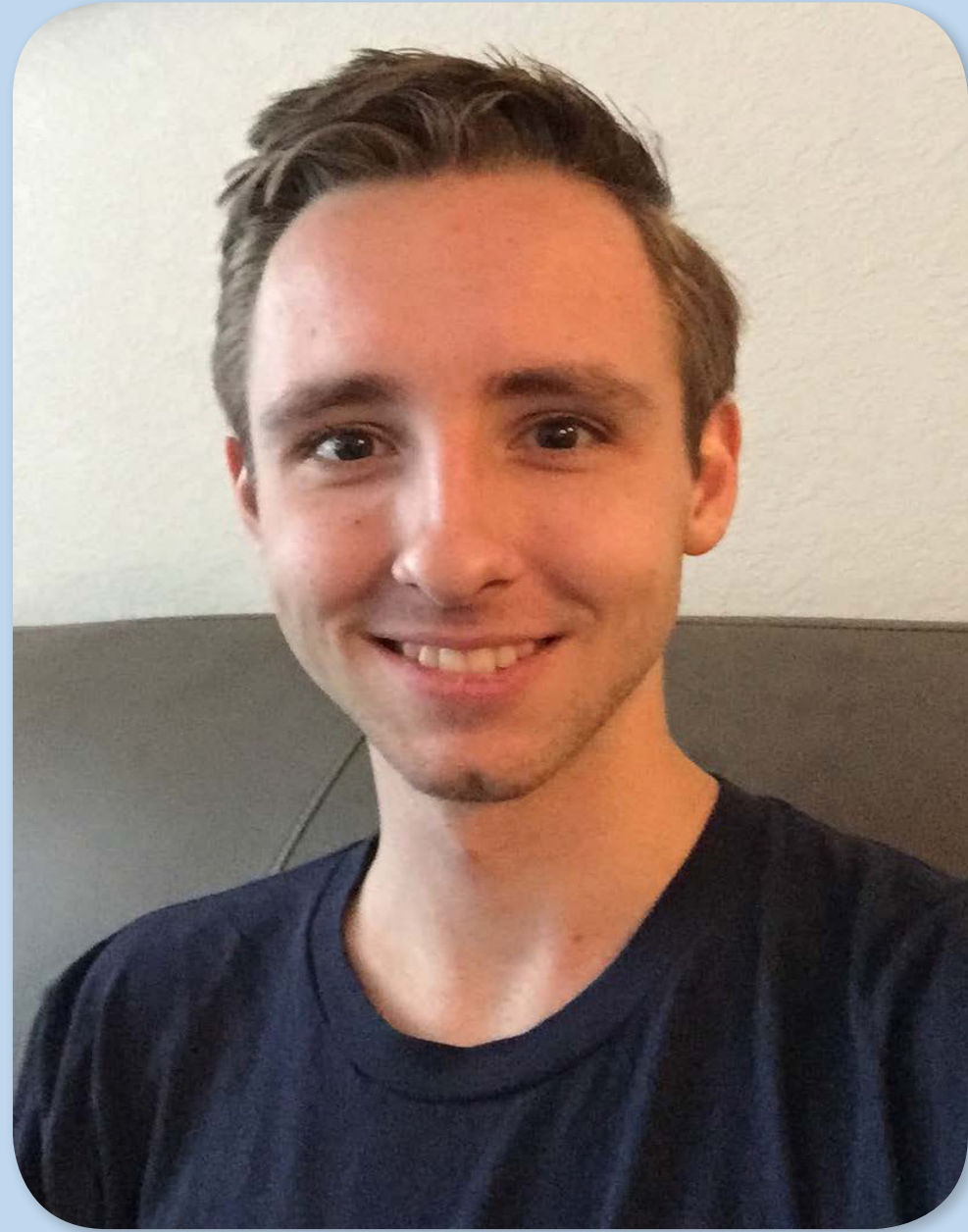


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Throughout my exposure to the niche field of musical neuroscience, I have noted that the vast majority of research centers around Western musical traditions. This dearth of cross-cultural literature in musical neuroscience is a gaping hole within the discipline. When musical neuroscience research is restricted to Western concepts, structures, and participants, it discounts how different experiences can create significant variation in culturally-based brain processes. My Burch Fellowship immersed me in the Balinese gamelan musical tradition, allowing me to experience first-hand how this non-Western musical system functions through the eyes of performers, audience members, and individuals in another culture.

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MUSICAL NEUROSCIENCE IN INDONESIA

For the past year I have worked in the Frohlich Lab, studying the neurological effects of rhythmic entrainment—the natural synchronization of neural processes with an external rhythmic stimuli. The neurological relevance of entrainment makes it a fundamental principle of music therapy, where



rhythmic interventions can be used to synchronize movements in physical therapy rehabilitation, reduce stress and repetitive behavior in children with autism spectrum disorders, and assist motor control in patients with Parkinson's disease. This research has the potential to help explain how neurological entrainment could be used for therapeutic applications, yet I wondered if the effects we are trying to document could vary across different musical traditions and populations.

This musical tradition of gamelan in Bali, Indonesia is conceptualized in a drastically different way than Western music. Its repetitive and homogeneous structure has been studied and



linked to trance and entrainment by cultural anthropologists and ethnomusicologists alike, making it an ideal complement to my study of Western musical practice. In Bali, I worked with Mekar Bhuana, a non-

profit organization dedicated to the documentation and understanding of traditional Balinese gamelan music and dance. The organization connects a network of local musicians to bring traditional compositions to life, while also working to

educate the public through private instruction, workshops, and performances. Their ultimate goal is to inspire an understanding and love of traditional music and dance in Balinese youth. Each day I studied a variety of gamelan styles one-on-

one with local musician and composer I Wayan Gede Purnama Gita S.sn, rehearsed with Mekar Bhuana's Semara Pagulingan orchestra, attended gamelan performances, and continued to work remotely on the research I conduct in the Frohlich Lab.

Studying gamelan music was a challenge for me, as it must be approached in a different way from the Western musical traditions I was familiar with. There is no notation, everything is learned through listening, repetition, and "feeling" the music. Rhythm is organized hierarchically, and subtle interplay between the performers gives rise to a malleable pulse. There is no single conductor

spacing or leading the ensemble, musicians achieve entrainment collectively. The rhythmic patterns I learned to play served a novel role within the ensemble, interlocking with a sibling instrument to produce a duet

interlocking pairs, creating a thick musical texture that glistens through the air. I also had the honor of performing with Mekar Bhuana's ensemble in the Bali Arts Festival, an opportunity few foreigners are given.



Playing the role of a performer—not only in rehearsals but before an audience—was invaluable, giving me insight into how musicians compose themselves in a performance setting as well as giving me the opportunity to let go and lose myself in the collective wash of a traditional gamelan performance.

The thorough understanding of Balinese gamelan I accumulated through my Burch Fellowship



is invaluable to me, expanding both my scientific and musical perspectives. I can now take the rhythms I have learned and work them into my own compositions, as well as use Balinese perspectives on musicianship to fuel my own musical development. I also now have the accrued knowledge to facilitate and inform a future cross-cultural study. This in-depth expertise of how another culture engages with rhythm is vital to designing and carrying out research that is sensitive to both cultures involved and is not biased to a Western audience. As the most foreign experience of my life to date, it has further bolstered me with the confidence and skills to move forward with my goals of conducting cross-cultural research. This work is complicated and difficult to perform well, but its need is paramount if we are to truly understand the brain and ourselves in a holistic manner.



Bali,
Indonesia