

**PSYC W3450/G4450  
EVOLUTION OF INTELLIGENCE & CONSCIOUSNESS  
Fall 2006**

**Professors Janet Metcalfe & Herbert Terrace**

<b>September 5.</b>	<b>Introduction</b>
<b>September 12</b>	<b>Reading period</b>
<b>September 19</b>	<b>Reading period</b>
<b>September 16</b>	<b>Darwin's Theory of Evolution</b>
<b>October 3</b>	<b>Freud's Theory of the Unconscious &amp; it's Implications of for Experimental Psychology</b>
<b>October 10</b>	<b>Comparative psychology</b>
<b>October 17</b>	<b>Behaviorism</b>
<b>October 24</b>	<b>Emergence of cognitive psychology</b>
<b>October 31</b>	<b>Animal cognition and comparative studies of intelligence</b>
<b>November 7</b>	<b>The Unconscious Mind</b>
<b>November 14</b>	<b>Theories Of The Development Of Consciousness</b>
<b>November 21</b>	<b>Theories Of The Development Of Language</b>
<b>November 28</b>	<b>Minds and machines</b>
<b>December 5</b>	<b>Theory Of Mind</b>

## **Guidelines for Presentations**

**Initial meeting:** Please check with one of us at least two weeks before your presentation for suggested readings. Ideally, you should see one of us 3-4 weeks before your presentation. That will allow you one week to find and digest those readings and to think about the focus of your talk, one week to start on specific readings for your topic and to select an assignment for other students to read, one week to prepare your outline and annotated bibliography, and one week to deal with unexpected crises.

**Assigned reading:** We'd like to aim for a reading assignment for each presentation of not more than 25 pages (total). Try to assign readings that will serve as background for your main argument(s). There is no need for students to read comprehensively about your topic. Your annotated bibliography should provide sufficient leads for those students who would like to read more.

**Annotated bibliography:** The purpose of your annotated bibliography is twofold. It should direct students to additional sources on your topic (at most 8-10 references) and it should provide a critical evaluation of each reference. Adjectives like "brilliant", "controversial", "clear", "difficult but worthwhile", "classic", "misguided", "muddled", etc. or combinations of such adjectives are in order **AND** a few terse sentences justifying those adjectives is all you need to write. Do not try to summarize the reference. You will be graded on the critical quality of your remarks.

**Outline:** The outline (1 – 1.5 pp.) should function as a road map for your talk in the sense that it will help other students see what topics you will cover and in what order. It should also serve as a mnemonic for students to review the material you covered. While preparing the annotated bibliography and the outline keep in mind that it should be a resource for other students to consult when writing their take-home exam.

### **Some miscellaneous but important rules:**

- Put your name and topic at the beginning of your annotated bibliographies and outlines.
- Send us the full reference(s) you want to assign by email at least one week before your seminar.
- Arrange for references to be xeroxed in the Psychology office (406 Schermerhorn) and then give the librarian of the Psychology library a clean copy that can be scanned to make a pdf file. The pdf files will be available by email and, possibly, on a web page. We will provide you with authorization forms for xerox requests.

**Proposal for take home essay exam. Due on December 12. (No extensions!)**

Write a critical essay on the evolution of intelligence and consciousness that addresses the following issues. Your paper should be about 10 double-space pages. When we grade your essay we will be more concerned with the clarity of your arguments about the positions you take on the issues listed below than on whether you agree with our positions (or anyone else's). Attach an annotated bibliography of (~6) references based on the readings that had the greatest influence on your essay.

- To what extent do animal species exhibit qualitatively different forms of intelligence?
- What adaptive pressures might select for different types of intelligence?
- Distinguish between, Freud's and Skinner's views of consciousness.
- Your answer to Nagel's question, "What is it like to be a bat?"
- The role of a theory of mind in language and consciousness.
- Are computers conscious and/or intelligent?

## Week 4: DARWIN & THE THEORY OF EVOLUTION

Boakes, R. (1984). From Darwin to behaviorism. Psychology and the minds of animals. Cambridge, Cambridge University Press.

Cartwright, J. (2000). Evolution and human behavior: Darwinian perspectives on human nature. Cambridge, MIT Press.

Darwin, C. (1859). On the Origin of Species. London, UK, Mercury.

Darwin, C. (1871). The Descent of Man and Selection in Relation to Sex. London, UK, J. Murray.

Darwin, C. (1872). The Expression of Emotions in Man and Animals. London, UK, J. Murray.

Dawkins, R. (1976). The Selfish Gene. New York, NY, Oxford University Press.

Dennett, D. (1995). Darwin's dangerous idea. New York, Touchstone.

