The averaged inter-brain coherence between the audience and a violinist predicts the popularity of violin performance

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Why is some music well-received whereas other music is not? Previous research has indicated the close temporal dependencies of neural activity among performers and among audiences. However, it is unknown whether similar neural contingencies exist between performers and audiences. Here, we used dual near-infrared spectroscopy (NIRS) to assess whether inter-brain synchronization between violinist and audience underlies the popularity of violin performance. In the experiment, individual audience members (16 females) watched pre-recorded videos, each lasting 100 s or so, in which a violinist performed 12 musical pieces. The results showed that the popularity of the performance correlated with the left-temporal inter-brain coherence (IBC) between the audience and the violinist. The correlation was stronger at late watching (>50 s) than at early watching (≤50 s). The smaller the Granger causality from the audience to the violinist was, the higher was the popularity of the piece with the audience. Discriminant analysis showed that the IBC could distinguish high popularity from low popularity. Further analysis using support vector regression showed that the IBC could also predict the popularity. These findings reveal the association of IBC with the popularity of violin performance. Music appreciation involves the brains of music producers and perceivers in a temporally aligned network through which audiences perceive the intentions of the performer and show positive emotions related to the musical performance.

Perché alcuni brani musicali sono ben accolti, mentre altri non lo sono? Precedenti ricerche hanno indicato le strette dipendenze temporali dell'attività neurale tra gli artisti e tra il pubblico. Tuttavia, non è noto se simili contingenze neurali esistano invece tra artisti "e" pubblico. Qui, gli Autori hanno usato la doppia spettroscopia nel vicino infrarosso (NIRS) per valutare se la sincronizzazione inter-cerebrale tra violinista e pubblico sia alla base della popularità delle performance con il violino. Nell'esperimento, singoli membri del pubblico (16 femmine) hanno guardato video preregistrati, della durata di circa 100 secondi, in cui un
When classical music relaxes the brain: an experimental study using ultrasound brain tissue imaging

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Recent evidence suggests that biomechanical parameters of the brain, such as Brain Tissue Pulsatility (BTP), could be involved in emotional reactivity. However, no study has investigated the impact of an emotional task on BTP. We used the ultrasound method of Tissue Pulsatility Imaging (TPI) to assess changes in BTP to exciting and relaxing classical music, in a musical perception task, as a validated paradigm to assess emotional reactivity.

25 healthy volunteers were exposed via earphones to four 5-minute musical excerpts (two exciting and two relaxing musical excerpts) presented in a randomized order and intersected by 5 silence periods. Measures of BTP, Heart Rate (HR) and Skin Conductance (SC) were collected during the entire task.

The BTP significantly decreased with relaxing music compared to silence, and especially with the excerpt 'Entrance of the Shades' by Minkus. The HR and SC, but not Heart Rate Variability, were also decreased with relaxing music. We found no significant effect of exciting music. We report, for the first time, that classical relaxing music decreases the amplitude of the brain pulsatile movements related to cerebral blood flow and mechanical properties of the brain parenchyma, which provides further evidence of the involvement of BTP in emotional reactivity. In addition, we validate the use of TPI as a non-invasive, portable and low cost tool for studies in psychophysiology, with the potential to be implemented as a biomarker in musicotherapy trials notably.

Prove recenti suggeriscono che i parametri biomeccanici del cervello, come la pulsatilità del tessuto cerebrale (BTP), potrebbero essere coinvolti nella reattività emotiva. Tuttavia, nessuno studio ha indagato l'impatto di un compito emotivo sul BTP. Gli Autori hanno usato il metodo ecografico di imaging della Pulsatilità dei Tessuti (TPI) per valutare i cambiamenti nella BTP alla musica classica eccitante e rilassante, in un compito di percezione musicale, come paradigma validato per misurare la reattività emotiva. 25 volontari sani sono stati esposti a quattro brani musicali di 5 minuti (due brani musicali eccitanti e due brani rilassanti) presentati in ordine casuale e intersecati con 5 periodi di silenzio. Durante l'intero compito sono state raccolte le Misure di BTP, Frequenza Cardiaca (HR) e Conduttanza Cutanea (SC). La BTP è notevolmente diminuita con musica rilassante rispetto al silenzio, in particolare con il brano "Entrance of the Shades" di Minkus. Anche la Frequenza Cardiaca (HR) e la Conduttanza Cutanea (SC) sono diminuite con musica rilassante, al contrario della variabilità della frequenza cardiaca. Gli Autori non hanno riscontrato effetti significativi con musica eccitante.

