Threading Memory via Projectional Motifs

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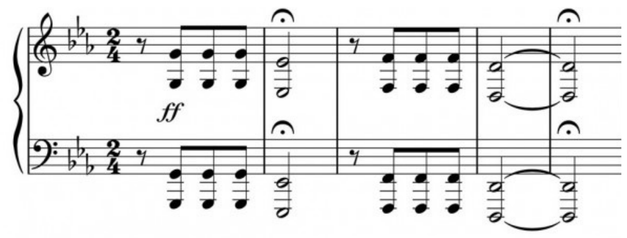
Repetitive motifs enhance our memory

- Motifs and variations in music
- Some music are easier to remember than others



PPAP, Shape of You, Fugue in G minor, Beethoven's Symphony No. 5

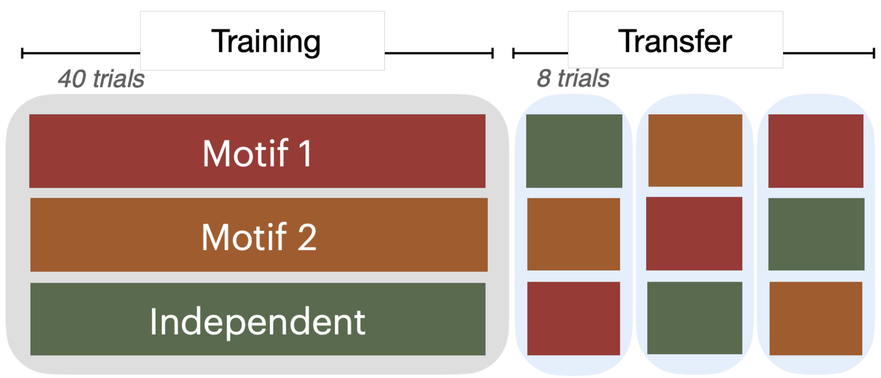
Less motifs ⟵ ⟶ More motifs + variations

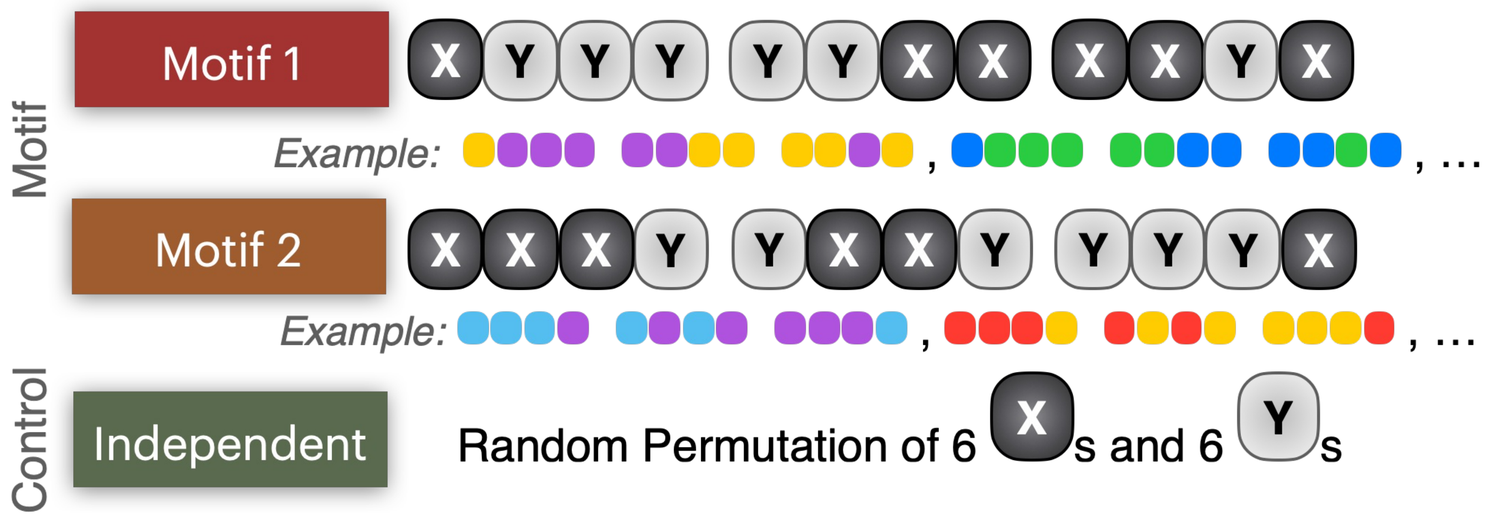
Such recurring patterns in a lower-dimensional space nail the sequences in our memory.
Some recurring patterns are only discoverable by transforming sequences onto a lower dimensional projectional space. We call these recurring patterns **projectional motifs**.

Question: How do projectional motifs help memory and transfer?

Experiment: train on sequences with motifs, test the transfer onto novel sequences

