Implicit spatiotemporal predictions improve short-term memory representation

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Dynamic Visual Search • Search for eight targets that fade-in and -out over time among distractors

Pre-assign 4 predictable targets a specific onset and spatial quadrant

Randomly allocate 4 unpredictable

Predictable targets appear at the same time and spatial quadrant

Unpredictable targets randomly distributed in time and space

Trials lasts ~15 seconds; Targets fade-in and -out over 4 seconds

Sequential order changes between trials

Dynamic search results

In line with our recent works1,2,3, participants were faster and more accurate when finding predictable targets (main effects of predictability; all p’s<.001)

Memory for searched items • At the end of each trial (starting from trial #10) participants recalled the targets they previously selected

Report all the letters you found (Exp1)

Select all the letters you found (Exp2)

Participants used implicit spatiotemporal regularities to guide behaviour

The pattern was replicated in two experiments (total N=240) and a pilot study (N=50)

See: (1) Boettcher et al., 2021 in JEP:General (2) Shalev et al., 2022 in Child Development (3) Williams et al., 2022 in PsyArXiv