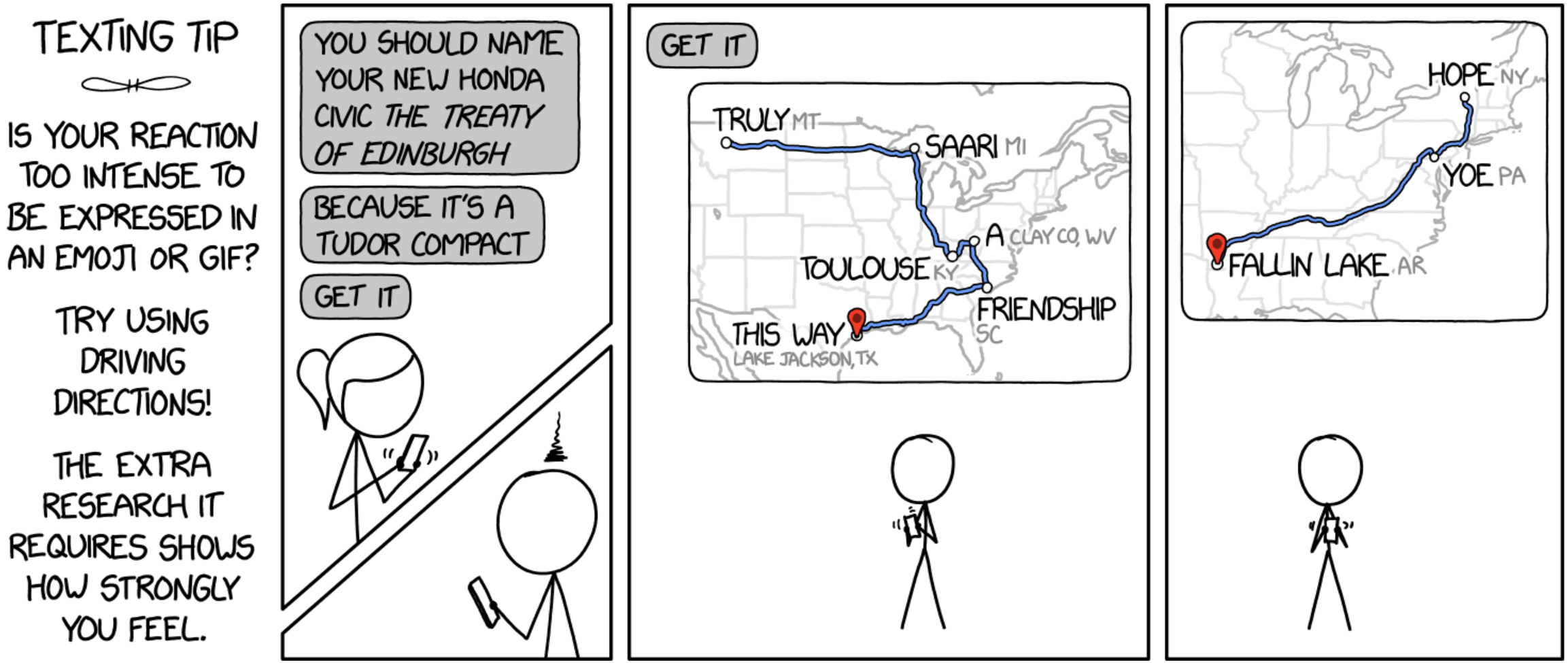
Are concepts anchored in space?

Readings for today

- Whittington, J. C., Muller, T. H., Mark, S., Chen, G., Barry, C., Burgess, N., & Behrens, T. E. (2020). The Tolman- Eichenbaum machine: Unifying space and relational memory through generalization in the hippocampal formation. Cell, 183(5), 1249-1263.

How do you learn to get from $A \rightarrow C$ via B?



In the authors' own words.

Abstraction and inference in the hippocampal/frontal circuit

Tim Behrens
Oxford and UCL

Come and see me if you want a rodent electrophysiology job.

