

INDIVIDUALIZED MAJOR STATEMENT OF PURPOSE COGNITIVE NEUROSCIENCE

This individualized major is intended to draw knowledge from a variety of disciplines, with a focus on specific classes from the departments of Psychology, and Physiology and Neurobiology. While a double major in these fields might offer a broad range of study, centered around the investigation of thought processes and the chemical structure of the brain, they inevitably offer little direction for my intended career path, which focuses more on normal development, abnormalities in the brain, and its assessment through subject behavior. Currently, I have begun to pursue a major in Cognitive Science with a minor in Neuroscience (since Neuroscience is not offered as a major) working under the direction of the Psychology Department. While these two areas certainly place more focus on the analysis and assessment of cognitive abilities, they fail to stress the areas of subject evaluation I feel are important to my plan of study. As an Honors student, I plan to compose my Honors Thesis on the effects of brain damage and learning disabilities using animal models, focusing on the assessment of brain disorders by using systematic behavioral testing. I do not feel this can be adequately achieved through an interdisciplinary major as indiscriminate as Cognitive Science, or as restrictive as a minor in Neuroscience.

Through my proposed plan of study, I will gain a comprehensive understanding of human learning and perception, among various other neurological processes, in addition to the deficits caused by hormones, drugs, and other detrimental influences. Culture, Language and Thought (ANTH 244), Principles of Research in Psychology (PSYC 202WQ) and Symbolic Logic (PHIL 211Q) serve as starting points for this major, providing general theories for how human thought is categorized and employed, while challenging my own methods of understanding and assessment. This continues with Principles of Linguistics (LING 202) and Developmental Psychology (PSYC 236), which include, but are not limited to, topics such as first language acquisition and normal stages of cognitive development throughout childhood. Additionally, courses like Biology of the Brain (PNB 251) and Physiological Psychology (PSYC 257) would provide essential background on the chemical makeup of the brain and how the body works with the brain to perform various tasks. These classes would provide the basis for courses examining basic cognitive abilities, some of which include Sensation and Perception (PSYC 254), and Learning (PSYC 220). Extensive study on areas of normal mental development would in turn, allow for better understanding of the effects of external influences. This of course, would be addressed in classes like Hormones and Behavior (PNB 230), Drugs and Behavior (PSYC 259), and Abnormal Psychology (PSYC 245).

Outside the traditional classroom setting, I am planning to begin research with a faculty advisor in the fall, through the Psychology Department (PSYC 297). There are currently two options for research available, and the one I choose to pursue will depend of course on the hours determined by my course schedule. One will explore the effects of dyslexia on cognitive abilities beyond that of just reading comprehension, while the other will determine the long-term effects of prematurity on learning and memory. In both cases, we will be humanely administering conditions to create certain changes in the organization of a rat brain, subsequently modeling the

improper lateralization of a human with dyslexia, and the environment that premature infants endure during the first crucial period of development. Tests will be administered throughout the semester, including rat mazes and other set-ups examining task performance. By drawing upon knowledge regarding normal human development, especially testing for skills in infancy, the same methods of research can be applied to the animal models in the lab.

Following my undergraduate career, I plan to attend graduate school, where I will study Neuropsychology and ultimately obtain my PhD. Neuropsychology, while it does base its understanding of cognitive functions on the core chemistry of the brain, relies more on the manifestation of irregularities through subject behavior. As of now, brain damage due to abnormalities in structure or incurred through injury cannot be properly assessed in live subjects, as the brain itself must be thoroughly examined and manipulated. Since information obtained from handling the brain directly cannot be achieved through the use of current imaging tools, subjects must instead be evaluated based on their competency in certain cognitive tasks. By studying subject behavior in various situations and providing in-depth neuropsychological assessments, mood, behavior, and basic cognitive abilities can be properly evaluated. The subject's level of competency on area-specific tasks would then pinpoint precise locations of brain damage or abnormal development. This in turn, allows for appropriate diagnosis and treatment of the patient. For these reasons, I feel an interdisciplinary major, focusing on behavioral patterns and research methods is adequately represented by the departments I have specified, and appropriately reflected by the distinct title of Cognitive Neuroscience.