Reminder re your experiments

Execute an experiment and present it in class

- Form a team
- Get an experiment
- Read up & hand in summaries
  - Group 2, today
  - Group 3, next week
- Plan data collection
  - Group 1, today
- Collect data in class
- Analyze your data
- Give PowerPoint presentation
Look up in Wikipedia:
Julian Beever
"anamorphic projection" or "anamorphosis"

Take-away re
Perception / Pattern Recognition

Perception / Pattern recognition
– What you see is NOT what you get
  • Sensory array ≠ mental representation
  • Objective stimulus ≠ subjective experience
– Knowledge, goals, context can affect perception
  • "top-down" effects
  • Perception is to a great extent subjective
– Theories need to talk about features and their structure (or interrelations)
– BUT, processing absolutely everything that we sense or perceive would overwhelm us!

Ch 3 Outline

I. Attention: Selectivity and Concentration
   – A. Filter and/or Selection
   – B. Bottleneck and Capacity Theories

II. Bottleneck Theories
   – A. Broadbent's Filter Theory
   – B. Treisman's Attenuation Model
   – C. Deutsch-Norman Memory Selection Model

III. Capacity Theories
   – A. Assume that two tasks can be performed simultaneously unless the combination requires more attention than the system has available (mental effort is the key)
   – B. Capacity and Stage of Selection

IV. Automatic Processing
   – A. A skill is automatic if R . . .
   – B. Automatic Encoding (Incidental Learning)
   – C. Automatic Processing and Reading
   – D. Cell Phone Use
Attention in life

What activities do you do that require you to stop and concentrate?

What activities do you do without having to concentrate much?

Attention

Three separate notions of “attention” – the three things that the Central Executive does:

- Select from sensory input
  - What to process?
  - Attention_1 is the control of perception
- Select the kinds of processing
  - How to process the input?
  - Attention_2 is the control of processing in STM
  - Processing can be automatic or controlled
- Select information from LTM
  - What knowledge to use during processing?
  - Attention_3 is the control of retrieval from LTM
  - We’ll see this later, in Chapters 5 and 6
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Bottleneck Theories of Attention

Assumption: We can only do one task at a time
   – Attention as selection of stimuli
   – Where and how do unattended stimuli get selected or filtered out? (cf. Attention_1)
   – Broadbent (sensory filter)
   – Treisman (selective pattern filter)
   – Deutsch-Norman (after pattern recognition)

(old) Models of Attention

Where's the bottleneck?
Read silently the message in this type style starting with the word Among.

Somewhere Among hidden on a the desert island most near the spectacular X islands, an cognitive old Survivor abilities contestant is has the concealed ability a box to of gold select won one in a message reward from challenge another. We Although do several hundred this people by (fans focusing our and producers) have attention looked on for it certain they cues have such not as found type it style.

Eye Movements

From Yarbus, 1967

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**Capacity Theories of Attention**

Assumption: We *can* do more than one task at a time
- Walk and chew gum; study and watch TV; drive and talk; listen and translate; etc.
- Attention as selection of processes
- What affects allocation of attention or resources to different processes? (cf. Attention_2)
- Attention is severely limited
  - there’s an upper limit on how much attention is available
- Some tasks require more attentional capacity ("processing resources") than is available
- "automatic" tasks use less attentional capacity; "controlled" tasks use more

---

Can you see an old man’s profile? A couple? Can you see both at the same time? We have to *choose* how we will see things.

---

**Shadowing**

“Dual-task interference”
- Have participants do 2 (or more) things at the same time to see what determines how they use ("allocate") insufficient processing resources
- Dr. van Selst

I need 3 volunteers, 2 with textbooks
- Watch how hard the one in the middle concentrates
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**Automatic vs Controlled Processing**

<table>
<thead>
<tr>
<th>Automatic Processing</th>
<th>Controlled Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects of instructions and practice</td>
<td>No effects</td>
</tr>
<tr>
<td>Intentional vs. incidental learning</td>
<td>No difference</td>
</tr>
<tr>
<td>Interference from additional tasks</td>
<td>No interference</td>
</tr>
<tr>
<td>Effects of depression or arousal</td>
<td>No effects</td>
</tr>
<tr>
<td>Developmental trends</td>
<td>None</td>
</tr>
</tbody>
</table>
Automatic vs. Controlled Processing

Experts vs. Novices – what’s automatic and what’s controlled?
- ER physicians
- Skiers
- Chess players
- This is the essence of expertise
  - More in Chapter 13
- Students
  - Intentional vs. incidental learning
  - “Hidden agenda” vs. subject matter
  - Teaching vs. coaching
  - Learning by example?

Attention

We tend to understand or perceive globally first
- Then look at details, if necessary
  - Often, we guess the details
  - Often, we don’t bother with the details
- “Top-down” perception
  - Based more on knowledge or experience
  - Based less on the stimulus
  - Use this global perception to guide the search for details
- Examples
  - Social stereotypes
  - First impressions; love at first sight; not my type
  - “they all look alike” – cross-race recognition deficit
  - “they all sound alike” – unknown languages or dialects
  - Others?

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Takeaway re Attention

Three separate notions of "attention" – the three things that the Central Executive does:
- Selection of sensory input
  - What to process?
  - Attention_1 is control of perception
- Focus of processing
  - How to process input?
  - Attention_2 is control of processing in STM
  - Processing can be automatic or controlled
- Selection of information from LTM
  - What knowledge to use during processing?
  - Attention_3 is control of retrieval from LTM
  - We'll see this later, in Chapters 5 and 6