

Perception

Psy 20

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Basic idea:

	(edges)	viewer-centered	object-cent'd
Light-->	Primal Sketch -->	2-1/2 D sketch-->	3D sketch--> recognition
like:	line drawing	painting	sculpture

Primal Sketch:

Neurolevel: Ganglions "on-off"/"bars" do edge detection

Forms tracing of light changes only (like a woodcut)

2-1/2 D Sketch (Viewer-centered)

Adds depth cues to primal sketch

monocular cues:

pictorial cues

linear perspective (parallel closer-- more distant)

aerial perspective (hazier-- more distant)

texture gradient (denser-- more distant)

familiar size (oversized playing cards seem closer)

motion parallax (move eyes, nearer objects move more)

binocular cues

stereopsis (disparity in retinal images, Viewmaster)

3 D Sketch (object-centered)

Enables rotation of object (liberated from observer)

Adds depth cues to primal sketch

How? Gestalt principles ('30s):

proximity, similarity, good continuation, closure

How do we know there are separate "sketches"?

A: From brain damage patients.

e.g. visual agnostics can "draw" anchor but not recognize it
children can't do object rotation (2-1/2 D only)

HJA stroke patient, could draw, define, name objects but not recognize

Herpes enceph. patients, can name from functions

(e.g. hits nails into wood) but not from visuals

optic aphasia-- can't name from sight, can from touch

Recognition

How are patterns recognized?

Three theories:

1. Template-matching

Match 3D sketch to "templates" of objects

Search through "file" of pictures for exact match

(a la witness searching police mugshots)

Problem: Older people should be slower (more objects to match); false

Can't explain flexibility of "unusual" cases

(Claes Oldenburg furry cup, Gail's G)

2. Feature-matching

Pattern is a specific set of features/attributes

E.g. A is two straight lines, meeting at the top, + cross bar

(advantage: objects differing in size etc can be matched,

unlike in template theory)

3. Object recognition

What about more complex objects?

Recognition-by-components theory (Biederman)

All objects composed of 36 geons ("visual alphabet", LEGO)

e.g. wedges, spheres, arcs, cylinders

Geons "attached" by concavities

Evidence: Recognition robust to deleting components,
not to deleting "midsegments"

Weaknesses:

1. clouds? (is this why clouds look like other things?)
2. designed for "easy" discrimination. works for subtler?
3. Ignores context

Context/pattern recognition

Context plays a role ("top down" vs "bottom up")...

e.g. word superiority effect (TAE CHT)
can identify letters more quickly in "natural" word

same w/ objects in "familiar" settings

words in "sensible" sentences

PDP/Connectionist model

links features, letters words
allows top-down influences (word superiority etc)

Faces

Special: particularly important (brain adapted? Evolutionary psych argument)

separate mechanisms:

prosopagnosiacs can't recognize familiar faces (even own!)
different locations of brain activity

- a. difficult to recognize upside-down (cf. cups)
- b. configural information needed
(e.g. top-bottom splices inhibit recognition, Stallone/McMahon)
- c. caricatures that exaggerate a feature are more
easily recognized (Oprah)
- d. different features matter, depending on familiarity
unfamiliar-- external, hairstyle, outline
familiar-- internal (eyes important, nose not)
- e. babies track "real" face at 9 minutes of age! (That's **innate**.)

Bruce-Young model:

Separate face recognition, name, info. units

- a. Should never be able to only name a person
- b. "That guy who does the news"
brain-damage-- can know info but not name
- c. Don't I know you?
feeling of familiarity (face recognition)
but can't name, can give identity info