

**Psychology 770J**  
**The Perceptual Bases of Cognition**  
**Emory University**  
**Lawrence W. Barsalou**  
**Spring 1998**

**Imagery (1/21)**

**Classic behavioral study with a reasoning twist**

Schwartz, D.L., & Black, J.B. (1996). Analog imagery in mental model reasoning: Depictive models. *Cognitive Psychology*, 30, 154-219. [pages 190-219 on the computational model are optional]

**Simultaneous perception and imagery**

Gilden, D., Blake, R., & Hurst, G. (1995). Neural adaptation of imaginary visual motion. *Cognitive Psychology*, 28, 1-16.

Craver-Lemley, C., & Reeves, A. (1997). Effects of imagery on vernier acuity under conditions of induced depth. *Journal of Experimental Psychology: Human Perception and Performance*, 23, 3-13.

**Eye movements during imagery**

Brandt, S.A., & Stark, L.W. (1997). Spontaneous eye movements during visual imagery reflect the content of the visual scene. *Journal of Cognitive Neuroscience*, 9, 27-38.

**Imagery (1/28)**

**Evidence for neural commonalities of imagery and perception**

Kosslyn, S.M., Alpert, N.M., Thompson, W.L., Maljkovic, V., Weise, S.B., Chabris, C.F., Hamilton, S.E., Rauch, S.L., & Buonanno, F.S. (1993). Visual mental imagery activates topographically organized visual cortex: PET investigations. *Journal of Cognitive Neuroscience*, 5, 263-287.

Kosslyn, S.M., Thompson, W.L., Kim, I.J., & Alpert, N.M. (1995). Topographical representations of mental images in primary visual cortex. *Nature*, 378, 496-498.

**Problems for the commonality view**

Goldenberg, G., Mullbacher, W., & Nowak, A. (1995). Imagery without perception—A case study of anosognosia for cortical blindness. *Neuropsychologia*, 33, 1373-1382.

Servos, P., & Goodale, M. (1995). Preserved visual imagery in visual form agnosia. *Neuropsychologia*, 33, 1383-1394.

**Neural bases of image generation**

Stangalino, C., Semenza, C., & Mondini, S. (1995). Generating visual mental images: Deficit after brain damage. *Neuropsychologia*, 33, 1473-1483.

Farah, M.J. (1995). Current issues in the neuropsychology of image generation. *Neuropsychologia*, 33, 1455-1471.

## Imagery (2/4)

### Auditory imagery

Zatorre, R.J., Halpern, A.R., Perry, D.W., Meyer, E., & Evans, A.C. (1996). Hearing in the mind's ear: A PET investigation of musical imagery and perception. *Journal of Cognitive Neuroscience*, 8, 29-46.

### Motor imagery

Annett, J. (1995). Motor imagery: Perception or action. *Neuropsychologia*, 33, 1395-1417.

Jeannerod, M. (1995). Mental imagery in the motor context. *Neuropsychologia*, 33, 1419-1432.

Crammond, D.J. (1997). Motor imagery: Never in your wildest dreams. *Trends in Neuroscience*, 20, 54-57.

## Knowledge (2/11)

### Grounding in perception

Barsalou, L.W. (1998). Perceptual symbol systems. Under review.

Barsalou, L.W., Solomon, K.O., & Wu, L.L. (1998). Perceptual simulation in conceptual tasks. In M.K. Hiraga, C. Sinha, & S. Wilcox (Eds.), *Cultural, typological, and psychological perspectives in cognitive linguistics: The proceedings of the 4th conference of the International Cognitive Linguistics Association, Vol. 3*. Amsterdam: John Benjamins.

Solomon, K.O., & Barsalou, L.W. (1998). Grounding property verification in perceptual simulation. Draft of a paper about to go out for review. [optional]

### Category-specific brain deficits

Gainotti, G., Silveri, M.C., Daniele, A., & Giustolisi, L. (1995). Neuroanatomical correlates of category-specific semantic disorders: A critical survey. *Memory*, 3, 247-264.

## Knowledge (2/18)

### Convergence zones

Damasio, A.R. (1989). Time-locked multiregional retroactivation: A systems-level proposal for the neural substrates of recall and recognition. *Cognition*, 33, 25-62.

