

Music and the Brain

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Music is the language of cultures

- Musical instruments have been found in ancient archeologic sites over 11,000 years old
- History is sung and chanted
- Music predates written language
- Cultures without written languages all sing
- We sing our emotions!
- Rap???

Memory

- Music brings you “back”
 - Where was I when I first heard it?
 - Who was I with?
 - When did I first hear this music?

J S Bach

- Dr Jeckel and Mr Hyde 1931
- Fantasia 1942
- 20,000 Leagues Under the Sea 1952
- Monty Python 1963
- Boardwalk Empire 2020



Movement

- Music makes you
 - Dance
 - Tap your feet
 - Type to the beat
 - Jog to the beat
 - Sway your body

Fear

- Emotional triggers
 - Rapidly increasing the beat
 - Rapidly increasing the volume
 - Raising the pitch

Blood pressure

- Music can:
 - Slow your heart rate
 - Lower your blood pressure
 - Relax your muscles
 - Untense your jaw

Teaching with music

- We all learn better if we can sing along
 - Songs in foreign languages are an entry into learning the language
- We never forget “Happy Birthday” or Frere Jacque
- We sing the alphabet
- Autistic children learn better with music
 - Music in schools is essential, yet is being cut out many school budgets.

Sleep

- Music can:
 - Put you to sleep
 - Wake you up
 - Calm you through a noisy night

Music Prevents Dementia!

- Learning music increases brain volume
 - Persists life-long
 - Musicians live longer (except maybe the 'hard partying' ones with lots of drugs and alcohol)
- Allows learning a new language easier
- Associated with slower decline, even in people diagnosed with dementia
- Singing is a prevention therapy and a treatment for memory loss

