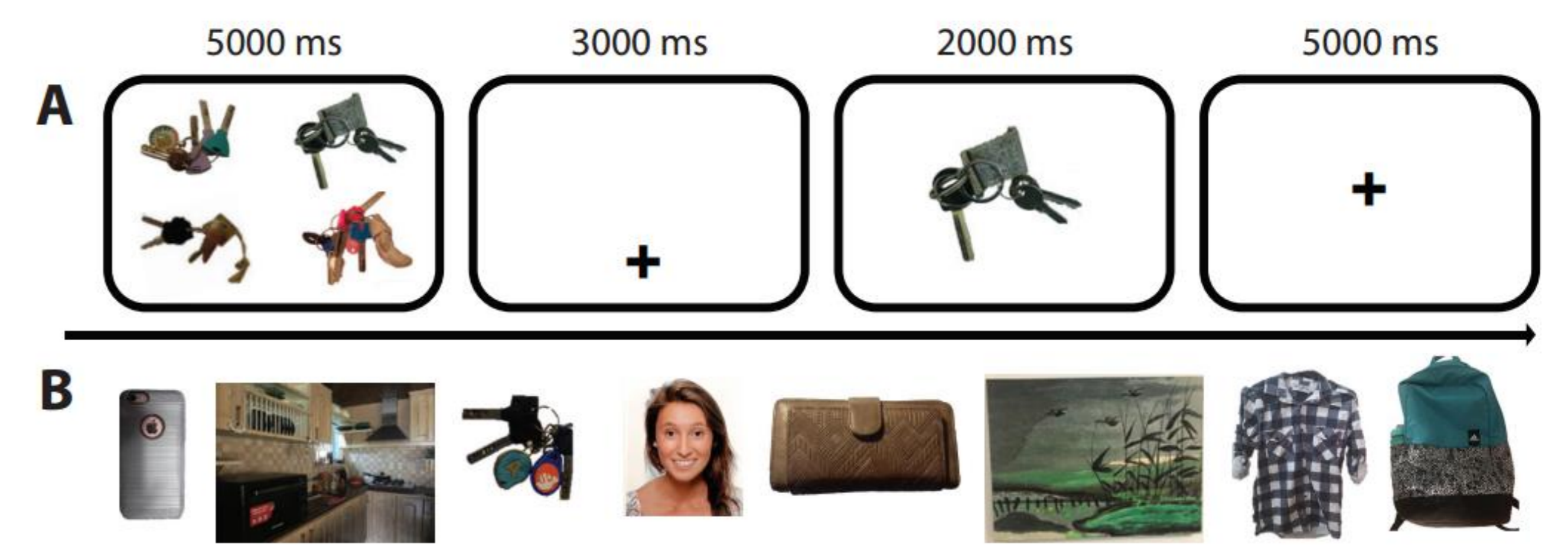# Can you control you gaze? The strong effect of familiarity on eye gaze behavior

