Prosopagnosia

- Face blindness: An inability to recognize faces
- Questions:
  - Can a prosopagnosic still recognize someone?
  - What’s a roughly equivalent task for someone without prosopagnosia? How equivalent is it?
  - Is it a deficit of perception or memory?

Perception

- A mental process that creates the representations in your awareness
  - We’re not aware of the world directly, even though it feels like it
- Perception works largely outside your awareness
  - Doesn’t tell you what cues or knowledge it’s using, or what inferences it’s making

Attention

What is attention?

Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, disordered, scatterbrained state which in French is called distraction and Zeitverschwendung in German.

James (1890), Principles of Psychology

The present book takes a more empirical and more skeptical tack, assuming instead that no one knows what attention is, and that that there may even not be an “it” there to be known about (although of course there might be).

Pashler (1998), The Psychology of Attention

Varieties of attention

- Selective attention
  - Select objects or messages to become aware of, from the large set of candidates
  - Unconscious processes play an important role
- Divided attention
  - Attending to different tasks concurrently
  - Hard to know whether this involves actual division or rapid selection

Varieties of attention

- Binding features into objects
  - Different brain areas represent different features
  - Attention binds them together
- Automaticity
  - Some processes don’t require attention to run
  - ... which can cause problems
Illusory conjunctions: Binding errors in which the wrong features are combined together. Attention plays a role in correct binding.

Automaticity

blue

Stroop effect

- Reading a word for meaning is automatic
  - Requires little to no attention
- Naming a color is controlled
  - Requires attention
- The Stroop effect:
  - Incongruent meanings interfere with color names
- Need to inhibit the meanings, or pay more attention to the naming task, or both

Selective attention

- What information does the system use to select objects?
  - It looks for things it expects
    - Top-down/expectation driven/knowledge driven
  - Things grab our attention
    - Bottom-up/data driven/stimulus driven
  - Top-down and bottom-up processes often work together

Find the unique thing

(then clap)
Visual search

- We have detectors for certain features, but not for conjunctions of features
  - When a unique feature is present in the field of view, it pops out

Visual transients

- A bottom-up factor with a strong influence
  - Can indicate a moving object
- Won’t work if they’re too slow
  - Changes that slow aren’t relevant
- Won’t work if there are too many of them
  - Detectors get confused
- Change blindness:
  - When visual transients fail to draw attention

Inattentional blindness

- When we miss things because we’re not paying attention
  - Generalization of change blindness
- There are lots of details we don’t pay attention to...