Gli Autori segnalano, per la prima volta, che la musica classica rilassante riduce l'ampiezza dei movimenti pulsatili del cervello legati al flusso sanguigno cerebrale e alle proprietà meccaniche del parenchima cerebrale. Questo fornisce ulteriori prove del coinvolgimento della BTP nella reattività emotiva. Inoltre, gli Autori convalidano l'uso dell'imaging del tessuto pulsatile (TPI) come strumento non invasivo, portatile e a
Complexity matching: brain signals mirror environment information patterns during music listening and reward

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Understanding how the human brain integrates information from the environment with intrinsic brain signals to produce individual perspectives is an essential element of understanding the human mind. Brain signal complexity, measured with multiscale entropy, has been employed as a measure of information processing in the brain, and we propose that it can also be used to measure the information available from a stimulus. We can directly assess the correspondence between brain signal complexity and stimulus complexity as an indication of how well the brain reflects the content of the environment in an analysis that we term "complexity matching." Music is an ideal stimulus because it is a multidimensional signal with a rich temporal evolution and because of its emotion- and reward-inducing potential. When participants focused on acoustic features of music, we found that EEG complexity was lower and more closely resembled the musical complexity compared to an emotional task that asked them to monitor how the music made them feel. Music-derived reward scores on the Barcelona Music Reward Questionnaire correlated with less complexity matching but higher EEG complexity. Compared with perceptual-level processing, emotional and reward responses are associated with additional internal information processes above and beyond those linked to the external stimulus. In other words, the brain adds something when judging the emotional valence of music.

Like a bridge over troubled water - a qualitative study of professional caregiver singing and music as a way to enable person-centred care for persons with dementia
Purpose: To describe the perspectives of caregivers in terms of using singing and music in their everyday work, and of their effect on care and interaction with the person with dementia.

Methods: A qualitative design was used, consisting of group discussions with professional caregivers from three nursing homes in a medium-sized city in a rural area of Sweden.

Results: The results demonstrate that caregiver singing and music can be powerful and useful in the care of and in communication with persons with dementia. Music, for example, can be used to facilitate socialization as it opens up for discussion, while caregiver singing was preferable when it came to the facilitation of care situations and interaction.

Conclusions: Singing and music can be powerful and useful tools in the care of and in communication with persons with dementia. Regardless of whether singing or music is used, the most important factor is that a person-centred approach is adopted so as to make the music a facilitative tool. Caregiver singing and music are ways to connect with the person with dementia and an understanding of their use can contribute to dementia research. This in turn can increase awareness of the possible ways to strengthen the partnership between caregivers and persons with dementia.

Obiettivo: descrivere le prospettive dei caregiver in termini di utilizzo del canto e della musica nel loro lavoro quotidiano e del loro effetto sulla cura e l'interazione con la persona con demenza.

Metodi: è stato utilizzato un design qualitativo, che consiste in discussioni di gruppo con operatori sanitari di tre case di cura in una città di medie dimensioni in una zona rurale della Svezia. Risultati: i risultati dimostrano che il canto e la musica dei caregiver possono essere potenti e utili nella cura e nella comunicazione con le persone affette da demenza. La musica, ad esempio, può essere utilizzata per facilitare la socializzazione perché apre alla discussione, mentre il canto del caregiver era proficuo quando si trattava di facilitare le situazioni di cura e l'interazione. Conclusioni: il canto e la musica possono essere strumenti potenti e utili nella cura e nella comunicazione con le persone con demenza. Indipendentemente dal fatto che si usi il canto o la musica, il fattore più importante è l'adozione di un approccio centrato sulla persona in modo da rendere la musica uno strumento di facilitazione. Il canto e la musica del caregiver sono modi per connotarsi con la persona con demenza, e la comprensione del loro uso può contribuire alla ricerca sulla demenza. Ciò a sua volta può accrescere la consapevolezza dei possibili modi per rafforzare il rapporto tra assistenti e persone con demenza.

The Pierfranco and Luisa Mariani Foundation

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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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