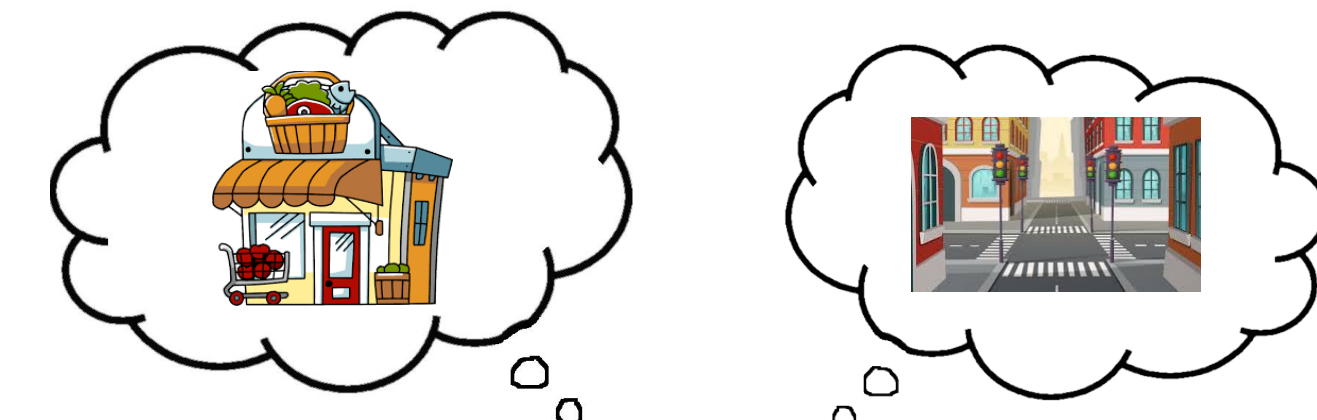


Introduction

Memory for the past serves a **prospective** function: to predict future events^{1, 2}.

