familiarity forced choice test

sentence acceptability test

Exp. 1

statistical property learning

stimuli: objects & events

Objects differ in terms of two types of statistics: identity of the rare event, and direction of contingency between two other events.

conditions: transition probabilities

event assignments varied across subjects; structure varied; conditional on object identity

causal acceptability

effect to cause

co-occurring frequent

only for object where frequent event was ambient, and for subjects who were accurate on non-causal contingency and frequency judgments (n = 20)

Thales cause/confetti to appear.

5. Subjects accept causal interpretations of these contingencies

6. They conceptually distinguish object-event co-occurrence vs. object-dependent contingency structure.

Exp. 2

supervised category membership judgments

is this a sibbie or a thale?

50 trials/object; subjects told to pay close attention and try to predict what will happen next; grass a key when something unexpected occurs. Attention checks required subjects to identify the rare event.

Exp. 3

unsupervised category induction

object-dependent structure

object stimuli

similarities

collected using a spatial sorting task

8. Subjects group objects by purely statistical properties.

9. They generalize over both object shape and the nature of the causal/effect event.

Conclusions

Human adults can acquire object categories based purely on statistical properties in a bottom-up manner from sensory streams, and gain explicit access to this knowledge. These categories can generalize over the nature of the individual events. We are currently tracing the neural mechanisms that allow such representations to be computed.


