PEDAGOGY for EVERY BRAIN



Neurodiversity in Music Education

31 October 2026

Heidi Moss Erickson
Assistant Professor of Voice
University of the Pacific

CMEA BAY SECTION
Promoting the Advancement of Music Education



VARIED INCLUSIVE PEDAGOGY

© 2026 Heidi Moss Erickson

*Because <u>every brain</u> is a **VIP**!*

Learning requires:

Active Engagement

- Think
- Play
- Pedagogy

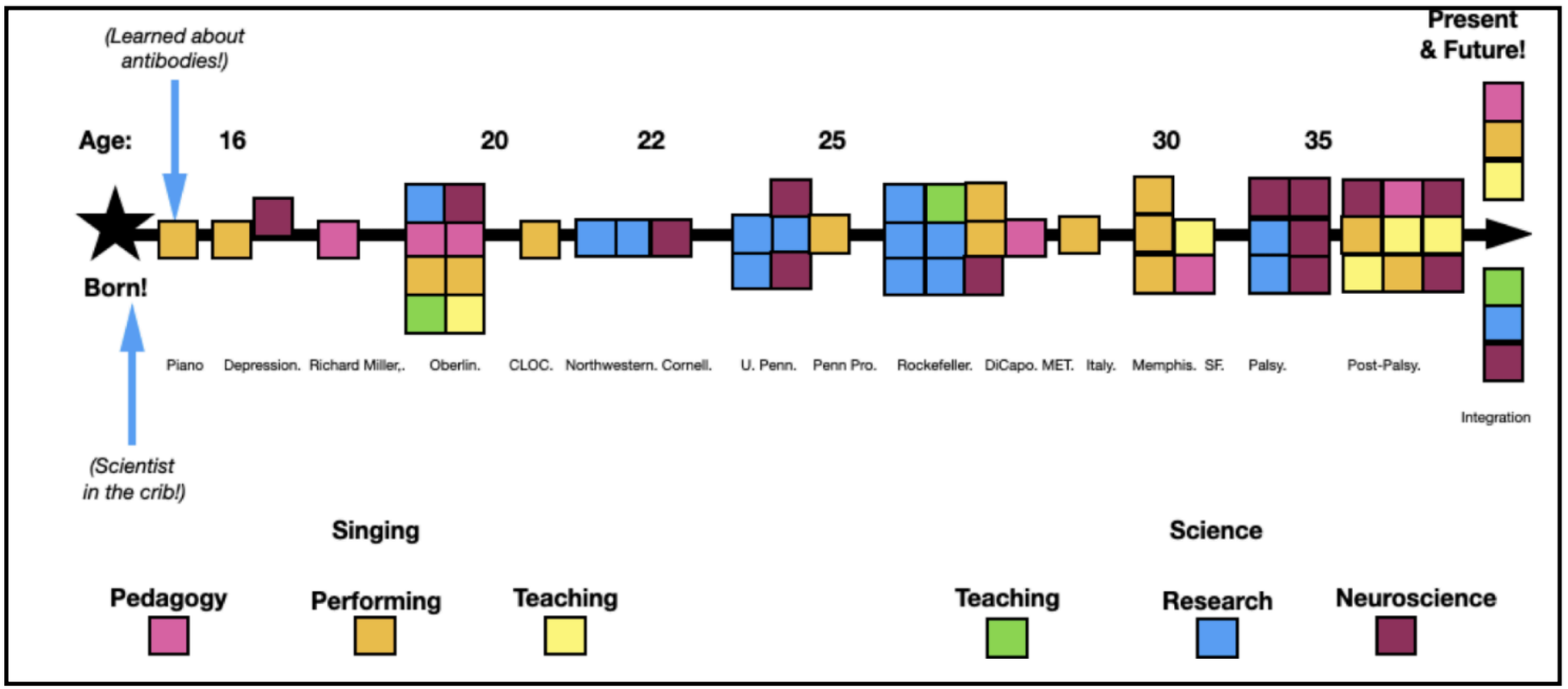
Square Peg --> Round Hole



In education *— and in life —*
being labeled neurodivergent can feel like this.

