Impact of Media Multitasking on Attentional Filtering and Disengagement

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Goal

Examine individual differences in attentional processing

- Are there attentional differences between:
  - **Heavy Media Multitaskers**: those who regularly consume more than one form of media at a time (e.g., reading while watching TV)
  - **Light Media Multitaskers**: those who regularly consume only one form of media at a time

Previous Work

- Heavy Media Multitaskers are more impacted by visual distraction than Light Media Multitaskers
  - Heavy Media Multitaskers performed poorly in a change detection task with irrelevant distractors
  - Heavy Media Multitaskers were more affected by distractors between cues and targets in N-back and AX-CPT paradigms

(Ophir et al., 2009)

Current Questions

- Previous findings are clear, but *how* and *why* do Heavy and Light Media Multitaskers differ?
  - Are differences due to memory impairments or problems with attentional capture, filtering, or disengagement?
- **Experiment 1** is an attentional capture task to test if the deficit is attention-based
- **Experiment 2** is a stop-signal task to test if there are differences in attentional disengagement
  - Heavy Media Multitaskers may engage in sensation seeking behaviors (Jeong & Fishbein, 2007)
  - Other studies have found high sensation seekers do not disengage from salient stimuli (Avila & Parcet, 2001)

Participants

Media Multitasking Index (MMI; Ophir et al., 2009)**:**
How often *multiple* media are consumed, normalized by total consumption

Experiment 1:
- 84 Duke undergraduates
- 17 Light Media Multitaskers (MMI < 2.86; 11M, 6F)
- 17 Heavy Media Multitaskers (MMI > 5.90; 8M, 9F)

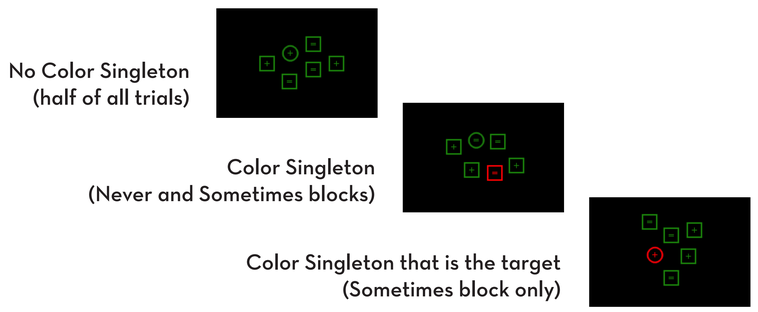
Experiment 2:
- 95 Duke undergraduates
- 23 Light Media Multitaskers (MMI < 2.77; 14M, 9F)
- 23 Heavy Media Multitaskers (MMI > 4.81; 7M, 16F)

Experiment 1 — Singleton

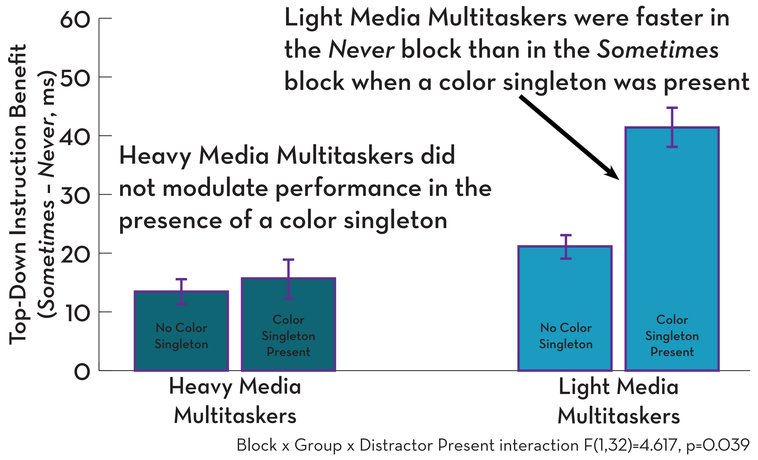
Task (Costello et al. 2010, Leber & Egeth 2006)**:**
- Did the circle (the target) contain + or =
- 3, 5, 7, or 11 square distractors
- On half the trials one shape was a red color singleton

Two Block Types (12 alternating blocks of 64 trials)**:**
Never blocks: Red singleton is *never* the target; never looking at the red shape is ideal
Sometimes blocks: Red singleton is *sometimes* the target (as often as any other shape); treating the red shape as any other shape is ideal

Example Displays (Display size 6)**:**



Experiment 1 Results



Block x Group x Distractor Present interaction $F(1,32)=4.617$, $p=0.039$

- Light Media Multitaskers made use of top-down information to ignore distractors
- Heavy Media Multitaskers did not do so
- Both groups performed equivalently when no color singleton distractors were present
- This suggests that Heavy Media Multitaskers attend to distracting information despite instructions not to

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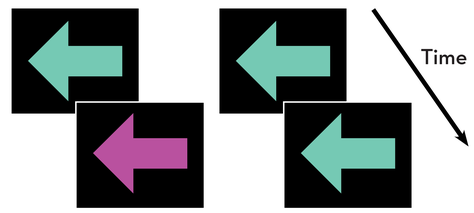
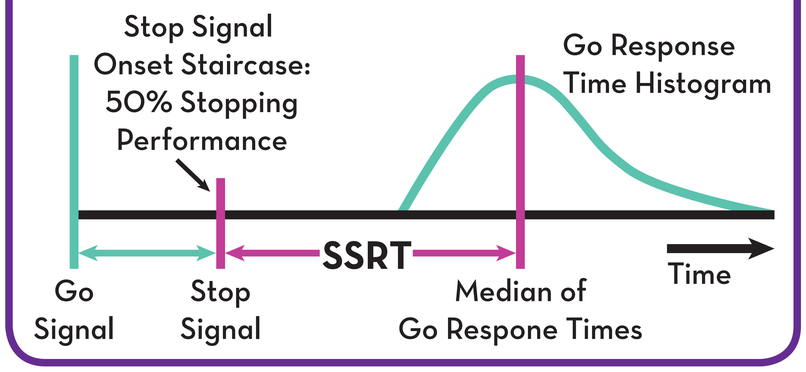
Experiment 2 — Stop Signal



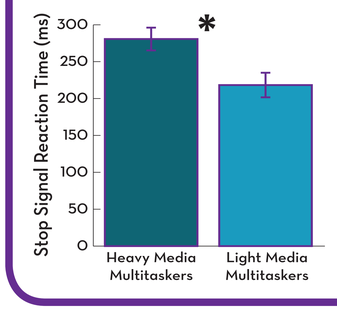
- **Task:** Respond quickly to arrows (left or right key)
- Stop Signal onset staircased to 50% stopping performance

Stop Signal Reaction Time (SSRT) Measurement



Experiment 2 Results

Stop Signal Reaction Time is longer for Heavy Media Multitaskers



- Heavy Media Multitaskers needed more time to stop a planned response
- This suggests that Heavy Media Multitaskers are slower to disengage from salient stimuli

Conclusions

Differences in attentional mechanisms may underlie group differences in attentional filtering and disengagement

- Those who commonly consume multiple forms of media at the same time may be worse at filtering out irrelevant or distracting information
- They also take longer to disengage from such stimuli
- Everyday behaviors may be indicative of different underlying attentional abilities and/or strategies
- These strategies affect both what information is attended and how long it is the focus of attention