

# *Cognitive Psychology at The Ohio State University*



## **Doctoral Program Brochure 2007 Edition**

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The Ohio State Impact

# Doctoral Program in Cognitive Psychology at Ohio State University

## Program Orientation

The Cognitive Psychology Program trains scholars who can make substantive contributions to basic knowledge in cognitive and experimental psychology. Graduate students develop research and analytical skills while learning to coordinate basic research with theory development and application. You will participate with faculty members in joint research projects investigating such questions as: How do people perform skilled movements? How do they perceive and classify objects and events? How do they process language, attend and remember? Answers may be pursued in experimental research and in theoretical modeling. Answers are pursued in class, in laboratory research, and in brown bag discussions and seminars. You will be encouraged to present findings at professional meetings and to publish papers in professional journals. Developing a sense of professional identity and commitment is a key component of study, and is fostered through participation in research seminars, conventions, and in interactions with visiting research scientists.

## Program of Study

An individualized study program allows you to complete the master's degree requirements, including the master's thesis, during the first two years of study. At the end of the third year, after passing the



*Lazenby Hall, current home of the Cognitive Psychology Program*

Candidacy Examination, you are admitted to Ph.D. candidacy. Questions for the Candidacy Examination are based on a reading list that is prepared with the help of the four faculty members who serve on your examination committee. You are expected to spend an additional one to two years completing the Ph.D. dissertation.

The Center for Cognitive Science at Ohio State is a lively and well-developed center which connects the departments of psychology, philosophy, computer science, linguistics, optometry, industrial and systems engineering, and speech and hearing sciences, among others. The Cognitive Area plays an active and important role in this flourishing center. Our students and faculty benefit from its interdisciplinary courses, seminars, and opportunities for research collaboration. GradCog is a student-led organization that meets regularly to talk about current issues in the field, plans speaker series, and organizes the annual

Cogfest, an afternoon-long mini conference with speakers and poster presentations.



*The "Oval" at The Ohio State University campus.*

## **Areas of Interest**

The Cognitive Area encompasses four broad areas and emphasizes both laboratory research and cognitive modeling in each:

### **Memory and Cognition**

Memory and cognition covers core areas in cognition psychology and cognitive neuroscience including memory, learning, attention, categorization, decision making, implicit memory, neural network modeling, aging, and various impairments in memory. One primary focus is the use of quantitative models to understand processing and representation in memory. In addition, along with some faculty in the quantitative area, there is a focus on modeling the time course of processing.

### **Perception**

You will pursue courses and participate in research on a variety of aspects of visual and auditory perception and attention. Topics range from psychophysics, information

processing, attention, and ecological perception, to those concerned with speech and music perception.

### **Language and Speech**

Language and speech covers core areas such as speech perception and production, reading, sentence processing, syntax, spoken and visual word recognition, memory for text and discourse, corpus analysis as well as computational modeling of several of these domains. This area has close ties to excellent programs in several other departments: linguistics including computational linguistics, computer science, and speech and hearing.

### **Human Performance**

Human performance incorporates aspects of the other subareas from a perspective grounded in engineering psychology. You will encounter the newest research on topics in perceptual-motor coordination, human decision-making, attention and visual performance. If your career interests include human factors engineering, your training can be coordinated with the Department of Industrial and Systems Engineering.

### **Cognitive Modeling**

This is a concentration that allows bridging between the cognitive area and other areas that focus on modeling. The aim is to provide flexibility for a student to design their own program of study that develops both quantitative skills and basic knowledge in the content area of interest. Quantitative skills are broadly defined and can include any of the topics covered in the quantitative program in the Psychology department or in other departments (e.g., mathematics,

computer science, statistics, linguistics, physics, and so on).

## Cognitive Development

Several of the cognitive area faculty are jointly appointed in the developmental area. Students can enroll in the cognitive program with their primary research focus in cognitive development, including development of language, numerosity, categorization, memory, and development of concepts.

## Course Requirements

The major guiding principle in the Cognitive Area graduate training program is to involve students in the tasks that are performed professionally by cognitive/experimental psychologists – theoretical analysis, research design, data analysis, scholarly writing, teaching, editorial reviewing, and oral presentation of research. These experiences are provided starting from the beginning of the first year of graduate work. The course of training is designed to enable students to complete the Candidacy Examination before the start of their fourth year of graduate work.