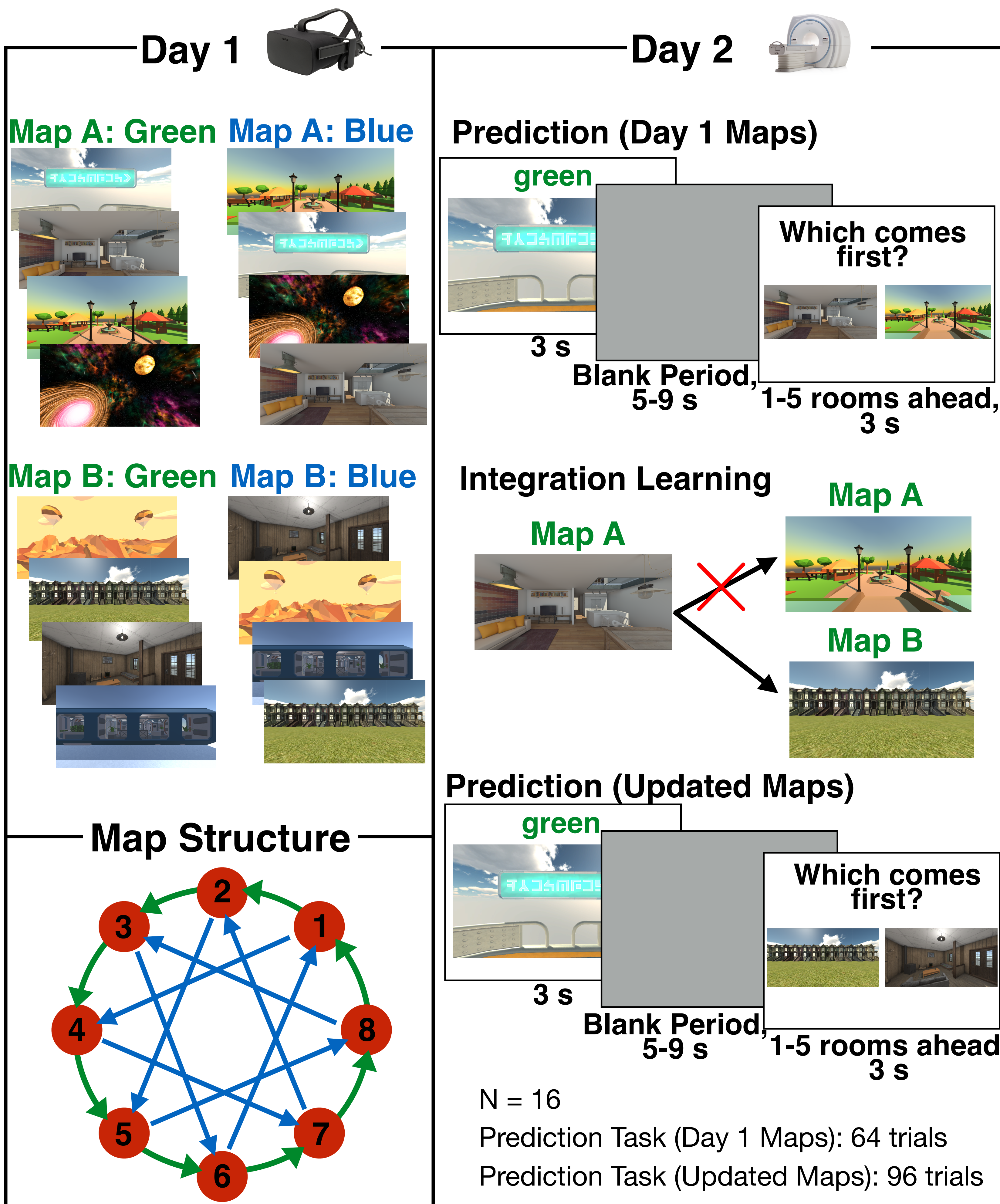


Question 1: How do we flexibly generate predictions at multiple timescales?

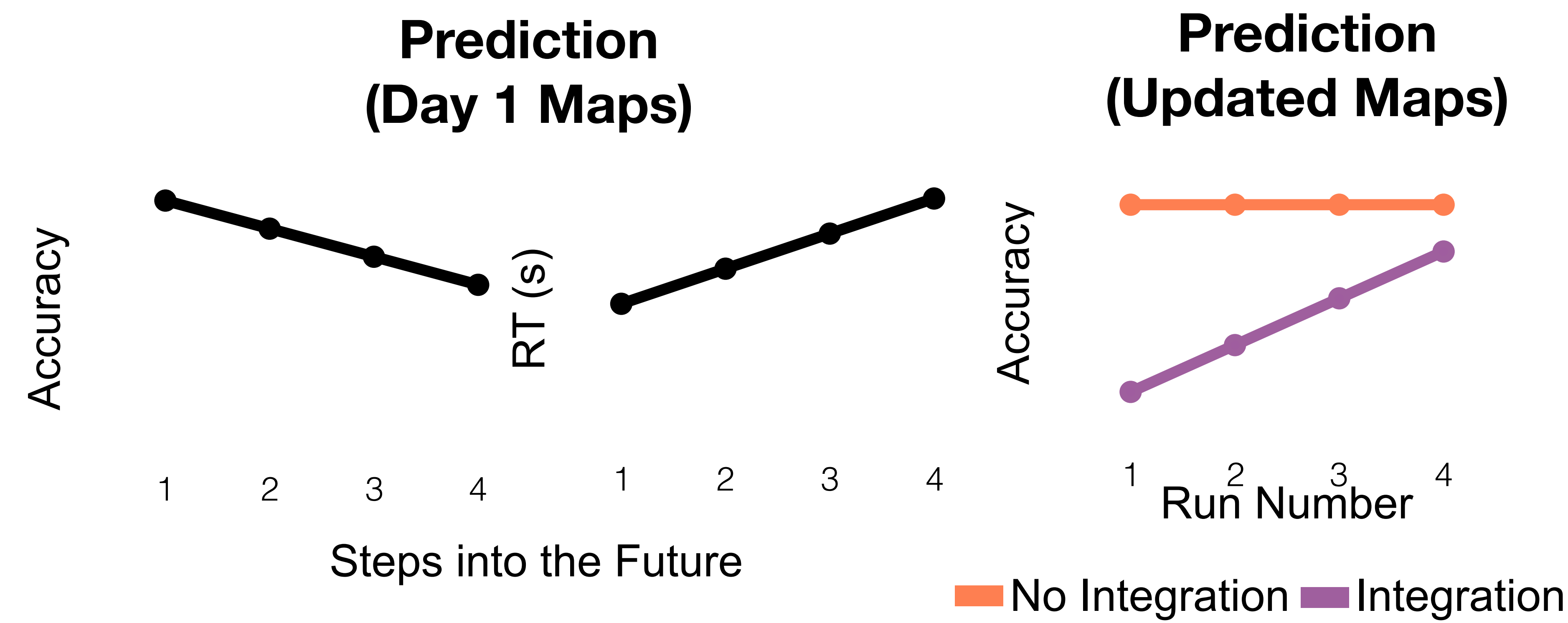
Question 2: How are predictions updated when our environments change?