Fodor, J. (1998). The trouble with psychological darwinism. London Review of Books. **20.**

Rose, H. and S. Rose (2000). Alas, Poor Darwin: Arguments Against Evolutionary Psychology. New York, Harmony Books.

## **Week 5 FREUD & THE UNCONSCIOUS**

Ellenberger, H. F. (1970). The discovery of the unconscious. New York, Basic Books.

Freud, S. (1925). The Ego & the Id. London, Hogarth Press.

Freud, S. (1965). The Interpretation of Dreams. New York, Avon Books.

Freud, S. (1966). Introductory Lectures on Psychoanalysis. New York, W.W. Norton and Company.

Whytte, L. L. (1978). The Unconscious before Freud, Julian Friedmann Publishers, LTD.

## **Week 6: COMPARATIVE PSYCHOLOGY & BEHAVIORISM**

Skinner, B. F. (1950). "Are theories of learning necessary?"  
Psychological Review **57**: 193-216.

Skinner, B. F. (1953). Science and Human Behavior. New York, NY,  
Macmillan.

Watson, J. B. (1914). Behavior: An introduction to comparative  
psychology. New York, NY, Henry Holt.

Watson, J. B. (1919). Psychology from the Standpoint of a  
Behaviorist. Philadelphia, PA, J.B. Lippincott.

Watson, J. B. (1924). Behaviorism. New York, NY, Norton.

## **Week 7: BEHAVIORISM**

Skinner, B. F. (1950). "Are theories of learning necessary?"  
Psychological Review **57**: 193-216.

Skinner, B. F. (1953). Science and Human Behavior. New York, NY,  
Macmillan.

Watson, J. B. (1914). Behavior: An introduction to comparative  
psychology. New York, NY, Henry Holt.

Watson, J. B. (1919). Psychology from the Standpoint of a  
Behaviorist. Philadelphia, PA, J.B. Lippincott.

Watson, J. B. (1924). Behaviorism. New York, NY, Norton.

## **Week 8: COGNITIVE PSYCHOLOGY**

Bower, G. H. (1975). Cognitive Psychology: An Introduction. Handbook of Learning and Cognitive Processes. W. K. Estes, Lawrence Erlbaum Associates. **12**: 25-80.

Gardner, H. (1985). The Minds New Science: A History of the Cognitive Revolution. New York, NY, Basic Books Inc.

Jones, T. C. and H. L. I. Roediger (1995). "The Experiential Basis of Serial Position Effects." European Journal of Cognitive Psychology **7**(1): 65-80.

Neisser, U. (1967). Cognitive Psychology. New York, NY, Appleton-Century-Crofts.

## Week 9: ANIMAL COGNITION

Allen, C. (1997). Animal cognition and animal minds. Philosophy and the sciences of the mind: Pittsburgh-Konstanz series in the philosophy and history of science. P. Machamer and M. Carrier. Pittsburgh, Pittsburgh University Press. **4**: 227-243.

Beran, M. J. and D. A. Washburn (2002). "Chimpanzee responding during matching to sample: Control by exclusion." Journal of the experimental analysis of behavior **78**(3): 497-508.

D'Amato, M. R. (1991). Comparative Cognition: Processing of Serial Order and Serial Pattern. Current Topics in Animal Cognition: Brain, Emotion, and Cognition. L. a. F. Dachowski, C.F. Hillsdale, NJ, Lawrence Erlbaum.

Dewsbury, D. A. (1989). "Comparative Psychology, ethology, and animal behavior." Annual Review Psychology **40**: 581-602.

Gallistel, C. R. (1989). "Animal cognition: the representation of space, time and number." Annual Review Psychology **40**: 155-189.

Kamil, A. C. (1998). On the proper definition of cognitive ethology. Animal cognition in nature: the convergence of psychology and biology in laboratory and field. R. P. Balda, I. M. Pepperberg and A. C. Kamil. San Diego, Academic Press.

Macphail, E. M. (1985). "Vertebrate intelligence: the null hypothesis." Phil. Trans. R. Soc. Lond. B **308**: 37-51.

Macphail, E. M. (1996). "Cognitive function in mammals: the evolutionary perspective." Cognitive Brain Research **3**: 279-290.

Nadel, L. (1990). Varieties of spatial cognition: Psychological considerations. The development and neural basis of higher cognitive functions. A. Diamond. New York, New York Academy of Sciences: 613-636.

## **Week 9: ANIMAL COGNITION (cont'd.)**

Pearce, J. M. (1987). An Introduction to Animal Cognition. London, UK, Erlbaum.

Roberts, W. (1998). Principles of Animal Cognition. Boston, The McGraw-Hill Companies.

Roitblat, H. and L. von Fersen (1992). "Comparative Cognition: Representations and Processes in Learning and Memory." Amer. Rev. Psychology **43**: 671-710.

