The Effect of Musical Training on Multisensory Reaction Times

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Introduction: Our perception of the world is based on the combination of multisensory cues provided by our senses. Recent studies have suggested that musical training can have an influence on these multisensory interactions. However, these investigations often use musically-related methodologies. Moreover, results are often analysed with musical training as a binary construct, which ignores the possibility of control group participants having limited but significant musical experience. In this present study, we look at audiotactile reaction times of non-musical stimuli in relation to self-reported musical training scores for all participants.
Methods: Individuals with long-term musical training were paired with control group participants and completed a musical sophistication questionnaire to assess their level of musical training. A non-musical audiotactile reaction time task was used. Participants were presented with 50ms white noise bursts, 50ms vibrotactile stimulations, or both simultaneously, and had to respond as quickly as possible. Each of the three stimulation type was randomly presented 180 times.
Results: Analysis of preliminary results suggest that musicians have statistically significant faster reaction times for tactile stimuli (p=0.031), but not for auditory (p=0.211) or audiotactile (p=0.200) stimuli. Furthermore, reaction times for each modalities were correlated with self-reported musical training scores and found significant negative correlation between musical training scores and tactile reaction time (r=-0.426, p=0.044) but not for the auditory (r=-0.290, p=0.130) or audiotactile (r=-0.242, p=0.175) reaction times.
Conclusion: Previous investigations have revealed enhanced audiotactile interactions in musicians. The present data suggest that these results could be explained by superior unimodal tactile ability in musicians, which might have an influence on multimodal perception. This is in line with neuroimaging studies that have revealed an increased cortical representation of the fingers for musicians. Moreover, statistically significant correlations between tactile reaction times and musical abilities suggest that exposure to any musical training can decrease tactile reaction times. These data, which suggest for the first time a correlation between exposure to musical training and enhanced multisensory ability, highlight the importance of considering musical training as a spectrum instead of a binary construct.