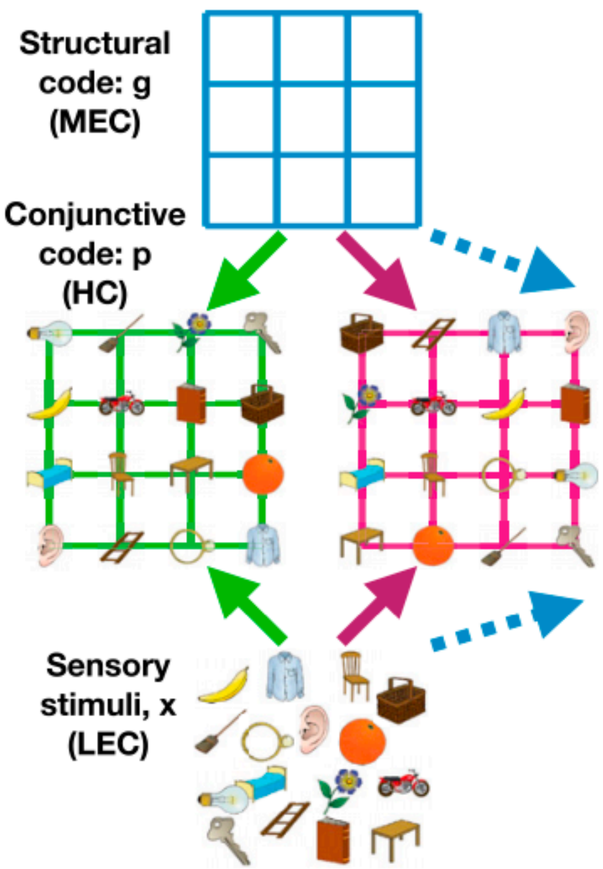
wellcome trust

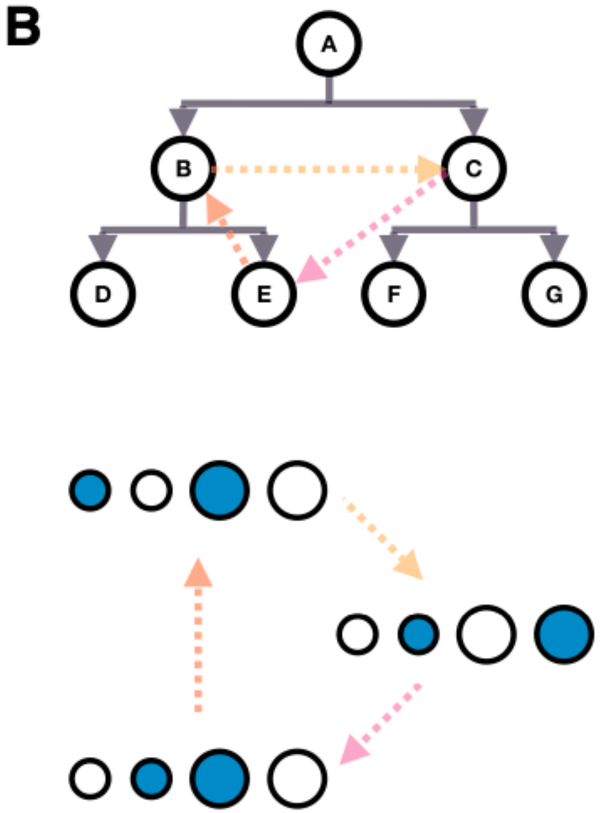
