Towards a Healthy Brain

COGNITIVE BENEFITS OF COORDINATED MOVEMENT

TWO LEFT FEET NO MORE…

Towards a Healthy Brain

- A "Well-Rounded Life" and Brain Health
- Coordinated Movement and Brain Health: *Research Findings on Cognitive Longevity*
- Selected Coordinated Movement: *Cultural Origins/Influences of Selected Music/ Dance Genre*
- Selected Coordinated Movement: *Audience Participation of Selected Music/Dance Genre*

A "Well-Rounded Life"

Extreme Longevity

Areas of the World Where People Live Longer

Sardinia, Italy

Loma Linda, California, U.S.A.

Okinawa, Japan

Large number of people over 100 years!

- Physical activity
- Strong social networks
- Diet rich in antioxidant fruits and vegetables, healthy grains and proteins

UCLA Semel Institute for Neuroscience & Human Behavior, 2013

Coordinated Movement and Brain Health: *Name that Latin Music Genre??*

- https://www.youtube.com/watch?v=bkaIv1SIIiw
- https://www.youtube.com/watch?v=n1eyDDi_m4E
- https://www.youtube.com/watch?v=_3ZGKX9csKM
- https://www.youtube.com/watch?v=BtpRm3o2-zY
- https://www.youtube.com/watch?v=eT28h35ek5s
- https://www.youtube.com/watch?v=NiGbxjBOdDk

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.

Johns Hopkins Medicine, 2017

Coordinated Movement and Brain Health

- Studies using PET imaging have identified regions of the brain that contribute to dance learning and performance. These regions include the motor cortex, somatosensory cortex, basal ganglia, and cerebellum.
  - The motor cortex is involved in the planning, control, and execution of voluntary movement.
  - The somatosensory cortex, located in the mid region of the brain, is responsible for motor control and also plays a role in eye-hand coordination.
  - The basal ganglia, a group of structures deep in the brain, work with other brain regions to smoothly coordinate movement.
  - The cerebellum integrates input from the brain and spinal cord and helps in the planning of fine and complex motor actions.

Harvard Medical School Department of Neurobiology, 2017

Coordinated Movement and Brain Health

- According to Dr. Kathrin Rehfeld, from the German Center for Neurodegenerative Disease, "Exercise has the beneficial effect of slowing down the or even counteracting age-related decline in mental and physical capacity."
- Dr. Kathrin Rehfeld was the lead author in a study of older adults that showed two different types of physical exercise (dancing and endurance training) both led to an increase in the area of the brain that declines with age.
- In this study, volunteer groups showed an increase in the hippocampus region of the brain, the area of the brain specifically prone to age-related decline. It also plays a key role in memory and learning, as well as keeping one's balance. But only participants in the dance group showed volume increases in more subfields of the left hippocampus and only dancing led to an increase in one subfield of the right hippocampus, namely the subiculum.

Frontiers in Human Neuroscience, 2017

Coordinated Movement and Brain Health

- A study by researchers at the Albert Einstein College of Medicine discovered that dance can decidedly improve brain health. The study investigated the effect leisure activities had on the risk of dementia in the elderly.
- The researchers looked at the effects of 11 different types of physical activity, including cycling, golf, swimming, and tennis, but found that only one of the activities studied – dance - significantly lowered participants' risk of dementia.

