Benefits of Childhood Music Training on Learning a Second Language

Does childhood training in the Arts yield a higher cognitive advantage—and for how long? A hotly debated topic has been whether early and extensive training in, for example, music might enhance learning in other higher cognitive domains (e.g., "Mozart effect" c.f., Rauscher, Shaw, & Ky, 1993). Recently, several carefully designed studies have supported this hypothesis. Schellenberg (2004) found that children participating in music training showed cognitive benefits in the form of higher IQ scores after approximately one year. However, the duration and the nature of such cognitive benefits are not known and are under serious debate. We ask whether early childhood music training yields cognitive benefits that persist into adulthood. Music training requires attention to multiple dimensions of patterned sequences, such as rhythm and pitch, some of which have been asserted to be akin to regularities in the linguistic stream. There also is evidence that aspects of musical processing occur in shared language areas in the brain (i.e., Broca's area; Levitin & Menon, 2003). Here we use the lens of learning a second language in adulthood to investigate whether there are cognitive benefits from childhood music training that are long-lasting. We hypothesize that early childhood music training will lead to an enhancement of language-learning abilities whereupon Musicians will outperform Non-Musicians when learning a second language in a formal instructional setting.

Subjects & Methods: Participants were monolingual college students who were enrolled in an introductory language class (Italian I, or Spanish I; N = 24). Participants underwent rigorous screening to assess music and language background to determine "Musician" and "Non-Musician" groups. "Musician" was assessed as per expert/novice criteria (e.g., Ericsson et al., 1993) with "Musicians" being individuals who had (i) at least 5 years of formal music training, (ii) started before the age of 9, (iii) maintained musical training into adulthood,

(iv) professional performance experience, and (v) found their musical training pleasurable as indicated on a standard self-evaluation assessment. Experimental tasks included: (a) a general attention task (Stimulus Response Compatibility), (b) a language competence and proficiency task in the native and new languages (Italian or Spanish), administered at the beginning and end of one academic term, (c) SAT scores (to equate academic achievement), and (d) new language self-evaluation.

Results: (a) General Attention: There were no differences in accuracy between Musician and Non-Musician groups ($p > .05$), suggesting that the groups had comparable general attention abilities. (b) Language: *Remarkably, Musicians performed significantly better than Non-musicians on all measures of language competence and proficiency in their new language.* All participants scored equally high on their native language competence. (c-d) Both groups had comparable SAT scores ($p>.05$) and rated themselves comparably as average-good in class performance.

Conclusions: The results suggest that childhood musical training may provide a life-long higher cognitive advantage that improves one's ability to learn new languages in adulthood. For those who design educational curricula for young students, these findings indicate that there may be a multifaceted, lifelong impact of early Arts education on children's cognitive development.