Damasio, A.R., Damasio, H., Tranel, D., & Brandt, J.P. (1990). Neural regionalization of knowledge access: Preliminary Evidence. *Cold Springs Harbor Symposia on Quantitative Biology*, 55, 1039-1047.

Damasio, A.R., Damasio, H. (1994). Cortical systems for retrieval of concrete knowledge: The convergence zone framework. In C. Koch & J.L. Davis (Eds.), *Large-scale neuronal theories of the brain* (61-74). Cambridge, MA: MIT Press.

### Category-specific brain localization

Rösler, F., Heil, M., & Hennighausen, E. (1995). Distinct cortical activation patterns during long-term memory retrieval of verbal, spatial, and color information. *Journal of Cognitive Neuroscience*, 7, 51-65.

## Memory (2/25)

### Emodiment

Glenberg, A.M. (1997). What memory is for. *Behavioral and Brain Sciences*, 20, 1-55.

Martin, M., & Jones, G.V. (1998). Generalizing everyday memory: Signs and handedness. *Memory & Cognition*, 26, 193-200.

**Implicit-explicit**

- Easton, R.D., & Srinivas, K., & Greene, A.J. (1997). Do vision and haptics share common representations? Implicit and explicit memory within and between modalities. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *23*, 153-163.
- Buckner, R.L., Petersen, S.E., Ojemann, J.G., Miezin, F.M., Squire, L.R., & Raichle, M.E. (1995). Functional anatomical studies of explicit and implicit memory retrieval tasks. *Journal of Neuroscience*, *15*, 12-29.

**Memory (3/4)****Filling-in**

- Intraub, H., Gottesman, C.V., & Bills, A.J. (1998). Effects of perceiving and imagining scenes on memory for pictures. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *24*, 186-201.

**Verbal overshadowing**

- Brandimonte, M.A., Schooler, J.W., & Gabbino, P. (1997). Attenuating verbal overshadowing through color retrieval cues. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *23*, 915-931.

**Imagery / bizarreness**

- Ironsmith, M., & Lutz, J. (1996). The effects of bizarreness and self-generation on mnemonic imagery. *Journal of Mental Imagery*, *20*, 113-126.
- Mercer, C. (1996). The bizarre imagery effect on memory. *Journal of Mental Imagery*, *20*, 141-152. (not required, background reading)

**Language (3/18)****Lexical / behavioral**

- Glaser, W.R. (1992). Picture naming. *Cognition*, *42*, 61-106.
- Potter, M.C., Kroll, J.F., Yachzel, B., Carpenter, E., & Sherman, J. (1986). Pictures in sentences: Understanding without words. *Journal of Experimental Psychology: General*, *115*, 281-294.

**Lexical / neural**

- Hillis, A.E., & Caramazza, A. (1995). Cognitive and neural mechanisms underlying visual and semantic processing: Implications from "Optic Aphasia." *Journal of Cognitive Neuroscience*, *7*, 457-478.
- Geminiana, G., Bisiach, E., Berti, A., & Rusconi, M.L. (1995). Analogical representation and language structure. *Neuropsychologia*, *33*, 1565-1574.

**Language (3/25)****Comprehension**

- Intraub, H., & Hoffman, J.E. (1992). Reading and visual memory: Remembering scenes that were never seen. *American Journal of Psychology*, *105*, 101-114.
- Gernsbacher, M.A., Varner, K.R., & Faust, M.E. (1990). Investigating differences in general comprehension skill. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, *16*, 430-445.

**Figurative Language**

- Gibbs, R.W., Jr., & Colston, H.L. (1995). The cognitive psychological reality of image schemas and their transformations. *Cognitive Linguistics*, *6*, 347-378.

**Thought (4/1)****Reasoning**

- Huttenlocher, J., Jordon, N.C., & Levine, S.C. (1994). A mental model for early arithmetic. *Journal of Experimental Psychology: General*, *123*, 284-296.
- Ahn, W., & Bailenson, J. (1996). Causal attribution as a search for underlying mechanisms: An explanation of the conjunction fallacy and the discounting principle. *Cognitive Psychology*, *31*, 82-123.

