Problem Set #1

Due: Wednesday January 24, 2007
Turn in to your TA at the beginning of lecture

1. The following data are from the experiment by Garcia and colleagues ("Cues: Their relative effectiveness as a function of the reinforcer" in Science). In this experiment, there were four groups of rats, two groups who got X-rays as reinforcement and two who got shock as reinforcement. Among the X-ray rats, the size group ate large pellets on X-ray days and small pellets on non-X-ray days; the flavor group ate flavor A pellets on X-ray days and flavor B pellets on non-X-ray days. Among the shock rats, the size group ate large pellets on shock days and small pellets on non-shock days; the flavor group ate flavor A pellets on shock days and flavor B pellets on non-shock days. The graph shows the difference in total amount eaten (and the amount of time, or latency, to begin eating) between large and small pellets and flavor A and flavor B pellets.

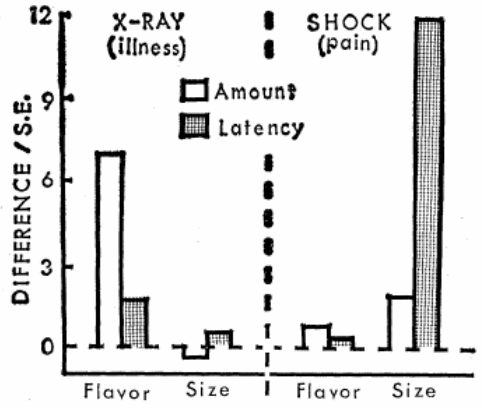

Fig. 1. Relative effectiveness of two attributes of food pellets (size or flavor) to act as cues after conditional pairing with two forms of noxious reinforcement (shock or x-ray) in four groups of rats. The mean difference between measures obtained with conditional and nonconditional forms of the food is scaled in terms of the standard error of that difference. (One S.E. is approximately 0.7 g or 8.2 seconds.) Amount reflects depressed consumption, and latency reflects hesitation before eating caused by the given cue on tests in absence of the reinforcer.

(a) Among the X-ray rats, which factor had more of an impact on the amount of pellets eaten – flavor, size, or neither?
(b) Among the X-ray rats, which factor had more of an impact on the latency to eat?
(c) Among the shock rats, which factor had more of an impact on the amount of pellets eaten?
(d) Among the shock rats, which factor had more of an impact on the latency to eat?
(e) What is the Garcia effect?

(f) How has the Garcia effect been interpreted?
(g) What tenet of behaviorism does this finding call into question?
(h) Why do you think the findings for latency and amount were different in this experiment?

(2) What evidence from neuroscience supports feature theory?

(3) In theory, Rumelhart & McClelland's interactive activation (IAC) model of visual word recognition could account for "THE MAN RAN" illusion in the Pattern Recognition slides.
(a) Explain how the model could use context to alter letter perception.
(b) What is the word superiority effect?
(c) Explain how the IAC model accounts for the word superiority effect.
(d) Name one way the interactive activation model would have to be modified to account for context effects on spoken word recognition.

(4) (a) Describe 2 arguments Chomsky made against the efficacy of a behaviorist explanation of verbal behavior. (b) Of the two you outlined, which do you think is more compelling? (c) Explain your answer to b.