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Auditory experiences come in many different forms, such as immersion in a particular linguistic community, exposure to voices of people with different racial backgrounds, or repeated encounters with music of a particular tradition. In most circumstances, these experiences are asymmetric, meaning one type of experience occurs more frequently than other types (e.g., a person raised in India will likely encounter the Indian Todi scale more so than a Westerner). In this talk, I will discuss recent findings from my laboratory that reveal the impact of short- and long-term asymmetric linguistic and musical experiences on how our nervous system responds to complex sounds. I will discuss experiments such as those that examine how musical experience may facilitate language learning, how listeners develop increased sensitivity to voices spoken by talkers of their own race, how musicians develop neural circuitries that are sensitive to musical melodies played in their instrument of expertise, and how even non-musicians are particularly sensitivity to music of their own culture(s). An understanding of these experiential asymmetries is useful in formulating a more comprehensive model of auditory perceptual expertise that considers how experiences shape auditory skill levels. Such a model has the potentials to aid in the development of programs targeting language learning and treatments of communication disorders.