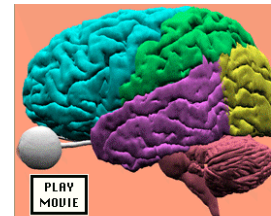


# *From Brain Stem to Cortex*



**Dr. Valerie Scaramella-Nowinski**  
**Drina Madden, M.A., C.A.S.**

# Awakening the Brain

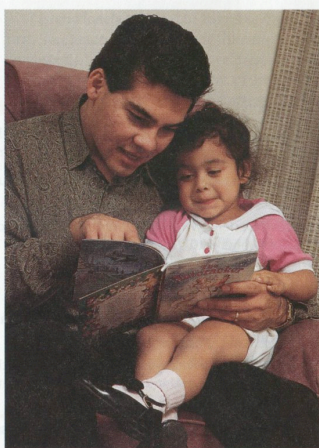


# Awakening the Brain



**Rhythms**

**Reflexes**



**Relationships**

# Awakening the Brain

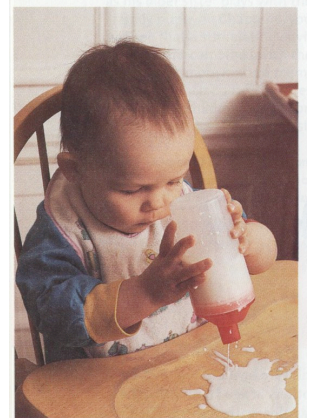
**Development is dependent upon:**

**Genetic Predisposition**

**Brain Structure - Electrical – Chemical Pathways**

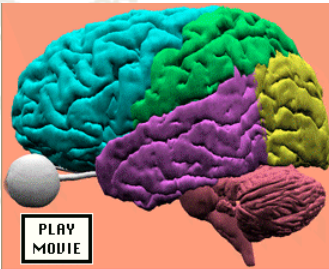
**Internal Economy**

**External/Environmental Cues**





# Awakening the Brain



**Understanding Brain Pathways**

Leads to

**More Specific Diagnosis and Treatment**

Leads to

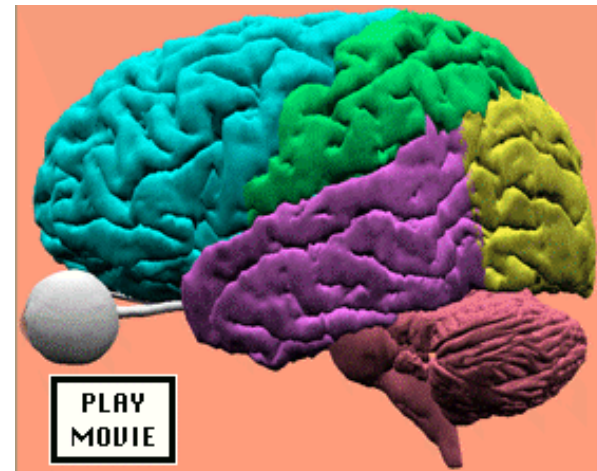
**Healthy Development**



# Awakening the Brain

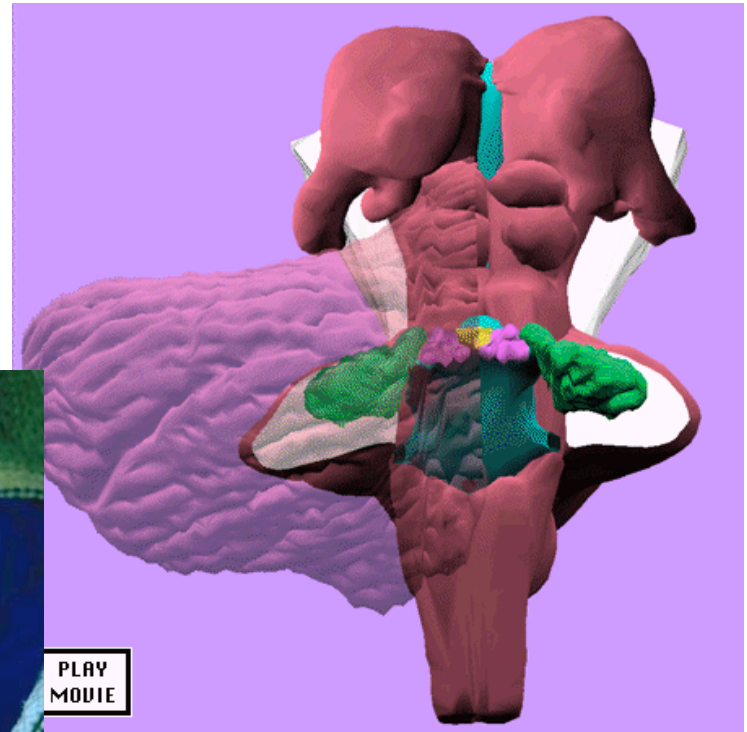
## Functions of Development

- Multisensory Attention
- Memory
- Speech/Language
- Sensory/Motor
- Mood/Social
- Executive Function