New England Journal of Medicine, 2003

Coordinated Movement and Brain Health

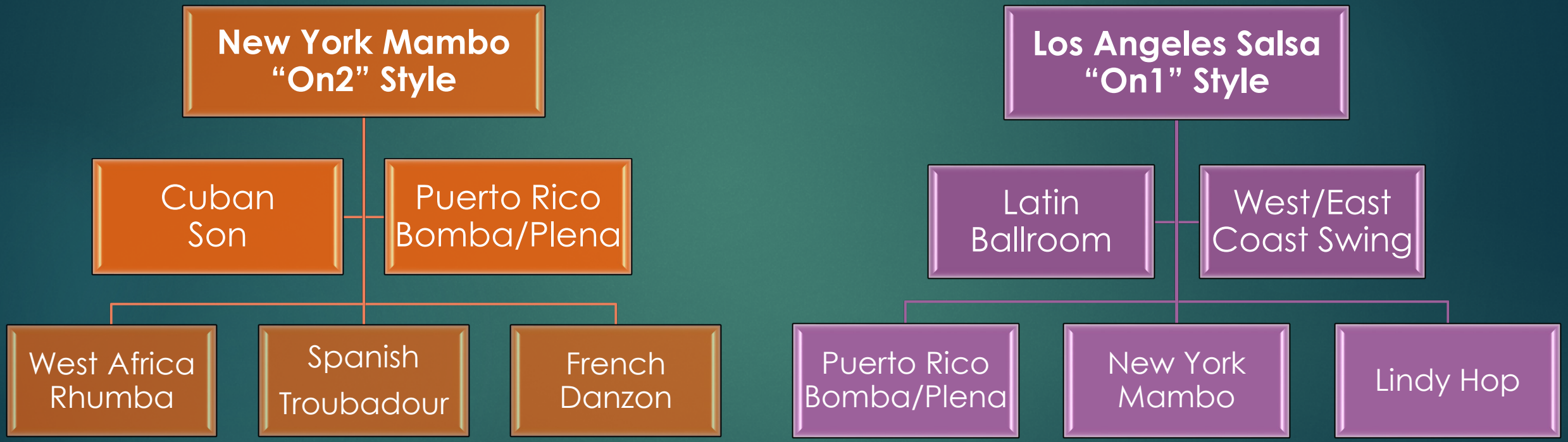
- Scientists in general have given little thought to the neurological effects of dance until relatively recently, when researchers began to investigate the complex mental coordination that dance requires.
- In a 2008 article in *Scientific American* magazine, a Columbia University neuroscientist posited that synchronizing music and movement – dance - constitutes a complex mental coordination that stimulates the brain.

