

# University of South Carolina Psychology PhD Program: Cognitive and Neural Sciences (CNS) Concentration

2023 Information Guide for Prospective Graduate Students

## About the Psychology Ph.D. program

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/](https://sc.edu/study/colleges_schools/artsandsciences/psychology/)

The Psychology PhD program at the University of South Carolina focuses on training students for careers in research, college-level teaching, and other settings. Students select a primary concentration when applying, so **Cognitive & Neural Sciences (CNS)** is one of four concentrations (CNS, Clinical-Community, Quantitative Psychology, School Psychology). All coursework and research emphasizes hands-on training with opportunities for extensive research with next-generation technologies and service to diverse populations.

## Focus of the CNS concentration

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/study/graduate/cognitive\\_neural\\_sciences/](https://sc.edu/study/colleges_schools/artsandsciences/psychology/study/graduate/cognitive_neural_sciences/)

In our program, **you will use experimental methods and the latest technology to uncover the cognitive and neural bases of behavior.**

Help advance psychological science by promoting excellence and productivity in research and gain graduate training in behavioral neuroscience, cognitive neuroscience and cognitive psychology to prepare for your future career in research, teaching, and/or industry.

### Fast facts!

- CNS program typically takes ~5 years
- All students are typically supported with a stipend and full tuition for the duration of their studies
- Health insurance and benefits are provided
- Applications are due December 1, 2023**
- NO APPLICATION FEES THIS YEAR**

### Faculty bios and videos!

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/study/graduate/cognitive\\_neural\\_sciences/cns\\_faculty2.php](https://sc.edu/study/colleges_schools/artsandsciences/psychology/study/graduate/cognitive_neural_sciences/cns_faculty2.php)



# QUESTIONS?

CNS Director: Jennifer Vendemia ([JMVCV@sc.edu](mailto:JMVCV@sc.edu))

Admissions committee:

- Caitlin Hudac: [chudac@mailbox.sc.edu](mailto:chudac@mailbox.sc.edu); @greatcait
- Peter Vento: [pvento@mailbox.sc.edu](mailto:pvento@mailbox.sc.edu); @peter\_vento



# Strengths of the CNS Program

## Topic areas

- Affect / Emotion
- Attention
- Behavioral inhibition
- Cognition and executive control
- Concepts
- Emotion regulation / Regulation
- Decision making / Judgment
- Development and aging
- Language
- Memory
- Microbiome / Gut-brain axis
- Multisensory perception
- Pain (neurocognition)
- Psycholinguistics
- Semantic processing
- Sensory-motor integration
- Spatial cognition

## Some techniques we use

- Animal models (rodent models of human disease)
- Brain stimulation (tDCS, TMS)
- Electroencephalography (EEG)
- Eye tracking (ET)
- Fluorescence microscopy
- Magnetic resonance imaging (MRI)
- Multivariate pattern analysis (MVPA)
- Optogenetics and optical imaging tools

## Some clinical & applied areas we study

Addiction and  
substance abuse

Stress and  
anxiety

Autism and  
neurodevelopment

Stroke and  
aphasia

*We offer several optional targeted coursework and training opportunities for expanding research and teaching skills.*

## CNS Resources

### Institute for Mind and Brain

Integrated research hub for scientists interested in structural and functional bases of higher cognitive processes in the human brain.

<https://go.sc.edu/imb>

### McCausland Center

Home to a Siemens 3-Tesla magnetic resonance imaging (MRI) system and supports the development and implementation of various MRI-related research paradigms.

<https://mccauslandcenter.sc.edu/>

### Research Computing Center

Access to high-performance research computing, remote and collaborative visualization, data storage, and assistance with code development.