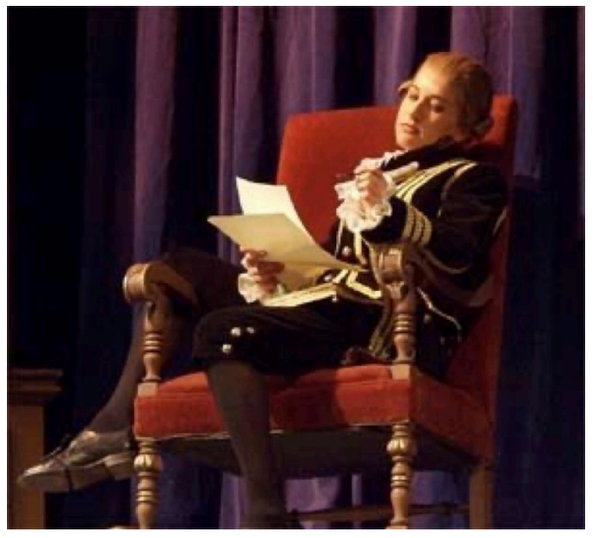
Our job isn't just to teach.
It's to create the conditions in which *every brain* can learn.

Scientist, teacher, musician, and neurodiverse!











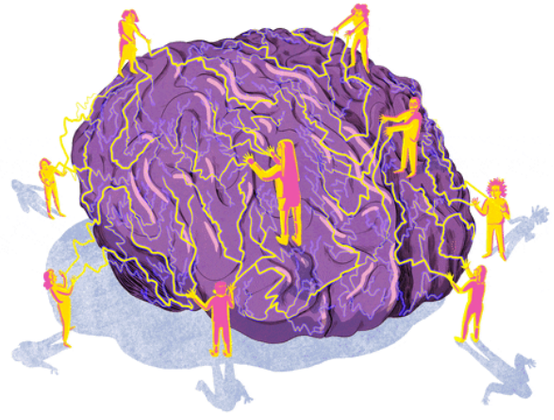


I credit my neurodiversity
for the curiosity that fueled my passion
for *music*, *pedagogy*, and the *brain*.

My challenges became my strengths.

INTRODUCTION

What is *neurodiversity*?



- **Neurodiversity** = natural variation in human brains
  - Coined in the 1990s by sociologist Judy Singer
- Describes differences ***without*** deficit framing
- Like **biodiversity** — variation ***strengthens*** systems
- **Differences** in *processing, circuitry, chemistry, genetics, learning, communication, social interaction*
- Shifts focus from "impairment" to ***diverse strengths and learning strategies***
- Estimated 30–40% of people are neurodivergent *(myself included!)*
  - *but* not all self-identify.
- *"Neurotypical"* is a misnomer — ***<u>all</u> brains are unique***
  - ***One size does NOT fit all!***
  - ***Labels can be misleading***

"I am"
vs
"I have"

Every brain is unique.



We ALL have characteristics that make things *easier* or *harder*.

It is NOT a value judgement.

It allows us to *design* ways to **learn** and **exist**:

to ***optimize*** for ourselves and others.

A varied and multi-sensory teaching toolbox benefits ALL students!

Meet the Judgement Monster



- It lives in everyone's brain.
- It worries about looking bad or making mistakes.
- It says things like, "*Don't mess up!*" or "*Everyone is judging you!*"
- It can make singing and playing feel scary instead of fun.
- It gets **louder** when you focus too much on being perfect.
- It gets *quieter* when you focus on ***curiosity*** and play.
- Mistakes are information, not proof that you're bad.
- Learning happens faster when the Judgment Monster isn't in charge.

Externalizing the monster can be helpful!
Drawing, stickers, a stuffed animal in the room...

Jimothy: *a good role model*

- Like biodiversity, there ARE extremes in **neurodiversity.**
- These can challenge both the individual and educators.
- But there should be more attention given to what <u>works</u>
- Rather than despair or frustration about what doesn't. (:



©HeidiMossErickson2026

Setting the Stage

Brain-Body-Environment Continuum

We are *more* than brains.



Homeostasis: *Keeping Balance*

- Our bodies constantly work to maintain internal stability.
- Even when the world around us changes.
  - *e.g. body temperature, blood sugar, and blood pH.*

Neurodiversity can impact the BOTH the interpretation of inputs AND the response outputs.

What are my students experiencing *before* they arrive to class?

Sleep deprived

Happy best day!

