Cognitive Control & Task Switching

- Focus on
  - *Endogenous* processes that
    - Reconfigure task set (i.e., representations and processing pathways associated with performance of a task)
  - Two types of reconfiguration:
    - Forward-looking: Activation of new task set
    - Backward-looking: Deactivation of the prior task set (Allport, Styles, & Hsieh, 1994; Rogers & Monsell, 1995).

Prior-Task Interference (PTI)

- *Exogenously-driven* inhibitory control over prior-task processes may be underappreciated with focus on task switch costs (Wyley & Allport, 2000).
  - PTI: Interference from prior-task processes
  - Stimuli allow performance of both tasks
  - Stimulus-driven *task set reactivation*
    - Requires inhibitory control over prior-task processes (Faust & Sanow, 2003; Waszak, Hommel, & Allport, 2003; Wyley & Allport, 2000).

- Interference from *previously-relevant stimulus dimensions* (e.g., *color of a word*) during performance of a switched-to task (e.g., *category of a word*) can provide information regarding cognitive control above and beyond task switch costs (Faust & Sanow, 2003; Faust & Wilkins III, 1999).

Current Questions

- Is PTI sensitive to switch difficulty?
- Is PTI sensitive to expectation of interference?

4 Word Naming Tasks

- Color Selection: Name RED Word
- Color Selection: Name GREEN Word
- Category Selection: Name ANIMAL Word
- Color Selection: Name OBJECT Word

Experiment 1: Easy (Constant) Task Switch

![Experiment 1: Easy Selection, 100% Color Trials](image1)

PTI Target Color for Category Task is Same/Different than in Preceding Color Selection Task.

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Experiments 2 & 3: Difficult (Variable) Switch

![Experiment 2: Difficult Selection, 100% Color Trials](image2)

- NonColor Trial

Experiment 3: Difficult Selection, 25% Color Trials

![Experiment 3: Difficult Selection, 25% Color Trials](image3)

Discussion

- **PTI & Task Switch Difficulty** (Experiment 1 vs. 2)
  - Robust PTI in both RT & Intrusion Errors for easy switch
  - Reduction in PTI with *INCREASE* in switch difficulty
  - Increased switch effort may lead to increased control & reduction in PTI
- **PTI & Proportion Interference (Color) Trials** (Experiment 2 vs. 3)
  - PTI for first switch trial modulated by expectancy

References