[https://sc.edu/about/offices\\_and\\_divisions/division\\_of\\_information\\_technology/rc/index.php](https://sc.edu/about/offices_and_divisions/division_of_information_technology/rc/index.php)



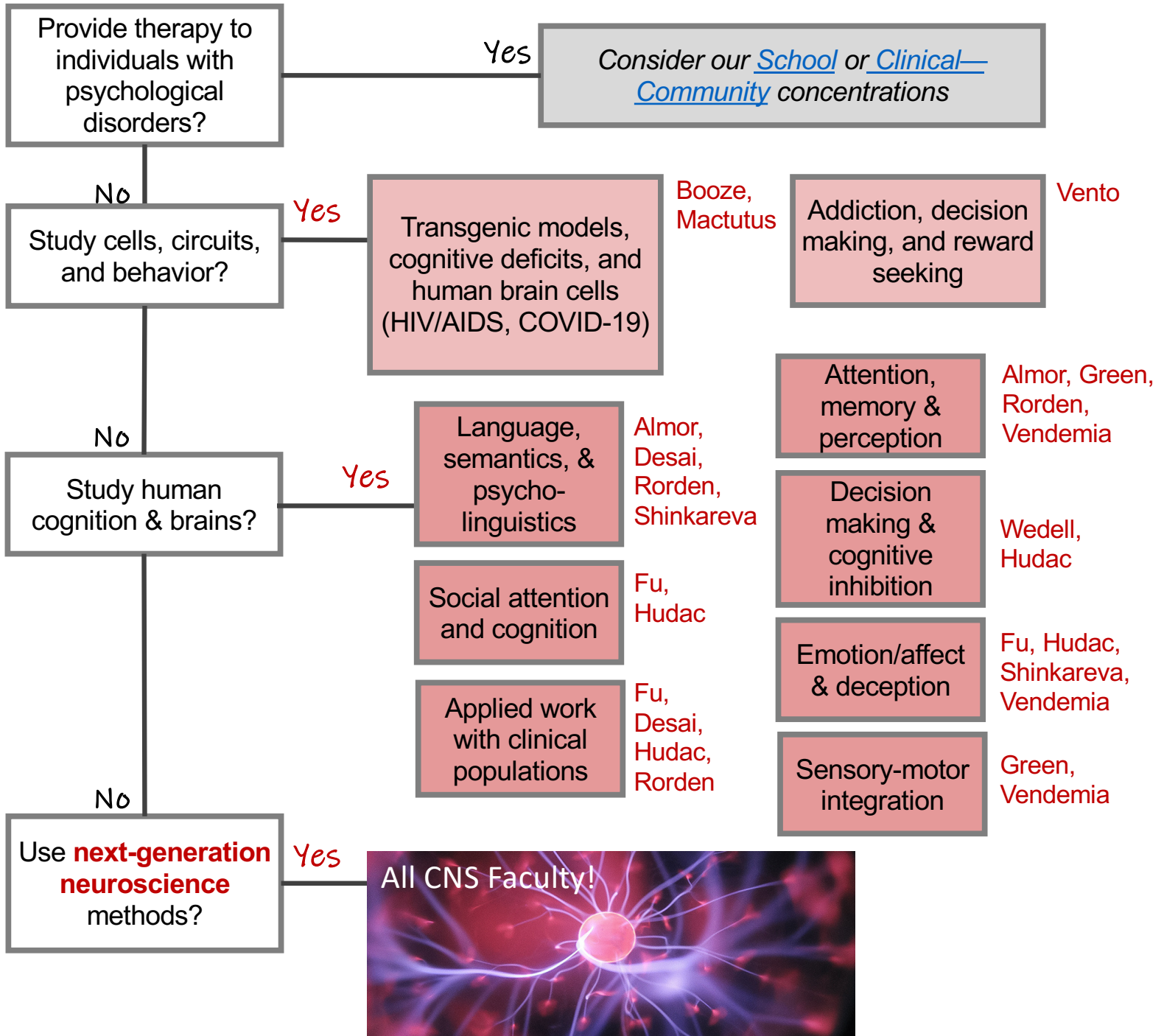
*Discovery building*



*CNS Faculty Dr. Chris Rorden is the director of the McCausland Center*

# CNS faculty research topic flow-chart

## Do you want to...



Unsure? Here are some other benefits of CNS versus clinically-oriented concentrations and programs:

1. **More time to focus on research and coursework.**
2. If you're interested on a specific clinical disorder or an applied area, you can focus on one area (**depth over breadth**) rather than spending time in clinical training to assess and treat a wide range of disorders.
3. The CNS program can be completed in a **shorter timeframe** (less coursework and no year-long internship).
4. CNS may be a better fit for those wanting to be **trained for a career in non-academic positions** such as industry, the National Institute of Health, foundations, or policy making.
5. For those interested in teaching, the CNS program provides opportunities for developing teaching skills and teaching your own classes. **There is a great need for more teachers in cognition and neuroscience!**

# CNS Faculty highlights – cells, circuits, and behavior

Faculty that primarily use models of human disease:

**Dr. Rosemarie Booze**



- Long-term effects of viruses in the human and non-human primate brain;
- Plant-based neurocognitive therapeutics;
- Drug dependence and abuse

**Dr. Charles F. Mactutus**



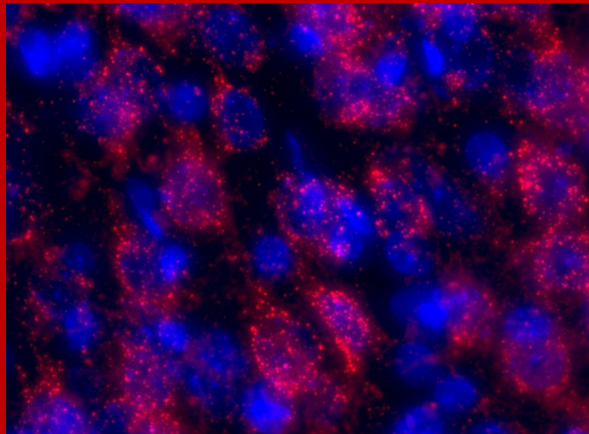
- Long-term effects of drugs, toxins, and viruses on cognitive processes in the non-human and human brain;
- Microbiome and gut-brain axis for neurotherapeutics;
- Drug dependence and choice behavior

**Dr. Peter Vento**

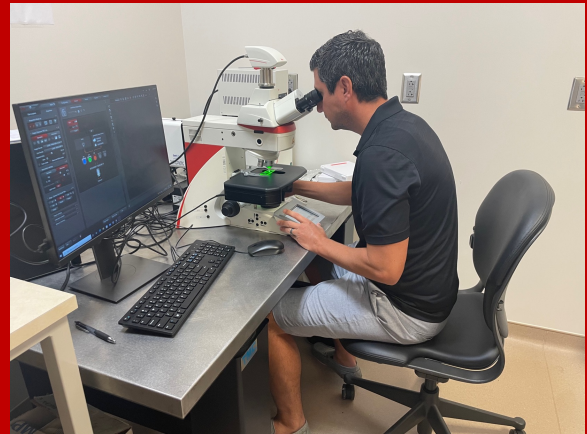


- Addiction; compulsivity
- Cost-benefit decision-making;
- Behavioral inhibition;
- Punishment learning

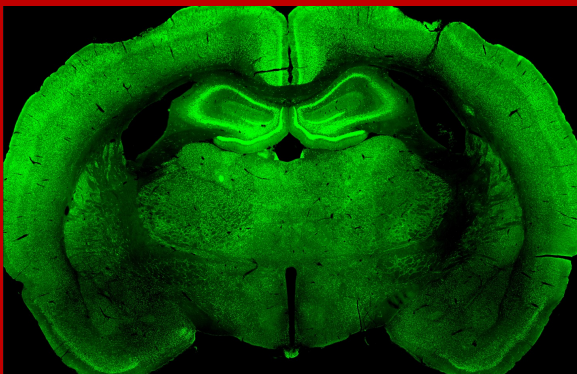
## Snapshots from Dr. Vento's lab:



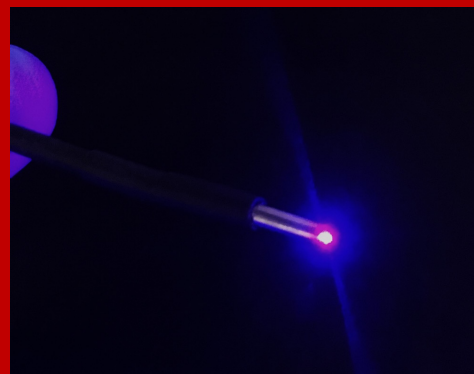
*Histology*



*Fluorescence microscopy*



*Neuroanatomy*



*Turning on the brain with light!*

*Optogenetic tools for modulating brain circuits and visualizing neural activity*