# Awakening the Brain

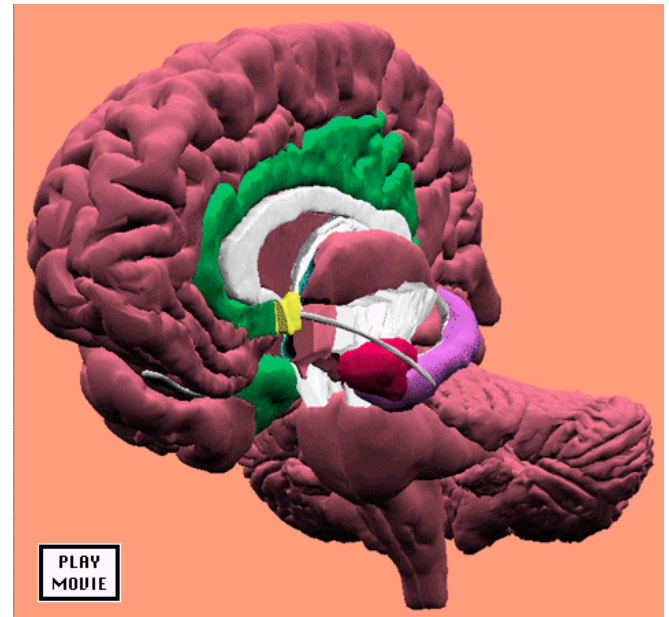
## MULTISENSORY ATTENTION



PLAY  
MOVIE

# Awakening the Brain

## MEMORY

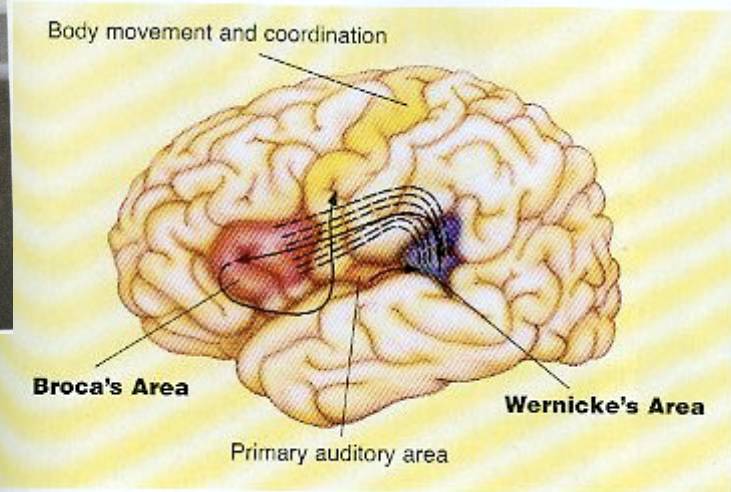


PLAY  
MOVIE



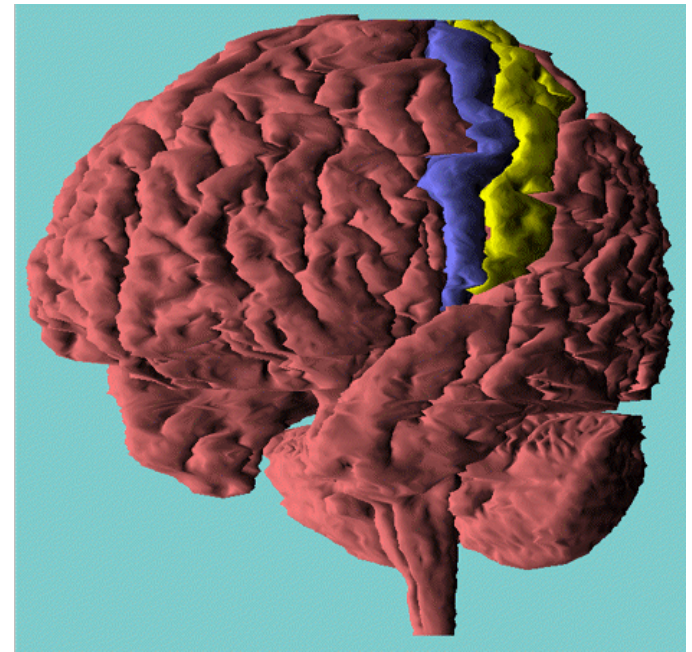
# Awakening the Brain

## SPEECH/LANGUAGE



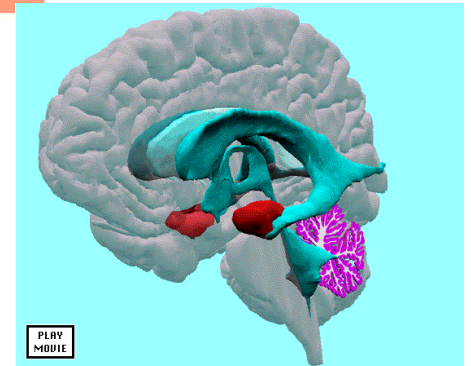
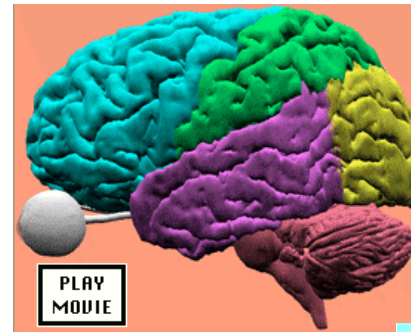