Tal Nahari, Oryah Lancry-Dayan, Gershon Ben-Shakhar, Yoni Pertzov
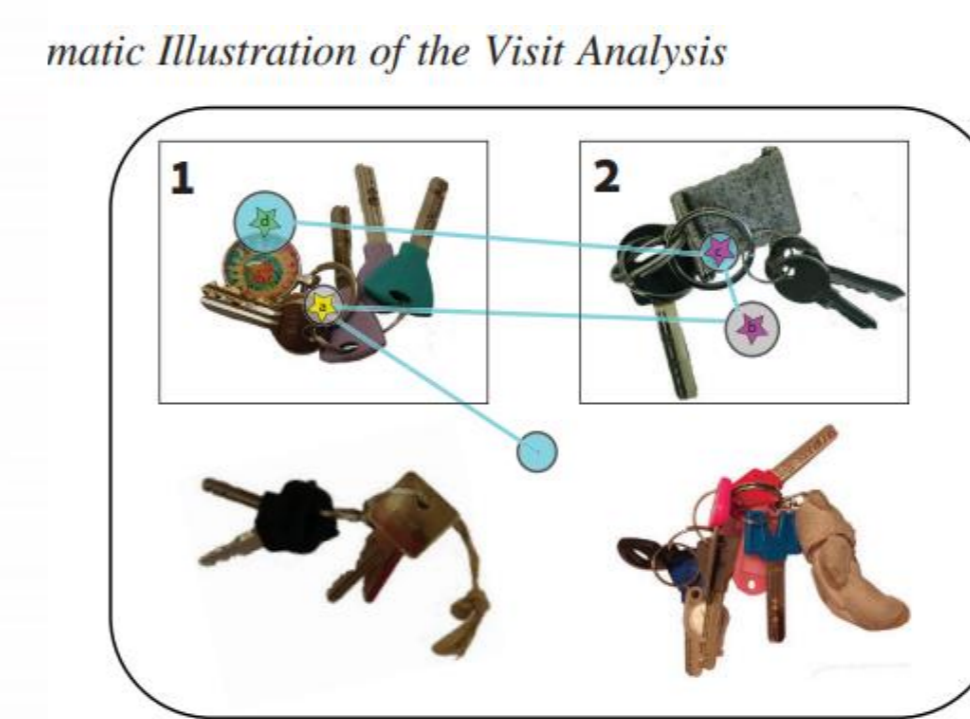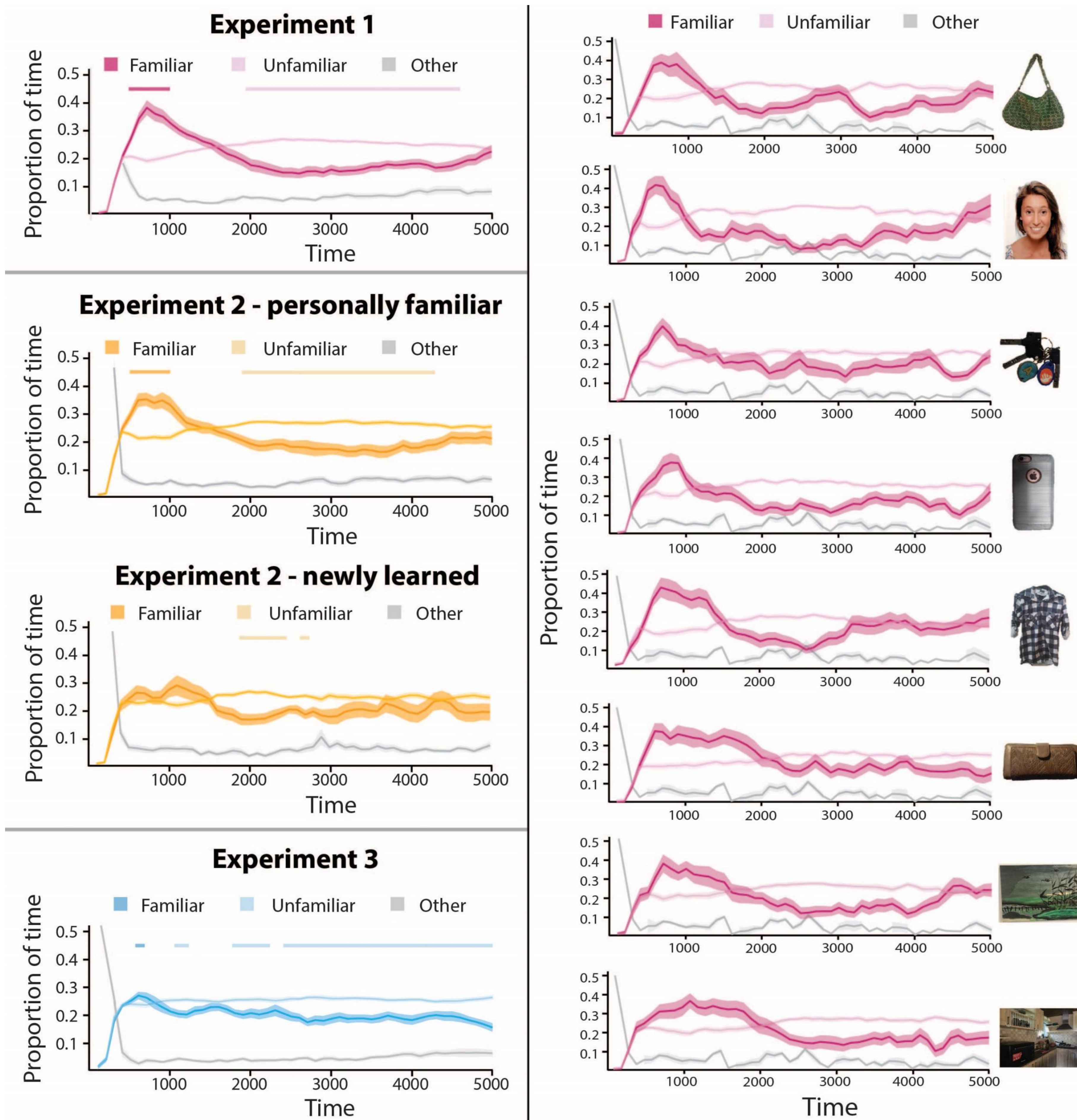
Through a series of studies, we provide a new framework for an interplay between memory and eye movements, across diverse types of stimuli. Throughout these studies, we see distinct gaze