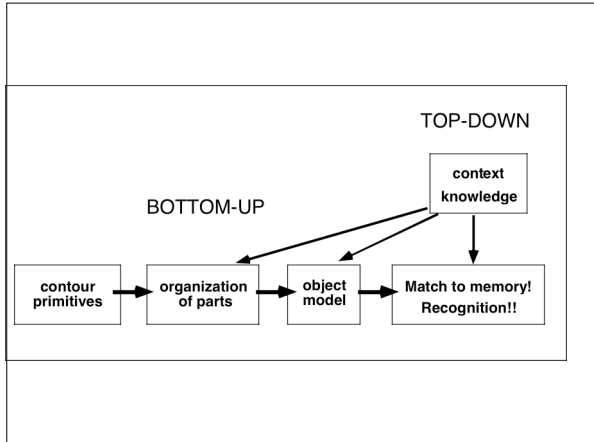


Recognition

Gnosia

Recognition: gnosia
Vision: knowing what is where?
Bottom-up and top-down strategies

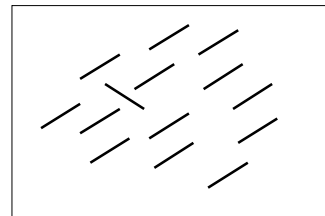
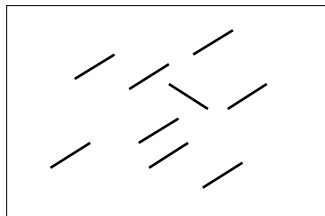
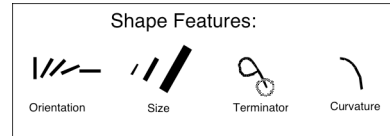


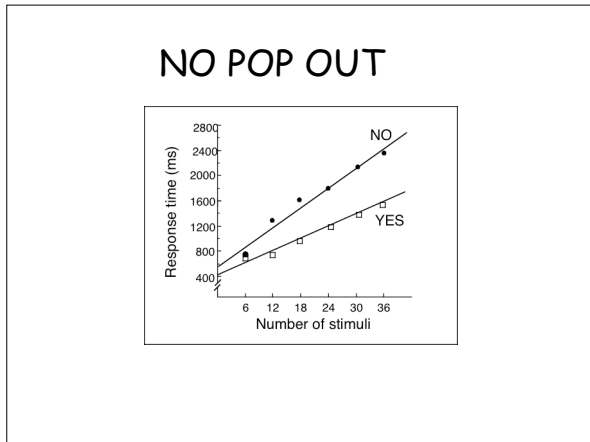
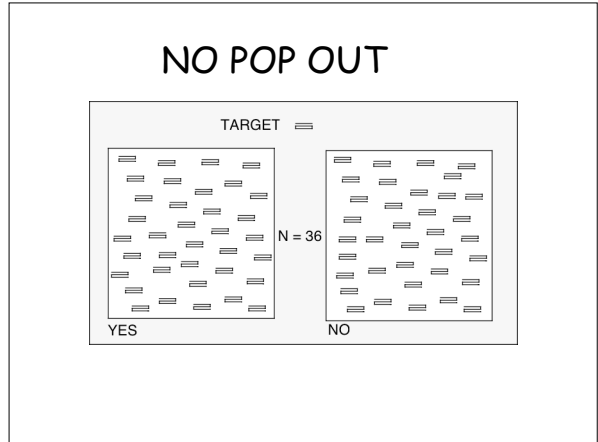
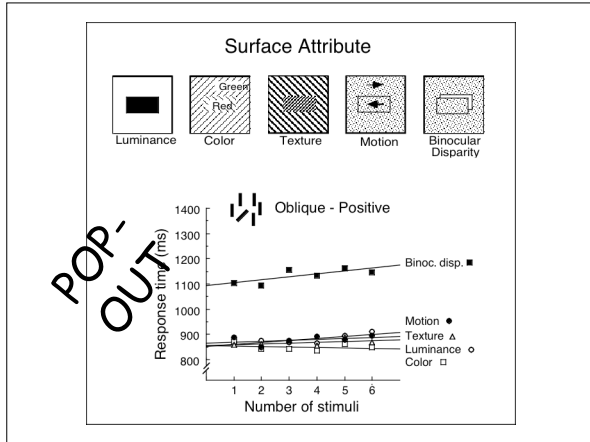
Bottom up approach
Primitives - features
Structural analysis
Recognition By Components –Biederman