# Awakening the Brain

## SENSORY/MOTOR



# Awakening the Brain

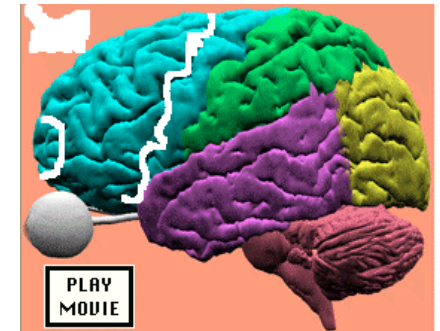
## MOOD/SOCIAL





# Awakening the Brain

## EXECUTIVE FUNCTION/PLANNING





# Awakening the Brain

**Stronger Brain Pathways**

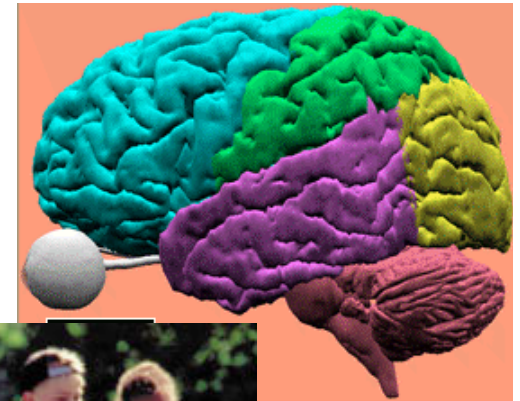
lead to

**Development of the Functions  
of Learning**



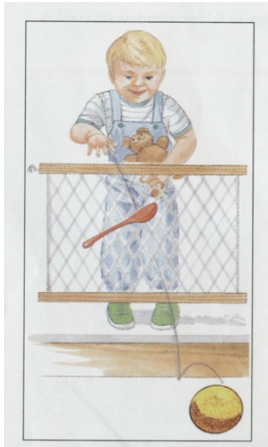
# Awakening the Brain

Functions of Learning  
are  
Governed by  
“Law of Strength”



