

# Within-Session Reversal Learning in Pigeons and Rats

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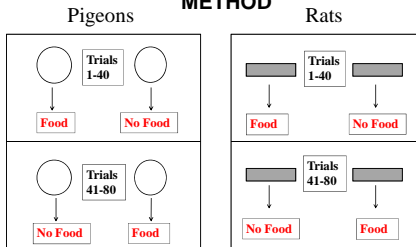
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## INTRODUCTION

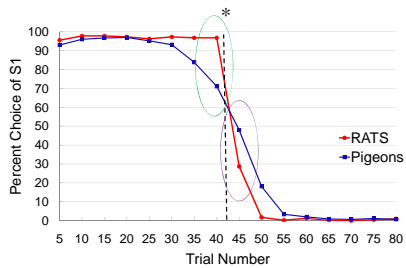
Behavioral flexibility, the ability to change behavior in response to the changing environment, was studied with a reversal paradigm. Experiment 1 used a mid-session reversal.

## EXPERIMENT 1

### METHOD



## RESULTS

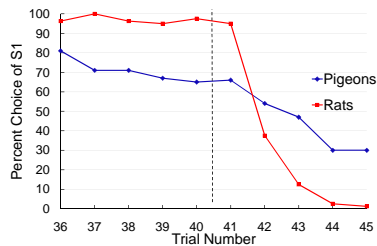


**Pigeons:**  
Anticipatory and perseverative errors

**Rats:**  
No anticipation and few perseverative errors

\* Point of Reversal

## TRIAL BY TRIAL DATA



**Pigeons:**  
Show relative insensitivity to the reversal

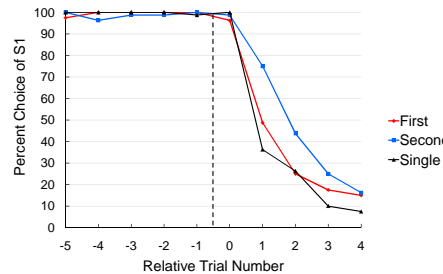
**Rats:**  
Switch to S2 by Trial 44

## EXPERIMENT 2A: VARIABLE & 2 REVERSAL LOCATIONS

### METHOD

- Using 5 different reversal locations (10, 25, 40, 55, & 70), rats were given single variable reversal and 2-reversal sessions randomly intermixed across sessions.
- Single Variable Reversal:** A single reversal could occur after Trial 10, 25, 40, 55 or 70
  - 10 sessions
- 2-Reversal Sessions:** For example, a reversal could occur after Trials 10 and 55
  - 10 sessions

## RESULTS



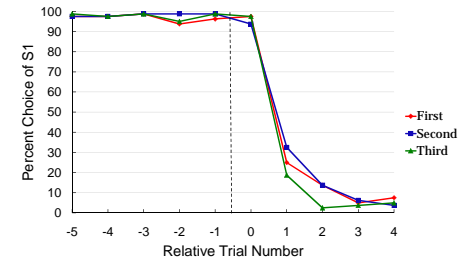
• Second reversal showed slightly more perseveration

## EXPERIMENT 2B: 3 REVERSAL LOCATIONS

### METHOD

- Using same reversal points as in Experiment 2A, a third reversal was introduced within a session
- 3-Reversal Sessions:** For example, a reversal could occur after Trials 10, 40 and 55
  - 10 sessions

## RESULTS



## DISCUSSION

- Rats use the most optimal information to maximize reinforcement, whereas pigeons seem to rely on the passage of time.
- When given a variable point of the reversal or multiple reversals per session, rats are able to adjust to changing contingency by using the outcome of the preceding trial(s) as a cue.
- Evidence of win-stay/lose-shift strategy in rats

## REFERENCES

- Cook, R. G., & Rosen, H. A. (2010). Temporal control of internal states in pigeons. *Psychonomic Bulletin & Review*, 17 (6), 915-922.
- Rayburn-Reeves, R. M., Molet, M., & Zentall, T. R. (2010). Simultaneous discrimination reversal learning in pigeons and humans: anticipatory and perseverative errors. *Learning & Behavior*, (in press).

## Acknowledgement

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