Bottom up approach

Primitives - features:
Hubel and Wiesel
Treisman

Anne Treisman



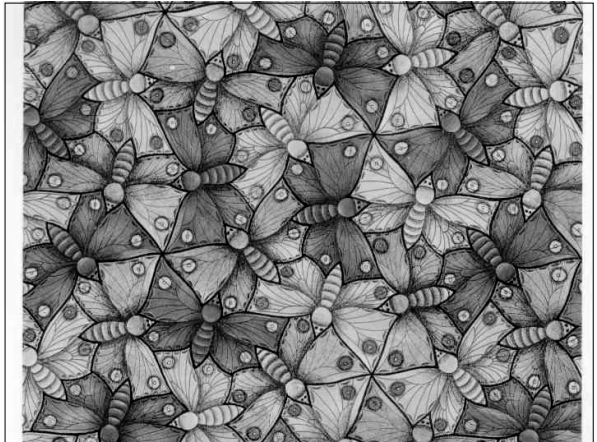
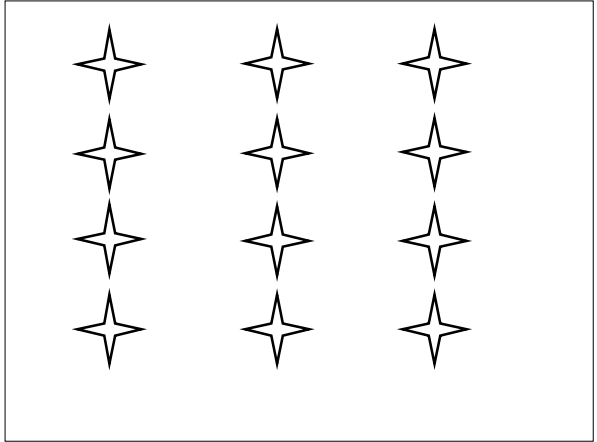
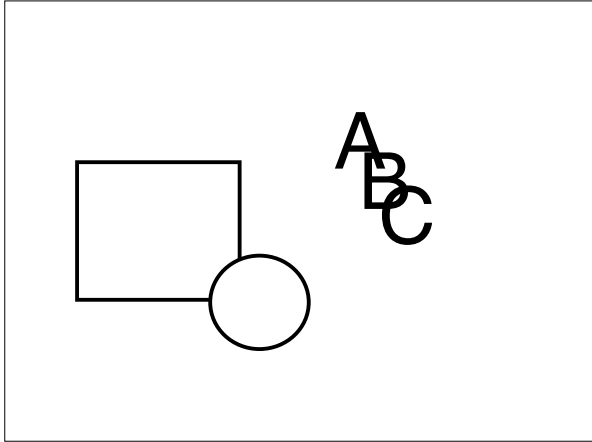


Structural analysis

laws of Gestalt:

- simplicity
- similarity
- proximity
- common fate

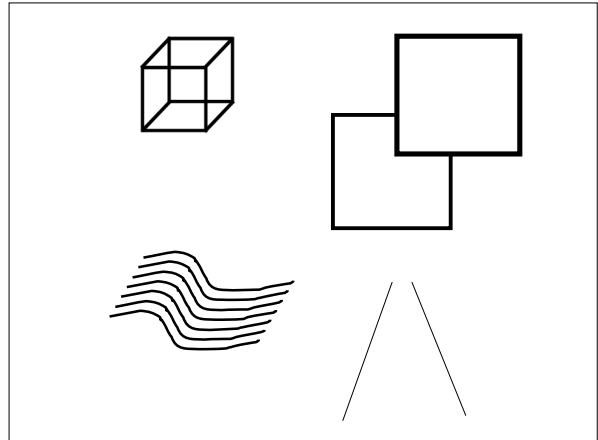
figure-ground grouping



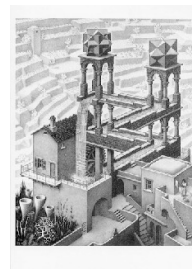
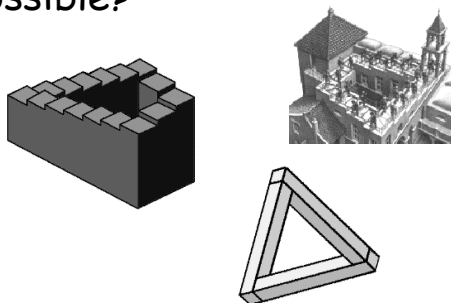
Structural analysis

