Associative and rule based learning

GeneralisationLearning individual associations is easier if the learning system computes similarity between the stimulus previously learned and new stimuli

Stimulus similarity will allow responding to generalise from previously learned associations to new but similar stimuli

Generalisation should decline with the distance from trained stimuli

Associative learning theory predictsthat the degree of generalization of associative strength of a CS depends on the interaction associative strength of other CS's lying along the dimension

If one stimulus is reinforced (S+) and another close on the dimension is not (S-) excitatory and inhibitory gradients will overlap.

The net excitatory associative strength of the S+ is less than that of an untrained S++ lying further along the dimension

Responding is therefore greater to S++ than S+. We see this in pigeons, but humans use a relational rule that operates in the opposite way to that predicted by associative theory - the further along the dimension a new stimulus is from the trained stimulus, the more likely the person is to regard it as an example of the rule.

can also be used to predict the outcomes an individual expects from a stimuli

also used to define how similar and individual perceives two stimuli to be

Discrete component representationEach stimulus is represented by its own nodeCatergorisationCategories are formed on the basis of the similarity between a set of exemplars

We can think of a set of exemplars as having a central tendency - those features of an exemplar that are most diagnostic of the category, known as the prototype

Small variation from the prototype (low distortion) will be regarded as highly typical members of the category while large variation (high distortion) will be regarded as less typical members

prototype effectExperiments manipulating the distortion from the prototype produce the prototype effect (better classification of the prototype during the test phase than other new exemplars) and the typicality effect - less accurate classification of high distortion exemplars compared to low distortion exemplarsRule learningThere are forms of learning that cannot be solved associatively processes such as the extraction of a general rule during learninShanks and Darby 1998trained complex discrimination using the allergy task I described in an earlier lecture

The experiment showed that good learners (high) responded according to the rules, whereas poor learners (low) tended to respond according the summed values of the elements, i. e. associatively.