Internalization of Stimulus Control During Skill Learning: When Can the Coach Leave?

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Introduction

• Role of coaches
• Internalization of stimulus control-control by exteroceptive stimuli to control by interoceptive stimuli.
• Stimulus control in a laboratory setting
  - Roles of guiding cues vs. the effects of evaluative feedback
Procedures

- Lights served as guiding cues while learning to complete a Left-Right sequence of lever presses.
- Light was illuminated over lever, pressing the appropriate lever turned the light off and switched to the other lever in the sequence.
**Lights Condition**
Complete Left-Right Sequence
Lights over levers present in succession as “guiding cues”
Correct sequence → Food
Incorrect → Timeout

**No-Lights Condition**
Complete Same Left-Right Sequence
No Lights were presented

**Reversed-Lights Condition**
Complete Same Left-Right Sequence
But, Lights presented in R-L order
Research Questions

• How would accuracy be affected if the guiding cues were removed?
• Would accuracy fall to random chance levels, or would rats use internal cues to select levers?
• Does the amount of training influence the switch to internal cues?
• How would accuracy be affected if the guiding cues were reversed?
Goal

Create an animal model of internalization of stimulus control during skill learning.
Expt. 1: Lights vs No-Lights

- First 5 sessions: Lights Condition
- Last 5 sessions: No-Lights Condition

Expt. 2: Reversing the Order of Lights

- First 5 sessions: Lights Condition
- Last 5 sessions: Reversed-Lights Condition

Mean of all subjects
Expt. 1: No-Lights Condition

Drop in L-R Accuracy (%)

Expt. 2: Reversed-Lights Condition

Drop in L-R Accuracy (%)

$\tau^2 = .587$

$\rho = .00226$

Drop = 97 - 4.11 \times \text{Sessions}$

$\tau^2 = .566$

$\rho = .051$

Drop = 94.6 - 1.18 \times \text{Sessions}$
Discussion

• Decreases shown in Experiment 2 were not due to generalization decrement
• Lever pressing controlled by external, misleading cues
• S-R associations involving external stimuli overshadowed internal cues
• How do we learn to be autonomous?
  - governing principles exist
What can we do with the animal model?

• Practical Application
  - Coaching Styles: highly directive vs. hands-off
• Explain the design for next year’s experiments in L & A
Research Opportunities

- Get involved Fall 2009
- Work with cute rats (not albino nasties)
- Learn about behavior
- Gain research experience
- Contact Dr. Reid!