

Evidence and Inquiry Certificate

The College of Natural Sciences Honors Center
Home of Polymathic Scholars

Before We Sleep

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I intend to examine how the mind can utilize different
sleeping states to enhance artistic creativity."*

Ren Daley

Natural Sciences

Neuroscience

Describe your field of study. What are some of the questions you would like to answer, and what academic disciplines do you think will be useful in answering them?

My best ideas always seem to come at the most fleeting time of the day, right before I slip into a long night of sleep. I seek to understand this sleep-induced imaginative state, and how a heightened sense of thoughtful creativity can be equipped to aid the conscious brain. In my interdisciplinary field of study, *Before We Sleep*, I intend to examine how the mind can utilize different sleeping states to enhance artistic creativity.

There are infinite avenues to explore the relationship between sleep and creativity. One form is through hypnagogia, the transitional state of consciousness between wakefulness and sleep. The most active parts of the brain and the types of brain waves emitted during hypnagogia may concur with neural activity happening during creative exploration. Identifying ways to induce a state similar to hypnagogia through alternative activities, without falling asleep, could help produce the same heightened creative state. There is a largely unexplored creative process during this unique transitional sleep state that could be the answer to some of the world's best literature, music, and art.

Artists and creatives spanning time and culture have noted the impact of different sleeping states in their work. The surrealist artist Salvador Dalí called certain states “slumber with a key”, and Mary Shelley said that the idea for her novel *Frankenstein* came to her during a “waking dream” (Mota-Rolim et al., 2021). Charles Dickens even describes these sleeping conditions through famous characters such as Ebenezer Scrooge, exemplifying how science can excite, rather than reductively explain, creativity and the neural bonds that forge a heightened imagination in people. I am interested in exploring and identifying the neurological processes that link sleep to innovation. In doing so, the possibilities for an unexplored realm of artistry that exceeds the limit of the fully conscious brain could be unlocked.

My curriculum will draw on the perspectives of Neuroscience, Psychology, Literature and Creative Writing, as well as the Fine Arts.

Why are you interested in studying this topic?

11:53 pm, Friday, September 23rd. At this point, I've changed my field of study about sixty billion times in my head, but it has to be perfect. It needs to be something I love, but something other people love! Oh, and it couldn't hurt if my research got me into every medical school I applied to and won me a Nobel prize in the process. I can practically envision when the clock strikes midnight. Dr. Corson comes up to me, she hands me a slip of paper. I fall to my knees in tears. I've been kicked out of Polymath for having the worst Section 1 *in existence*.

Okay, I'm not actually thinking that— I have some grip on reality. But I am pulling my hair in frustration in the middle of FAC at my inability to choose a topic. I lean back in frustration and close my eyes as I will the perfect idea to come to me. I wish for one moment that I could be safely tucked away in my bed, saturated with squishmallows and my illegally soft sage green blanket. I always have my *best* ideas in that bed, right before I'm about to fall asleep. It's like my creative writing brain explodes with ideas of witty one-liners and conversations of betrayal and brilliant dialogue I could only hope to think of during the waking day. I laugh, if only I

could learn some way to harness that kind of sleepy creativity right now... *genius strikes*.

I don't know why I didn't think of it sooner. As a writer, unlocking every facet of imagination is a necessity for me. It couldn't be just me who wanted to know this infinitely more thoughtful and creative version of myself I found in my pre-sleeping state. Every painting I make, every instrument I play, every line I write, are they just a fraction of what I can come up with when the lights turn off and reality fades? Understanding the brain and sleep and my odd dreams inspired me to pursue neuroscience in the first place. I mean, *why* was I dreaming about field trips with the Russian prime minister to a strawberry lemonade garden? It never occurred to me until I started wracking my brain in the middle of FAC that maybe I wasn't alone in seeking answers.

- Name two faculty with research interests in your area. Include their home and relevant research interests. If a research interest isn't obviously related to your topic, explain its relevance.**

Dr. Hongjoo Lee: Department of Psychology, primary research goal has been to use a multidisciplinary approach to understand amygdala-dopamine systems in learning and memory, and applying this knowledge to better understand the nature of emotional and cognitive thought processes seen among people with neurological disorders.

Dr. Jacqueline D. Woolley: Department of Psychology, focuses on conceptual development in preschool and elementary school children, concept of mind, religious cognition, and the fantasy-reality distinction.

- Explain how each course is relevant to this field. What do you hope to learn from each?**

Primary Courses

NEU 466G

Functional and Synaptic Neuroanatomy.

The course covers neuroanatomy and the function of synapses as a basis for brain function and behavior. This would be a great course to cover foundational knowledge on how the brain works and molds to possibly encourage creative thinking.

CRW 325

Creative Writing

There is much anecdotal evidence from authors and writers on the impact of hypnagogia on therapeutic thinking and taking a creative writing course would give me a practical approach to understanding their mindset and the possible scientific implications on creativity in writing.

PSY 333F**Fantasy And Reality**

This course is important to understanding the blurry boundaries in a hypnagogic state where one balances their present reality before slipping into their subconscious. This would help me gauge a better understanding of the psychological implications of distinguishing between what is real and what isn't and how fantasy may contribute to creativity in reality.

PSY 341K**Psychology Of Consciousness**

This lecture course is designed to provide students with an understanding of the process of brain development from embryogenesis through adulthood with emphasis on the role of the environment in directing this process. Having a thorough understanding of what environmental roles affect how we consciously and unconsciously think is necessary to unlocking the creative potential during the hypnagogic state.

PSY 332S**Psychology and Neuroscience of Sleep**

Discusses the scientific literature on neuroscience underlying sleep, psychological influences on sleep, and sleep habits and interventions. Understanding how we psychologically create when we aren't fully awake would help me build bridges to the differences when we're awake.

SOC 322C**Sociology of Creativity**

Introduction to varying aspects of creative insights, human consciousness, social processes, and the 'invention of reality.' Understanding how humans invent reality would provide valuable knowledge to creativity at different levels of consciousness.

