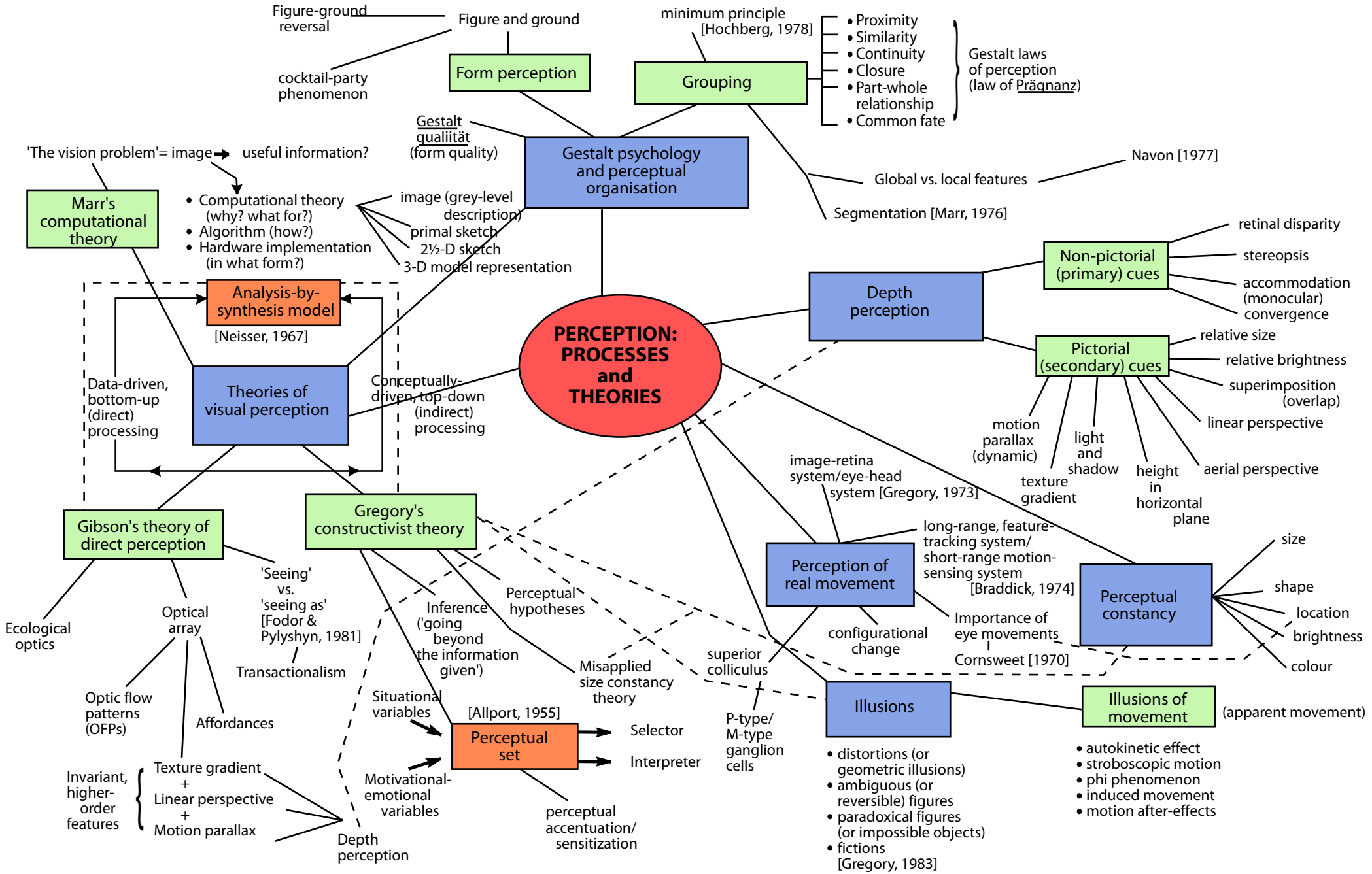
PERCEPTION: PROCESSES and THEORIES
Gestalt psychology and perceptual organisation
Form perception
Figure and ground
Figure-ground reversal
cocktail-party phenomenon
Grouping
minimum principle [Hochberg, 1978]
• Proximity
• Similarity
• Continuity
• Closure
• Part-whole relationship
• Common fate
Gestalt laws of perception (law of Prägnanz)
Gestalt qualiität (form quality)
Global vs. local features
Navon [1977]
Segmentation [Marr, 1976]
Marr's computational theory
'The vision problem'= image → useful information?
• Computational theory (why? what for?)
• Algorithm (how?)
• Hardware implementation (in what form?)
image (grey-level description)
primal sketch
2½-D sketch
3-D model representation
Analysis-by-synthesis model
[Neisser, 1967]
Theories of visual perception
Data-driven, bottom-up (direct) processing
Conceptually-driven, top-down (indirect) processing
Depth perception
Non-pictorial (primary) cues
retinal disparity
stereopsis
accommodation (monocular)
convergence
Pictorial (secondary) cues
relative size
relative brightness
superimposition (overlap)
linear perspective
aerial perspective
height in horizontal plane
light and shadow
texture gradient
motion parallax (dynamic)
Gibson's theory of direct perception
Ecological optics
Optical array
Optic flow patterns (OFPs)
Affordances
Transactionalism
'Seeing' vs. 'seeing as' [Fodor & Pylyshyn, 1981]
Gregory's constructivist theory
Inference ('going beyond the information given')
Perceptual hypotheses
Misapplied size constancy theory
Perception of real movement
image-retina system/eye-head system [Gregory, 1973]
long-range, feature-tracking system/ short-range motion-sensing system [Braddick, 1974]
configurational change
Importance of eye movements
Cornsweet [1970]
superior colliculus
P-type/ M-type ganglion cells
Perceptual constancy
size
shape
location
brightness
colour
Illusions
• distortions (or geometric illusions)
• ambiguous (or reversible) figures
• paradoxical figures (or impossible objects)
• fictions [Gregory, 1983]
Illusions of movement
(apparent movement)
• autokinetic effect
• stroboscopic motion
• phi phenomenon
• induced movement
• motion after-effects
Perceptual set
[Allport, 1955]
Selector
Interpreter
Situational variables
Motivational-emotional variables
perceptual accentuation/ sensitization
Depth perception
Texture gradient + Linear perspective + Motion parallax
Invariant, higher-order features