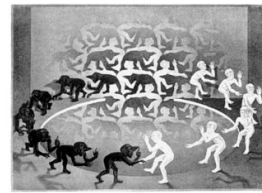
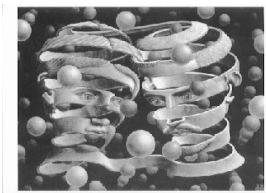
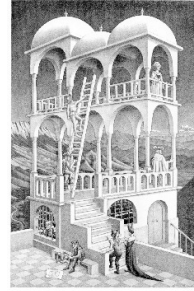
types of connections:

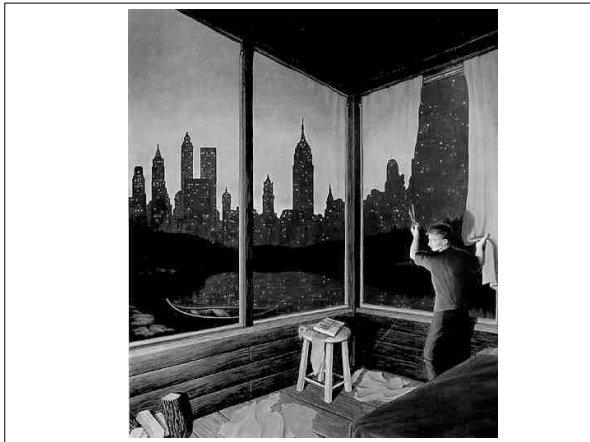
- T junction --> occlusion
- X junction --> transparency
- shadow --> depth
- curvature --> depth
- perspective --> depth

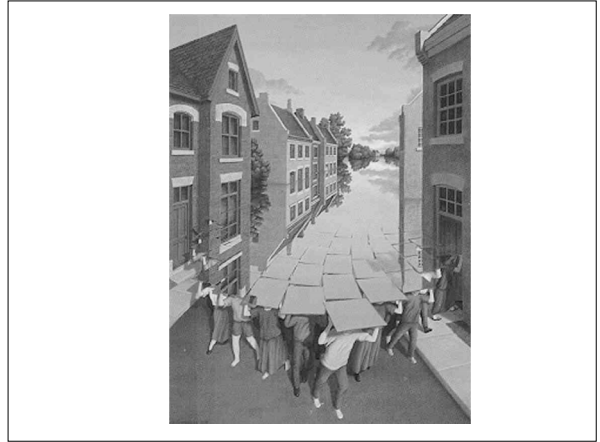
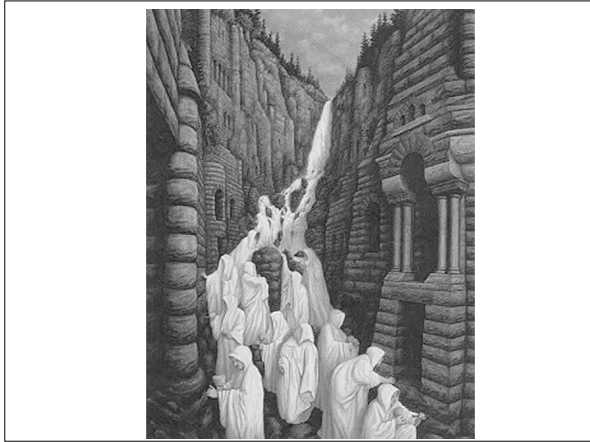


Why are these images impossible?