# CNS Faculty highlights - Neuroimaging

Faculty that primarily use neuroimaging methods such as magnetic resonance imaging (MRI):

**Dr. Amit Almor**



- Psycholinguistics
- Language, Memory, attention, space and aging;
- Discourse Reference Processing

**Dr. Rutvik Desai**



- Neural representation of concepts;
- Neural basis of language

**Dr. Svetlana Shinkareva**



- MVPA methods;
- Representation of affect;
- Representation of semantic meaning

**Dr. Chris Rorden**



- Language, attention and perception;
- Neuropsychology, brain imaging and brain stimulation

**Dr. Doug Wedell**

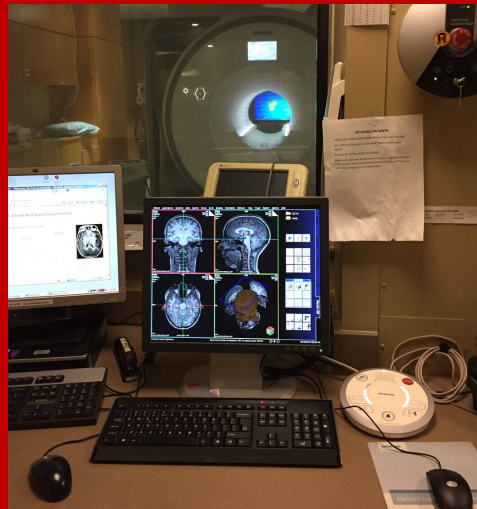


- Judgment and decision making;
- Context effects;
- Neural representation of affect

## Snapshots of Dr. Desai's lab:



*Dr. Desai getting ready for an tDCS (left) and an example of a TMS study (right)*



← 3T fMRI session

*One of many social events!*



# CNS Faculty highlights - Electrophysiology

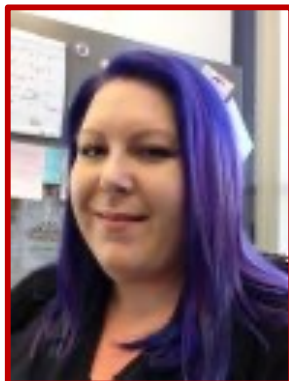
Faculty that primarily use electroencephalography (EEG) and/or event-related potentials (ERP) include:

**Dr. Jessica Fu**



- Social cognition
- Socioemotional behaviors
- Autism
- Development

**Dr. Jessica Green**



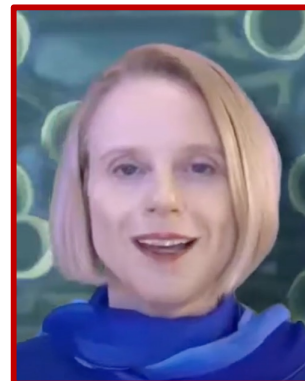
- Attention;
- Multisensory Perception;
- Human Electrophysiology (EEG)

**Dr. Caitlin Hudac**



- Social motivation, perception, cognition;
- Emotion regulation;
- Autism & genetics;
- Development

**Dr. Jennifer Vendemia**



- Director of CNS program**
- Neurocognition of pain;
- Sensory motor integration;
- Stress and cognition

## Snapshots from Dr. Hudac's lab:

*We work with kids that have genetic mutations, including GRIN2B.*



*Here is Dr. Hudac as a bee for GRIN2B(ee) awareness day!*



*New methods coming out of our lab utilizing "hyperscanning" or dual EEG*



*New grant focused on biological basis of how social connections support well-being during adolescence*



Find us out in the community!  
@B\_RADLab

# New CNS Faculty alert!



Dr. Xiaoxue (Jessie) Fu joined the CNS area in Fall 2023. Learn more about her lab!



