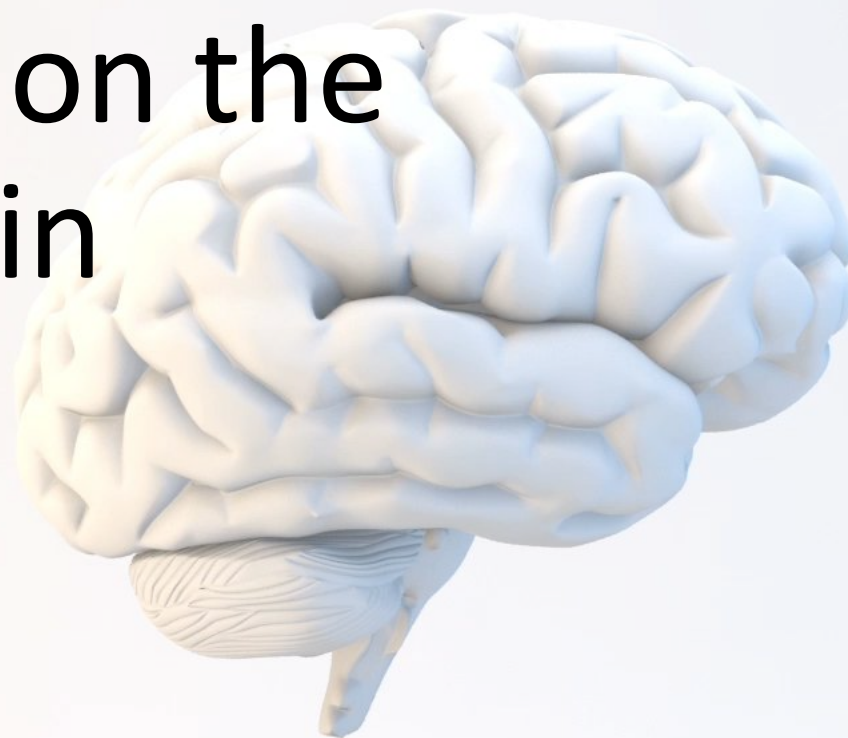
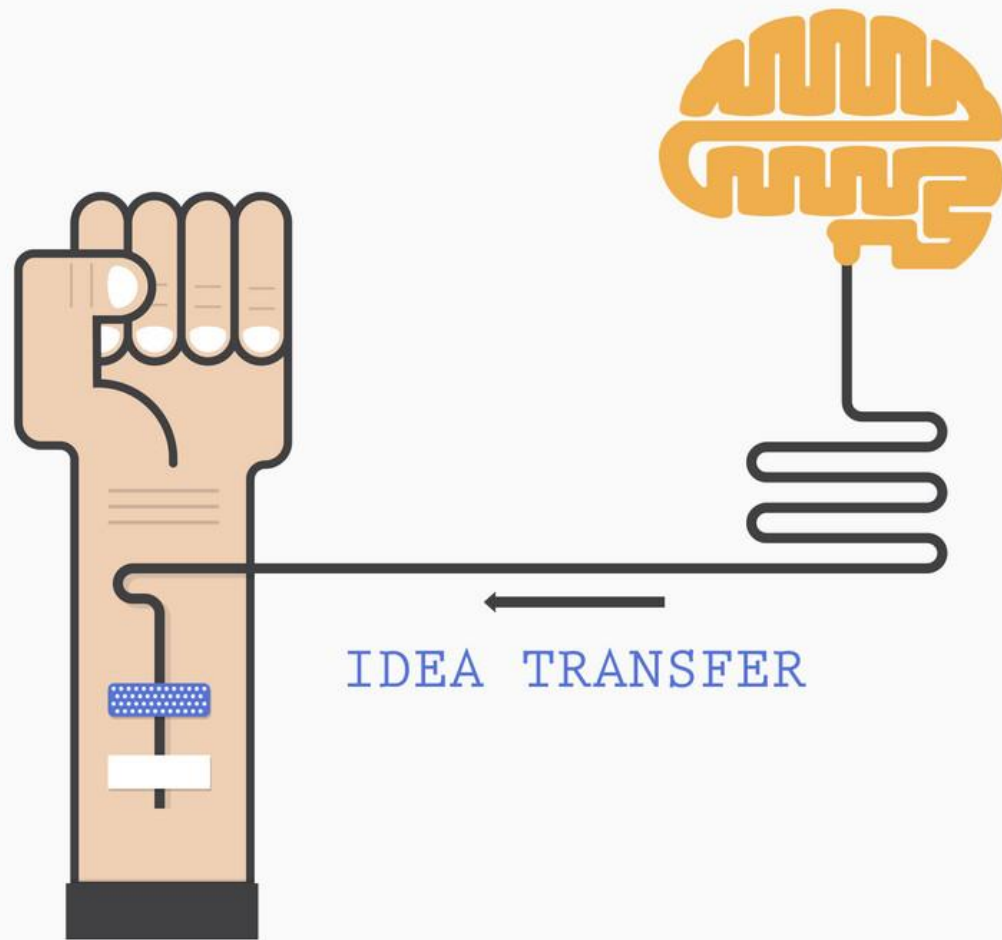