**Decision making**

- Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases* (pp. 201-210). New York: Cambridge University Press.

**Perception (4/15)****Apparent Motion**

- Shiffrar, M., & Freyd, J.J. (1993). Timing and apparent motion path choice with human body photographs. *Psychological Science*, *6*, 379-384.
- Shiffrar, M., & Freyd, J.J. (1990). Apparent motion of the human body. *Psychological Science*, *4*, 257-264.

**Visual Top-Down Processing**

- Frith, C., & Dolan, R.J. (1997). Brain mechanisms associated with top-down processes in perception. *Philosophical Transactions of the Royal Society of London, Series B: Biological sciences*, *352*, 1221-1230.
- Humphreys, G.W., Riddoch, J., & Price, C.J. (1997). Top-down processes in object identification: Evidence from experimental psychology, neuropsychology, and functional anatomy. *Philosophical Transactions of the Royal Society of London, Series B: Biological sciences*, *352*, 1275-1282.

**Visual Anticipation**

- Hespos, S.J., & Rochat, P. (1997). Dynamic mental representation in infancy. *Cognition*, *64*, 153-188.

**Perception (4/22)****Filling-In**

- Samuel, A.G. (1997). Lexical activation produces potent phonemic percepts. *Cognitive Psychology*, *32*, 97-127.

**Body schema**

- Berluchhi, & Aglioti, S. (1997). The body in the brain: Neural bases of corporeal awareness. *Trends in Neuroscience*, *20*, 560-564.
- Reed, C.L., & Farah, M.J. (1995). The psychological reality of the body schema: A test with normal participants. *Journal of Experimental Psychology: Human Perception and Performance*, *21*, 334-43.

**Scotomas and Phantom Limbs**

- Ramachandran, V.S. (1992). Filling in gaps in perception: Part 1. *Current Directions in Psychological Science*, *1*, 199-205.
- Ramachandran, V.S. (1993). Filling in gaps in perception: Part II: Scotomas and phantom limbs. *Current Directions in Psychological Science*, *2*, 56-65.

## Potential Topics

### High-Level Perception

- Perceptual Filling-In
  - Scotomas and Phantom Limbs
  - Apparent Motion and Visual Anticipation
  - Visual Top-Down Processing
  - Phonemic Restoration and Articulatory Simulation
- Spatial Processing
- Viewer-Dependent vs. Object-Dependent Representation
- Haptic Object Recognition
- Object vs Location/Action: Behavioral Findings
- Object vs Location/Action: Neural Bases
- Somatosensory Perception

### Attention

- Roles in Higher Cognition

### Imagery in Working Memory

- Visual Imagery: Behavioral Findings
  - Basic Sources
  - Imaging While Perceiving
  - Visual Imagery: Eye Movements
  - Knowledge-Based Rotation
  - Miscellaneous
- Visual Imagery: Neural Bases
  - Basic Sources and Reviews
  - Grounding Imagery in Perception
  - Limits to Grounding Imagery in Perception
  - Image Generation
  - Image Processing
- Motor Imagery
- Auditory Imagery

### Episodic Long-Term Memory

- Embodiment of Memory
- Perceptual Filling-In
- Verbal Overshadowing
- Mnemonic Effects of Imagery
- Bizarreness Effects
- Implicit vs. Explicit Memory (and Intersensory Connection)

### Knowledge

- Perceptual Grounding of Concepts: Behavioral Findings
- Category-Specific Neuroanatomical Regions
- Convergence Zones and Sensory Maps

**Language**

- Lexical Processing: Behavioral Findings
- Lexical Processing: Neural Bases
- Spatial Prepositions: Behavioral Findings
- Comprehension
  - Mental Models
  - Relations between Language and Perception
  - Visual Perspective in Comprehension
  - Figurative Language

**Thought**

- Decision Making
- Reasoning: Mathematics
- Reasoning: Deduction
- Reasoning: Causality

**Development**

**Evolution**

**Philosophy**

- Traditional
- Modern

**Cognitive Linguistics**

**Proof in Computer Science, Mathematics, and Logic**

## Potential Readings

### High-Level Perception

#### Perceptual Filling-In

##### Scotomas and Phantom Limbs

Ramachandran, V.S. (1992). Filling in gaps in perception: Part 1. *Current Directions in Psychological Science*, 1, 199-205.