James S. McDonnell Foundation

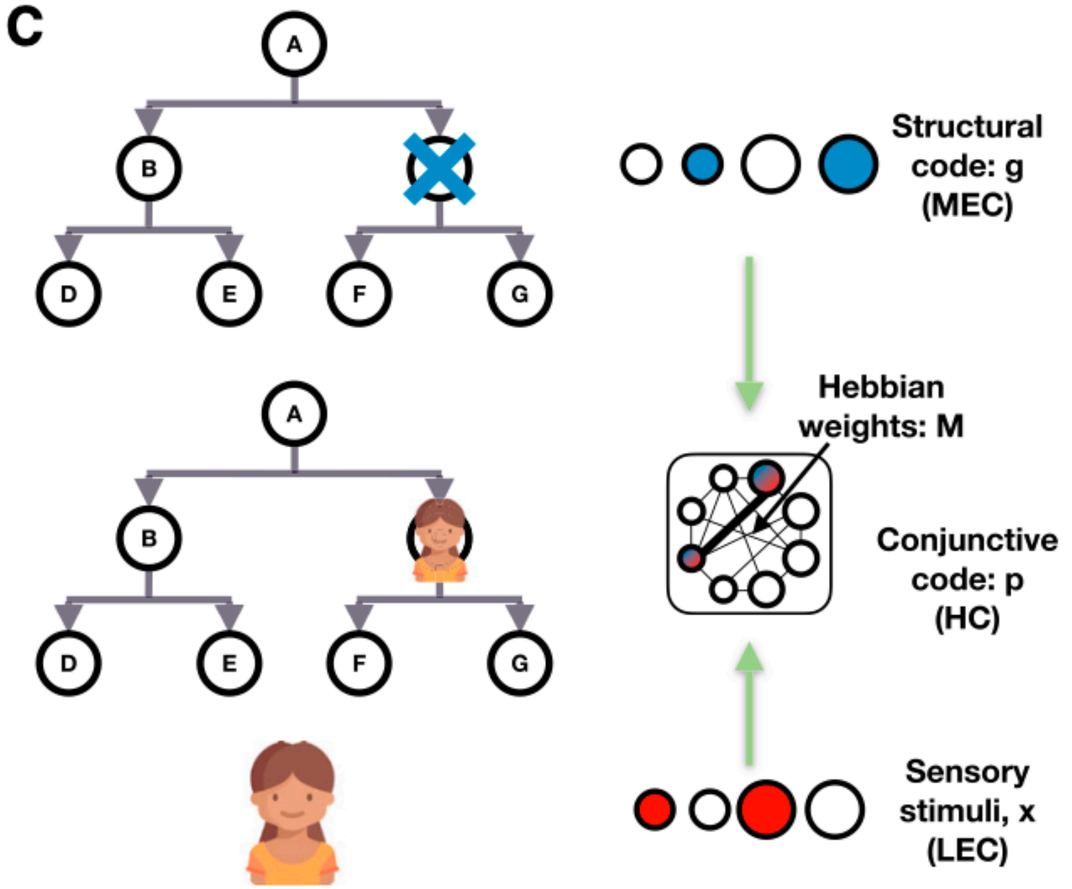
Google DeepMind

(Whittington et al. 2020)

