

Psychology 770J
The Perceptual Bases of Cognition
Emory University
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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.

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

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

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.

Smith, J.D., Wilson, M., & Reisberg, D. (1995). The role of subvocalization in auditory imagery. *Neuropsychologia*, *33*, 1433-1454.

Reisberg, D. (Ed.) (1992). *Auditory imagery*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Sensory-Motor Tuning in Working Memory

Rushworth, M.F.S., & Owen, A.M. (1998). The functional organisation of the lateral frontal cortex: conjecture or conjuncture in the electrophysiology literature? *Trends in Cognitive Sciences*, *2*, 46-53.

Ó Scalaidhe, S.P., Wilson, F.A.W., & Goldman-Rakic, P.S. (1997). Areal segregation of face-processing neurons in prefrontal cortex. *Science*, *278*, 1135-1138.

Rao, S.C., Rainer, G., & Miller, E.K. (1997). Integration of what and where in the primate prefrontal cortex. *Science*, *276*, 821-824.

Jonides, J., & Smith, E.E. (1997). The architecture of working memory. In M.D. Rugg (Ed.), *Cognitive neuroscience* (243-276). Cambridge, MA: MIT Press.

Episodic Long-Term Memory

Embodiment of Memory

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