Ramachandran, V.S. (1993). Filling in gaps in perception: Part II: Scotomas and phantom limbs. *Current Directions in Psychological Science*, 2, 56-65.

##### Apparent Motion

Shiffrar, M., & Freyd, J.J. (1993). Timing and apparent motion path choice with human body photographs. *Psychological Science*, 6, 379-384.

Shiffrar, M., & Freyd, J.J. (1990). Apparent motion of the human body. *Psychological Science*, 4, 257-264.

##### Visual Anticipation

Nagai, M., & Yagi, A. (2001). The pointedness effect on representational momentum. *Memory & Cognition*, 29, 91-99.

Hespos, S.J., & Rochat, P. (1997). Dynamic mental representation in infancy. *Cognition*, 64, 153-188.

Reed, C.L., & Vinson, N.G. (1996). Conceptual effects on representational momentum.

*Journal of Experimental Psychology: Human Perception and Performance*, 22, 839-850.

Freyd, J.J. (1987). Dynamic mental representations. *Psychological Review*, 94, 427-438.

##### Visual Top-Down Processing

Frith, C., & Dolan, R.J. (1997). Brain mechanisms associated with top-down processes in perception. *Philosophical Transactions of the Royal Society of London, Series B: Biological sciences*, 352, 1221-1230.

Humphreys, G.W., Riddoch, J., & Price, C.J. (1997). Top-down processes in object identification: Evidence from experimental psychology, neuropsychology, and functional anatomy. *Philosophical Transactions of the Royal Society of London, Series B: Biological sciences*, 352, 1275-1282.

##### Phoneme Restoration and Articulatory Simulation

Samuel, A.G. (1997). Lexical activation produces potent phonemic percepts. *Cognitive Psychology*, 32, 97-127.

Samuel, A.G. (1987). Lexical uniqueness effects on phonemic restoration. *Journal of Memory and Language*, 26, 36-56.

Zatorre, R.J., Meyer, E., Gjedde, A., & Evans, A.C. (1996). PET studies of phonetic processing of speech: Review, Replication, and Reanalysis. *Cerebral Cortex*, 6, 21-30.

#### Spatial Processing

Shelton, A.L., & McNamara, T.P. (1997). Multiple views of spatial memory. *Psychonomic Bulletin & Review*, 4, 102-106.

Rieser, J.J. (1989). Access to knowledge of spatial structure at novel points of observation. *Journal of Experimental Psychology: Learning, Memory, & Cognition*, 15, 1157-1165.

- Schacter, D.L., & Nadel, L. (1991). Varieties of spatial memory: A problem for cognitive neuroscience. In R.G. Lister & H.J. Weingartner (Eds.), *Perspectives on cognitive neuroscience* (165-185). New York: Oxford University Press.
- Mellet, E., & Tzourio, N., Denis, M., Mazoyer, B. (1995). A positron emission topography study of visual and mental spatial exploration. *Journal of Cognitive Neuroscience*, 7, 433-445.
- Clark, V.P., & Hillyard, S.A. (1996). Spatial selective attention affects early extrastriate but not striate components of the visual evoked potential. *Journal of Cognitive Neuroscience*, 8, 387-402.