# LAW OF STRENGTH

**STRONG STIMULUS  
= STRONG  
RESPONSE**



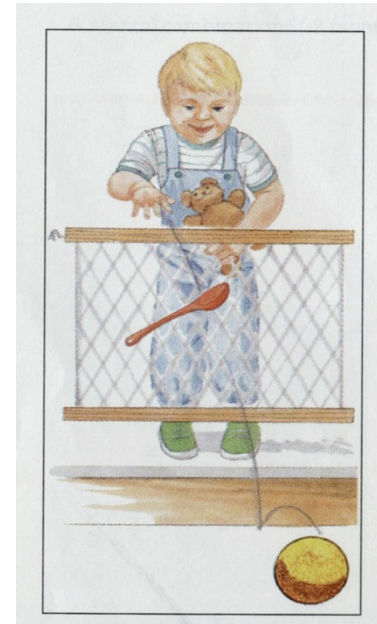
*Weak stimulus = Weak response*



# LAW OF STRENGTH

## PARADOX 1

## STRONG STIMULI



*Weak response*





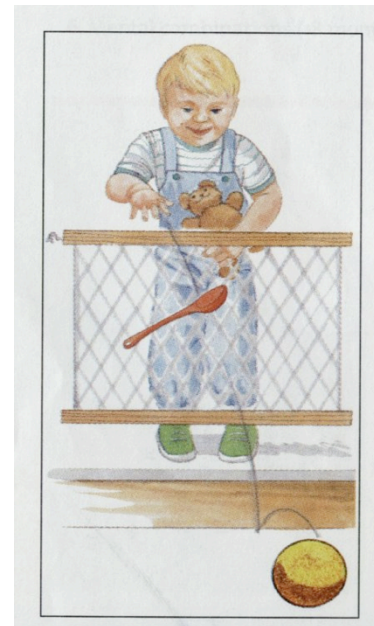
# LAW OF STRENGTH

## PARADOX 2

*Weak stimuli*

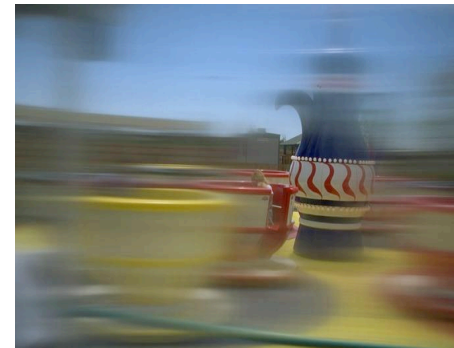


**STRONG  
RESPONSE**



# ***LAW OF STRENGTH***

*Keeps body rhythms/reflexes in  
synchronized time*

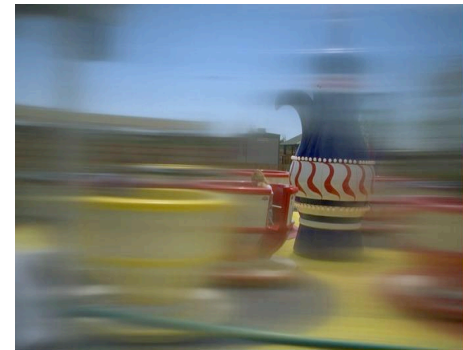


***Poor***

***synchrony/timing***

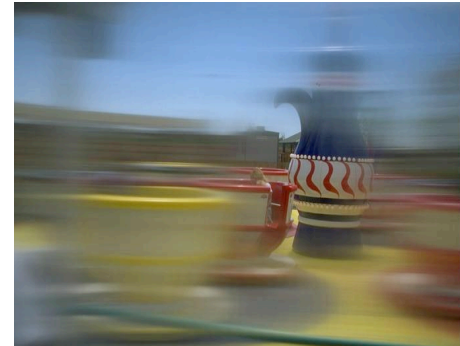
# LAW OF STRENGTH

*Poor synchrony/timing leads to*  
