Distractor Filtering in Media Multitaskers

Matthew S. Cain & Stephen R. Mitroff
Center for Cognitive Neuroscience, Department of Psychology & Neuroscience, Duke University

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
  • Light Media Multitaskers: those who regularly consume only one form of media at a time

Previous Work
• Ophir et al. (2009) found that Heavy Media Multitaskers were more impacted by visual distraction than Light Media Multitaskers
• e.g., Heavy Media Multitaskers performed poorly in a change detection task with irrelevant distractors

Current Question
Why are Heavy Media Multitaskers more susceptible to distraction than Light Media Multitaskers?
• Change detection results are clear, but what is the underlying cognitive mechanism?
• We use an attentional capture task to ask if the deficit is attention-based

Methods
Task
(Costello et al., Leber & Egeth 2009a)
• 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; ideal performance is never looking at the red shape
Sometimes blocks: Red singleton is sometimes the target; treating the red shape as any other shape is ideal

Group Measure (Ophir et al., 2009b)
Media Multitasking Index: How often multiple media are consumed (e.g., reading while watching TV), normalized by total consumption. Range in sample: 0.20–8.13

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

Results
Heavy Media Multitaskers do not modulate performance based on instructions in the same manner as Light Media Multitaskers
• Light Media Multitaskers used instruction information to improve performance in the Never block when a color singleton was present
• Heavy Media Multitaskers did not modulate performance in the presence of a color singleton
• Both groups performed equivalently when no color singleton distractors were present
  • Specifically, both groups responded more slowly in the Sometimes block than the Never block

Response Time Breakdown

z-transformed Response Time Breakdown

Summary
• Light Media Multitaskers made effective use of Never block instructional information
  • They better filtered out red singleton shapes in the Never vs. Sometimes blocks
• Heavy Media Multitaskers performed quite well overall, but did not make use of the Never block information
  • They were just as likely to attend to red shapes in Never and Sometimes blocks

Implications
Differences in attentional mechanisms likely underlie group differences in distractor processing
• Those who commonly consume multiple forms of media at the same time may be worse at filtering out irrelevant or distracting information
• Everyday behaviors may be indicative of different underlying attentional abilities and/or strategies

References

Address correspondence to:
Matthew S. Cain
matthew.s.cain@duke.edu