Recognition By Components

Biederman

Biederman: Recognition by Components (Geons)

Non accidental properties: correspondence between the world and the retina

Collinearity



Parallelism



Curvilinearity



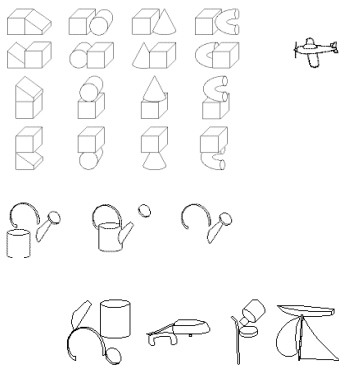
Vertices



Symmetry

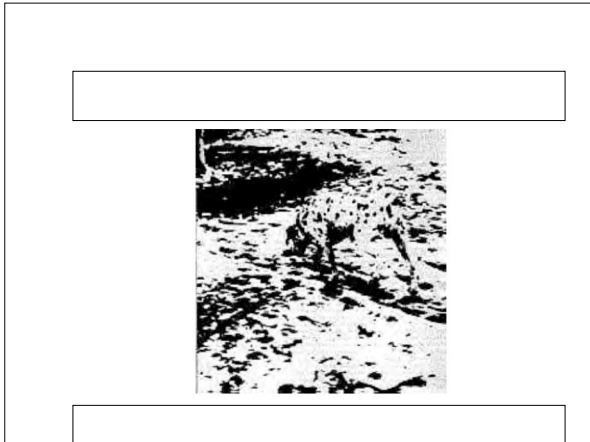
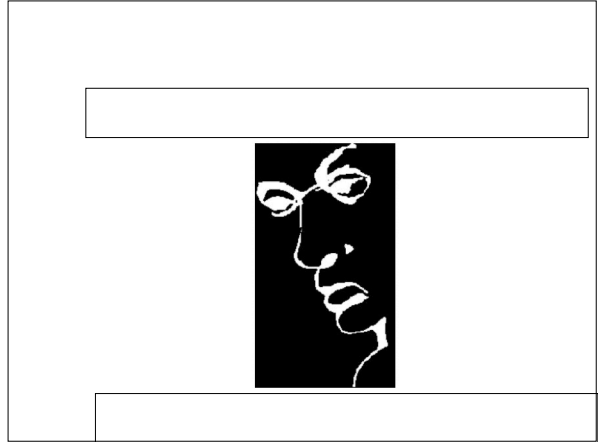
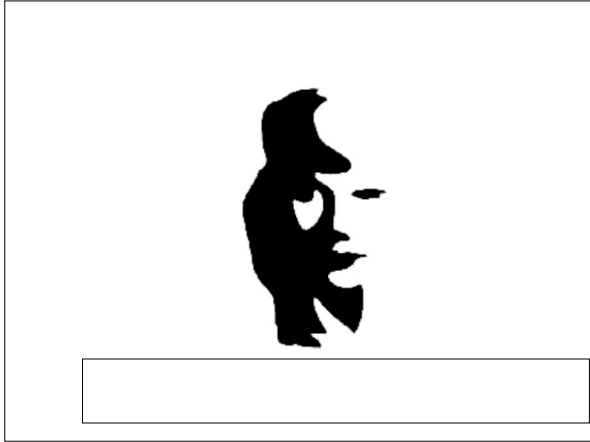