Harvard Medical School Department of Neurobiology, 2017

Cultural Origins/Influences of Selected Music/Dance Genre

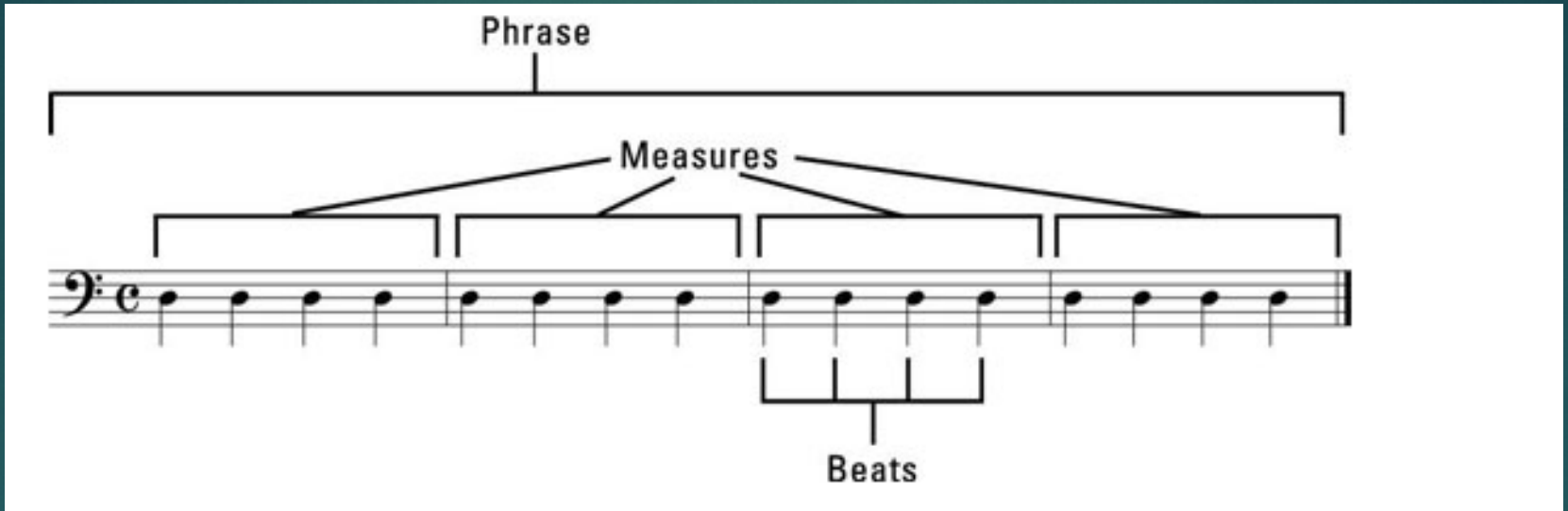
Smithsonian Latino Center, 2017

Cultural Origins/Influences of Selected Music/Dance Genre



Smithsonian Latino Center, 2017

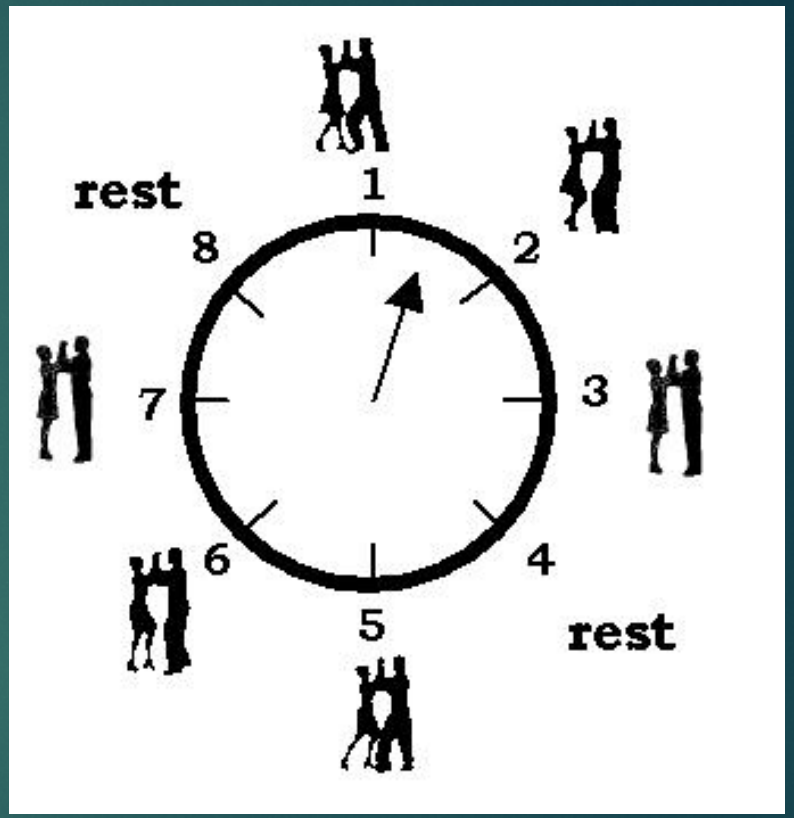
Fundamentals of Music Structure



Whether you're a dancer, a musician, or just a music-lover, you know that rhythm is an important foundation of any song, and you've probably heard the term beat. A beat is the basic unit of rhythm, the underlying steady pulse of the song, the part that makes you tap your feet. With a little practice and a basic knowledge of music theory, anyone can learn to find and count beats in a piece of music.