# Effects of Piano Training on the Brain



Feasibility Study Conducted in Summer  
2023 by Eastman School of Music  
(Dr. Elinor Freer) and URM (Dr. Kathi  
Heffner) with funding from Eastman  
Performing Arts Medicine (EPAM)

Feasibility



# Benefits for children

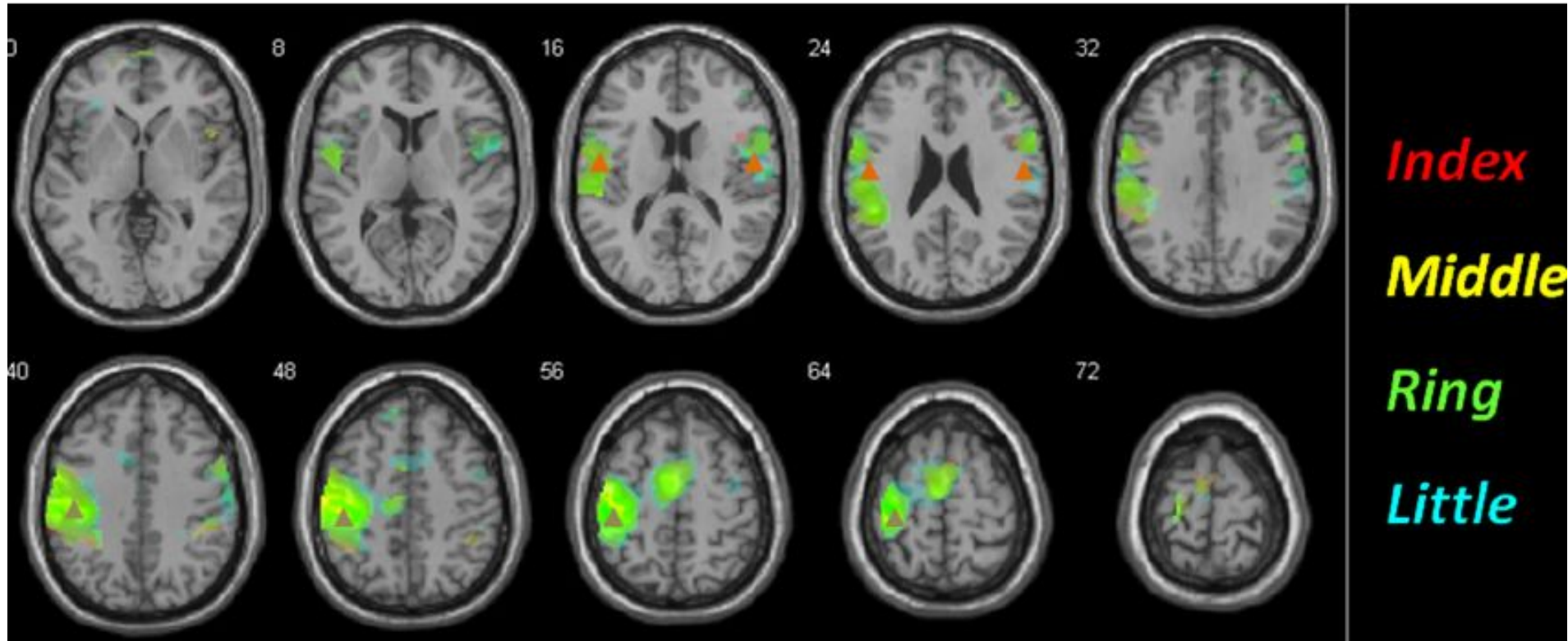
- Children who received 36-weeks musical lessons (standard keyboard or Kodály) showed a small **but significant increase in IQ** compared to children who took drama lessons or no lessons at all. ([Schellenberg · 2004](#))
- 6-year-old children who received 15 months private keyboard lessons showed **structural brain changes** that correlated with improvements in auditory and motor skills when compared to a control group that did not receive such instruction. ([Hyde et al., 2009](#))
- A series of follow-up studies comparing 8-year-old children who received either music or painting lessons for several months found that **music training had transfer effects to language abilities** while painting lessons did not. ([Moreno et al., 2009](#); [Chobert et al., 2012](#); [François et al., 2013](#))
- These studies show that there is a **clear transfer effect from musical training to auditory and speech skills**. ([Kraus and Chandrasekaran, 2010](#); [Besson et al., 2011](#))