Bullied by a peer



Skipped lunch

Had a meltdown

Received praise

Sensory overload

Aced a difficult test

Schedule Changed

Group nervous system regulation:

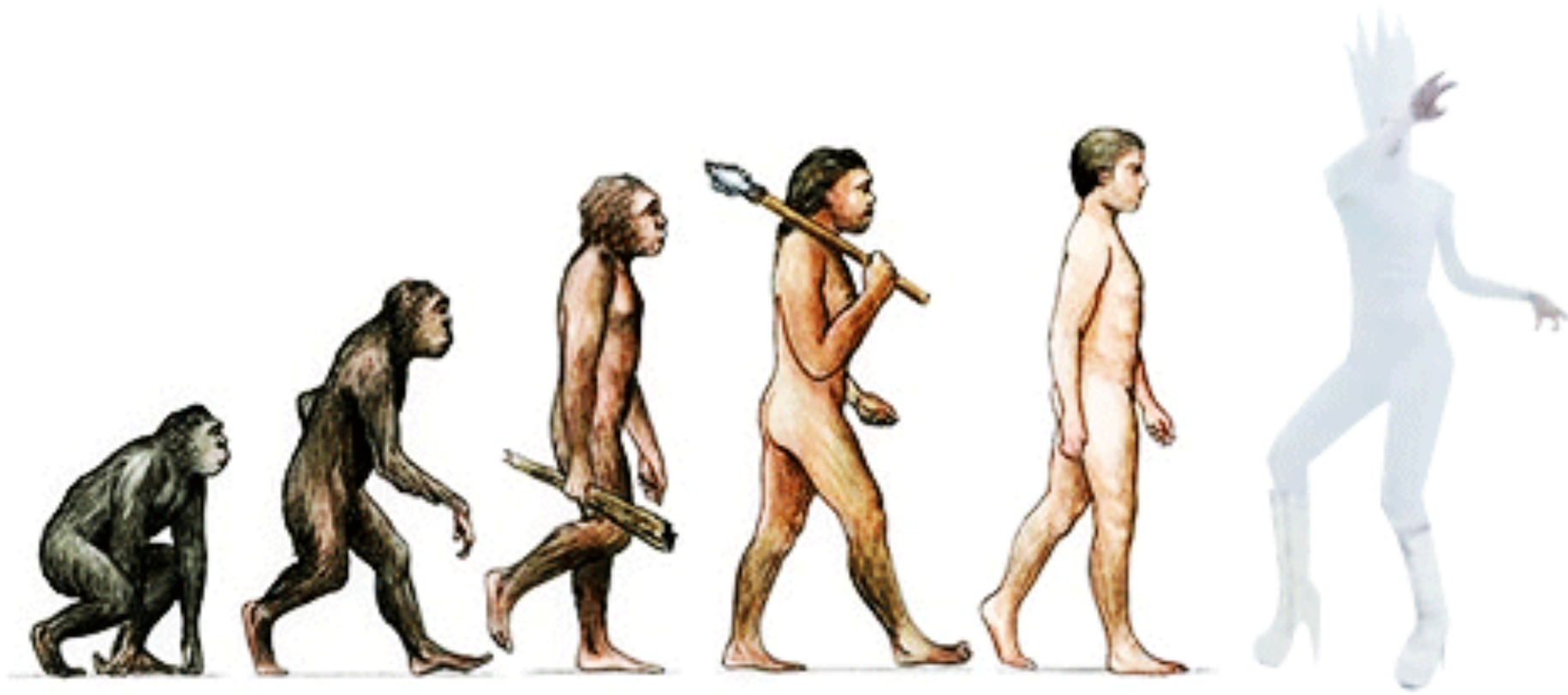
Getting into a calm learning zone
with extended exhales
(Good for breaks too!)



The Origin of Species

We are *Homo Sapiens.*

(but we sometimes forget that...)



We have strayed from our ***fundamental biology.***



- Modern society is evolutionarily *novel*.
- Our nervous systems are *not.*
- We are running *ancient biology* in *artificial environments*.
- Human brains evolved for *rhythm, movement, groups, variation*.
- Today's systems prioritize *speed, uniformity, productivity.*
- ***Neurodiversity*** is not a flaw in the blueprint.
  - <u>It was part of the blueprint.</u>
- The *mismatch is societal— not* biological.
- The issue is not broken brains:
  - It is an *anthropologic mismatch.*



Think about the average school day schedule for a child.