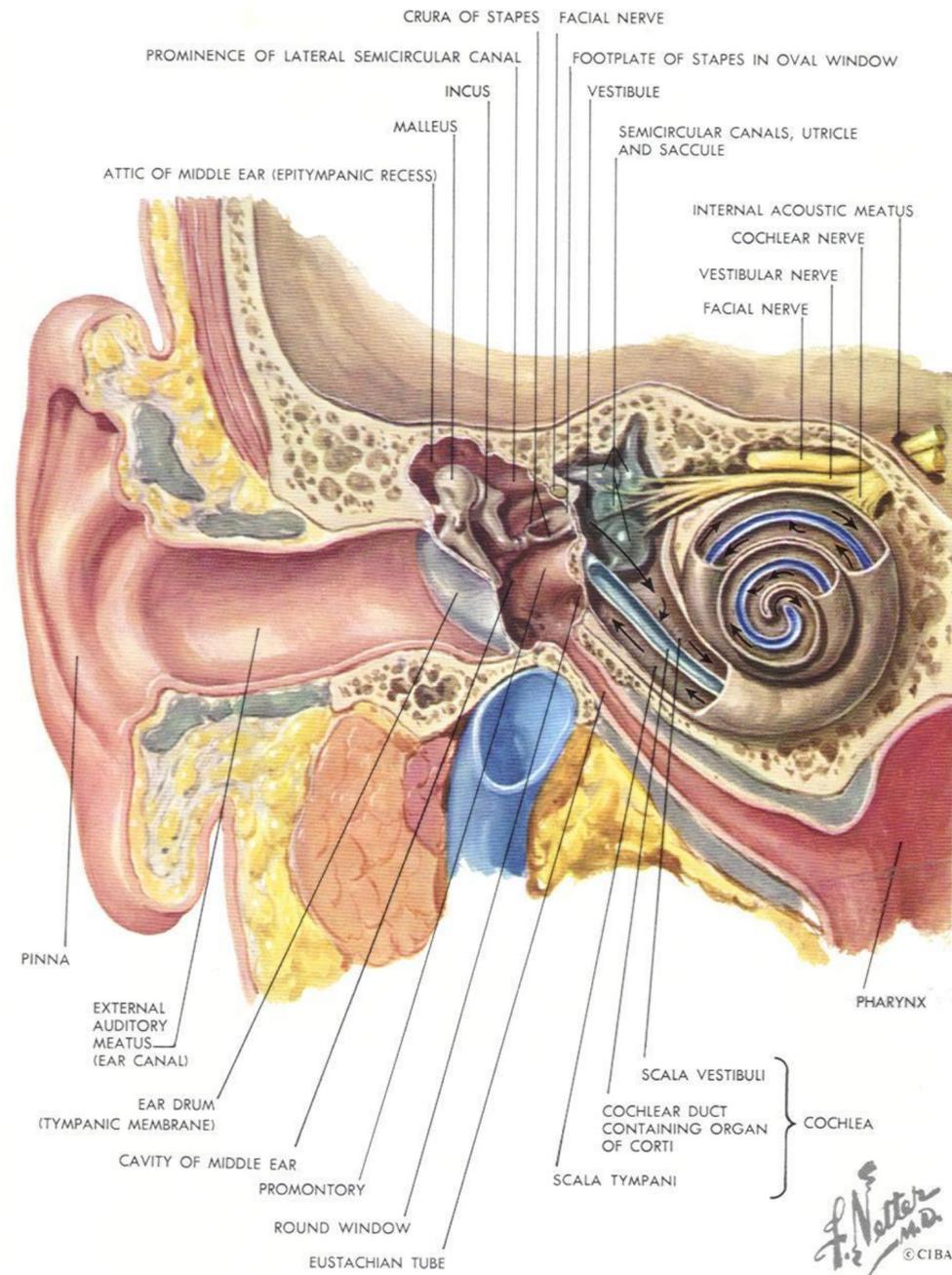
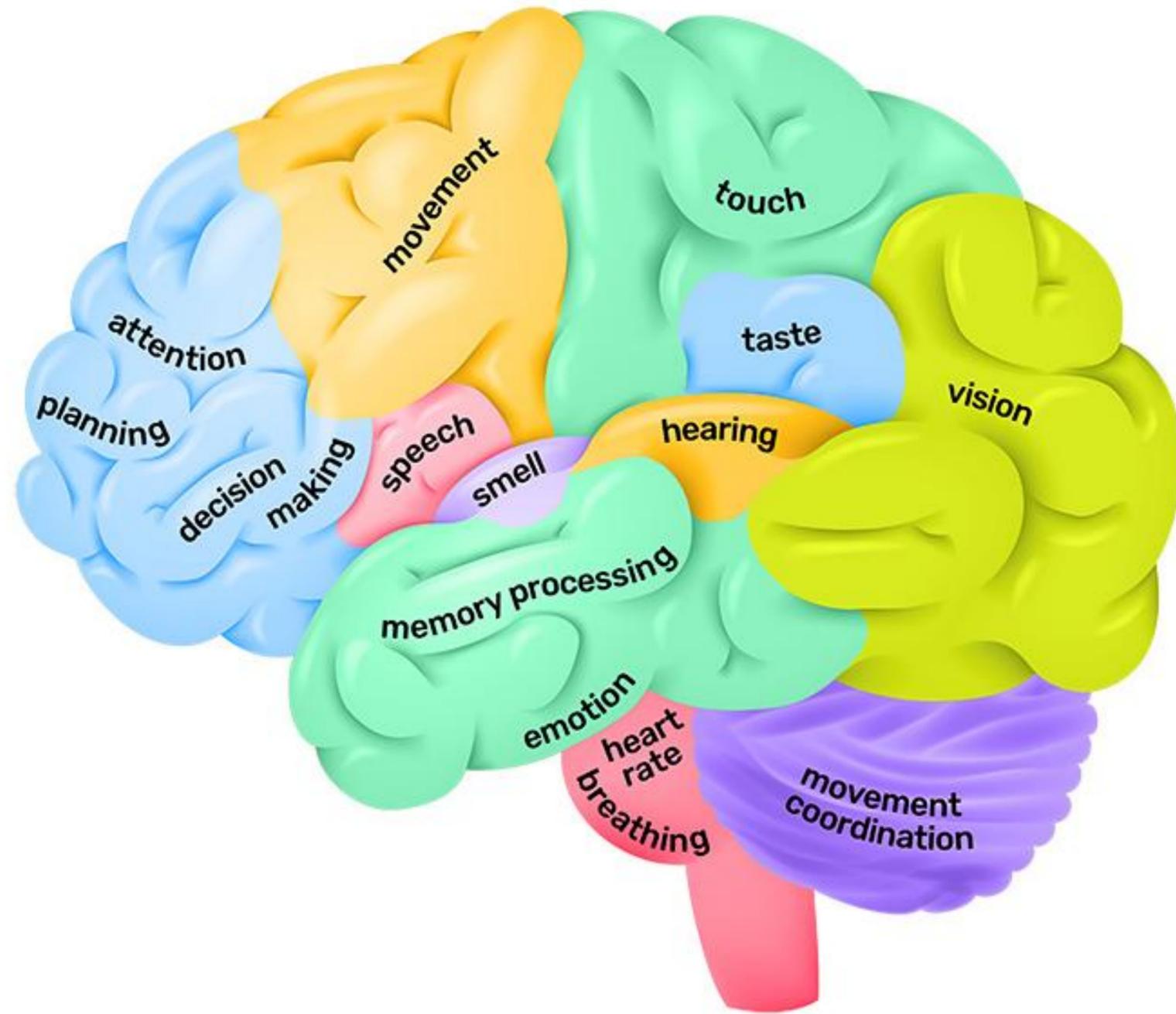