# How does music affect us?

- Research has shown that listening to music can reduce anxiety, blood pressure, and pain as well as improve sleep quality, mood, mental alertness, and memory. ([www.johnshopkinsmedicine.org](http://www.johnshopkinsmedicine.org))
- Music is structural, mathematical and architectural. It is built on relationships between pitches and rhythms. Our brains have to work hard to process music even as listeners. As players of music, our brain stimulation is even more intense. ([www.johnshopkinsmedicine.org](http://www.johnshopkinsmedicine.org))
- Playing the piano stimulates the brain in virtually all areas. (S Seinfeld, 2013)

## Brain activation patterns

(Plata-Bello, Julio & Modroño, Cristián & Marcano, Francisco & González-Mora, Jose. (2015)  
Find the whole study here: <https://pubmed.ncbi.nlm.nih.gov/25511522>)



# One part of the brain that is particularly stimulated by playing the piano:

- **CORPUS CALLOSUM**

- Enables the left and right hemispheres of the brain to communicate; fine motor skills (piano playing) require use of both hemispheres
- The corpus callosum is also responsible for eye movement and balance.
- Controls coordinated body movement as well as complex thoughts that require logic (left side) and intuition (right side).
- Musicians have a larger corpus callosum than non-musicians.
- Pianists grow a larger corpus callosum than non-pianists, in the way that an athlete grows larger muscles from regular, strenuous use. Landmark study at Harvard in 1995 found that this comes from having to do separate things with each hand. ([Schlaug and others 1995a](#))

# A second part of the brain that is particularly active when playing the piano:

- **HIPPOCAMPUS**

- Produces and retrieves memories, regulates emotional responses and helps us navigate. Considered the central processing unit of the brain, it's one of the first regions of the brain to be affected by Alzheimer's disease, leading to confusion and memory loss.
- Regular and constant musical practice and repetition affects the hippocampus by allowing production of new neurons. This results in improved memory and faster processing of new information. Regular and constant musical practice and repetition affects the hippocampus by allowing production of new neurons. This results in improved memory and faster processing of new information. ([Sugaya & Yonetani, "Music and the Brain," 2017](#))