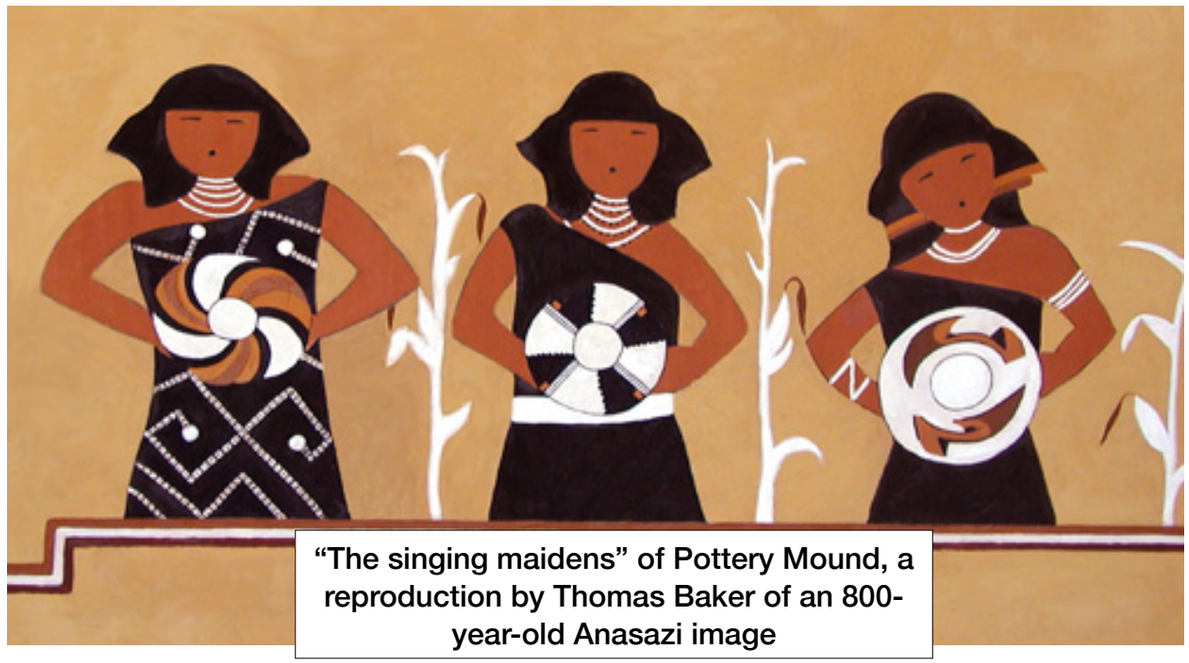
How does it compare to a traditional hunter-gatherer childhood?



©HeidiMossErickson2026

Why do we sing?
Why do we make music?

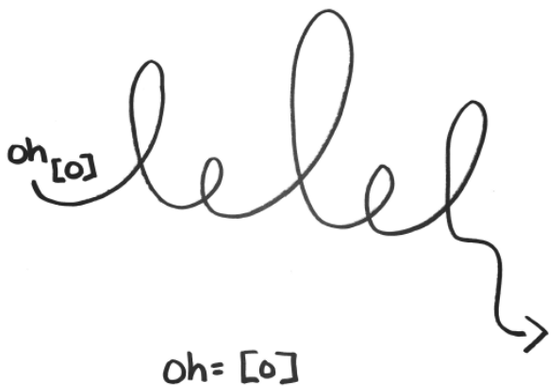
- To EXPRESS.
- To CONNECT.
- To COMMUNICATE.



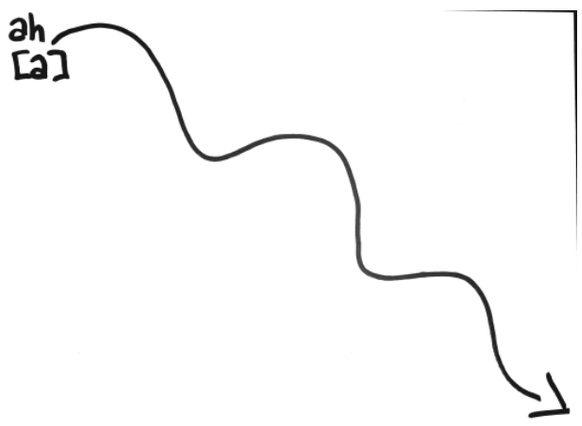
"The singing maidens" of Pottery Mound, a reproduction by Thomas Baker of an 800-year-old Anasazi image

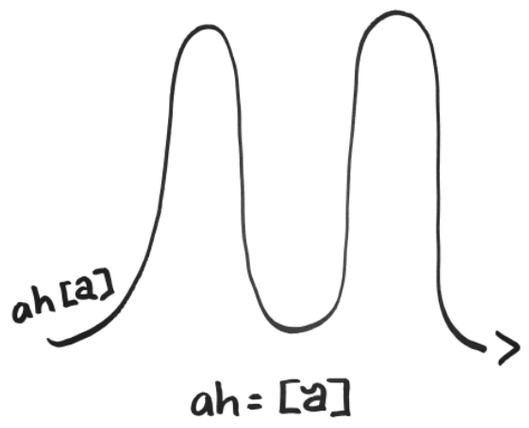
If music is a form of human communication,
then our pedagogy must embrace
the many different ways humans communicate.