Unifying relational learning

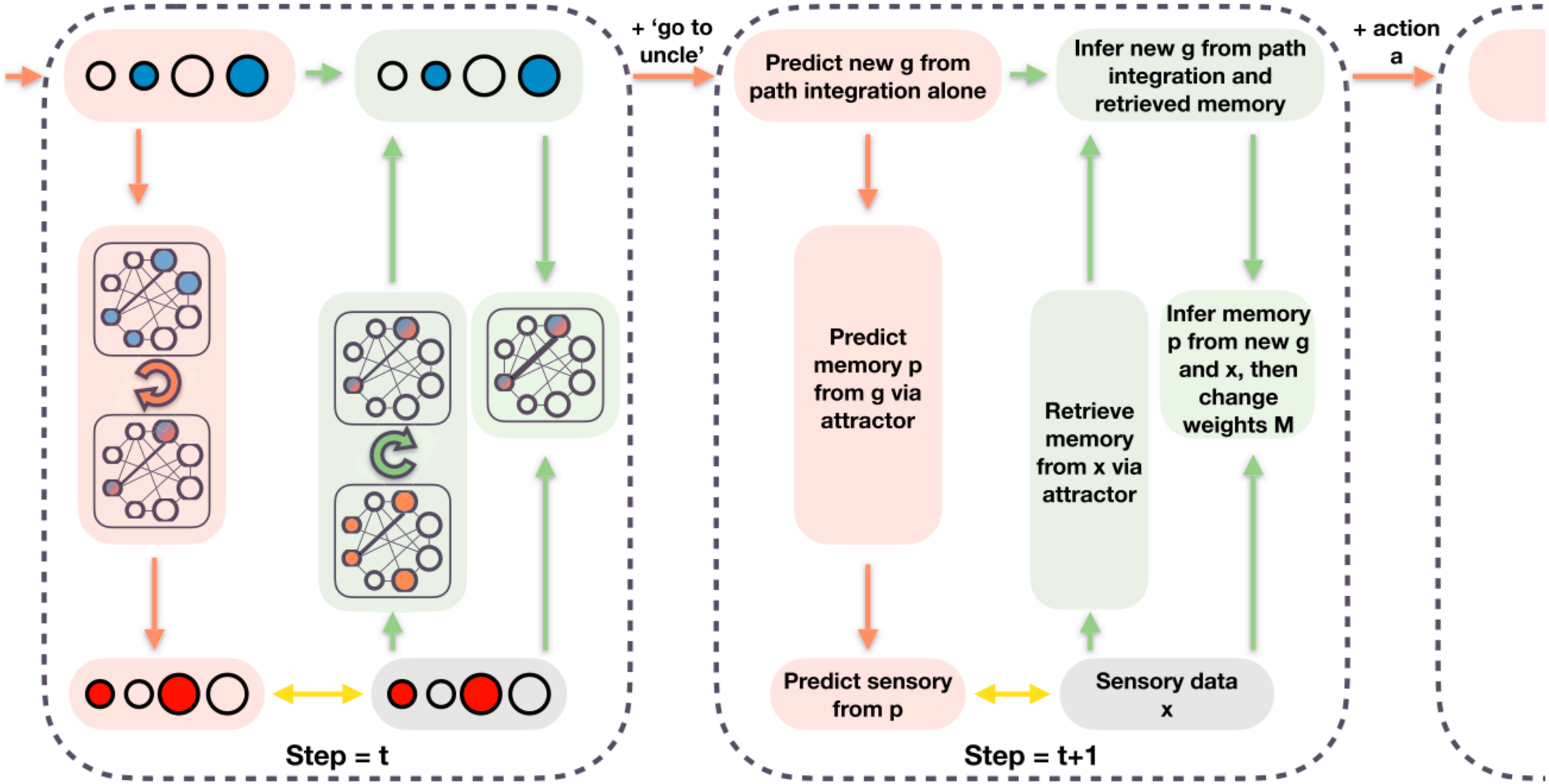






(Whittington et al. 2020)

