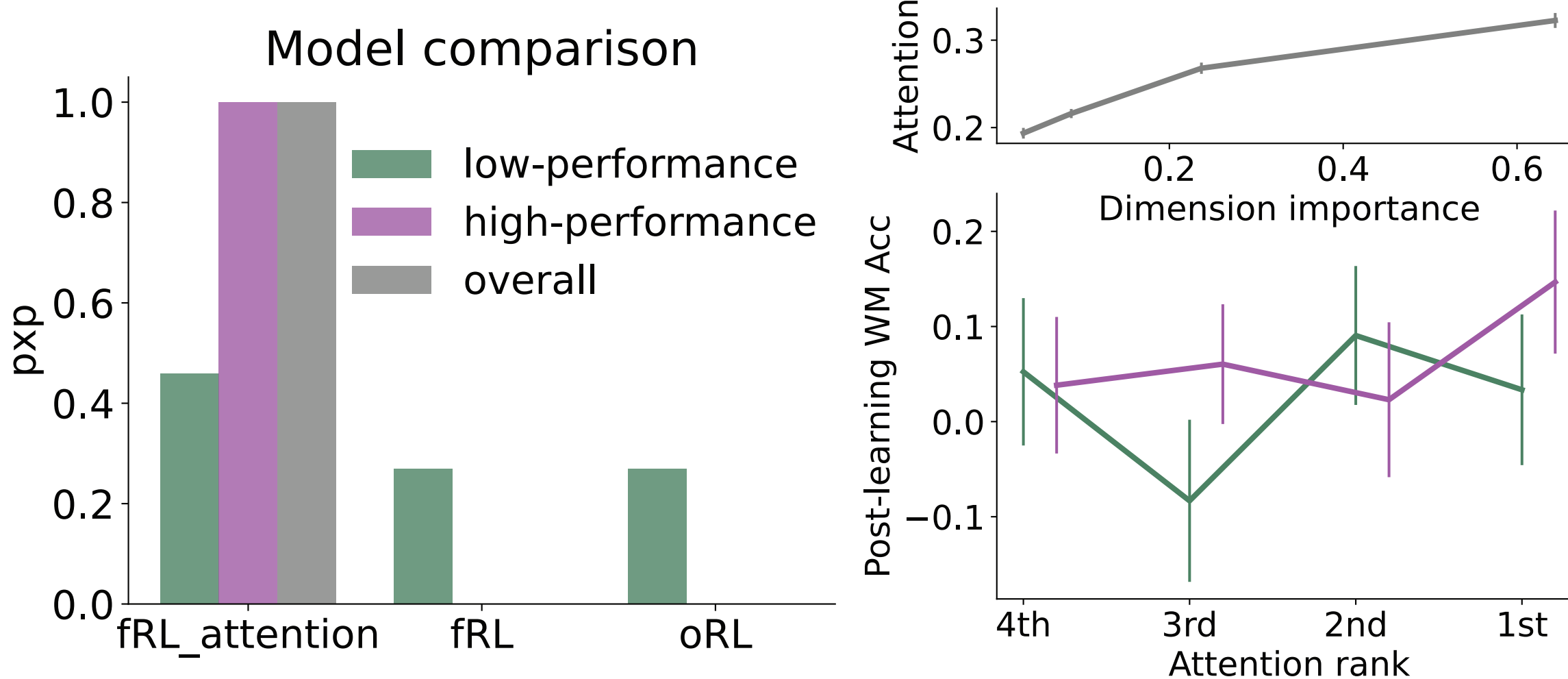
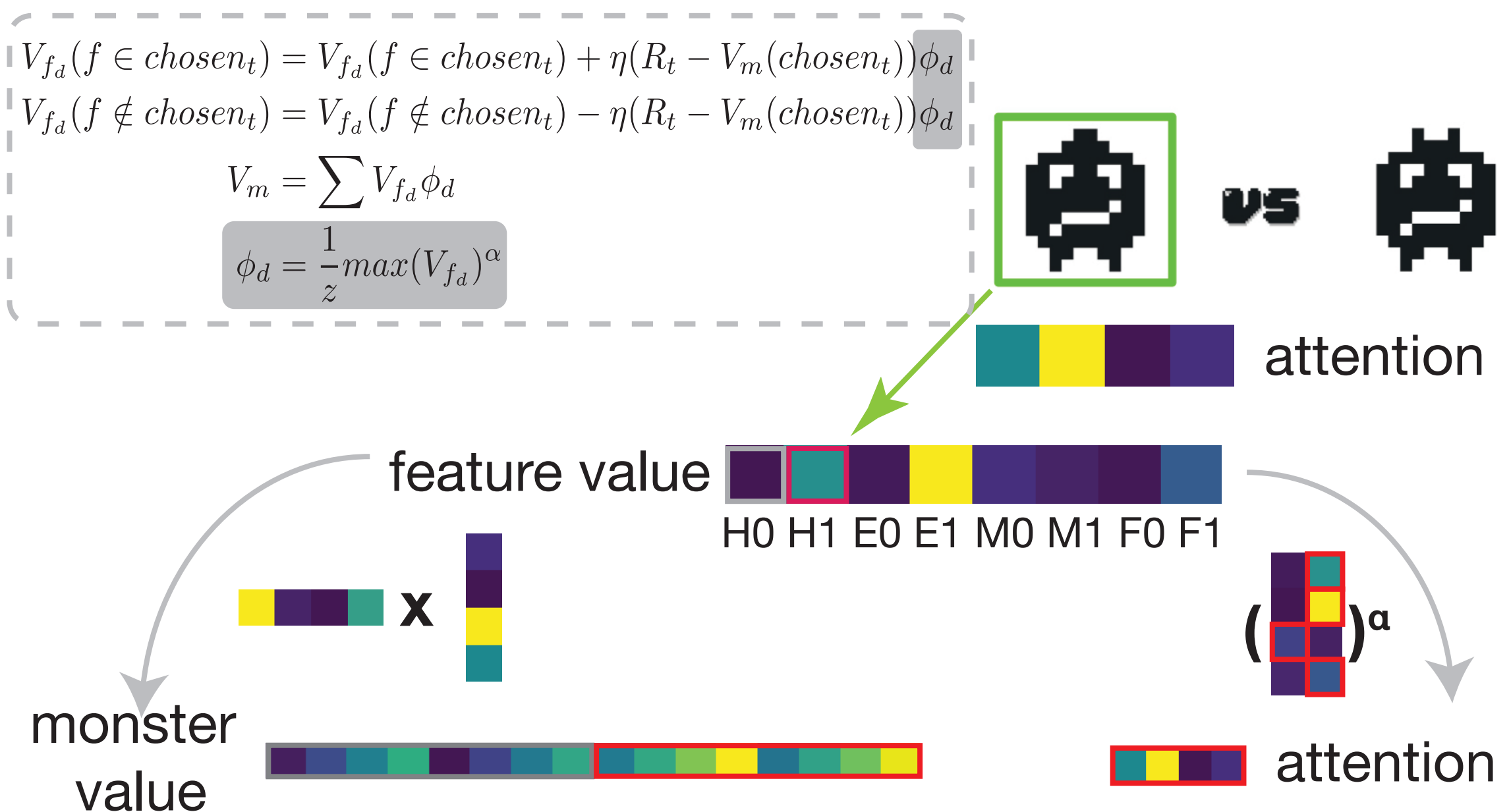
object-based RL



feature-based RL



feature and attention based RL^[3,4]



- fRL_attention > fRL and oRL models.
- Dimension importance influenced attention allocation.
- The high-performance group exhibited a tendency to outperform in the dimension with the highest attendance.

Reference:

- [1] Cowan 2000 [2] Knowlton and Castel 2022
[3] Niv et al. 2015 [4] Radulescu, Niv, and Ballard 2019