patterns to familiar and unfamiliar items, both learned and personally familiar. Importantly, we see these patterns even when participants are fully aware of the scanning strategy they should employ and have an incentive to do so.
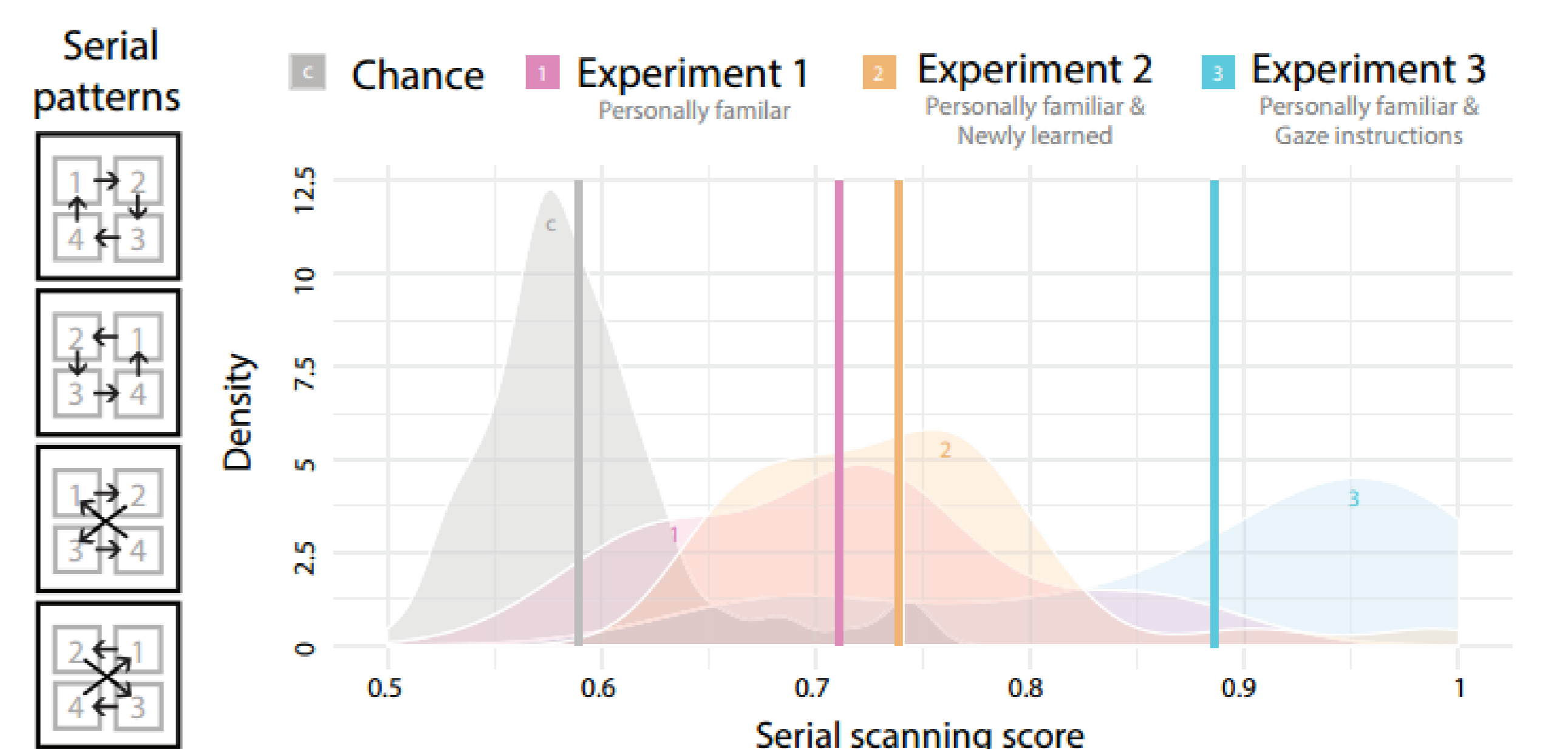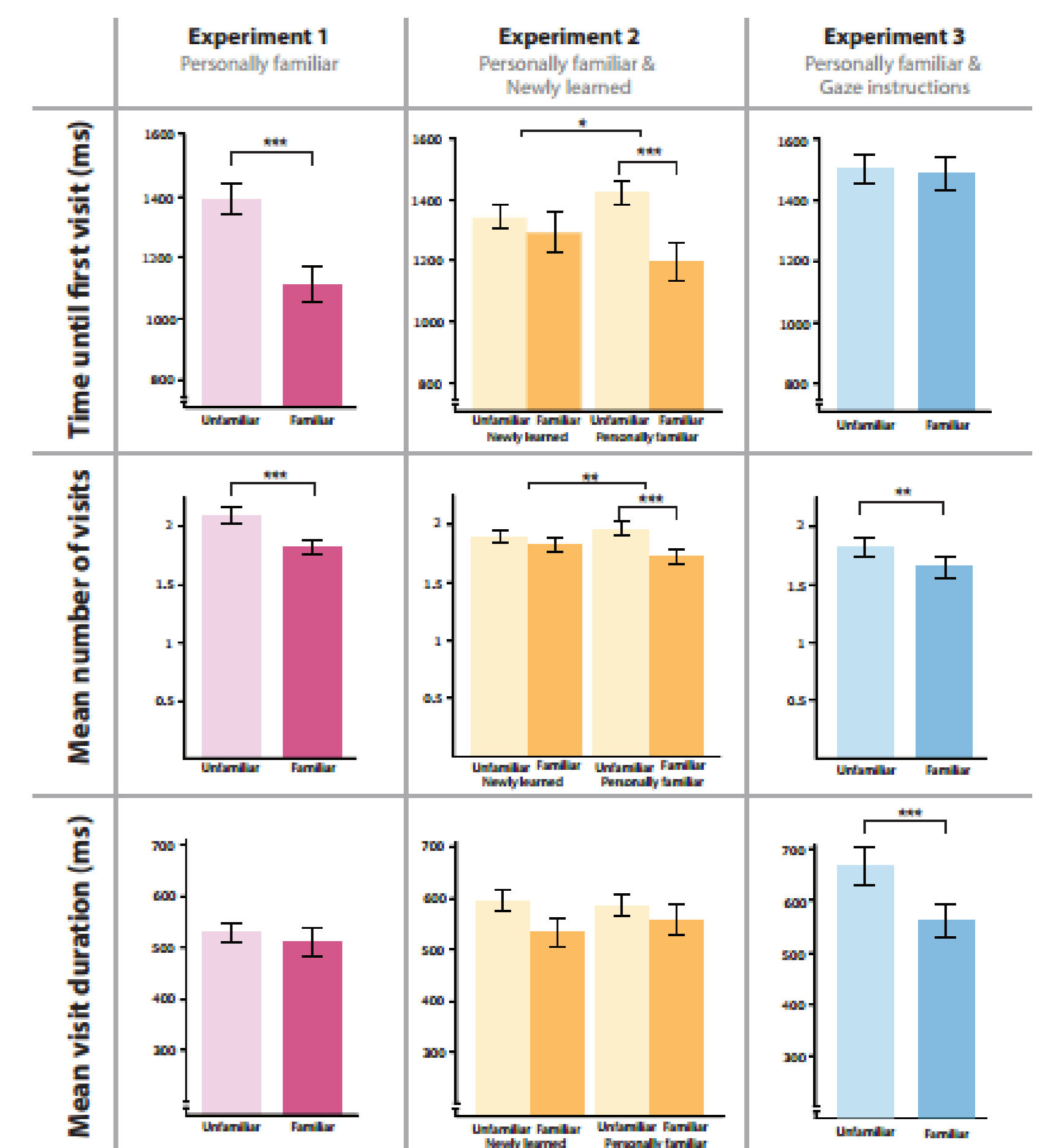
Paradigm and Methods