Terrace, H. S. (1984). Animal Cognition. Animal Cognition. H. L. Roitblat, T. G. Bever and H. S. Terrace. Hillsdale, NJ, Lawrence Earlbaum Associates: 7-28.

Vauclair, J. (1996). Animal Cognition: an introduction to modern comparative psychology. Cambridge, MA, Harvard University Press.

Wasserman, E. A. (1996). The Science of Animal Cognition.

## **Week 10: UNCONSCIOUSNESS & THE HUMAN MIND**

Greenwald, A. G. (1992). "Unconscious cognition reclaimed." American Psychologist **47**: 766-779.

Kihlstrom, J., T. M. Barnhardt, et al. (1992). "The Psychological Unconscious." American Psychologist **47**(6): 788-791.

Libet, B. (1985). Unconscious cerebral initiative and the role of conscious will in voluntary action. The Behavioral & Brain Sciences. S. Harnad, Cambridge University Press: 529-566.

Merikle, P. M. and M. Daneman (1998). "Psychological investigations of unconscious perception." Journal of Consciousness Studies **5**: 5-18.

Reber, A. S. (1993). Implicit learning and tacit knowledge: An essay on the cognitive unconscious. New York, NY, Oxford University Press.

Schacter, D. L. (1992). "Implicit Knowledge: New perspectives on unconscious processes." Pro. Natl. Acad. Sci. USA **89**(December 1992): 11113-11117.

## WEEK 11: THEORIES OF DEVELOPMENT OF CONSCIOUSNESS

Allen, C. (2004). Animal Consciousness. The Stanford Encyclopedia of Philosophy (Winter 2004 edition). E. N. Zalta: 1-6.

Block, N. (1995). "On a confusion about a function of consciousness." Behavioral and Brain Sciences **18**(2): 227-287.

Cary, M. and L. M. Reder (2002). Metacognition in strategy selection: Giving consciousness too much credit. Metacognition: Process, function and use. M. Izaute, P. Chambres and P. J. Marescaux. New York, Kluwer: 63-73.

Churchland, P. S. (1983). "Consciousness: The Transmutation of a Concept." Pacific Philosophical Quarterly **60**: 80-95.

Donald, M. (2001). A mind so rare: The evolution of human consciousness. New York, Norton.

Humphrey, N. (1983). Consciousness regained: Chapters in the development of mind. Oxford, Oxford University Press.

Libet, B. (2004). Mind time: The temporal factor in consciousness. Cambridge, Harvard University Press.

Macphail, E. M. (1998). The evolution of consciousness. New York, Oxford University Press.

Mandler, G. (1998). Consciousness and mind as philosophical problems and psychological issues. Perception and Cognition at Century's End. G. Mandler: 45-65.

Premack, D. (2004). "Is Language the Key to Human Intelligence?" Science **303**: 318-320.

Rieber, R. W. and G. Voyat (1983). Dialogue I. Noam Chomsky's views on the psychology of language and thought. Dialogues on the psychology of language and thought: conversations with Noam Chomsky, Charles Osgood, Jean Piaget, Ulric Neisser, and Marcel Kinsbourne. New York, Plenum Press: 33-63.

Rosenthal, D. (2002). "How many kinds of consciousness?"  
Conscious Cognition **11**(4): 653-665.

Rosenthal, D. M. (2000). Consciousness and metacognition.  
Metarepresentations : a multidisciplinary perspective. D. Sperber.  
Oxford, Oxford University Press.

Rozin, P. (1976). "The evolution of intelligence and access to the  
cognitive unconscious." Progress in Psychobiology and Physiological  
Psychology **6**: 245-280.

Searle, J. (1995). The Mystery of Consciousness. New York, The New  
York Review.

Thompson, R. F. and S. A. Madigan (2005). Memory: The key to  
consciousness. Washington, D.C., Joseph Henry Press.

## **Week 12: THEORIES OF LANGUAGE DEVELOPMENT**

Aitchison, J. (2000). The seeds of speech: Language origin and evolution. Cambridge, Cambridge University Press.

Bickerton, D. (1995). Language and Human Behavior. Seattle, University of Washington Press.

Chomsky, N. (1997). Language and Mind: Current Thoughts on Ancient Problems, University of Brazil.

Chomsky, N. (2000). New horizons in the study of language and mind. Cambridge, Cambridge University Press.

Danto, A. C. (1978). Freudian Explanations and the Language of the Unconscious. Psychoanalysis and Language. J. H. Smith. New Haven, Yale University Press.

Deacon, T. W. (1997). The Symbolic Species: The co-evolution of language and the brain. New York, Norton Paperback.

Fitch, W. T., M. D. Hauser, et al. (2005). "The evolution of the language faculty: Clarifications and implications." Cognition.

