Abstracts from the Literature

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Temporary tinnitus as a result of loud music exposure is usually considered as noise-induced damage. Authors performed an epidemiological study to obtain prevalence data of permanent noise-induced tinnitus as well as temporary tinnitus following noise exposure in a young population. A questionnaire was completed by 3,892 high school students (mean age 16.64 yrs) to assess the prevalence of temporary and permanent tinnitus. Also, the “Youth Attitudes to Noise Scale” and “Beliefs About Hearing Protection and Hearing Loss” instruments were used to assess attitudes and beliefs towards noise and hearing protection, respectively. The prevalence of temporary noise-induced tinnitus and permanent tinnitus in these high school students was 74.9% and 18.3%, respectively. Temporary tinnitus prevalence increased with student age. Most students had a neutral attitude towards loud music, and only 4.7% used any form of hearing protection. This limited use was explained by a logistic regression analysis showing the relation between certain parameters and the use of hearing protection. Despite the high prevalence of tinnitus in such a young population, their knowledge about the risks of loud music and the rate of hearing protection use was extremely low. Future preventive campaigns should focus more on tinnitus as a warning signal for noise-induced damage and emphasize also that temporary symptoms can result in permanent noise-induced damage.


Objective tinnitus is an auditory perception in the absence of physical sources. The generation and maintenance of tinnitus are assumed to be based on maladaptive functional cortical reorganization. Short-term and long-term listening to spectrally “notched” music containing no energy in the frequency range at and around the individual tinnitus frequency can considerably reduce the tinnitus-related neuronal activity of primary and secondary auditory cortical structures and alleviate tinnitus perception through lateral inhibition. Using magnetoencephalographic and behavioral measurements, investigators evaluated the cortical plasticity effects of 2 months of 1 hr/day active listening to (unisensory) vs learning to play (multisensory) tailor-made notched music in 26 tinnitus patients. Recognizing that uni- and multi-sensory trainings induce different patterns of cortical plasticity, they hypothesized that the two protocols would have different effects. Only the active listening group showed significant reduction of tinnitus-related activity of the middle temporal cortex and an increase in the activity of a tinnitus-coping-related posterior parietal area. These findings indicate that active listening to tailor-made notched music induces greater neuromorphic changes in the maladaptively organized cortical network of tinnitus patients, while additional integration of other sensory modalities during training reduces those neuromorphic effects. Authors assume that the mechanisms reversing the maladaptively reorganized auditory system that generates tinnitus perception are different from those driving the cortical plasticity induced by music training in healthy brains.


Literature supports the premise that the use of a mirror in a ballet classroom improves proprioception. During rehabilitation, the mirror is an important instrument to improve stability. In some sports, including dance, mirrors are widely used during training. This study wished to evaluate the effectiveness of using a classroom mirror on balance in young dancers. Sixty-four students dancers, age 9–10 yrs, formed the study group. Thirty-two students attending lessons with a mirror were compared to 32 who attended the same lessons without a mirror. Balance was evaluated by the Balance Error Scoring System (BESS), which consists of 3 stances (double limb, single limb, and tandem) on 2 surfaces (firm and foam). Errors in balance during these 20-s trials were assessed at each stance and added to create two total scores (firm and foam) and the final BESS total score. The BESS was employed at the beginning of training (T0) and after 6 mos of lessons (T1). ANOVA analysis showed that, for the BESS total score, there was a difference only due to time (duration) (p<0.05). No other differences due to the group or the time of measurement were found (p>0.05). Analysis of the multiple regression model showed the influence of the values at T0 for all BESS items and the dominance of limb for stability on an unstable surface standing on one or two legs. Preliminary results suggest that using a mirror in a ballet classroom does not improve balance acquisition. On the other hand, improvement found at T1 confirms that at the age of the dancers studied, motor skills and balance can be trained and improved easily.

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Generalized joint hypermobility (GJH) can be associated with musculoskeletal complaints and disability. For some, it is seen as a prerequisite for excellence in certain sports and dance. However, the role of GJH in human performance remains unclear. The purpose of this study was to establish an association between GJH and functional status and to explore the contribution of physical fitness and musculoskeletal complaints to this association. Seventy-two female participants from the Netherlands were recruited from a health professions (36) and a dance/theatre (36) school. Data were collected on physical activity level, capacity for walking distance and jumping, presence of GJH (Beighton score ≥4), muscle strength, musculoskeletal complaints, BMI, and age. Results showed that GJH was negatively associated with all capacity measures of functional status when controlled for age, BMI, and musculoskeletal complaints (p = 0.38 for two measures) compared to subjects without GJH when controlled for age, BMI, and musculoskeletal complaints. In participants with GJH, functional status was not associated with performance measures. Decreased walking and jumping capacities in GJH individuals were likely due to the compromised structural integrity of connective tissue. However, pain, fatigue, and muscle strength were also important contributors to functional status.


