

**MMTA State Conference- Parkinson's Conference**  
**(Originally presented 10/16/2000)**  
**Rhythmic Entrainment Theory & Practice**  
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**Plato's** definition of rhythm: "The order in the movement"

**Gaston:** "Rhythm is the organizer and the energizer"

**Madsen & Madsen:** "Music is organized sound and silence in time"

### **Human Rhythms**

#### *Environmental*

We are also exposed and affected by rhythms all around us in cycles of day & night, the seasons, the vibrations of matter. Indigenous and ancient cultures knew that these cycles were a matter of life and death.

#### *Internal*

Human beings are made up of rhythms- from simple rhythms such as heart-rate and respiration, through the rhythms of peristalsis which enable us to digest food, molecular rhythms, action potentials of muscle fiber, monthly sexual cycles to the complex rhythms of the nervous system.

It takes the rhythmic movement for muscles to move.

**One of the defining symptoms of Parkinson's disease** is a lack of rhythmic muscular control- the ability to move a part of the body in the way that is controlled and intended.

**The Law of Entrainment-** Fundamental law of the universe.

-If two rhythms are nearly the same and in close proximity, they will always entrain.

-Rider (1985) states that entrainment occurs when "...stimuli, particularly periodic phenomena, time lock and therefore affect similar behaviors or actions."

(p184)

**Discovered in 1665 by dutch scientist Christian Huygens**--noticed that if two clocks were placed next to each other, within a very short time they would lock up and tick in perfect synchrony. He even tried starting the pendulums in opposite directions with the same effect.

### **Why?**

The best theory is that nature is efficient- it takes less energy to pulse together than in opposition.

**Roederer (1975):** rhythmic sound stimuli create a resonance with the natural clocks of the brain that ultimately control physiological function and behavior.

Best biological example of entrainment- Cardiac Cells

## **Origins in Ancient Practice**

Rhythmic entrainment is a practice which comes from tribal/indigenous cultures of Africa, Asia, and Native America. These cultures understood the rhythms of life in a way that western culture has largely lost. This practice is centuries old

## **Iso-principle is key to rhythmic entrainment.**

- The iso principal is a means of bringing about mood change in psychiatric patients by first matching music to the existing mood (Altschuler, 1948).
- Entraining with the existing rhythms of the person- and then slowly altering the rhythm/tempo
- ESPECIALLY IMPORTANT FOR THOSE WITH BRADYKINESIA

**Stephanie-** show video swallow

## **Matthew's Story**

### **Entrainment Technique & Practice:**

Rhythmic entrainment is a two way street- it can not be one way only  
-it involves high levels of observation, concentration, and focus

- Start by observing the level of the client(s)  
-to what tempo are they moving
- Also observe the movement tempo of the group leader  
-this may be very different from the rhythms of the clients and may need to be altered  
-find compromise between leader and members of the group

subdivision of rhythm-

- increases rhythmic accuracy in musicians
- helps with accuracy of non-musicians in movements

With gait training-

- match the rhythm of the "out of step gait", then move with the client into a more stable gait rhythm.
- Freezing- give a slow, steady beat for client to move to until they "unfreeze"
- Some people with Parkinson's actually walk with the assistance of a metronome

With other activities- to enhance fine & gross motor movement

- creative arts- such as painting, drawing, ceramics, etc.
- horticultural therapy

With relaxation techniques- calming tremor, etc.

## **Demonstration**