**Learning the Statistics of Events**

One of the marvels of neural systems is their ability to latch onto and use the statistical structure of their environment in the service of organizing cognition. After ordering and eating food in a restaurant, we know to order the bill; as the speaker presents her research, we assemble our question for the Q&A period that should follow. What cognitive construct affords such an ability to form anticipations and organize the rest of cognition in accordance with this anticipation? Schemas: superordinate knowledge structures that are learned through experience and provide a scaffold for organizing perceptual through mnemonic processes (Gilboa & Marlatte, 2017).

We are interested in studying the life span of schemas, from how they are constructed and updated through to how they influence online processing. To investigate this space of questions, we have built an engine which algorithmically generates narratives depicting instances of an event type (e.g. dinning at a restaurant, watching a poetry reading) from underlying probabilistic (acyclic) graphs. Each event type has a graph associated with it; nodes in the graph represents a particular situation within the event (e.g. waiter is taking order), edges encode the probability of transitioning between two situations (e.g. probability that the customers will tip the waiter before leaving). Different instantiations of an event type will have different surface properties (for example, what characters partaking in the event, slight variations in the sequence of situations that makeup the event), but will have been generated from the same underlying graph.

As a first step, we have been exposing subjects (both humans and neural network models) to a variety of such event instances, generated from a few sets of underlying graph structures, and probing their ability to construct and use representations for prediction. Here we will present preliminary experimental findings from data collected on Amazon Mechanical Turk subjects. Subjects will read stories generated by our engine a sentence at a time. With a certain probability, they are probed to predict, by adjusting a slider, which one of two possible next situations happens next in the story.

Given that this project is in its early stages, these data will help establish the learning curves for events with different probabilistic structures under different learning regimes. Future studies will use multivariate and connectivity analyses on fMRI data to track the assembling and use of schemas.

**Reference**

Gilboa, A. & Marlatte, H., (2017). Neurobiology of Schemas and Schema-Mediated Memory. Trends in Cognitive Science. Vol 21, No. 8.