**SENSORY SENSITIVITY**



# ***LAW OF STRENGTH***

***Poor Synchrony/Timing can affect all sensory pathways – rhythms and reflexes***



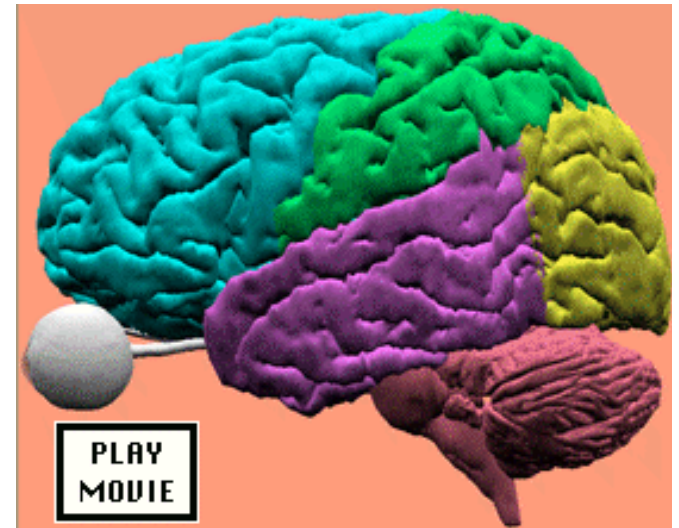
***(Light/Dark, Loud/Soft, Heavy/Light, Slow/Fast...)***



# ***LAW OF STRENGTH***

***Better synchrony/timing consolidates  
multisensory memory***

***This is the  
Basis of Learning***



# LAW OF STRENGTH

*Poor synchrony makes all stimuli seem new*



*Repetition helps increase synchrony and  
consolidate memory and learning*

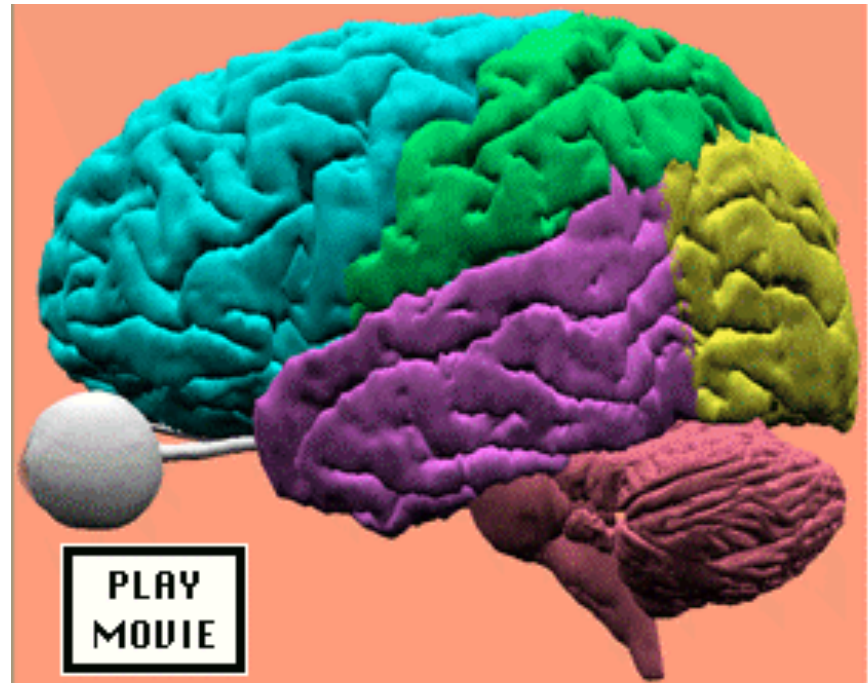
(Note: The basis of Apply Behavioral Analysis (ABA) AND Rapid Prompting methods)