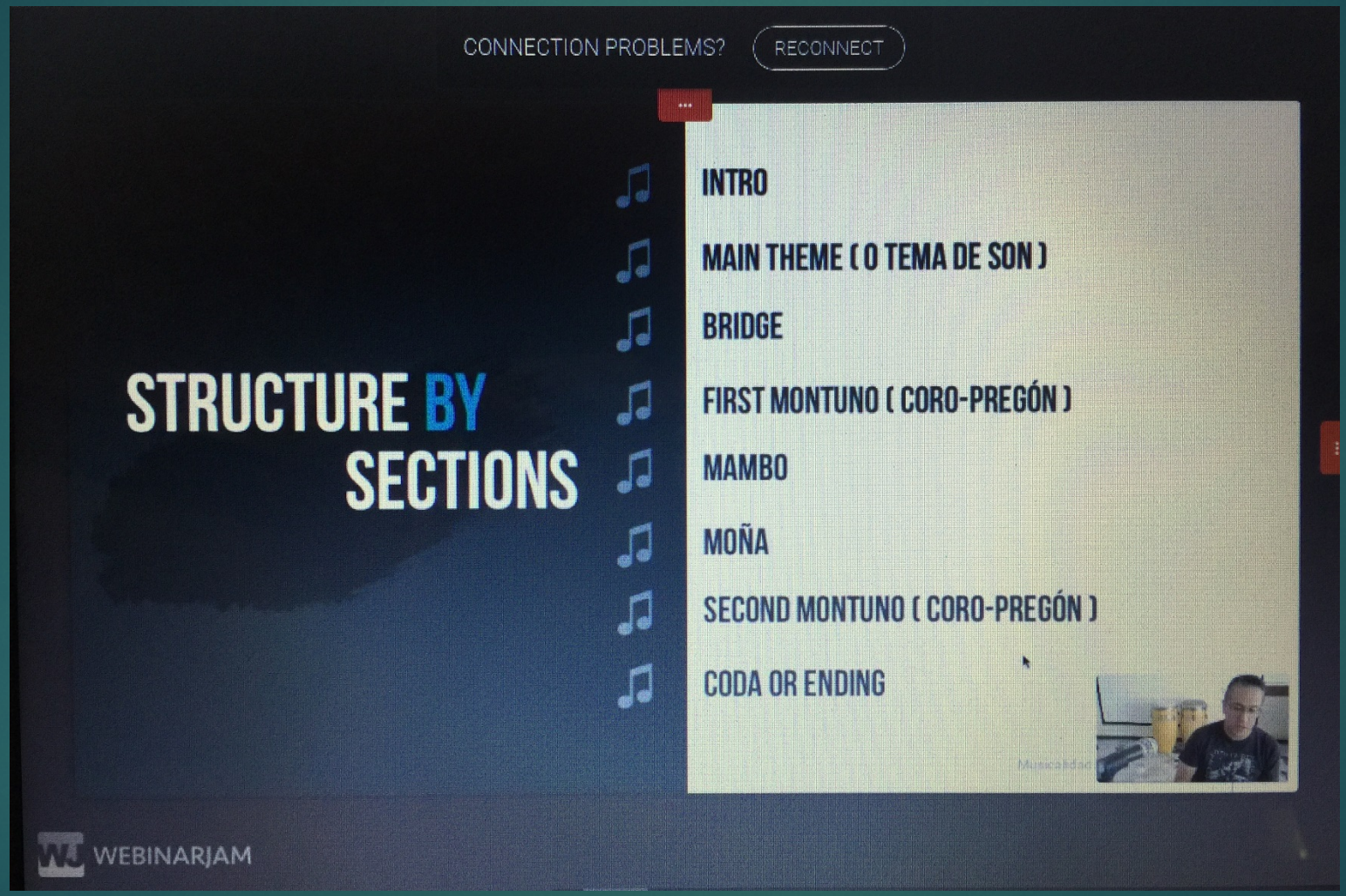
Fundamentals of Salsa Music Timing

- In music the unit of time is called a 'bar'. In the context of this our discussion, each bar of music is made of 4 beats. In Salsa, most phrases (both in music and in dancing) cover blocks of 2 bars, which means 8 beats.
- This is important to both train your ear to follow the music time and to synchronize your movements to the Salsa rhythm.
- Since Salsa music has the basic pattern of time involves 8 beats. The steps are synchronized with these beats.
- Imagine the clock as illustrated in this figure. The hand of the clock moves a full circle in exactly 8 beats. We can imagine the 8 beats to be equally spaced around the clock. When the hand moves past a tick it marks a beat. Each beat takes the same amount of time. This is the basic element of musical timing.