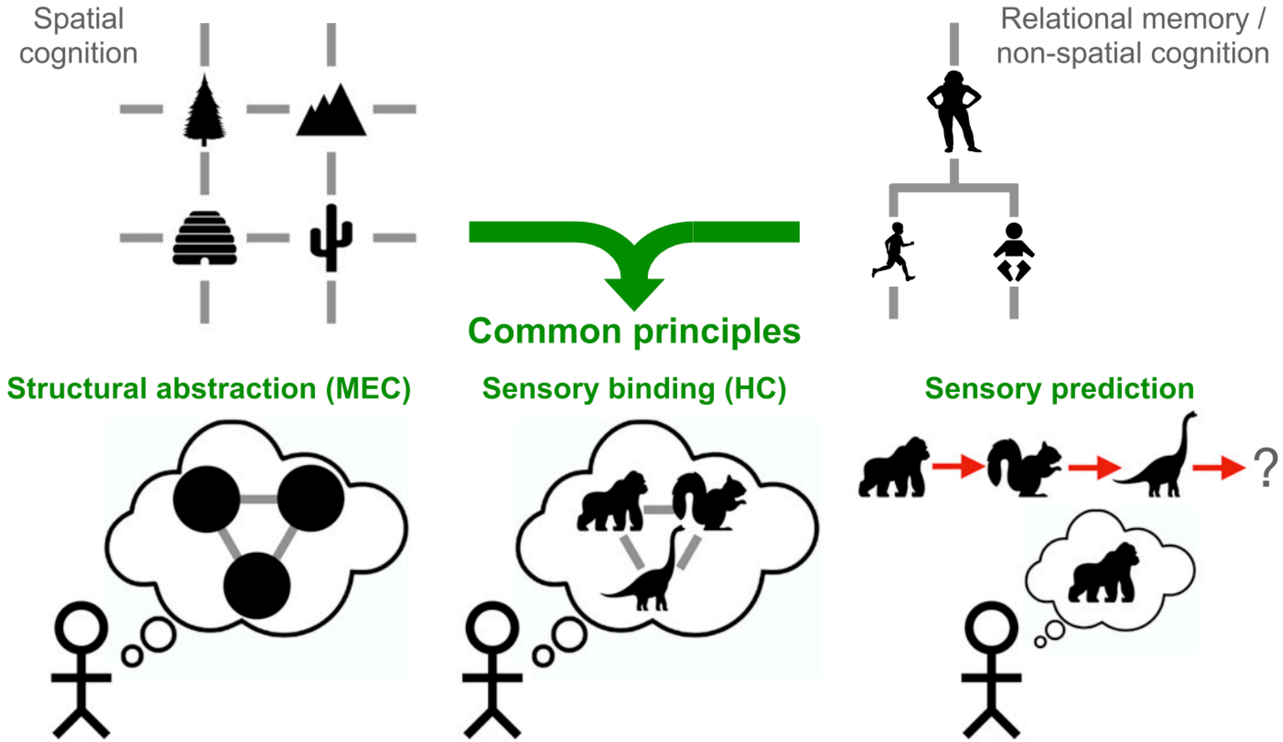
Path of prediction



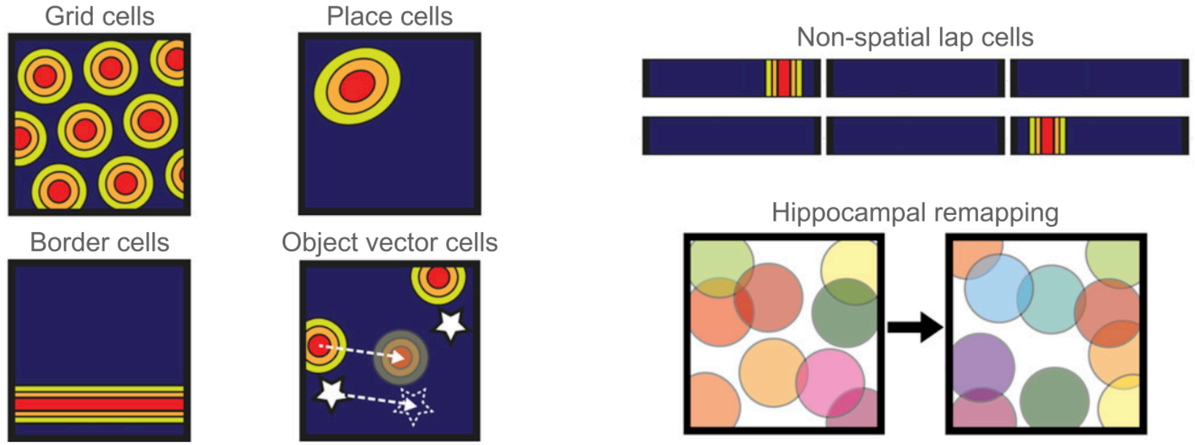
(Whittington et al. 2020)

Take home message

1. Unifying major functions of the hippocampal formation



2. These principles predict many cellular phenomena



(Whittington et al. 2020)

Break out discussion

- Whittington & colleagues make the case that a relational learning system (the TEM), evolved for spatial navigation, provides the infrastructure for general relational knowledge. **What *limitations* could this produce on our understanding of non-spatial relations?**