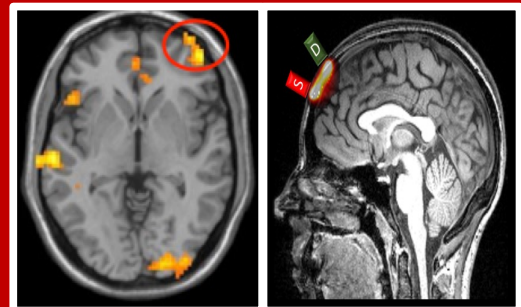
*At the Affective Social Cognition Neurodevelopment (ASCENT) Lab, we take a developmental psychopathology perspective to study how early risk factors impact the way that children perceive and interact with their social world. We do this by implementing neural, cognitive, and behavioral measurements in our laboratory. We focus on examining and characterizing the neurocognitive and behavioral processes that lead to either adaptive or maladaptive developmental pathways for at-risk children.*

## Snapshots from Dr. Fu's lab:

### Computer-based eye tracking



### Functional magnetic resonance imaging (fMRI)



### Mobile eye tracking



### Functional near-infrared spectroscopy (fNIRS)



# Psychology benefits from diversity

Psychological sciences must capture the full range of human experiences in order to truly understand psychological constructs or phenomena. Different identities in race, gender, and culture shape influence individuals' psychology. Everyone benefits if the field of psychology is representative of the population as a whole. A more representative workforce of psychologists is more likely to pursue questions and problems that reflect a broader perspective on humanity.

## ***Everyone belongs in science.***

In the Psychology Department at UofSC, we aim to improve diversity in psychology and in the psychology workforce. In addition to recruiting graduate students and faculty from a variety of backgrounds, the Psychology Program has active research programs addressing a wide variety of topics including racial and gender disparities, stereotyping, how aesthetic perceptions may differ by race, rural health disparities, and many more.

### Here are some diversity initiatives from the CNS Programs:

#### **Inclusion in Neuroscience**

The CNS concentration will be hosting a table to celebrate inclusion in neuroscience at a UofSC event during Brain Awareness week March 13-19, 2023!

As an example, Dr. Caitlin Hudac and her research group have developed resource guides for prospective participants *and* researchers to encourage more individuals with coarse and curly hair types to participate in brain research using EEG. See videos here: <https://www.b-radlab.com/what-is-eeeg.html>



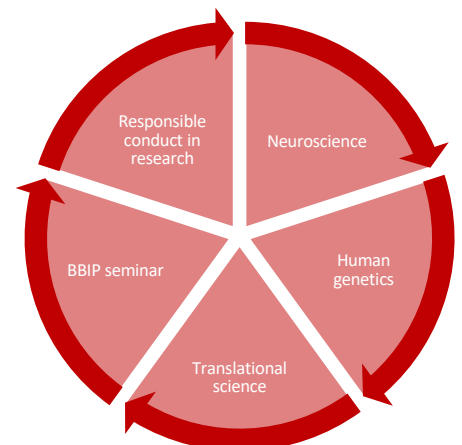
## Behavioral-Biomedical Interface Program (BBIP)

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/study/graduate/behavioral\\_biomedical\\_interface\\_program/](https://sc.edu/study/colleges_schools/artsandsciences/psychology/study/graduate/behavioral_biomedical_interface_program/)

BBPI is an interdisciplinary research training program designed for select doctoral students in epidemiology, exercise science and psychology.

**Students apply for BBIP in conjunction with the Psychology program, so talk to the faculty early and often!**

This program is supported by a prestigious NIH T32 pre-doctoral research training grant (5T32GM081740) from the National Institute of General Medical Sciences.





# Careers after the UofSC CNS Program

## Postdocs:

### Currently completing postdoctoral scholarship

- Dr. Victoria Macht (2018), University of North Carolina, Chapel Hill
- Dr. Michael Cranston (2018), Uniformed Services University of the Health Sciences
- Dr. Spencer MacAdams (2019), Wake Forest School of Medicine
- Dr. Kristen McLaurin (2020), University of South Carolina
- Dr. Chuanji Gao (2020), Donders Institute for Brain, Cognition, and Behaviour
- Dr. Adam Denton (2021), Medical University of South Carolina
- Dr. Alex Steiner (2021), Vanderbilt University
- Dr. Jessica Illenberger (2021), The Scripps Research Institute
- Dr. William Hayes (2022), Indiana University