### **Viewer-Dependent vs. Object-Dependent Representation**

- Bar, M., & Biederman, I. (1998). One-shot viewpoint invariance in matching novel objects. Under review.
- Biederman, I., & Gerhardstein, P.C., Cooper, E.E., & Nelson, C.A. (1997). High-level object recognition without an anterior inferior temporal lobe. *Neuropsychologia*, 35, 271-287.
- Fiser, J., Biederman, I., & Cooper, E. E. (1996). To what extent can matching algorithms based on direct outputs of spatial filters account for human object recognition? *Spatial Vision*, 10, 237-271.
- Biederman, I., & Gerhardstein, P.C. (1995). Viewpoint-dependent mechanisms in visual object recognition: Reply to Tarr and Bulthoff (1995). *Journal of Experimental Psychology: Human Perception and Performance*, 21, 1506-1514.
- Fiser, J., & Biederman, I. (1995). Size invariance in visual object priming of gray-scale images. *Perception*, 24, 741-748.
- Biederman, I., & Gerhardstein, P.C. (1993). Recognizing depth-rotated objects: Evidence and conditions for three-dimensional viewpoint invariance. *Journal of Experimental Psychology: Human Perception and Performance*, 19, 1162-1182.
- Biederman, I., & Cooper, E.E. (1992). Evidence for translational and reflectional invariance in visual object priming. *Perception*, 20, 585-593.
- Biederman, I., & Cooper, E.E. (1992). Size invariance in visual object priming. *Journal of Experimental Psychology: Human Perception and Performance*, 18, 121-133.
- Williams, P., & Tarr, M.J. (1998). Orientation-specific possibility priming for novel three-dimensional objects. Under review.
- Tarr, M.J., & Gauthier, I. (1998). Do viewpoint-dependent mechanisms generalize across members of a class. Under review.
- Hayward, W.G., & Tarr, M.J. (in press). Testing conditions for viewpoint invariance in object recognition. *Journal of Experimental Psychology: Human Perception and Performance*.
- Gauthier, I., & Tarr, M.J. (in press). Orientation priming of novel shapes in the context of viewpoint-dependent recognition. *Perception*.
- Tarr, M.J., & Bulthoff, H.H. (1995). Is human object recognition better described by geon structural descriptions or by multiple views? Comment on Biederman and Gerhardstein (1993). *Journal of Experimental Psychology: Human Perception and Performance*, 21, 1494-1505.
- Tarr, M.J. (1995). Rotating objects to recognize them: A case study on the role of viewpoint dependency in the recognition of three-dimensional objects. *Psychonomic Bulletin & Review*, 2, 55-82.
- Tarr, M.J., & Pinker, S. (1991). Orientation-dependent mechanisms in shape recognition: further issues *Psychological Science*, 2, 207-209.

- Tarr, M.J., & Pinker, S. (1990). When does human object recognition use a viewer-centered reference frame? *Psychological Science*, *1*, 253-256.
- Tarr, M.J., & Pinker, S. (1989). Mental rotation and orientation-dependence in shape recognition. *Cognitive Psychology*, *21*, 233-282.

- Kourtzi, Z., & Shiffrar, M. (1997). One-shot invariance in a moving world. *Psychological Science*, *8*, 461-466.
- Sholl, M.J., & Nolin, T.L. (1977). Orientation specificity in representations of place. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *23*, 1494-1507.
- Reuter-Lorenz, P.A., Drain, M., & Hardy-Morais, C. (1996). Object-centered attentional biases in the intact brain. *Journal of Cognitive Neuroscience*, *8*, 540-550.
- Tipper, S.P., & Behrmann, M. (1996). Object-centered not scene-based visual neglect. *Journal of Experimental Psychology: Human Perception and Performance*, *22*, 1261-1278.

### **Haptic Object Recognition**

- Klatzky, R.L., & Lederman, S.J. (1995). Identifying objects from a haptic glance. *Perception & Psychophysics*, *57*, 1111-1123.

### **Object vs Location/Action: Behavioral Findings**

- Landau, B., & Jackendoff, R. (1993). "What" and "where" in spatial language and spatial cognition. *Behavioral and Brain Sciences*, *16*, 217-265.
- Hale, S., & Jansen, J. (1994). Global processing-time coefficients characterize individual and group differences in cognitive speed. *Psychological Science*, *5*, 384-389.

### **Object vs Location/Action: Neural Bases**

- Owen, A.M., Milner, B., Petrides, M., & Evans, A.C. (1996). A specific role for the right parahippocampal gyrus in the retrieval of object-location: A positron emission tomography study. *Journal of Cognitive Neuroscience*, *8*, 588-602.
- Mecklinger, A., & Muller, N. (1996). Dissociations in the processing of "what" and "where" information in working memory: An event-related potential analysis. *Journal of Cognitive Neuroscience*, *8*, 453-473.
- Robertson, L., Treisman, A., Friedman-Hill, S., & Grabowecky, M. (1997). The interaction of spatial and object pathways: Evidence from Balint's Syndrome. *Journal of Cognitive Neuroscience*, *9*, 295-317.
- Milner, A.D., & Goodale, M.A. ((1995). *The visual brain in action*. New York: Oxford University Press.

