Divided attention and automaticity

Questions

- What factors determine whether we can attend to several things at once?
- How does practice change the role of attention?
  - Tasks that now seem “unitary” once seemed to involve many things at once
  - E.g., driving

Attentional resources

- Attention seems to require resources
  - Some specific to certain tasks, some general across most tasks, all of them limited
  - The more two tasks depend on the same resources, the less you’ll be able to do both
- Some specific resources:
  - Verbal and spatial

Specific resources

(Allport, Antons, & Reynolds, 1972, see p. 118 of book)

- Two tasks:
  - Shadowing a message played to one ear
  - Encoding 15 items for a recognition test
- Manipulation:
  - Extent to which the two tasks used the same resources

Conditions

- Pictures
  - 15 pictures presented on a screen
- Visual words
  - 15 words presented on a screen
- Auditory words
  - 15 words played to the non-shadowed ear
- Demo: Visual word condition
Results

Dual task

General resources
(Johnston and Heinz, 1978)

• Participants perform a shadowing task and a visual detection task.
  • Detection task:
    – Light flashes unpredictably
    – Press a button when you see it

General resources

<table>
<thead>
<tr>
<th>Condition</th>
<th>Time to respond to light (msec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lights only</td>
<td>310</td>
</tr>
<tr>
<td>Shadow one list</td>
<td>370</td>
</tr>
<tr>
<td>Shadow one of two lists</td>
<td>482</td>
</tr>
</tbody>
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E.g., shadow a list of cities, ignoring the list of occupations 482 - 310 = 172 msec

15 feet @ 60 miles/hour
Stroop effect

- Incongruent word meanings interfere with color naming
  - Probably due to practice reading words for meaning
- Practice makes a task *automatic*
  - Requires little attention to perform
    - Leaving more resources for other tasks
  - Requires lots of attention to *inhibit*