1. Statistics Sequence
2. At least two courses from each of the following topic areas: Perception and Psychophysics; Human Performance; Learning, Memory, and Cognition: Foundations; High-level Cognitive Processes
4. Three courses outside of the Cognitive Area. A few examples are courses in Psychobiology, Developmental, and Quantitative Psychology, Linguistics, Speech and Hearing Science, Industrial Engineering, Computer Science, and Neuroscience.

## Faculty

**SIMON DENNIS:** Associate Professor; Ph.D., University of Queensland, Australia, 1993 – Interests: Human memory and learning, natural language processing, connectionist models of cognition, information retrieval  
Email: dennis.210@osu.edu

Dennis, S. (2004). An unsupervised method for the extraction of propositional information from text. *Proceedings of the National Academy of Sciences*, 101, 5206-5213.

Dennis, S. & Humphreys, M. S. (2001). A context noise model of episodic word recognition. *Psychological Review*. 108(2). 452-477.

**RICHARD J. JAGACINSKI:** Professor; Ph.D., University of Michigan, 1973 – Interests: Engineering Psychology; Behavioral applications of control theory; Decision making in guiding dynamic systems; Aging; Environmental and social effects of technology. (Jointly with Industrial, Welding, and Systems Engineering.)  
Email: jagacinski.1@osu.edu

Jagacinski, R. J. & Flach, J. M. (2003). *Control theory for humans: Quantitative approaches to modeling performance*. Mahwah, New Jersey: Erlbaum.

Liao, M. & Jagacinski, R. J. (2000). A dynamical systems approach to manual tracking performance. *Journal of Motor Behavior*, 32, 361-378.

**NEAL F. JOHNSON:** Emeritus Professor; Ph.D., University of Minnesota, 1962 –

Interests: Human learning and memory; Psycholinguistics; Reading; Psychological implications of language structure; The nature of the decision units used in the production of behavior.

Email: johnson.64@osu.edu

Johnson, N. F. & Pugh, K. R. (1994). A cohort model of visual word recognition. *Cognitive Psychology*, 26(3), 240-346.

Seifert, L. S. & Johnson, N. F. (1994). On the naming of color words and color patches. *Memory and Cognition*, 22, 169-180.

**MARI R. JONES:** Emeritus Professor; Ph.D., University of Massachusetts, 1967 – Interests: Sequence learning and perception; Attention, perception, and serial learning of dynamic visual and auditory patterns; Affiliated theoretical work on dynamic aspects of attention to temporal events (e.g. music).

Lab: [www.psy.ohio-state.edu/roar/](http://www.psy.ohio-state.edu/roar/)

Email: jones.80@osu.edu

Jones, M. R., Moynihan, H. MacKenzie, N. & Puente, J. (2002). Temporal Aspects of Stimulus-Driven Attending in Dynamic Arrays. *Psychological Science*, 13(4), 313-319.

Drake, C., Jones, M. R. & Baruch, C. (2000). The development of rhythmic attending in auditory sequences: attunement, referent period, focal attending, *Cognition*, 77, 251-288.

**GAIL MCKOON:** Professor; Ph.D., University of Colorado, 1975 – Interests: Psycholinguistics; Reading; Memory; Aging. Current research focus: Testing the psychological reality of lexical semantic representations of verbs with comprehension time and corpus data.



*Psychology Building*

Email: mckoon.1@osu.edu

Gerrig, R., & McKoon, G. (1998). The readiness is all: The functionality of memory-based text processing. Invited article, *Discourse Processes*, 26, 67-86.

McKoon, G., Ratcliff, R. (2003). Meaning through syntax: language comprehension and the reduced clause construction. *Psychological Review*, 110, 490-525.

**JOHN E. OPFER:** Assistant Professor; Ph.D., University of Michigan, 2000 – Interests: Conceptual development; Representation of knowledge; Naïve biology; Numerical cognition. [www.cog.ohio-state.edu/opfer](http://www.cog.ohio-state.edu/opfer)  
Email: opfer.7@osu.edu

Opfer, J. E. & Siegler, R. S. (2004). Revisiting the living things concept: A microgenetic study of conceptual change in basic biology. *Cognitive Psychology*, 49, 301-332.