### **Somatosensory Perception**

- Berluchhi, & Aglioti, S. (1997). The body in the brain: Neural bases of corporeal awareness. *Trends in Neuroscience*, *20*, 560-564.
- Reed, C.L., & Farah, M.J. (1995). The psychological reality of the body schema: A test with normal participants. *Journal of Experimental Psychology: Human Perception and Performance*, *21*, 334-43.
- Damasio, A.R. (1994). *Descartes' error*. New York: Grosset / Putnam.

## **Attention**

### **Roles in Higher Cognition**

Logan, G.D., & Zbrodoff, N.J. (in press). Selection for cognition: Cognitive constraints on visual spatial attention. *Visual Cognition*.

Logan, G. (1995). Linguistic and conceptual control of visual spatial attention. *Cognitive Psychology*, 28, 103-174.

## **Imagery in Working Memory**

### **Visual Imagery: Behavioral Findings**

#### **Basic Sources**

Finke, R.A. (1989). *Principles of mental imagery* (29-60). Cambridge, MA: MIT Press.

Shepard, R.N., & Cooper, L.A. (1982). *Mental images and their transformations*. New York: Cambridge University Press.

Kosslyn, S.M. (1980). *Image and mind*. Cambridge, MA: Harvard University Press.

#### **Imaging While Perceiving**

Craver-Lemley, C., & Reeves, A. (1997). Effects of imagery on vernier acuity under conditions of induced depth. *Journal of Experimental Psychology: Human Perception and Performance*, 23, 3-13.

Ishai, A., & Sagi, D. (1997). Visual-imagery: Effects of short- and long-term memory. *Journal of Cognitive Neuroscience*, 9, 734-742.

Gilden, D., Blake, R., & Hurst, G. (1995). Neural adaptation of imaginary visual motion. *Cognitive Psychology*, 28, 1-16.

Ishai, A., & Sagi, D. (1995). Common mechanisms of visual imagery and perception. *Science*, 268, 1172-1174.

#### **Visual Imagery: Eye Movements**

Brandt, S.A., & Stark, L.W. (1997). Spontaneous eye movements during visual imagery reflect the content of the visual scene. *Journal of Cognitive Neuroscience*, 9, 27-38.

Stark, L.W., & Ellis, S.R. (1981). Scanpaths revisited: Cognitive models direct active looking. In D.F. Fisher, R.A. Monty, & J.W. Senders (Eds.), *Eye movements: Cognition and visual perception* (193-226). Hillsdale, NJ: Lawrence Erlbaum Associates.

Malmstrom, F.V., Randle, R.J., Bendix, J.S., & Weber, R.J. (1980). The visual accommodation response during concurrent mental activity. *Perception & Psychophysics*, 28, 440-448.

#### **Knowledge-Based Rotation**

Parsons, L.M. (1987a). Imagined spatial transformations of one's body. *Journal of Experimental Psychology: General*, 116, 172-191.

Parsons, L.M. (1987b). Imagined spatial transformations of one's hands and feet. *Cognitive Psychology*, 19, 178-241.

#### **Miscellaneous**

Scott, F.J., & Baron-Cohen, S. (1996). Imagining real and unreal things: Evidence of a dissociation in autism. *Journal of Cognitive Neuroscience*, 8, 371-382.

Schwartz, D.L., & Black, J.B. (1996). Analog imagery in mental model reasoning: Depictive models. *Cognitive Psychology*, 30, 111-153.

- Vecchi, T., Montecellai, M.L., & Cornoldi, C. (1995). Visuo-spatial working memory: Structures and variables affecting a capacity measure. *Neuropsychologia*, *33*, 1549-1564.
- Cave, K.R., Pinker, S., Giorgi, L., Thomas, C.E., Heller, L.M., Wolfe, J.M., & Lin, H. (1994). The representation of location in visual images. *Cognitive Psychology*, *26*, 1-32.
- Chambers, D., & Reisberg, D. (1992). What an image depicts depends on what an image means. *Cognitive Psychology*, *24*, 145-174.