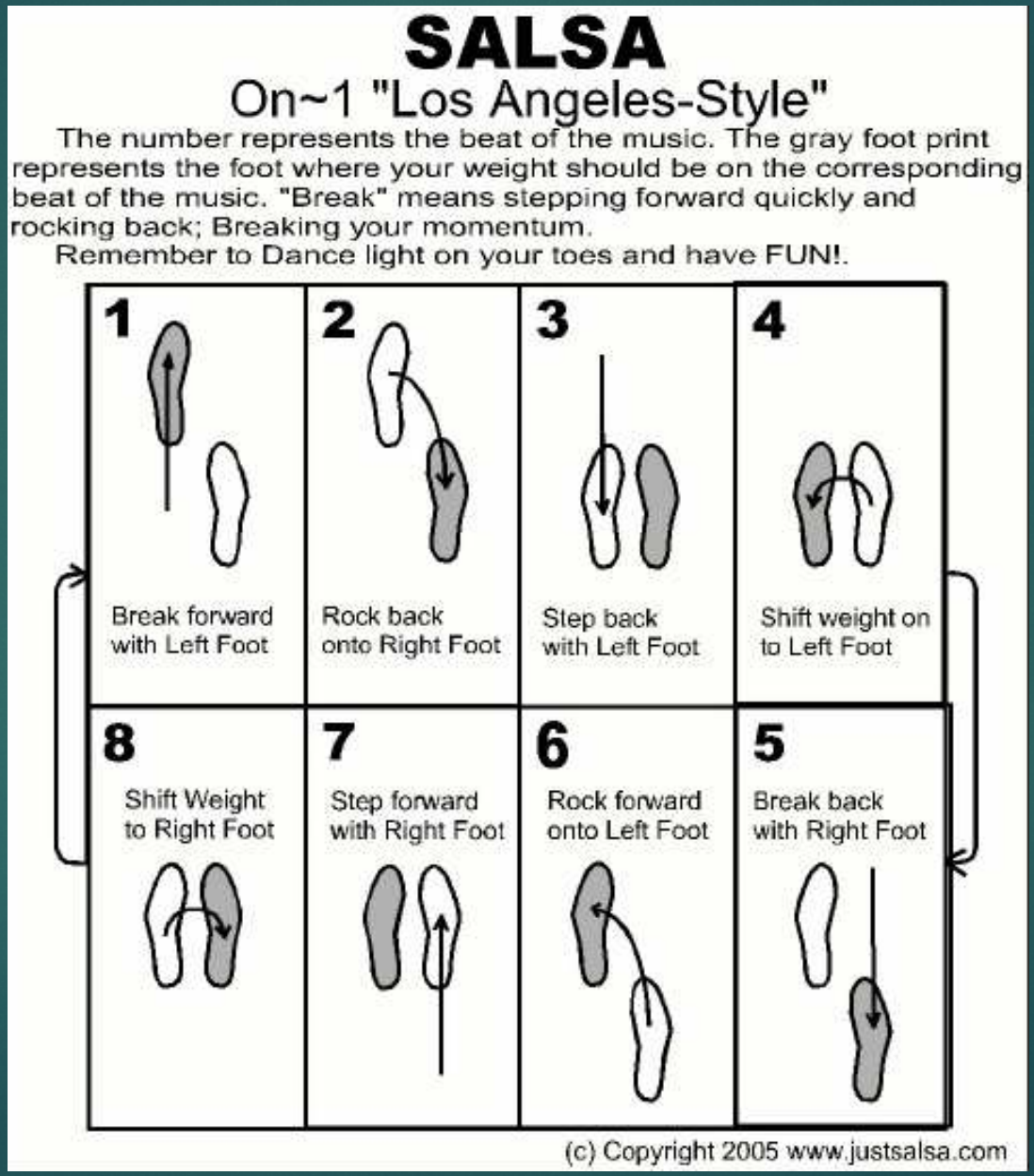
www.salsaisgood.com

Fundamental Structure of a Salsa Song



JoelSalsa NY Webinar, 2017

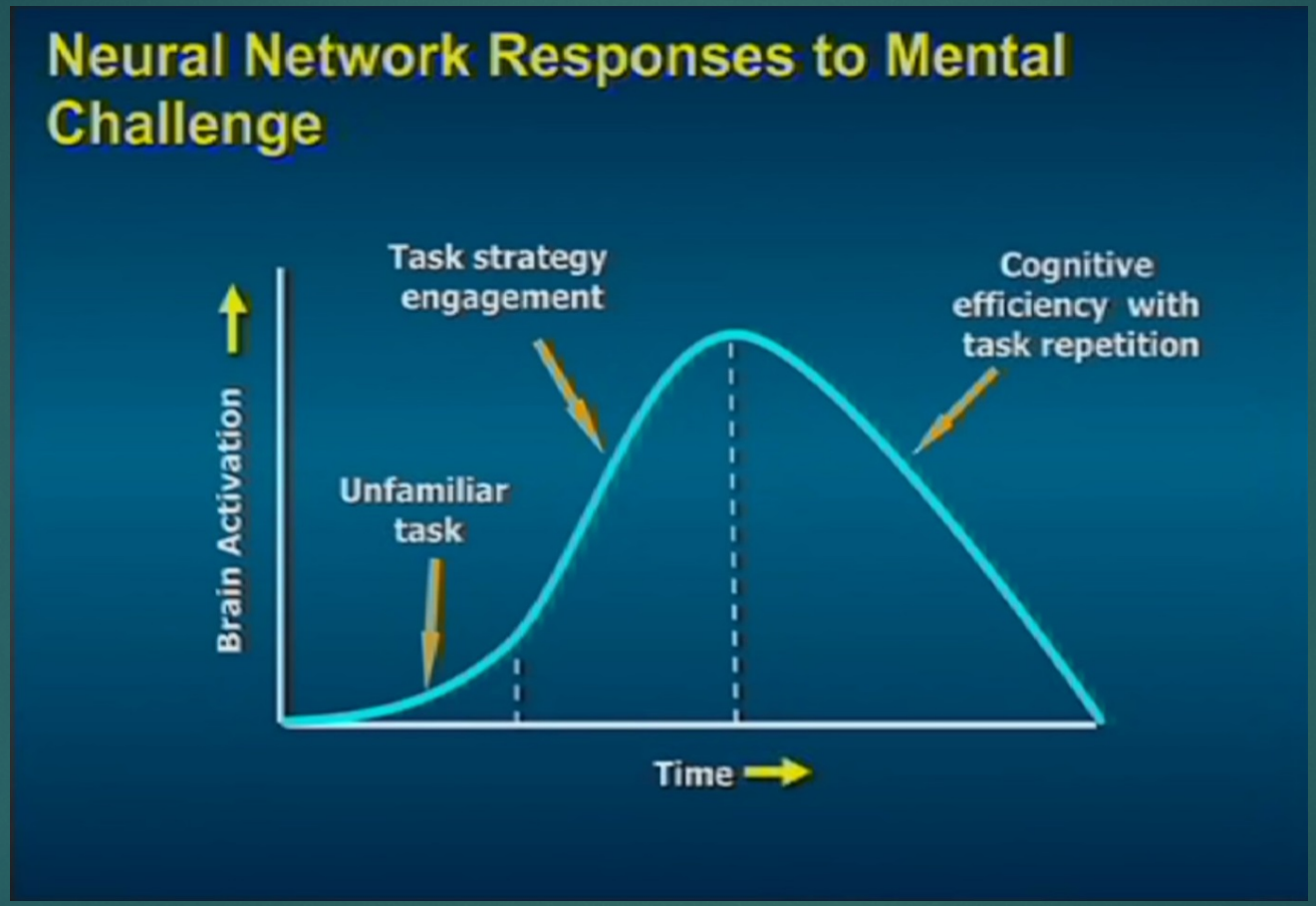
Fundamentals of Salsa Dance



Coordinated Movement: Part I

- https://youtu.be/-M62zG51_UA