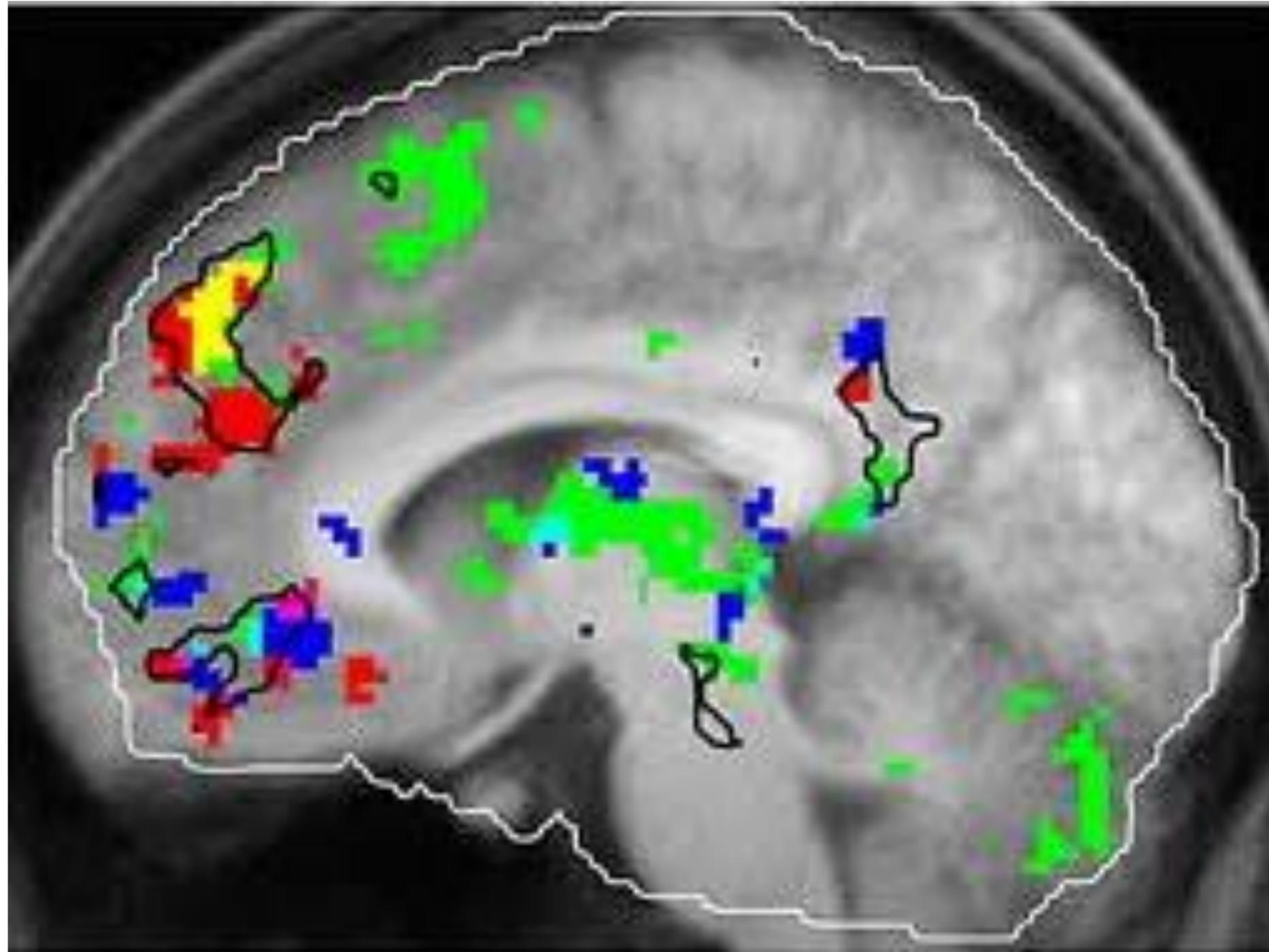


