“getting attention”: Top-down vs. bottom-up attn

Top-down (goal-directed) ➔ voluntary

Bottom-up (stimulus-driven) ➔ *relatively*
  exogenous (p.126) ➔ involuntary
Top-down vs. bottom-up attention

Top-down (goal-directed) → voluntary

Bottom-up (stimulus-driven) → *relatively* involuntary

Search for “Blue”
Can shift attention without moving eyes
Sometimes bottom-up attention distracts

Top-down (goal-directed) voluntary

Bottom-up (stimulus-driven) *relatively* involuntary

Can help you notice new things
Odd colors, odd shapes
Can distract
• Top-down, bottom-up
  – Attention shifts combo of stimulus-driven and voluntary
  – Attention system can preferentially respond to your name and sometimes other things
  – Why did the monster capture your attention?
    • Was it the monstrosity?
    • Was it the flashiness?
FAILED

- Unleavened stupidity?
- Absent-minded professor?
- Inexperienced driver?
  - Had been driving for over 15 years, a few thousand miles most years, no significant incidents
  - Including two 3,000 mile trips without incident
Capacity in vision

• Selected (attended) things are processed extensively
• What is the capacity of selection, how are unattended things processed?

• In opening our eyes, we have the feeling that we’re experiencing the whole visual field, perhaps doing some cognitive processing on it
• We expect that we’d notice any dramatic changes to the scene that occur while we’re staring at it
  – Change blindness
  – Inattentional blindness

Change blindness experiment
Change blindness

- Seeing does not result in as much processing as one might think
- A grand illusion of visual experience

CB corner movie link

Change blindness

- When you’re paying attention to the changing thing, the change is very salient
- Focused attention appears necessary for change detection
- What kinds of things could be happening and leave us oblivious?
- How often do you think change blindness happens in the real world?
  •
Change blindness

- Can only select a few things
- When you’re not attentionally selecting something, change often not noticed
- WHY?
  - Objects not remembered from frame 1 until frame 2?
  - Objects not compared?
- What is full field of visual experience good for if can’t do this simple thing?

Change blindness in the real world

- Reduced by motion detectors or “change signal”
Change blindness in the real world

- Reduced by motion detectors or “change signal”

- Motion detectors, corresponding to every point in the visual field, detect sudden changes from visual transient
- Attention grabbed by visual transient
- Stimulus-driven attention can combine with subsequent selection so you see sudden changes
- What about real real-world changes??
- Can the phenomenon of change blindness explain why Dr. Holcombe failed his driving test?
Detecting changes

- Expect a change, but can’t find it (change blindness)
  - Focussed attention goes to it thanks to unique visual transient or motion
  - When there are many items, focussed attention lands on it after time-consuming search
  - If only one or two items on screen, you notice it immediately because paying focussed attention to it
  - If try hard, can monitor about 4 at a time
  - Is this how magic tricks work?
  - With complicated objects (e.g. people), might not have in WM changing aspect

- Don’t expect a change (Inattentional blindness)
  - Then, even when only one or two uncomplicated items, might not notice!

& 25% of subjects failed to see the square

& When the background task cross was made 10% as large, Inattentional Blindness increased to 66%.
Inattentional blindness
Mack & Rock (1998) inattentional blindness

• Can anything break through?
  – Own name 12.7% IB
  – Other name 35% IB
  – Common noun 50% IB

Door study: WATCH FOR HW

http://viscog.beckman.uiuc.edu/djs_lab/demos.html

• Approximately 50 percent of the subjects failed to notice that they were talking to a different person after the door passed. Interestingly, those who noticed tended to be from the same social group (students) as the experimenters, and those who failed to notice tended to be older than the experimenters

• What is the role of visual transients / stimulus driven attention?

• Do you think the first person was not processed because unattended?
• Do you think any processing capacity limits are involved?