Sequence recall task:
Recall a sequence of length 12





Motif Learning Model

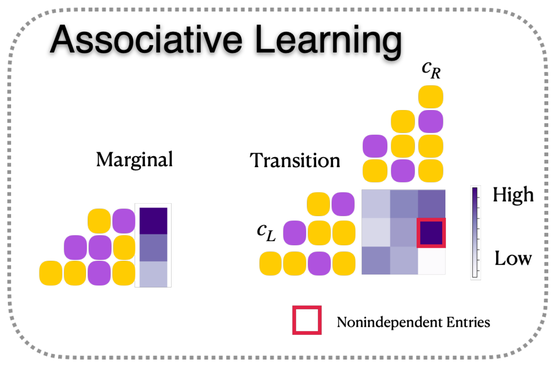
Instruction Sequences: , , …

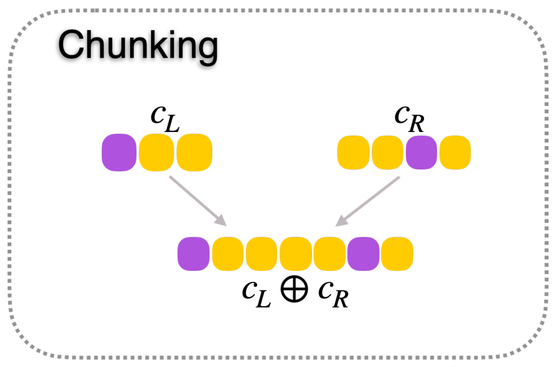
Time

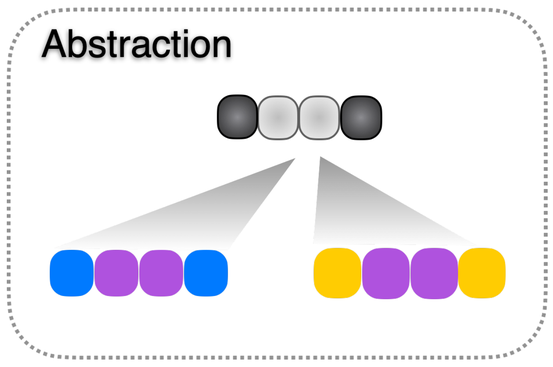
Find minimal complexity sequence representations via:

- Associative Learning
- Chunking
- Abstraction

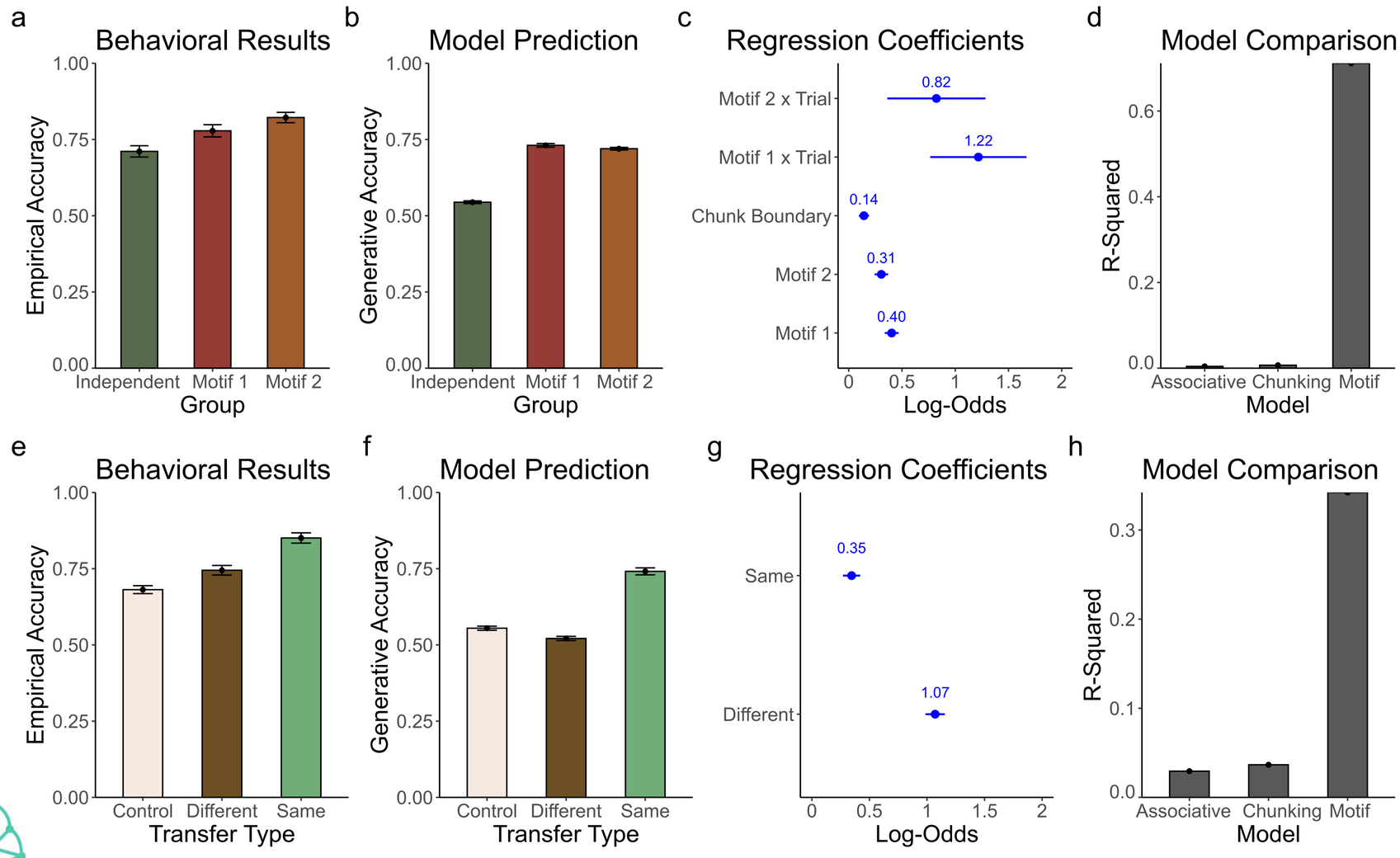
Memory Representation







Projectional Motifs facilitate sequence memorization and transfer



Humans construct efficient sequential memory representations via learning projectional motifs.

A motif learning model captures human learning and transfer behavior.

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Control: Independent - Motif 1, Independent - Motif 2
Different: Motif 1 - Motif 2, Motif 2 - Motif 1
Same: Motif 1 - Motif 1, Motif 2 - Motif 2