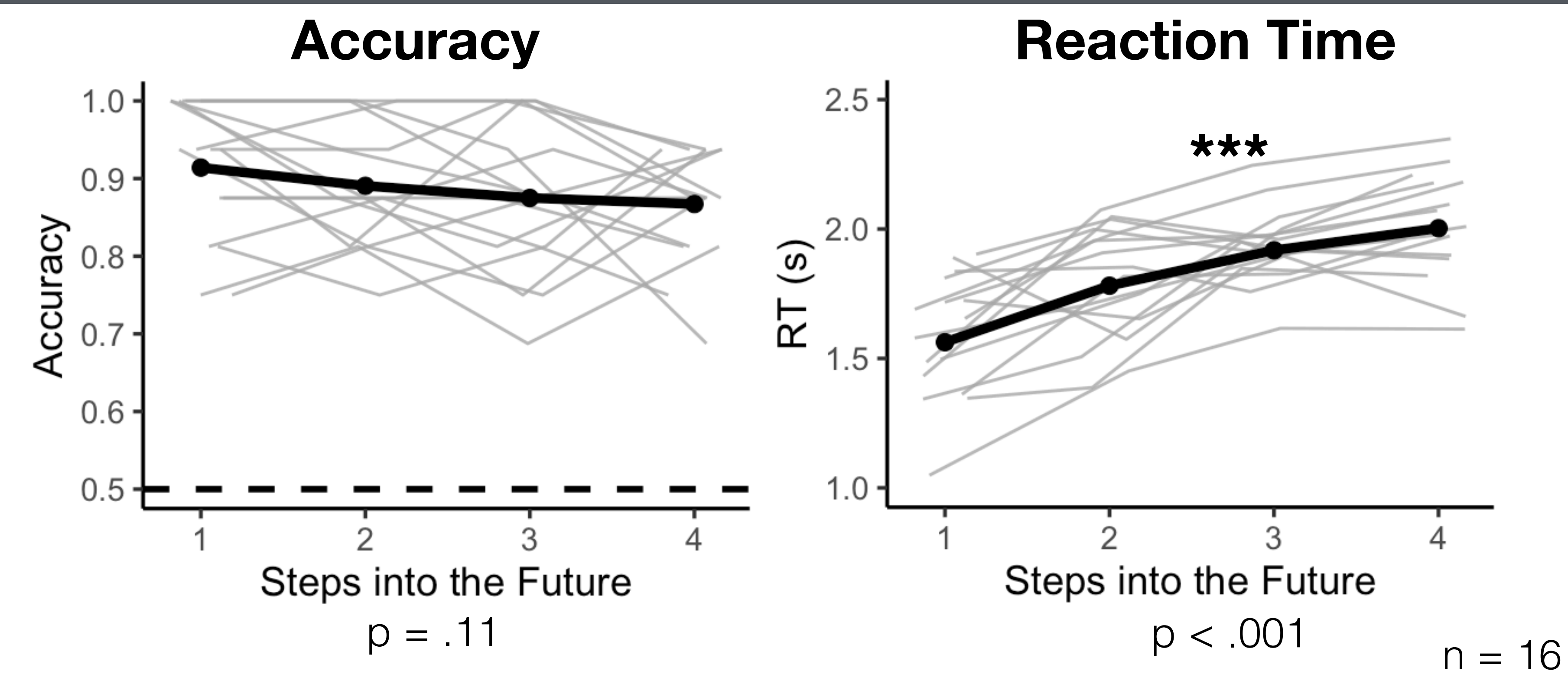
Experimental Design



Hypotheses

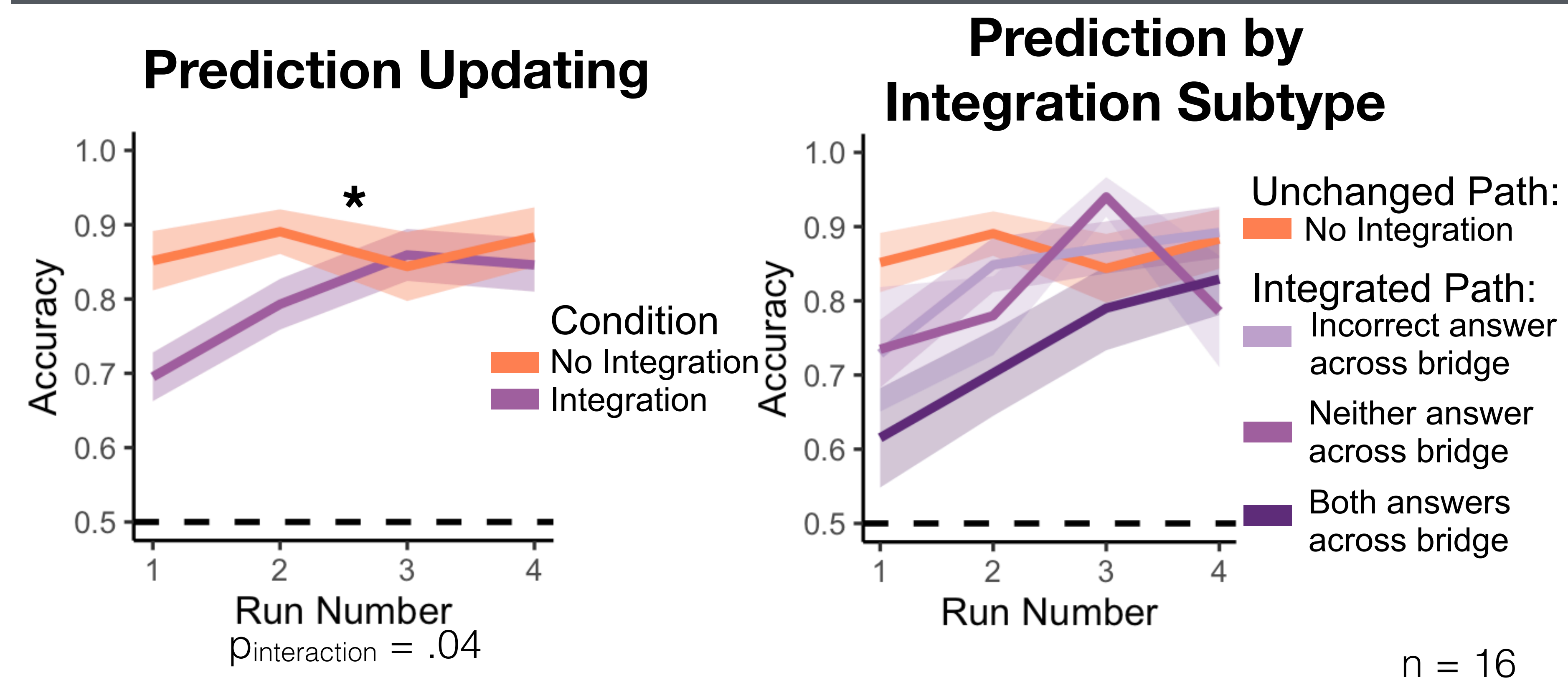


Prediction at Multiple Timescales



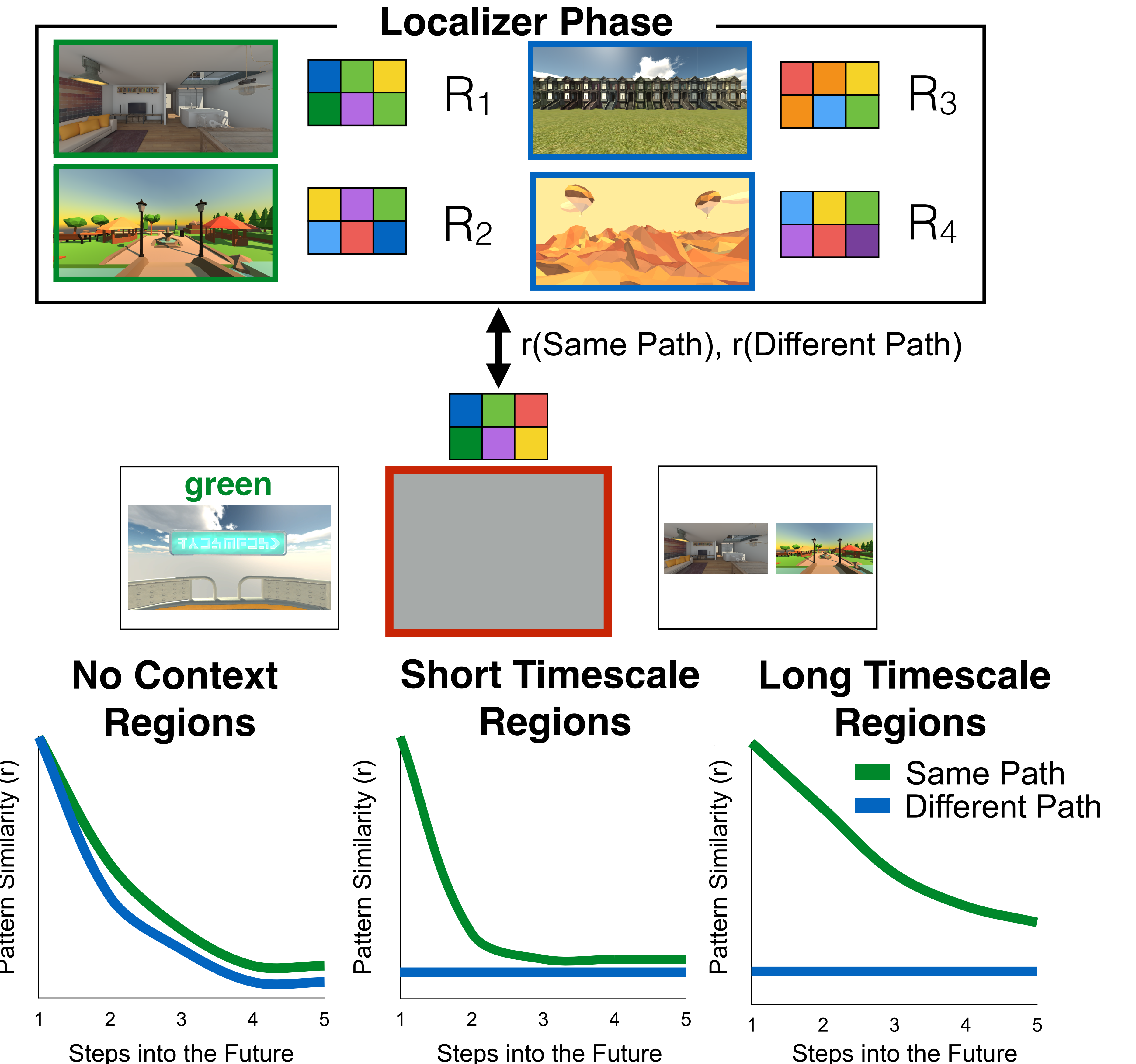
Participants predicted upcoming events from the day 1 maps along multiple timescales with comparable accuracy, but were slower for further rooms.

Predictions are Flexibly Updated after Integration



Prediction performance using the updated maps improved across runs, even without trial-by-trial feedback. Participants improved most for trials that required integration to reach the correct answer.

Planned Neuroimaging Analyses



Activity patterns during the blank period should resemble those for upcoming rooms, though in some regions this prediction may not be context-specific. The timescale of prediction will be longer for progressively more anterior brain regions^{3, 4}.

After integration, we hypothesize that patterns of activity will be updated to correlate with the templates for the integrated path, and these correlations will increase as a function of run number.

Summary

Individuals can accurately make predictions at a range of timescales. These predictions can be updated rapidly, but improve with practice. Ongoing fMRI studies will examine how multiple timescales of prediction are supported across perceptual and memory systems.

References

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