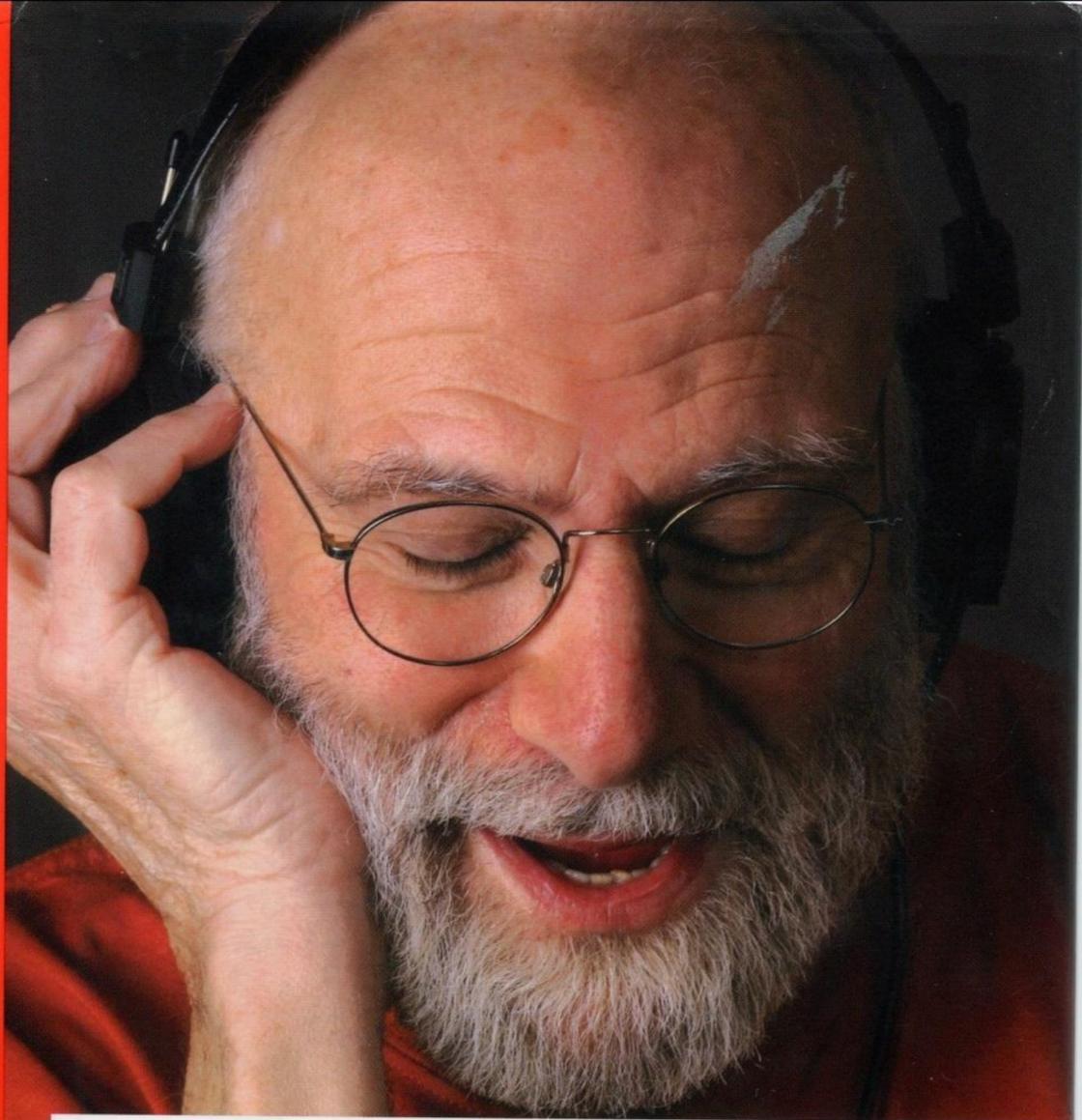
PLATE I

PATHWAY OF SOUND RECEPTION





Pet scan of brain areas activated by music

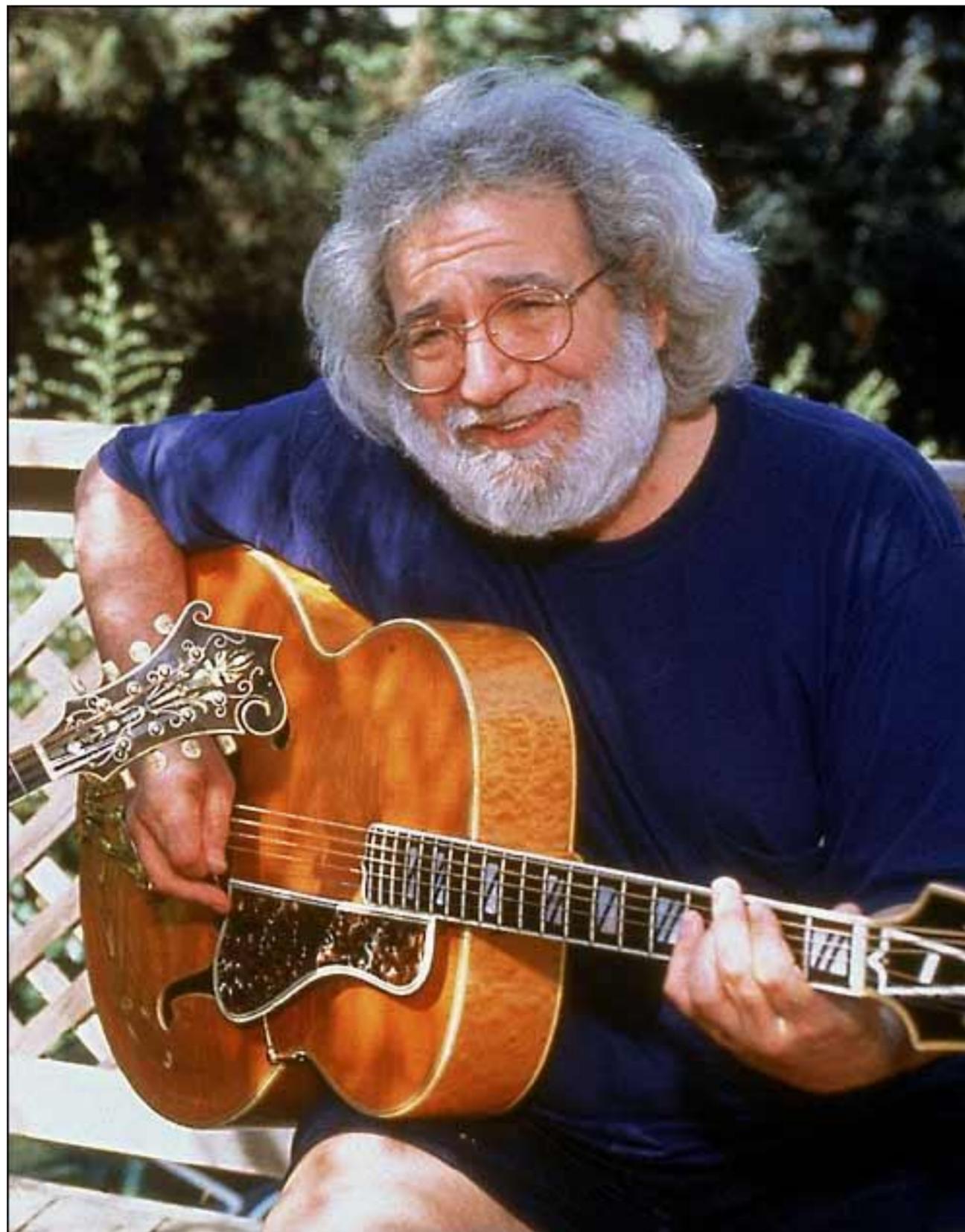


MUSICOPHILIA
Tales of Music and the Brain
OLIVER SACKS

MUSICOPHILIA
OLIVER SACKS
Knopf

Sex and Drugs and Rock&Roll

- Its all the same neurochemistry
 - Dopamine makes you happy
 - Norepinephrine makes you bounce
 - Serotonin keeps you from getting depressed
 - Rock&Roll keeps you young