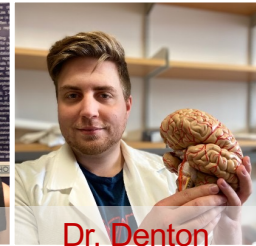
Dr. Macht



Dr. Cranston



Dr. McLaurin



Dr. Denton



Dr. Jocoy



Dr. Xie



Dr. Kim

## Academics:

Our CNS graduates work in a wide range of settings. Here are some examples of careers from our recent alumni:

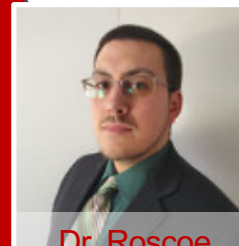
### Professor/Instructor conducting research, teaching, and training students at a university or liberal arts college

- Dr. Jongwan Kim (2015), Jeonbuk National University
- Dr. Wanze Xie (2017), Peking University
- Dr. Kathleen Jocoy (2019), Frostburg State University
- Dr. Christine Weber (2020), University of South Carolina
- Dr. Kristin Kirchner (2022), Valdosta State University

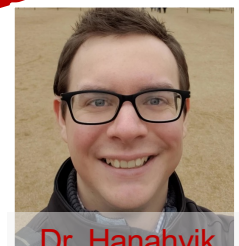
## Industry / Government:

### Working for a business, organization, or government agency to understand or change aspects of human behavior

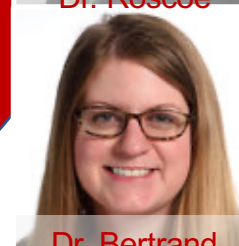
- Dr. Sarah J. Bertrand (2014), Senior scientist at Transcend Therapeutics
- Dr. Taylor Hanahyik (2019), of Clinical Neurosciences
- Dr. William Brixius (2017), ReseAnalysis research software engineer at University of Oxford, Nuffield Department arch specialist at SR Research Ltd
- Dr. Robert F. Roscoe (2017), Product manager at IsoPlexis
- Dr. Jonathan Rann (2023), Computer Scientist, Naval Information Warfare Center, US Department of Defense



Dr. Roscoe



Dr. Hanahyik



Dr. Bertrand



Dr. Rann

# INTERVIEW WITH CURRENT CNS GRADUATE STUDENTS



**Jacob Watson**

*3<sup>rd</sup> year doctoral student with Dr. Vento*



**Sewon Oh**

*4<sup>th</sup> year doctoral student with Dr. Shinkareva*

## Area of study

**Behavioral neuroscience** with an emphasis on addiction and addiction-related behaviors

**Cognitive Neuroscience** with an emphasis on mechanisms underlying emotion perception.

## Why did you choose CNS @ USC?

I chose the Cognitive and Neural Sciences program here at USC because it provides opportunities to work with a diverse group of faculty from a wide range of psychological specialties.

I chose CNS at USC because of the faculty expertise and an opportunity to learn machine learning methods for fMRI data analyses.

## What is the best strength of our program?

How helpful and resourceful our faculty are! Whether it be coursework, independent research, or meeting deadlines, I know I can rely on my professors and mentors to offer support and guidance!

I love how strong and diverse the quantitative courses are within the CNS program.

## What do you hope to do after your Ph.D.?

I intend to apply for a post-doctoral fellowship to continue my addiction research.

I intend to continue to a post-doctorate position to deepen and compliment my expertise in emotional perception.

# Applying to the UofSC CNS Concentration

## Recommended steps for preparing an application

### 1. Identify possible mentors & contact them

**Our program uses a mentor model, which means that each graduate student works with a specific faculty member on research.** Sometimes this may involve a primary mentor with possible secondary mentors (see below). We *strongly recommend* that applicants read through the faculty directory to determine which faculty member's research may best match their own interests.