Fodor, J. A. (1975). The language of Thought. New York, NY, Crowell, T.Y. .

Locke, J. L. and B. Bogin (2005). "Language and life history: A new perspective on the development and evolution of human language." Behavioural Brain Research.

Nelson, K. (1996). Language in cognitive development. Cambridge, Cambridge University Press.

Pinker, S. (1994). The Language Instinct. New York, William Morrow and Company, Inc.

Premack, D. (2004). "Is Language the Key to Human Intelligence?" Science **303**: 318-320.

Rieber, R. W. and G. Voyat (1983). Dialogue I. Noam Chomsky's views on the psychology of language and thought. Dialogues on the psychology of language and thought: conversations with Noam Chomsky, Charles Osgood, Jean Piaget, Ulric Neisser, and Marcel Kinsbourne. New York, Plenum Press: 33-63.

Seal, B. and J. D. Bonvillian (1997). "Sign Language and Motor Functioning in Students with Autistic Disorder." Journal of Autism and Developmental Disorders **27**(4): 437-466.

Shanker, S. (2001). "What Children Know When They Know What a Name Is: The Non-Cartesian View of Language Acquisition." Current Anthropology **43**(2): 481-513.

## Week 13: Minds & Machines

Greenwald, A. G. (1992). "Unconscious cognition reclaimed." American Psychologist **47**: 766-779.

Kihlstrom, J., T. M. Barnhardt, et al. (1992). "The Psychological Unconscious." American Psychologist **47**(6): 788-791.

Libet, B. (1985). Unconscious cerebral initiative and the role of conscious will in voluntary action. The Behavioral & Brain Sciences. S. Harnad, Cambridge University Press: 529-566.

Merikle, P. M. and M. Daneman (1998). "Psychological investigations of unconscious perception." Journal of Consciousness Studies **5**: 5-18.

Reber, A. S. (1993). Implicit learning and tacit knowledge: An essay on the cognitive unconscious. New York, NY, Oxford University Press.

Schacter, D. L. (1992). "Implicit Knowledge: New perspectives on unconscious processes." Pro. Natl. Acad. Sci. USA **89**(December 1992): 11113-11117.

## Week 14: THEORY OF MIND

Bloom, P. and T. German (2000). "Two reasons to abandon the false belief task as a test of theory of mind." Cognition **77**: B25-B31.

Call, J., B. A. Hare, et al. (1998). "Chimpanzee gaze following in an object-choice task." Animal Cognition **1**: 89-99.

Carpenter, M., K. Nagell, et al. (1998). "Social cognition, joint attention, and communicative competence from 9 to 15 months of age." Monograph of the Society for Research in Child Development **63**.

Cheney, D. L. and R. M. Seyfarth (1997). Why animals don't have language. Tanner Lectures on Human Values, Cambridge University.

deWaal, F. and M. Embree (2003). "The triadic nature of primate social relationships." Family Systems **4**(1).

Fodor, J. A. (1992). "A Theory of the Child's Theory of Mind." Cognition **44**.

Gergely, G., Z. Nádasdy, et al. (1995). "Taking the intentional stance at 12 months of age." Cognition **56**: 165-193.

Metcalf, J. and A. P. Shimamura (1994). Metacognition: Knowing about knowing. Cambridge, MA, MIT Press.

Neisser, U. (1997). The roots of self-knowledge: perceiving self, it, and thou. The self across psychology: Self-recognition, self-awareness, and the self concept. J. G. Snodgrass and R. L. Thompson. New York, New York Academy of Sciences: 19-33.

Perner, J. (1989). "Is "thinking" belief? Reply to Wellman and Bartsch." Cognition **33**(3): 315-9.

Perner, J. (1995). "The Many Faces of Belief: Reflections on Fodor's and the child's theory of mind." Cognition **57**: 241-269.

Povinelli, D. (2001). On the possibilities of detecting intentions prior to understanding them. Intentions and intentionality: Foundations of social cognition. B. F. Malle, L. J. Moses and D. A. Baldwin. Cambridge, MA, MIT Press: 225-248.

Rosenthal, D. (2002). "How many kinds of consciousness?" Conscious Cognition **11**(4): 653-665.

Terrace, H. and J. Metcalfe, Eds. (2005). The Missing Link in Cognition: Origins of Self-Knowing Consciousness. New York, Oxford University Press (in press).

Terrace, H. S. (2005). Metacognition and The Evolution of Language. The Missing Link in Cognition: Origins of Self-Knowing Consciousness. H. S. Terrace and J. Metcalfe. New York, Oxford University Press: 84-115.

Tomasello, M. (1999). The Cultural Origins of Human Cognition. London, Harvard University Press.