Geons

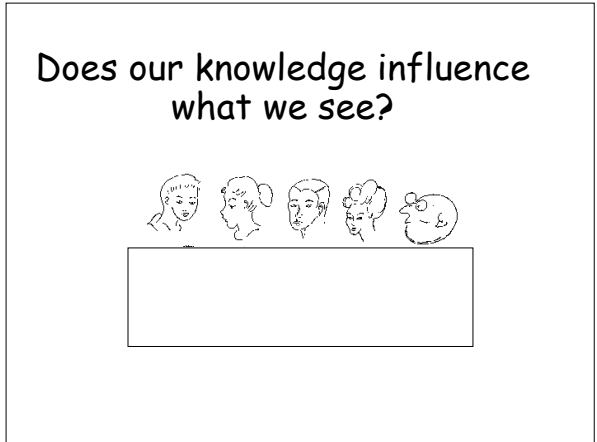
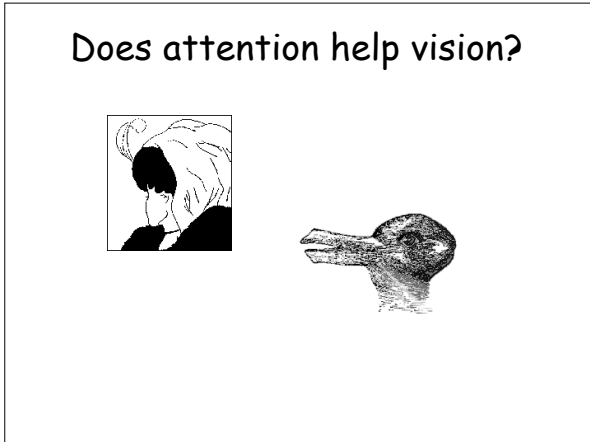
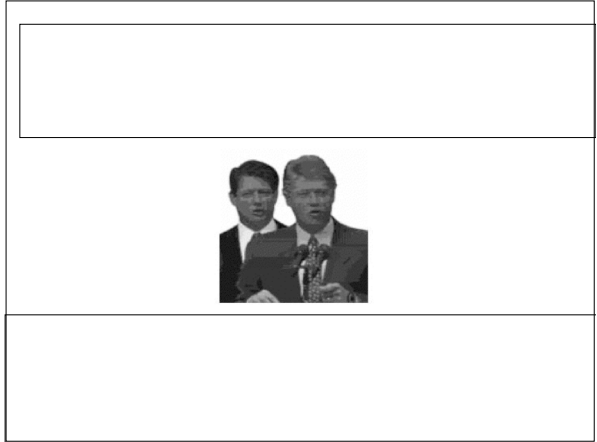
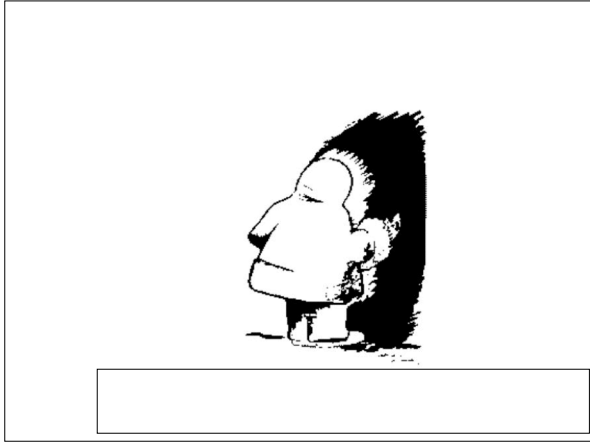


Top-down approach

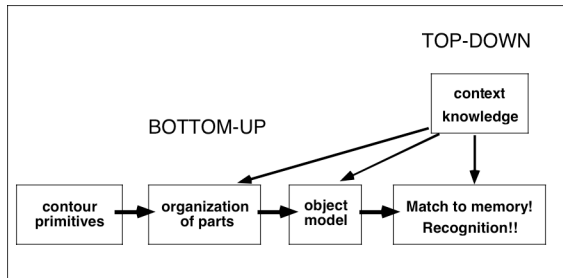
memory
knowledge
familiarity
physiological state



Do you see the three faces?



Does our knowledge influence what we see?



Anatomy & physiology

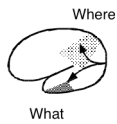
what & where systems
Minsky, Ungerleider & Marco

prosopagnosia
infero-temporal area: IT
face selective neurons

object agnosia: John

What and Where systems

Mishkin, Ungerleider & Macko (1983)



How system
Goodale and
colleagues



"the world is out of focus to my brain"

John

1981: stroke

occipital lobes → temporal lobes → ventral pathway

What is wrong with John?

prosopagnosia

object agnosia

achromatopsia

no spatial orientation

problem with short-term memory with sight

What is not wrong with John?

acuity

eye movements

intelligence

first memories from sounds, smell

draw objects out of memories

copy object line by line

memory before the operation

More about his vision:

intact registration of features

trouble to put features together

no top down influence

more information = better

DF
Milner & Goodale

34 years old woman
Damage to the ventral pathway
from carbon monoxide poisoning

Visual form agnosia

DF

- Cannot copy,
but can draw from memory
- Cannot visually match orientation
- Could "mail" an oriented paper

Single dissociation:

- One mechanism for judging orientation
- One mechanism for coordination of
vision & action

Double dissociation:
another patient can't "mail"
but is fine with
judging line orientation.

