RESEARCH STATEMENT

Music is a cultural universal capable of altering our brains and behavior. Although the origins of music are unknown, it is generally accepted that music functions as an evolutionary mechanism for social and emotional bonding. For instance, music provides a unique intersection between subjective experience and social belonging. In settings like a live musical performance, emotional responses can be enhanced with the knowledge that others are sharing in the same experience. Similarly, learning an instrument is shown to improve the executive functions of inhibition, working memory, and cognitive flexibility; playing an instrument requires bilateral cortical processing of sound, the precise coordination of body movements, and the integration of auditory and motor systems. Regardless of the varied and meaningful ways music can modify brain structure and cognitive function, additional research is required before we can identify the mechanisms underlying these phenomena. For example, research on musical training tends to focus on the cognitive benefits of music education or its use as a model for brain plasticity. However, the extent to which biological/genetic factors influence a musician's brain development presents a sparsely researched confound.

Through the Dornsife Neuroimaging Center and the constellation of labs, individuals, and resources available at the University of Southern California, the Brain & Music Lab is conducting meaningful research into music-evoked emotion and musical development. Their ongoing projects are looking to clarify both the neural mechanisms which underlie musical emotion and the effects of musical training on socioemotional and cognitive development. Their research on music and emotion combines multivariate, data-driven analysis with whole-brain and dynamic functional connectivity techniques that assess temporally sensitive neural activity in response to emotional music. Likewise, their longitudinal study on musical development follows children from under-resourced communities in Los Angeles as they start and continue musical training. Assessing their development through psychometric measurements and neuroimaging has given us a better understanding of music education's impact on improving executive functioning and cognitive development in under-resourced communities, separate from pre-existing biological traits.

With the support of a Paglia Fellowship, I will collaborate directly with the Principal Investigator of the Brain & Music Lab, Dr. Assal Habibi, and her team of graduate and postdoctoral researchers. My role in this lab will involve designing and implementing studies on music-evoked emotion and musical development. I will learn to collect neuroimaging data from school-age children using techniques such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI). I will also undergo programming training to analyze collected data through machine learning techniques such as multivoxel pattern analysis (MVPA). Enriching my skill set with neuroimaging and machine learning techniques will complement my experience with subjective and behavioral measures. These methods will allow me to approach music-related phenomena through multiple dimensions, affording me a more holistic understanding, and preparing me for a career in musical psychology.