	Participants	Instructions	Stimuli
1	29 (16 males)	"conceal your familiarity with the pictures"	Personally familiar
2	31 (12 males)	"conceal your familiarity with the pictures"	learned and personally familiar
3	29 (14 males)	"You should refrain from looking initially at the familiar object and deploy gaze equally on all objects. A good strategy would be to serially scan the images. For example, in a clockwise manner, and look at each object a similar amount of time"	Personally familiar

Results

The visits analysis is composed of all the consecutive fixations on the same picture.

Note. The gray distribution (c) is the distribution of scores following permutations of the order of visits and captures the chance level of serially scores across all experiments. The vertical line stands for the mean of each distribution. The left panels schematically illustrate the four scanning patterns that were considered as a serial scanning. See the online article for the color version of this figure.

Conclusion

some elements of eye movements are controllable, when the observer is aware of the expected scanning characteristics, such as seriality of gaze. Other gaze characteristics depend on the task and are unavoidable. These findings imply that familiarity is a fast-developing construct that draws visual attention, even when people are aware of the expected scanning characteristics and try to control their gaze behavior.

For further reading:

Lancry-Dayan, O. C., Nahari, T., Ben-Shakhar, G., & Pertzov, Y. (2021). Keep an eye on your belongings: Gaze dynamics toward familiar and unfamiliar objects. JEP:LMC
Nahari, T., Lancry-Dayan, O., Ben-Shakhar, G., & Pertzov, Y. (2019). Detecting concealed familiarity using eye movements: The role of task demands. *CR:PI*