# Awakening the Brain

We LEARN by

**MULTISENSORY**

- Repetition
- Recollection
- Reflection

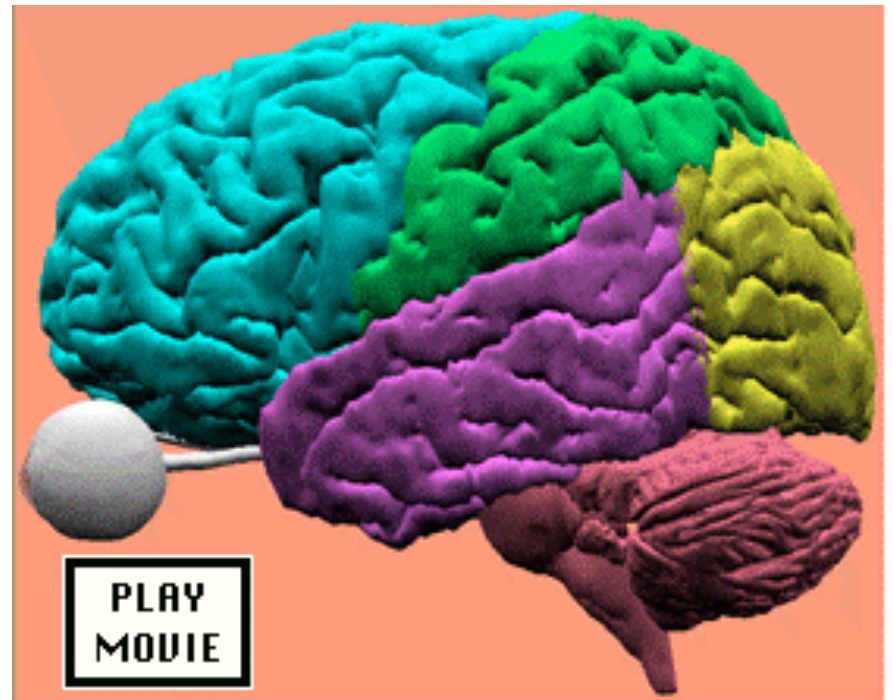


# Awakening the Brain

We must TREAT by

**MULTISENSORY**

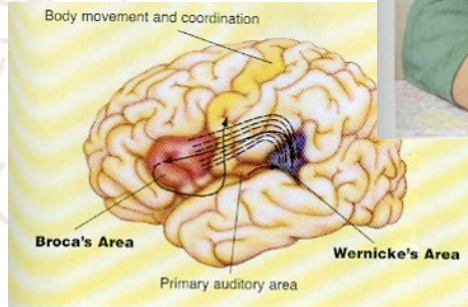
- Repetition
- Recollection
- Reflection





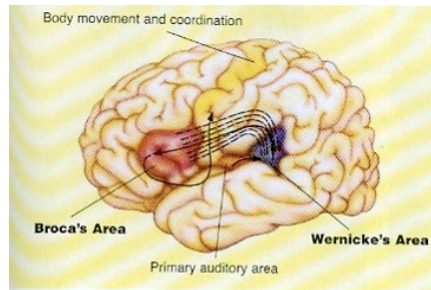
# Awakening the Brain

What makes us **human** is the **complexities** of language



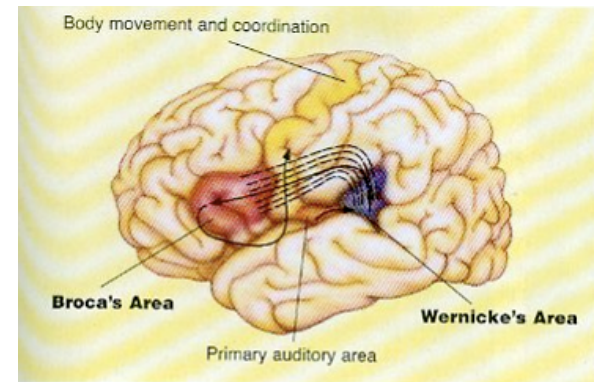
# Awakening the Brain

**We need repetition, recollection and reflection of all sensory experiences for language to develop**



# Awakening the Brain

As sensory rhythms and reflexes are synchronized (the “in-sync” child) language pathways are being strengthened