- https://www.youtube.com/watch?v=t-aGWPHw8Ec

Supporting Cognitive Health

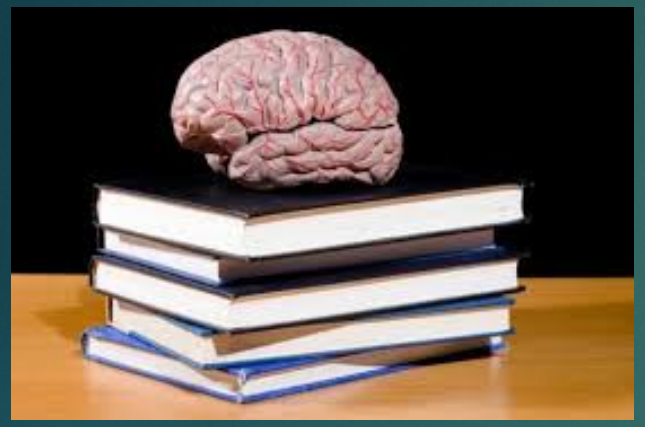


UCLA Semel Institute for Neuroscience & Human Behavior, 2013

Coordinated Movement: Part II

- https://www.youtube.com/watch?v=MVFBJ1nwehg

Towards a Healthy Brain…



Session Evaluation