## **Visual Imagery: Neural Bases**

### **Basic Sources and Reviews**

- Farah, M. (1995). The neural bases of mental imagery. In M.S. Gazzaniga (Ed), *The cognitive neurosciences* (963-975). Cambridge, MA: MIT Press.
- Kosslyn, S.M., Behrmann, M., & Jeannerod, M. (1995). The cognitive neurosciences of mental imagery. *Neuropsychologia*, *33*, 1335-1334.
- Cooper, L.A. (1995). Varieties of visual representation: How are we to analyze the concept of mental image? *Neuropsychologia*, *33*, 1575-1582.
- Kosslyn, S.M. (1994). *Image and brain*. Cambridge, MA: MIT Press.
- Tippett, L.J. (1992). The generation of visual images: A review of neuropsychological research and theory. *Psychological Bulletin*, *112*, 415-432.

### **Grounding Imagery in Perception**

- Kosslyn, S.M., Thompson, W.L., Kim, I.J., Rauch, S.L., & Alpert, N.M. (1996). Individual differences in cerebral blood flow in area 17 predict the time to evaluate visualized letters. *Journal of Cognitive Neuroscience*, *8*, 78-82.
- Kosslyn, S.M., Thompson, W.L., Kim, I.J., & Alpert, N.M. (1995). Topographical representations of mental images in primary visual cortex. *Nature*, *378*, 496-498.
- Kosslyn, S.M., Alpert, N.M., Thompson, W.L., Maljkovic, V., Weise, S.B., Chabris, C.F., Hamilton, S.E., Rauch, S.L., & Buonanno, F.S. (1993). Visual mental imagery activates topographically organized visual cortex: PET investigations. *Journal of Cognitive Neuroscience*, *5*, 263-287.

### **Limits to Grounding Imagery in Perception**

- Tagaris, G.A., Seong-Gi, K., Strupp, J.P., Andersen, P., Ugurbil, K., & Georgopoulos, A.P. (1997). Mental rotation studied by functional magnetic resonance imaging at high field (4 tesla): Performance and cortical activation. *Journal of Cognitive Neuroscience*, *9*, 419-432.
- Goldenberg, G., Mullbacher, W., & Nowak, A. (1995). Imagery without perception—A case study of anosognosia for cortical blindness. *Neuropsychologia*, *33*, 1373-1382.
- Servos, P., & Goodale, M. (1995). Preserved visual imagery in visual form agnosia. *Neuropsychologia*, *33*, 1383-1394.

### **Image Generation**

- Farah, M.J. (1995). Current issues in the neuropsychology of image generation. *Neuropsychologia*, *33*, 1455-1471.
- Stangalino, C., Semenza, C., & Mondini, S. (1995). Generating visual mental images: Deficit after brain damage. *Neuropsychologia*, *33*, 1473-1483.

Kosslyn, S.M., Maljkovic, V., Hamilton, S.E., Horwitz, G., & Thompson, W.L. (1995). Two types of image generation: Evidence for left and right hemisphere processes. *Neuropsychologia*, *33*, 1485-1510.

### **Image Processing**

Georgopoulos, A.P., & Pellizzer, G. (1995). The mental and the neural: Psychological and neural studies of mental rotation and memory scanning. *Neuropsychologia*, *33*, 1531-1547.

### **Motor Imagery**

Crammond, D.J. (1997). Motor imagery: Never in your wildest dreams. *Trends in Neuroscience*, *20*, 54-57.

Annett, J. (1995). Motor imagery: Perception or action. *Neuropsychologia*, *33*, 1395-1417.

Jeannerod, M. (1995). Mental imagery in the motor context. *Neuropsychologia*, *33*, 1419-1432.

Klatzky, R.L., Lederman, S.J., & Matula, D.E. (1991). Imagined haptic exploration in judgments of object properties. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *17*, 314-322.

Intons-Peterson, M.J., Roskos-Ewoldsen, B.B. (1989). Sensory-perceptual qualities of images. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *15*, 188-199.

### **Auditory Imagery**

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