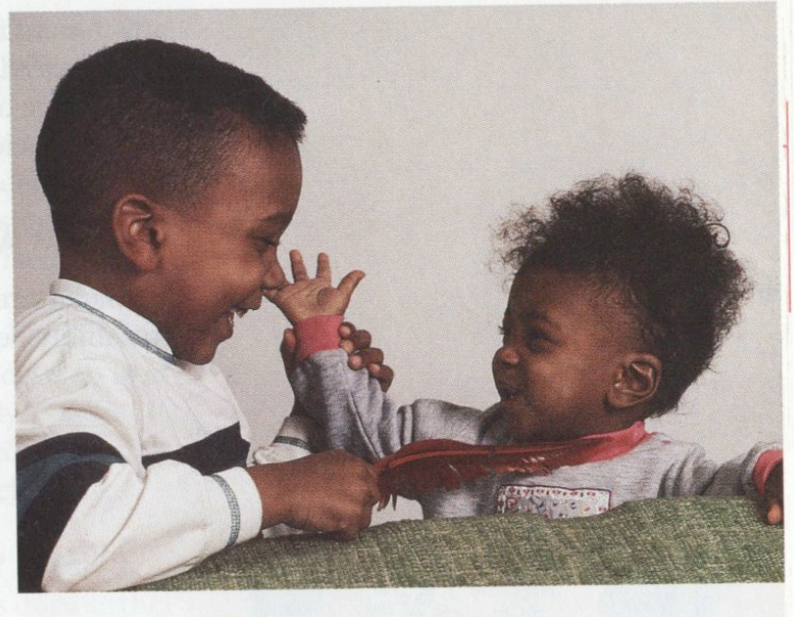


# Awakening the Brain

**External speech**

**Becomes**

**Internal speech**



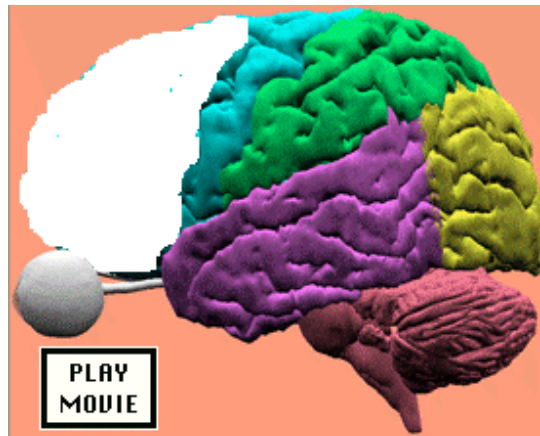
**Which governs self-regulation of  
behavior/executive function**



