Lingering effects of response inhibition: Evidence for both control settings and memory association mechanisms
Rachel M Wynn, Dwight J. Kravitz, & Stephen R Mitroff
The George Washington University, Washington, DC

Airport Scanner
General Facts
- Visual search mobile game app
- Search for prohibited items
- Massive dataset ~30,750 individuals contributed data to this project

Key Trial Types
Search Response Inhibition
- Targets in ~50% of bags
- Use a finger tap to identify the item
- “Air Marshal” bags
- Indicated by a star badge
- Withhold the finger tap <3% of trials

Methods
Anchor
Variable Lag
Trials of Interest
- All lags individually examined
- Response time and hit rate recorded

Results
Memory Associations
Response time reliably longer out to lag 7
Hit rate lower out to lag 7
Relatively large effect

Control Setting Adjustments
Response time reliably longer for lags 1 & 2
Hit rate lower for early lags
Relatively small effect

Discussion
Both memory associations and control setting adjustments influence visual search following response inhibition but on different timescales
- Memory associations have a prolonged, relatively large effect
- Control settings have a transient, relatively small effect

Next Steps
- Increase stability with full dataset (~10x more data)
- Examine additional influences on response inhibition interference:
  - Item-specific (e.g., shape, color, category)
  - Position-specific (e.g., rotation, location)
  - Context (e.g., previous experience with the items)
- More? (tell us your favorite possible contributing factor!)

References | Funding

Question
How does response inhibition affect subsequent processing?

Background
Response inhibition
Withholding an automatic or already initiated response
- Performance slowed following response inhibition

Two main hypotheses about the time course of response inhibition
1. Memory associations
   - Association between “inhibit” and the stimulus that appeared during that trial
   - When that stimulus reappears, the “inhibit response” goal is recalled
2. Adjustments in control settings
   - Response inhibition triggers switch to “inhibition mode”
   - “Inhibition mode” carries over to subsequent trials

Current Questions
How does response inhibition influence subsequent visual search?
What is the time course of that effect?
Are the aftereffects of response inhibition driven by memory associations and/or adjustments in control settings?