Music is Sound

- Children identify sounds in the womb
- Children react to both rhythm and tones at a very young age
- They identify tones and sing them back, far earlier than words

Music

- Pitch can be learned, usually at a young age, i.e., many Asian languages that have multiple tones are difficult for adults to learn, but relatively easy for children.
- Best before age 8
- Hearing music vs listening to music.
 - Paying attention is essential, i.e., 'elevator music' probably isn't improving your brain

70% of my brain is filled with lyrics to songs I don't even like!

- Music **imprints** the lyrics on BOTH SIDES of your brain.
- i.e try to hum the Star Spangled Banner without the lyrics
- Advertising jingles can be addictive

Why is there music/sound we don't like?

- Too simple
- “Tired” of it
- Wrong tone
- Wrong rhythm
- Wrong emotion
- Wrong time to be listening,
 - Sousa Marches don't make good bed time listening

Does the brain make music?

- Hallucinations
 - Epilepsy (deja entendu?)
 - Migraine
 - Trauma
 - Drug-induced
- Music “stuck” in the brain-EarWorms
- Musical genius (Mozart, JS Bach, etc.)

Music as Medicine

Parkinson's disease

- Singing improves lung capacity
- Dancing improves balance
- Exercising to music increases mobility

Music as Medicine

Stroke

- Singing helps recover speech
- Music improves mobility
- Music improves mood (stroke is often associated with depression)

Music in Alzheimer's disease

- A series of studies in Sweden showed that when caregivers sang to their patients both the caregivers and the patients felt better
- The patients were more cooperative, communicative and helpful to the caregivers
- The songs were folk songs, childrens' songs and drinking songs

Music in Alzheimer's disease

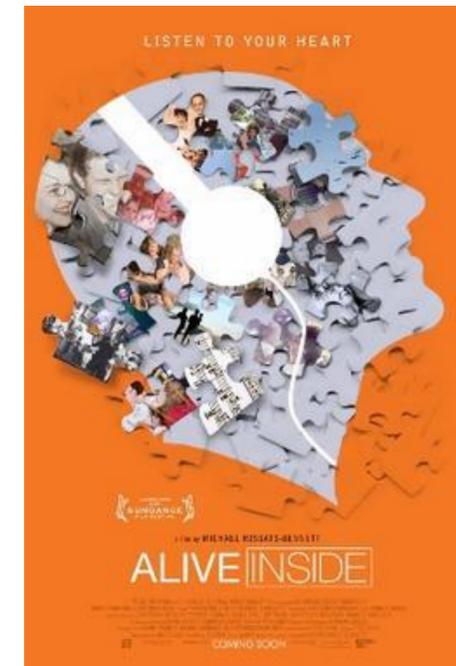
- Caregivers were not trained singers or musicians
- Caregivers could be family or professionals
- Take home message, teach the families the benefit of singing to relatives with AD

Music and the aging brain

- Helping recall memories
 - Mostly good times
- Helping to do exercise
- Stress management
- Can improve blood pressure
- Socialization -listen with friends

Alive Inside

- An award winning documentary about the power of music in people totally withdrawn from all communication with other people. Usually a variant of dementia.
- Awakens the “Inside Person”
- <https://youtu.be/laB5Egej0TQ?si=O3Nr9cl716mwtnlc>



Summary

- Music aids in learning new material
- Music evokes memories, good and bad
- Music is important in rehabilitation programs.
- Music reduces fear and anxiety in children and in Alzheimer's patients
- Music can be therapy
- MUSIC IS FUN!

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"Your operation was a complete success. Our team of brain surgeons was able to get that song out of your head."