Spatial Cognition

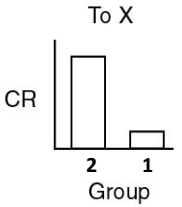
Tolman (1948): cognitive mapping = learning relationships among environmental stimuli, *S-S* learning, as opposed to route learning, the *S-R* learning thought more important at the time. Cognitive maps could be learned without explicit reward, latent learning. For example: rats that had explored maze with no food present (and they were not hungry), learned to locate reward in the maze faster than did rats who had not explored the maze.

O'Keefe & Nadel (1978): cognitive maps based on a learning system – located in the hippocampus – *different from* the learning system underlying associative learning. *New information can be added to a cognitive map more or less indefinitely just as to a paper map.* This property distinguish cognitive maps from compound stimuli in condition, in which cues compete for a fixed pool of associative strength (Spence; Rescorla & Wagner) – blocking and overshadowing.

Spatial Cognition

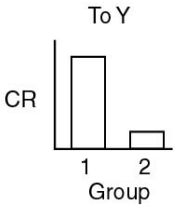
Overshadowing

	Train	Test
Group 1	AX+	X
Group 2	X+	



Blocking

	I	II	Test
Group 1	B/+	BY+	Y
Group 2	B+		



Spatial Cognition

Overshadowing: A stimulus (A) when it is presented alone may develop strong stimulus control. However, if that discriminative stimulus is accompanied by another stimulus (X), then stimulus control by the 1st stimulus may be reduced or eliminated ('overshadowed') by the 2nd stimulus. Has to do with which stimulus is inherently more salient (X > A).

Blocking: If a stimulus (A) is 1st presented alone and followed by reinforcement, then it may develop strong stimulus control. If that stimulus is later combined with a novel stimulus (X) and the stimulus compound (AX) is followed by the same reinforcement, then little or no control may be exerted by the 2nd stimulus (X) in tests with it alone. An additional comparison – only AX training is given – is needed l to show that stimulus control by X has been blocked by prior training with A: stimulus control by X alone in this comparison condition greatly exceeds that in the first condition. Has to do with which stimulus was trained 1st (primacy).

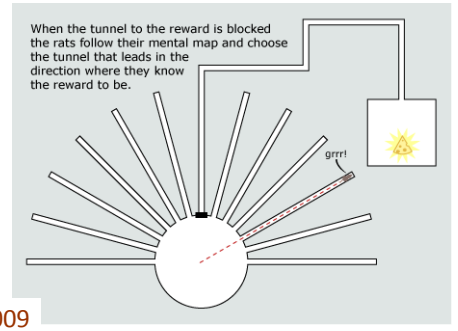
Spatial Cognition

Train with one landmark. Later add second landmark, then test with second landmark alone. Can they use it? If it is 'blocked', evidence for associative learning account, evidence against 'cognitive map'.

Other sorts of maze tests (a la Tolman):

Shettleworth:

"Analysis in terms of elementary processes of learning and behavioral control is more illuminating than seeking evidence for grand but vaguely defined anthropomorphic processes.



For next Tuesday: Pearce 2009