- Faculty list:

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/study/graduate/cognitive\\_neural\\_sciences/cns\\_faculty2](https://sc.edu/study/colleges_schools/artsandsciences/psychology/study/graduate/cognitive_neural_sciences/cns_faculty2)

- Overview of research areas:

[https://sc.edu/study/colleges\\_schools/artsandsciences/psychology/research\\_clinical\\_facilities/](https://sc.edu/study/colleges_schools/artsandsciences/psychology/research_clinical_facilities/)

We encourage you to email the faculty member with any questions you may have, though this is not required. **Applicants will list the faculty member's name who they are interested in working with in their application and should in their personal statement.**

### 2. Prepare application materials

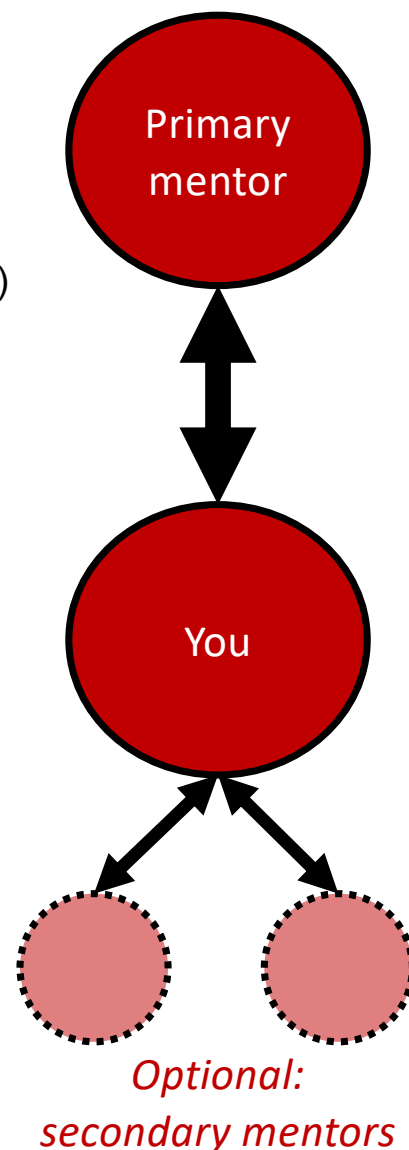
Select Cognitive and Neural Sciences concentration.

Your application will include:

- **A resume or curriculum vitae** ("CV")
- **Education transcripts** (e.g., college, graduate programs)
- **3 letters of recommendation** (e.g., instructors, research faculty)
- **Personal statement (Statement of Purpose)**: see tips below!
- **Official transcript**
- The GRE is **NOT** required and will **NOT** be reviewed
- *Optional*: Writing samples (e.g., thesis, course paper)
- *Optional*: Diversity statement

**Tips for your personal statement: This should speak to:**

- Why are you interested in the UofSC CNS Program?
- Your preparation for graduate school
- Details about your research experiences and scholarly products
- Your writing and quantitative skills (and, if relevant, how you've handled past challenges).
- How your cultural, ethnic, or personal backgrounds will bring a unique and diverse perspective to the graduate program.
- **Include the names of 1-3 potential faculty mentors and why your research focus aligns with their work.**



# Applying to the USC CNS Concentration

## 3. Submit application to the Graduate School

Submit your application by **December 1** on the graduate school website:

