



# COGNITIVE SCIENCE

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## Introduction

Cognitive science is the interdisciplinary study of the human mind. It examines questions such as: How do individuals learn and use language? How do people direct their attention? How do people perceive and remember the world?

Cognitive science integrates the study of psychology, linguistics, computer science, philosophy, and neuroscience. It combines converging research methods, such as behavioral experiments, computational modeling, and neurophysiology.

## Cognitive Science at the University of Richmond

The cognitive science major emphasizes critical inquiry and scientific discovery. The curriculum allows students to select classes from several related disciplines, including psychology, neuroscience, biology, computer science, philosophy, anthropology, and linguistics. In addition to taking laboratory-based courses and seminars with small class sizes, students have the opportunity to conduct independent research mentored closely by the faculty.

## Research Opportunities

Cognitive science majors are encouraged to engage in collaborative research with the faculty. State-of-the-art research facilities include an electrophysiology laboratory and an eye-tracking laboratory, which enable students to examine the electrical activity of the brain and eye movements during cognitive tasks. Students present their research at national conferences, including the annual meetings of the Cognitive Science Society, the Society for Neuroscience, the Vision Sciences Society, the Association for Psychological Science, and the Psychonomic Society, and the Conference on Human Sentence Processing.

Recent student research projects have examined how eye movement patterns during reading can inform us about the cognitive processes involved in language

comprehension; how emotional responses influence spatial cognition; how written letters influence the auditory perception of spoken words; how people learn to recognize objects and faces; and how spatial attention may influence the way people learn mathematical operations.

## Scholarship Awards

Each year, three Cognitive Neuroscience fellowships are available through the support of the James S. McDonnell Foundation. These fellowships include a stipend to cover 8 hours of research per week during the academic year and a 10-week summer research fellowship for two consecutive years. In addition, the School of Arts and Sciences Undergraduate Research Committee typically supports several summer research fellowships for our majors that provide research and living stipends to pursue research projects during a 10-week period in the summer.

## Graduate School Acceptances

Boston College  
Columbia University  
Cornell University  
Emory University  
Georgetown University  
Pennsylvania State University  
University of Florida  
University of Illinois Urbana-Champaign  
University of North Carolina-Chapel Hill  
University of Maryland  
University of Virginia  
University of Richmond Law School  
Vanderbilt University  
Virginia Commonwealth University

## Research Symposium Presentations

Novel Forms of Learning and Memory in the Maternal Rat  
Investigating 3D Printing Technology  
Holistic Processing of Greebles is Related to Expertise, Not Similarity to Faces  
Human-Computer Interaction

Electrophysiology: Lens to the Inner Workings of the Brain  
Does Holistic Processing Increase as People Develop Expertise in Chinese Character Recognition?  
Interactions Between Abstract Actions and Apparent Distance  
Image Classification Using Convolutional Neural Networks  
Does Holistic Processing Really Help? Failure to Replicate Functional Relationship Between Holistic Processing and Face Recognition  
Pursuing Knowledge through Interactive ERP simulations  
Effects of Lexical Predictability and Syntactic Structure on Fixation Times during Reading  
Eye Movements during the Processing of Figurative Language: The Case of Metonymy  
Prominence Hierarchy and the Acceptability of Dangling Modifiers  
Xenophobic Rhetoric and Anti-Asian Attitudes During Covid  
Moderation of external face features on reduction of ORE with Motivation

## Faculty

### Arryn Robbins

Ph.D., New Mexico State University  
Areas of specialty: visual attention and memory; eye movements during search; applied cognition; safety behavior; computational methods

### Cindy M. Bukach

Ph.D., University of Victoria  
Trawick Professorship in Psychology  
Areas of specialty: cognitive neuroscience: face and object recognition in intact and impaired individuals; development and loss of perceptual expertise across the lifespan; factors underlying the way we categorize our world; racial bias and other-race effects

**Kelly Lambert**

Ph.D., University of Georgia Neuroscience  
Program Co-coordinator  
Trawick Professorship in Psychology  
Areas of specialty: experience-based  
neuroplasticity, neurobiology of parental  
behavior, neurobiological impact of  
natural-enriched environments, effective  
coping strategies and emotional  
resilience, comparative animal behavior

**Matthew W. Lowder**

Ph.D., University of North Carolina at  
Chapel Hill  
Cognitive Science Coordinator  
Areas of specialty: psycholinguistics;  
lexical, semantic, and syntactic  
processing; eye movements during  
reading; individual differences in  
sentence processing; mechanisms of  
memory and attention that support  
language comprehension

**OFFICE OF ADMISSION**

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