Opfer, J. E. (2002). Identifying living and sentient kinds from dynamic information: The role of goal-directed versus aimless autonomous movement in conceptual change. *Cognition*, 86, 97-122.

**ALEXANDER A. PETROV:** Assistant Professor; Ph.D., New Bulgarian University, 1998 – Interests: Perceptual learning, reinforcement learning, connectionist models of relational structure, memory-based models, analogy, computational cognitive neuroscience, cognitive architectures, spatial vision.  
<http://alexpetrov.com/teach>  
Email: petrov.11@osu.edu

Petrov, A. A., & Anderson, J. R. (2005). The dynamics of scaling: A memory-based anchor model of category rating and absolute identification. *Psychological Review*, 112(2), 383-416.

Petrov, A. A., Doshier, B. A., & Lu, Z. L. (2005). The dynamics of perceptual learning: An incremental reweighting model. *Psychological Review*, 112(4), 715-743.

**MARK A. PITT:** Professor; Ph.D., Yale University, 1989 – Interests: Psycholinguistics; Spoken word recognition, Mathematical Modeling. Current focus: How listeners cope with the pronunciation variation found in everyday speech, and developing methods to understand and compare mathematical models of cognition.  
Lab: <http://lpl.psy.ohio-state.edu/>  
See also: <http://www.buckeyecorpus.osu.edu>  
Email: pitt.2@osu.edu

Pitt, M. A., Johnson, K., Hume, E., Kiesling, S. & Raymond, W. (2005). The Buckeye Corpus of Conversational Speech: Labeling Conventions and a Test of Transcriber Reliability. *Speech Communication*, 45, 89-95.

Pitt, M. A., Kim, W., Navarro, D. J., & Myung, J. I. (2006). Global model analysis by parameter space partitioning. *Psychological Review*, 113, 57-83.

**ROGER RATCLIFF:** Professor; Ph.D., University of Auckland, New Zealand, 1974 – Interests: Mathematical modeling of cognitive processes; Simple decisions and reaction time; Memory models; Implicit memory; Methodology; Aging and reaction time; Neural modeling including single cell recording; Text processing.  
Email: ratcliff.22@osu.edu

Ratcliff, R. & Smith, P. L. (2004). A comparison of sequential sampling models for two-choice reaction time. *Psychological Review*, 111, 333-367.

Smith, P. L., Ratcliff, R. (2004). The Psychology and Neurobiology of Simple Decisions. *Trends in Neuroscience*, 27, 161-168.

**HARVEY G. SHULMAN:** Associate Professor; Ph.D., University of Michigan, 1969 – Interests: Memory; Attention; Human performance and human factors; Attention and cognition; Memory and emotion; Divided attention.  
Email: shulman.1@osu.edu

Ainsworth-Darnell, K., Shulman, H. G. & Boland, J. E. (1998). Dissociating Brain Responses to Syntactic Anomalies: Evidence from Event-related Potentials. *Journal of Memory and Language*, 38, 112-130.

Huber, S. J., Shulman, H. G., Paulson, G. W. & Shuttleworth, E. C. (1989). Dose Dependent Memory Impairment in Parkinson's Disease. *Neurology*, 39, 438-440.

**JAMES T. TODD:** Professor; Ph.D., University of Connecticut, 1977 – Interests: Visual perception and cognition; Perceptual-motor coordination; Computational

modeling of sensory processes; Computer graphics.

Lab: [www2.psy.ohio-state.edu/visionlab/](http://www2.psy.ohio-state.edu/visionlab/)

Email: [todd.44@osu.edu](mailto:todd.44@osu.edu)

Todd, J. T. (2004). The visual perception of 3D shape. *TRENDS in Cognitive Science*, 83, 115-121.

Todd, J. T. , Thaler, L., & Dijkstra, T. M. H. (2005). The effects of field of view on the perception of 3D slant from texture. *Vision Research*, 45, 1501-1517.

**LAURA WAGNER:** Assistant Professor; Ph.D., University of Pennsylvania, 1998 – Interests: Language Acquisition; Event Representation; Pre-Linguistic Concepts; Connections between Linguistic and Conceptual Development.  
<http://faculty.psy.ohio-state.edu/wagner>  
Email: [wagner.602@osu.edu](mailto:wagner.602@osu.edu)

Wagner, L. (2006). Aspectual Bootstrapping in Language Acquisition: Transitivity and Telicity. *Language Learning and Development*, 2(1), 51-77.

