PS1003 Cognitive Psychology: Attention 25 October


• Citing stuff from my lecture
  – Dan Simons’ website has papers for door study, etc.
  – Change blindness (variety of papers by Ron Rensink cited in Simons paper)

• Today’s outline
  – Finish inattentential blindness
  – Review “noticing things”: change blindness, inattentional blindness
  – Finding things
  – Quantifying attentional capacity

comments

• 7 want notes beforehand
• You mumble towards end of sentences
• 4 Inattentential blindness
• 4 names of researchers
• 2 Slides changed too quickly
• Didn’t understand difference between CB and IB
• Visually clearer than last lecture when used blue bg and black text
• understood it all. Involving in the examples was really useful
• Have a nice day!
• Could do with more theory, less examples
• Understood well in conjunction with reading
• You mentioned a lot of topics e.g. CB but it was hard to link it all together
• don’t know links between topics
• Very interesting
Inattentional blindness: when don’t expect a change
Mack & Rock (1998) Inattentional blindness

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

Inattentional blindness

• Do you think the unnoticed item was fully processed?
  – Processed at least to level where smileys distinguished from frownies

• Do you think the participant was conscious of the briefly-presented item?

• Why didn’t bottom-up, stimulus-driven attention always cause the participants to notice the item?

• Critical difference between IB and CB
Door study: watched 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.

- 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?

Sustained inattentinal blindness

Gorillas in Our Midst
http://viscog beckman.uiuc.edu/djs_lab/demos.html

Table 1. Percentage of subjects noticing the unexpected event in each condition. Each row corresponds to one of the four video display types. Columns are grouped by monitoring task and attended team (White or Black). In the Easy task, subjects counted the total number of passes made by the attended team. In the Hard task, subjects maintained separate simultaneous counts of the aerial and bounce passes made by the attended team.

<table>
<thead>
<tr>
<th></th>
<th>Easy task</th>
<th></th>
<th>Hard task</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>White team</td>
<td>Black team</td>
<td>White team</td>
<td>Black team</td>
</tr>
<tr>
<td>Gorilla</td>
<td>42</td>
<td>83</td>
<td>50</td>
<td>58</td>
</tr>
</tbody>
</table>
Inattentional Blindness

• Pilots landing an aircraft simulator
• Experimenters were interested in a new heads-up display
• Pilots didn’t notice a large plane placed on the runway at the last minute
• Dr. Holcombe should be an airline pilot

Haines (1991)

Noticing things

• Review
  – Expect change or something funny to happen
    • If many items, no unique transient to grab attention, often don’t notice
  – Don’t expect new item or change
    • Often don’t notice, especially if engaged in task
    • even if only few items in scene
    • Even if change location signalled by transient flash
  – Some things break through
    • Name in auditory shadowing experiments, inattentional blindness
• Magic tricks?
Noticing things

- Even when right in front of us,
  - Noticing changes can be hard when don’t know what change will be
  - Noticing unexpected things even harder
  - What about finding specific thing that you do expect?

- Next: find the red item
Feature Search

Capacity appears fairly unlimited (e.g. Treisman 1988, 1992)
Find the ○
Find the
Conjunction Search

Target

Distractors

Response Time

# of distractors

(difficult search)

Feature integration theory (Treisman)

• Initial parallel processing of color in one module, shape in another
• These feature modules flag odd places
• Finding an object that differs by one feature (e.g. color or shape) happens without attention doing any scanning
• When target cannot be found on the basis of single-feature oddness, features must be combined
• Attention must visit each location to bind the features and determine if the item is the target
Feature Integration Theory

Master Map of Locations:

Feature Maps:

Visual Stimulus:
Feature integration theory: Problems

- No direct evidence that attention scans field serially
- Some conjunction searches are very fast
- Conjunction search being harder than odd-feature search can be explained by other theories (Palmer)

<table>
<thead>
<tr>
<th>Feature search</th>
<th>Conjunction search</th>
</tr>
</thead>
<tbody>
<tr>
<td>leftward</td>
<td>leftward</td>
</tr>
<tr>
<td>rightward</td>
<td>rightward</td>
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<tr>
<td>D</td>
<td>D</td>
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<tr>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>red, green</td>
<td>red, green</td>
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<tr>
<td>color</td>
<td>color</td>
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</table>
After it’s found

- You want to feed it into cognition so you can scrutinize etc.

Identify the blue letter

- Finding the blue happens very fast, in parallel
- Identifying the letter requires selective **focused attention** to feed it into cognition, because letter identification has limited capacity