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23 Musical Training May Not Enhance Cognitive-Motor Integration in Healthy Young Adults.

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Objective: Hand and arm functions have been associated with cognition in healthy young and older adults (Vasylenko et al., 2018) and in patients with Parkinson's disease (Bezdicsek et al., 2014). Music training has been proposed to integrate motor and cognitive functions by engaging motoric, sensory, perceptual, and various cognitive domains (Wan & Schlaug, 2010). In this study, we examined if performance on fine and gross motor tasks is predicted by cognitive measures of memory, attention, and executive functions, and whether this relationship varies by the extent of musical training in healthy young participants.

Participants and Methods: Forty five healthy young participants were recruited ($M = 22.32$, $SD = 4.10$; 78% female). Participants completed fine (Grooved pegboard) and gross motor (Box and Blocks) measures as well as cognitive measures (Rey auditory verbal learning test, Stroop, Trail making, and D2 cancellation), and the musical training subscale of the Goldsmith Musical Sophistication Index. Two multiple regression models were conducted assessing cognitive measures as predictors of fine and gross motor functions, with musical training as a covariate in both models.

Results: Musical training was normally distributed across participants ($M = 23.47$, $SD = 10.28$). The results of the first model assessing the role of cognitive measures as predictors of fine motor function indicate a moderate fit ($F(5,36) = 3.32$, $R = 0.55$, explaining .32 of variance, $p < .05$), with memory ($B = 2.75$, $SE = 0.82$, $p < .005$) and sustained attention ($B = 0.09$, $SE = 0.03$, $p < .01$) as moderate predictors. These cognitive measures were also found to predict gross motor function ($F(5,36) = 3.06$, $p < .05$, $R = 0.55$, explaining .30 of the

variance), with memory retention ($B = 2.49$, $SE = 0.83$, $p < .001$) and sustained attention ($B = 0.07$, $SE = 0.03$, $p < .05$) as moderate predictors. In both models, musical training was not a significant predictor.

Conclusions: We found that both fine and gross hand motor functions are predicted by cognitive measures of memory retention and sustained attention. Our results support previous findings associating cognition and motor function, with attention being relevant in young adults and memory a predictor in older adults (Vasylenko et al., 2018). We corroborate these findings for hand function, but did not find executive functions to be implicated, which were previously reported as a predictor only for older adults. While musical training has been suggested to enhance the cognitive-motor relationship as it involves motor skills as well as engages various cognitive domains (Wan & Schlaug, 2010), prior musical training was not found to affect this relationship. While music background did not predict better hand motor function, it did account for more interpersonal variance. The results suggest that for most amateur musicians, including those with years of experience, musical training may not affect the association between cognition and both fine and gross hand motor skill. The current findings indicate that while musical training can be an enriching experience, it may not (exclusively) enhance motor-cognitive integration. Different outcomes may be found with more extreme levels of music training, or a different age group.

Categories: Movement and Movement Disorders

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24 Functional Distinctions in Metabolic Network Patterns in Parkinson's Disease

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Objective: Cognitive decline is a common non-motor feature of Parkinson's disease (PD). However, the underlying mechanisms of