Wagner, L. & Carey, S. (2005). 12-month-olds Represent Probably Endings of Motion Events. *Infancy*, 7(1), 73-83.

## Admissions

Admission to the Cognitive program is selective. Only students who intend to pursue the Ph.D. are admitted. You need not have an undergraduate psychology degree.

In considering your application for admission, we will pay close attention to the following: your undergraduate transcript (we normally require at least a 3.2 average for admission); GRE scores in the verbal,

quantitative, and analytical sections; three letters of recommendation; autobiographical statement and resume.

Fellowship and other stipend decisions are made in early Winter quarter for students who will begin graduate study the following Autumn quarter. If you wish to be considered for an award, your application must be on file with us on or before December 31 for Domestic applicants and November 30 for International applicants.

## Additional Information

Cognitive Psychology Area:  
<http://cog.psy.ohio-state.edu/>

Department of Psychology:  
[www.psy.ohio-state.edu/](http://www.psy.ohio-state.edu/)

Ohio State University:  
[www.osu.edu](http://www.osu.edu)

Psychology Graduate Program Coordinator  
Telephone: (614) 292-4112  
Fax: (614) 292-4537  
Email: [psygrad@osu.edu](mailto:psygrad@osu.edu)  
<http://psy.ohio-state.edu/graduate>

Ohio State Graduate Admissions Office  
Telephone: (614) 292-9444  
Email: [domestic.grad@osu.edu](mailto:domestic.grad@osu.edu) (United States applicants)  
Email: [international.grad@osu.edu](mailto:international.grad@osu.edu) (International applicants)  
<http://www-afa.adm.ohio-state.edu>

## Application Checklist for the Doctoral Program in Cognitive Psychology

- ❑ Complete the Department of Psychology Application found at:  
[www.psy.ohio-state.edu/graduate/html/application.htm](http://www.psy.ohio-state.edu/graduate/html/application.htm)
  - ❑ Information on all Psychology courses taken (Course, Instructor, Grade, Credit Hours)
  - ❑ Autobiographical Statement: This statement is very important. It should not exceed 600 words (about two typed and double spaced pages). Please describe why you wish to pursue graduate study, why you chose psychology as your major field of graduate study, and why you are interested in attending Ohio State. **Also indicate if you are interested in the cognitive modeling program.**
  - ❑ Vitae/Resume (no more than TWO pages): required of all applicants who wish to be considered for a Graduate School Fellowship. This can be sent as an attachment to the following email address: [psygrad@osu.edu](mailto:psygrad@osu.edu)
  - ❑ References: The names of three people writing your letters of recommendation.  
Reference forms can be downloaded from the following web site:  
<http://www-afa.adm.ohio-state.edu/apps/pdfs/refer.pdf> Letters should then be sent to Graduate Program Coordinator, Department of Psychology, The Ohio State University, 211 Psychology Building, 1835 Neil Avenue, Columbus, OH 43210-1287

- ❑ Complete the Ohio State University Graduate School Application found at:  
<http://gradadmissions.osu.edu/> A credit card is required (Fee: \$40 domestic, \$50 international)

- ❑ Send two OFFICIAL Transcripts from EACH school attended.

- ❑ Send one to:

### **Domestic Applicants**

Graduate Admissions Office  
The Ohio State University  
P.O. Box 182004  
Columbus, OH 43218-2004

### **International Applicants\***

International Graduate Admissions Office  
The Ohio State University  
P.O. Box 182083  
Columbus, OH 43218-2083

- ❑ Domestic and International Applicants\* send one to:

Graduate Program Coordinator  
Department of Psychology  
The Ohio State University  
211 Psychology Building  
1835 Neil Avenue  
Columbus, OH 43210-1287

*\*International students also MUST submit OFFICIAL TOEFL Scores if they have not graduated from an accredited U.S. University or college.*

- ❑ Send Official General GRE Scores
  - ❑ Send one to Ohio State (1592)
  - ❑ Send one to Department of Psychology (2016)

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