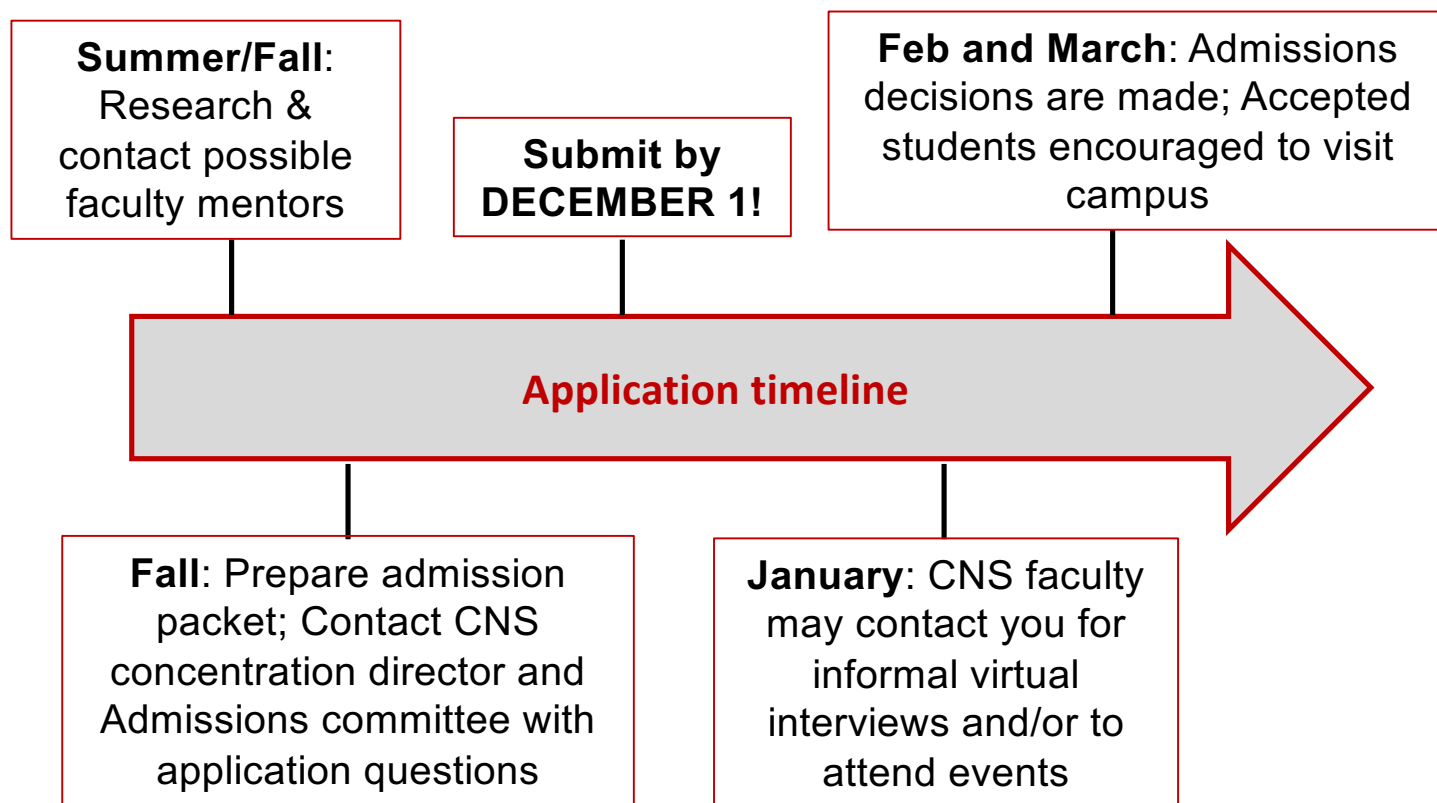
[https://sc.edu/study/colleges\\_schools/graduate\\_school/apply/degree\\_programs-application-requirements/psychology-phd/index.php](https://sc.edu/study/colleges_schools/graduate_school/apply/degree_programs-application-requirements/psychology-phd/index.php)

**There are no application fees this year!**

## 4. Process for admissions decisions

### How are admissions decisions made?

We have an admissions committee that review all applications and sends applications to faculty that may be a potential match. Decisions about admission are often made based on how well the applicant's research interests match those of the faculty member, as well as the applicants' potential for success in graduate school. Faculty may contact you for an informal virtual interview. Faculty members consult with other program faculty to make final admissions decisions. Although we do not currently have plans for any on-campus events, we encourage accepted students to arrange for a campus visit with their faculty mentor.



We hope to hear from you – let us know if you have questions or want to start chatting about science. Best of luck!

# QUESTIONS?

**Cognitive and Neural Science Concentration**

CNS Director: Jennifer Vendemia ([JMVCV@sc.edu](mailto:JMVCV@sc.edu))

Admissions committee:

• Caitlin Hudac: [chudac@mailbox.sc.edu](mailto:chudac@mailbox.sc.edu); @greatcait

• Peter Vento: [pvento@mailbox.sc.edu](mailto:pvento@mailbox.sc.edu); @peter\_vento

