

20180202 COGS 101b Lecture Notes

Cabinet COGS101b Lecture Notes

Geons & Recognition by Components

A feature-net or alphabet for 3D objects.

Can be recognized across a variety of different perspectives

Viewpoint-Dependent Recognition

Can only recognize only if you can match a current view with a stored memory - mentally rotate object to find a match.

Faces are Special Objects

Prosopagnosia

Cannot recognize individual faces.

Seems to imply the existence of special neural structures for recognition and discrimination .

Pareidolia

Perception of familiar patterns when it's not really there. In this context its applied to faces, but its definition is more general than that.

Viewpoint-dependence

Facial recognition is much worse when the faces are inverted.

Orientation matters for faces.

Holistic Representation

Facial recognition is heavily dependent on **configuration** rather than features.

Hence, we are more sensitive to changes in configuration than changes in features for faces.

This is opposite with objects. Which suggests other types of object recognition is **not** holistic.

Composite Face Effect

Humans have a difficult time discerning facial features when they are part of a whole, the mind is viewing the face holistically.

Attention

- Select and enhance relevant perceptual information
- Perceive a coherent world
- Sustain behavior and select appropriate actions

Selecting and enhancing relevant information

Selective Attention

The process of attending to one thing while ignoring others.

You only perceive what you explicitly attend to and miss what you don't explicitly attend to.

Dichotic Listening Task

Shadowing: Participants instructed to repeat the message in one ear and to ignore the message in the other ear. In general, people are good at this.

Participants are aware of **low level** information:

- Non-speech sounds

- Gender of speaking
- Human vs. Robot voice

Participants are unaware of **high level** information:

- Semantic content
- Syntax
- Language

Information Processing Models of Selective Attention

Early Selection Theories

Most unattended information is eliminated by the filter.

EEG data show attended inputs is distinguishable from unattended inputs, even when sensory processing is still underway.

Broadbent's filter model.

Bottleneck Model: Filter restricts the flow of information flow.

Problems with this model:

- Listener's recognize their own name in the unattended ear. (See Moray 1959)
- Listeners form coherent sentences from both streams. (See Gray and Wedderburn 1969).

Treisman's Attenuation Model

Analyzes the incoming message in terms of:

1. Physical qualities
2. language
3. meaning if needed.

Both attended and unattended messages pass through, just at varying degrees of strength.

Dictionary unit: Contains words, stored in memory, each of which has a threshold for being activated.

Late Selection Theories

All inputs receive relatively complete analysis.

Evidence:

Subjects listened to an ambiguous sentence.

Biasing words played in the other ear.

Unattended messages were not consciously perceived, but influenced the interpretation of the attended message.

See Mackay 1973