Music training for children with sensorineural hearing loss improves speech-in-noise perception

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A growing body of evidence suggests that long-term music training provides benefits to auditory abilities for typical-hearing adults and children. The purpose of this study was to evaluate how music training may provide perceptual benefits (such as speech-in-noise, spectral resolution, and prosody) for children with hearing loss. Method Fourteen children aged 6-9 years with prelingual sensorineural hearing loss using bilateral cochlear implants, bilateral hearing aids, or bimodal configuration participated in a 12-week music training program, with nine participants completing the full testing requirements of the music training. Activities included weekly group-based music therapy and take-home music apps three times a week. The design was a pseudorandomized, longitudinal study (half the cohort was wait-listed, initially serving as a passive control group prior to music training). The test battery consisted of tasks related to music perception, music appreciation, and speech perception. As a comparison, 16 age-matched children with typical hearing also completed this test battery, but without participation in the music training. Results There were no changes for any outcomes for the passive control group. After music training, perception of speech-in-noise, question/statement prosody, musical timbre, and spectral resolution improved significantly, as did measures of music appreciation. There were no benefits for emotional prosody or pitch perception. Conclusion The findings suggest even a modest amount of music training has benefits for music and speech outcomes. These preliminary results provide further evidence that music training is a suitable complementary means of habilitation to improve the outcomes for children with hearing loss.

Un numero crescente di evidenze suggerisce che la formazione musicale a lungo termine fornisce benefici alle capacità uditive per adulti e bambini con udito tipico. Lo scopo di questo studio era valutare come la
Consonance and dissonance are basic phenomena in the perception of chords that can be discriminated very early in sensory processing. Musical expertise has been shown to facilitate neural processing of various musical stimuli, but it is unclear whether this applies to detecting consonance and dissonance. Our study aimed to determine if sensitivity to increasing levels of dissonance differs between musicians and nonmusicians, using a combination of neural (electroencephalographic mismatch negativity, MMN) and behavioral measurements (conscious discrimination). Furthermore, we wanted to see if focusing attention to the sounds modulated the neural processing. We used chords comprised of either highly consonant or highly dissonant intervals and further manipulated the degree of dissonance to create two levels of dissonant chords. Both groups discriminated dissonant chords from consonant ones neurally and behaviorally. The magnitude of the MMN differed only marginally between the more dissonant and the less dissonant chords. The musicians outperformed the nonmusicians in the behavioral task. As the dissonant chords elicited MMN responses for both groups, sensory dissonance seems to be discriminated in an early sensory level, irrespective of musical expertise, and the facilitating effects of musicianship for this discrimination may arise in later stages of auditory processing, appearing only in the behavioral auditory task.

La consonanza e la dissonanza sono fenomeni fondamentali nella percezione degli accordi che possono essere discriminati molto presto nella elaborazione sensoriale. È stato dimostrato che l'esperienza musicale facilita l'elaborazione neurale di vari stimoli musicali, ma non è così chiaro se ciò si applichi alla rilevazione di consonanze e dissonanze. Lo studio mirava a determinare se la sensibilità a livelli crescenti di dissonanza differiva tra musicisti e non musicisti, utilizzando una combinazione di misure neurali (Mismatch negativity elettroencefalografica, MMN) e comportamentali (discriminazione cosciente). Inoltre, si voleva indagare se focalizzare l'attenzione sui suoni modulava l'elaborazione neurale. Gli Autori hanno usato accordi composti da intervalli che erano altamente consonanti o altamente dissonanti e hanno ulteriormente manipolato il grado di dissonanza per creare due livelli di accordi dissonanti. Entrambi i gruppi discriminavano gli accordi dissonanti da quelli consonanti, sia nelle prove neurali che in quelle comportamentali. L'entità della MMN differiva solo marginalmente tra gli accordi più dissonanti e meno dissonanti. I musicisti hanno superato i non musicisti nel compito comportamentale. Dato che gli accordi dissonanti hanno suscitato risposte MMN per entrambi i gruppi, la dissonanza sensoriale sembra essere discriminata a un livello sensoriale precoce, indipendentemente dall'esperienza musicale, e gli effetti di facilitazione della musicalità per questa discriminazione possono
Perceiving pitch is a central function of the human auditory system; congenital amusia is a disorder of pitch perception. The underlying neural mechanisms of congenital amusia have been actively discussed. However, little attention has been paid to the changes in the motor rain within congenital amusia. In this case-control study, 17 participants with congenital amusia and 14 healthy controls underwent functional magnetic resonance imaging while resting with their eyes closed. A voxel-based degree centrality method was used to identify abnormal functional network centrality by comparing degree centrality values between the congenital amusia group and the healthy control group. We found decreased degree centrality values in the right primary sensorimotor areas in participants with congenital amusia relative to controls, indicating potentially decreased centrality of the corresponding brain regions in the auditory-sensory motor feedback network. We found a significant positive correlation between the degree centrality values and the Montreal Battery of Evaluation of Amusia scores. In conclusion, our study identified novel, hitherto undiscussed candidate brain regions that may partly contribute to or be modulated by congenital amusia. Our evidence supports the view that sensorimotor coupling plays an important role in memory and musical discrimination.
The aim of this study was to investigate the effect of music intervention on breast milk production in breastfeeding mothers. A systematic review and meta-analysis of randomized controlled trials following Cochrane methods were conducted. We performed a literature search in Web of Science, Science Direct, PubMed, MEDLINE, Cochrane Library, CINAHL, the Networked Digital Library of Theses & Dissertations, Ovid and ProQuest without year limitation. The review period covered January 1978-March 2020. Two independent researchers screened the literature using specific keywords and selected randomized controlled trials based on the inclusion and exclusion criteria according to the PICOS criteria. Of 2,081 randomized controlled trials, 5 were included in this systematic review and meta-analysis. The total sample of the five trials was 554 participants. Active and passive music lasting 11-60 min was played in 1-14 sessions. No publication bias was noted. Cochran's Q test results pointed to a low level of heterogeneity among the randomized controlled trials. Overall, the results showed that music intervention had a low and positive effect on breast milk production in breastfeeding mothers. A systematic review and meta-analysis conducted on five trials showed that music can be an effective way to increase breast milk production. Impact: This systematic review and meta-analysis investigated the effect of music on breast milk production in breastfeeding mothers and found sound evidence supporting its positive effects. Nurses, academics, mothers, and their children and society can benefit from these results. Nurses who give counselling to breastfeeding.

The Pierfranco and Luisa Mariani Foundation

Since its beginnings in 1985, the Mariani Foundation has established itself as a leading organization in the field of paediatric neurology by organizing a variety of advanced courses, providing research grants, and supporting specialized care. The Foundation works in close cooperation with major public healthcare institutions, complementing their scientific programs and other activities. In 2009 it became the first private entity in Italy to join the founding members of the National Neurologic Institute “Carlo Besta” in Milan. In addition to its services, the Foundation aims, through its continuing medical education courses and publications, to spread knowledge in the field of paediatric neurology in order to help treat or alleviate a large number of paediatric neurologic disorders.

In the year 2000, the Mariani Foundation has added a new and important dimension to its activities: fostering the study of the multiple links between the neurosciences and music, including music education and early intervention. This significant commitment has inspired the series of “Neurosciences and Music” conferences, held in Venice (2002), Leipzig (2005), Montreal (2008), Edinburgh (2011), Dijon (2014) and Boston (2017). The next congress is planned for 2021 in Aarhus, Denmark, in collaboration with the Center for Music in the
Brain. All these meetings have led to the publication of major volumes in the Annals of the New York Academy of Sciences.

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