# Awakening the Brain

**Expression**

**/Self-Regulation/Planning**



**Reception**

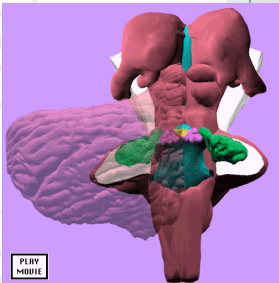
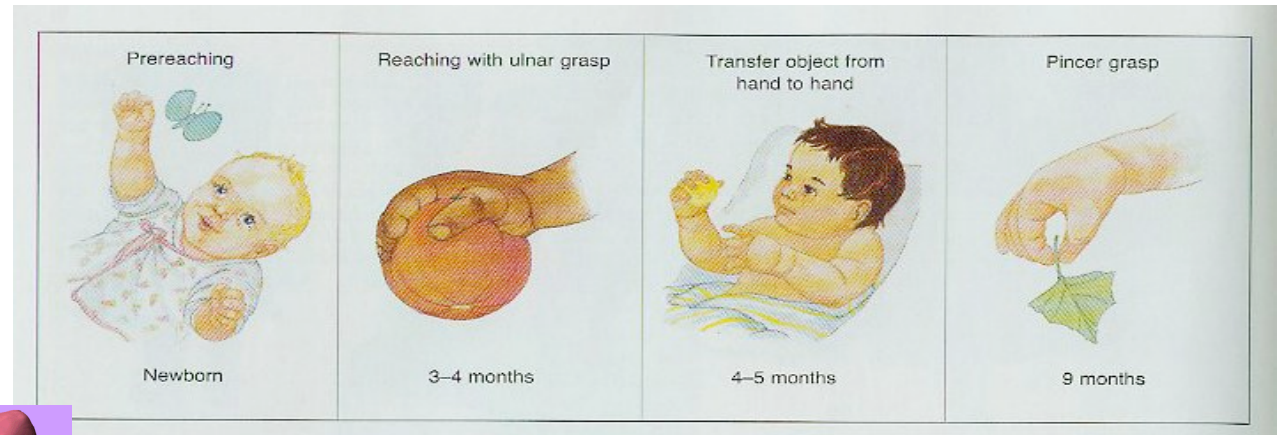
**/Analysis**

**/Storage**

**Rhythm/Synchrony**

# Awakening the Brain

## Rhythms & Reflexes Begin in Utero



**We Are Born a Bundle of Reflexes**

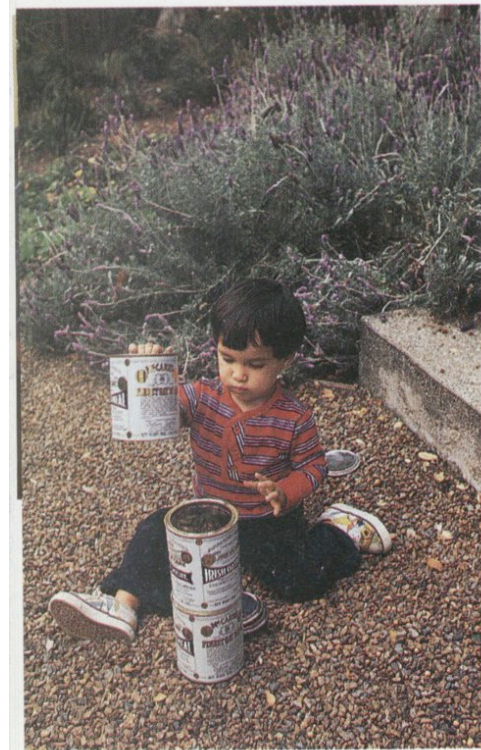
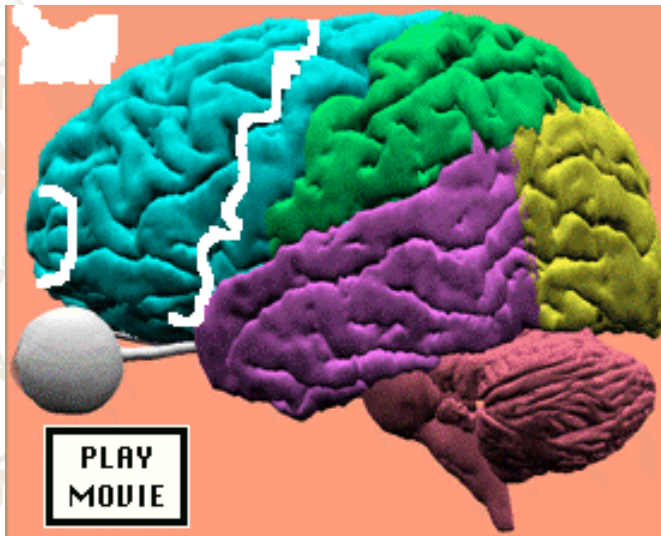
# Awakening the Brain

## Reception, Analysis & Storage



# Awakening the Brain

Expression, Planning, Executive Function





# Awakening the Brain

**Expression, Planning, Executive Function**