This study predicted music performance anxiety (MPA) in skilled flute players. Participants played 2 orchestral excerpts under audition conditions. Prior to the performance, they completed both parts of the State-Trait Anxiety Inventory (STAI), the Kenny Music Performance Anxiety Inventory (K-MPAI), and the Fear of Negative Evaluation (FNE). Electromyography and electrocardiography were performed before and during their playing. Subjects also provided information on their musical achievements and how much time they had spent practicing the test pieces. Investigators assessed levels of musical achievement, as well as relationships between each group of variables entered; MPA was assessed with K-MPAI. The final model included the 3 anxiety measures, the rating of highest level of achievement as a soloist, number of minutes spent practicing the test pieces, and the 2 physiological measures. This model accounted for 70.4% of the variance in MPA, but only STAI-State and FNE contributed significant unique variance to its prediction. This study group, like other musician groups assessed for trait anxiety, had very elevated mean trait anxiety scores compared to a comparable population sample. Trait anxiety did not contribute to the prediction of MPA as hypothesized. Finally, higher anxiety resulted in lower tension in the EMG tracings, a finding which authors believe had not been reported previously.


The use of intracarotid propofol procedure (IPP) to assess musical lateralization has not been reported in the literature until now. This procedure has provided the opportunity to investigate not only lateralization of language and memory functions in epileptic patients but also offers a functional mapping approach with superior spatial and temporal resolution to analyze the lateralization of musical abilities. Literature findings suggest that musical training modifies structural and functional brain organization. Authors studied hemispheric lateralization in a 33-year-old female professional musician with left medial temporal lobe epilepsy. Before epilepsy surgery, testing of musical abilities, language, and memory during IPP was performed by an exhaustive battery focusing on music processing. A selection of stimuli was used to analyze listening, score reading, and temporal discrimination. Results suggested that IPP is an excellent method to determine not only language, semantic, and episodic memory, but also musical dominance in this patient. Neuropsychological testing revealed that the patient’s right hemisphere is involved in semantic and episodic musical memory processes, whereas her score reading and tempo processing require contributions from both hemispheres. IPP can help predict who might be at risk for postoperative musical, language, and memory deficits after epilepsy surgery.
Music is an integral part of the cultural heritage of all known human societies, and most people possess the capacity for music perception and production. Researchers generally agree that both genetic and environmental factors contribute to the broader realization of music ability, with the degree of music aptitude varying, not only from individual to individual but across various components of music ability within the same individual. While environmental factors influencing music development and expertise have been well investigated in the psychological and music literature, the exploration of possible genetic influences has not progressed at the same rate. Recent advances in genetic research offer fertile ground for exploring the genetic basis of musical ability. This review paper begins with a brief overview of behavioral and molecular genetic approaches commonly used in genetic analyses, then critically reviews the key findings of genetic investigations of the components of music ability. Some converging and promising findings have emerged, with several loci on chromosome 4 implicated in singing and music perception, and certain loci on chromosome 8q in absolute pitch and music perception. The gene AVPRIA on chromosome 12q also has been connected to music perception, music memory, and music listening, whereas SLC6A4 on chromosome 17q has been associated with music memory and choir participation. Replication of these results in additional populations and with larger samples is warranted to confirm these findings. Through increased research efforts, a clearer picture of the genetic mechanisms underlying music ability will hopefully emerge. The article’s 166 references provide an excellent source of additional details.


This preliminary study examined the effect of music listening on steroid hormones and the relationship between receptor polymorphisms and musical ability. A pilot study determined the musical ability of the subjects. With both types of music, the cortisol levels decreased significantly in both sexes. Females with very high or very low T levels scored poorly on the test, whereas those with moderately high T levels scored very well. The 17ß estradiol levels increased in males with both types of music, whereas in females the levels increased with chill-inducing music but declined with disliked music. AMMA scores were higher for the short repeat length-type AR than for the long repeat length-type. Comparisons of AR polymorphisms and T levels showed that T levels were within the low range of the short repeat length-type group. This is the first study conducted in humans to examine the relationships between the AR gene, T levels, and musical ability.