Siren Improvisations









automation

gesture

affect



intention

spontaneity

ease

You just did everything you needed for singing AND playing!

Neurodiversity Up Close

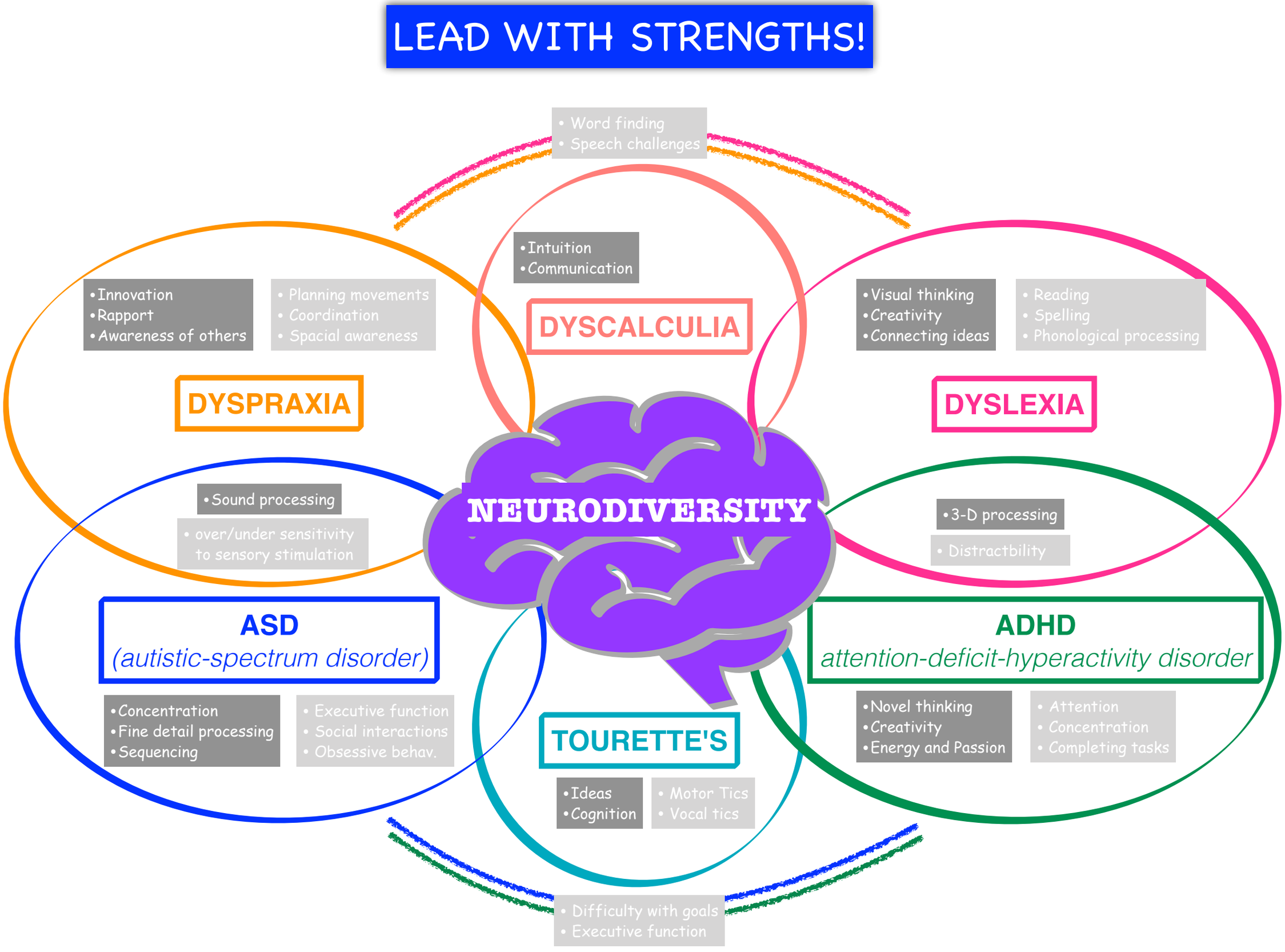
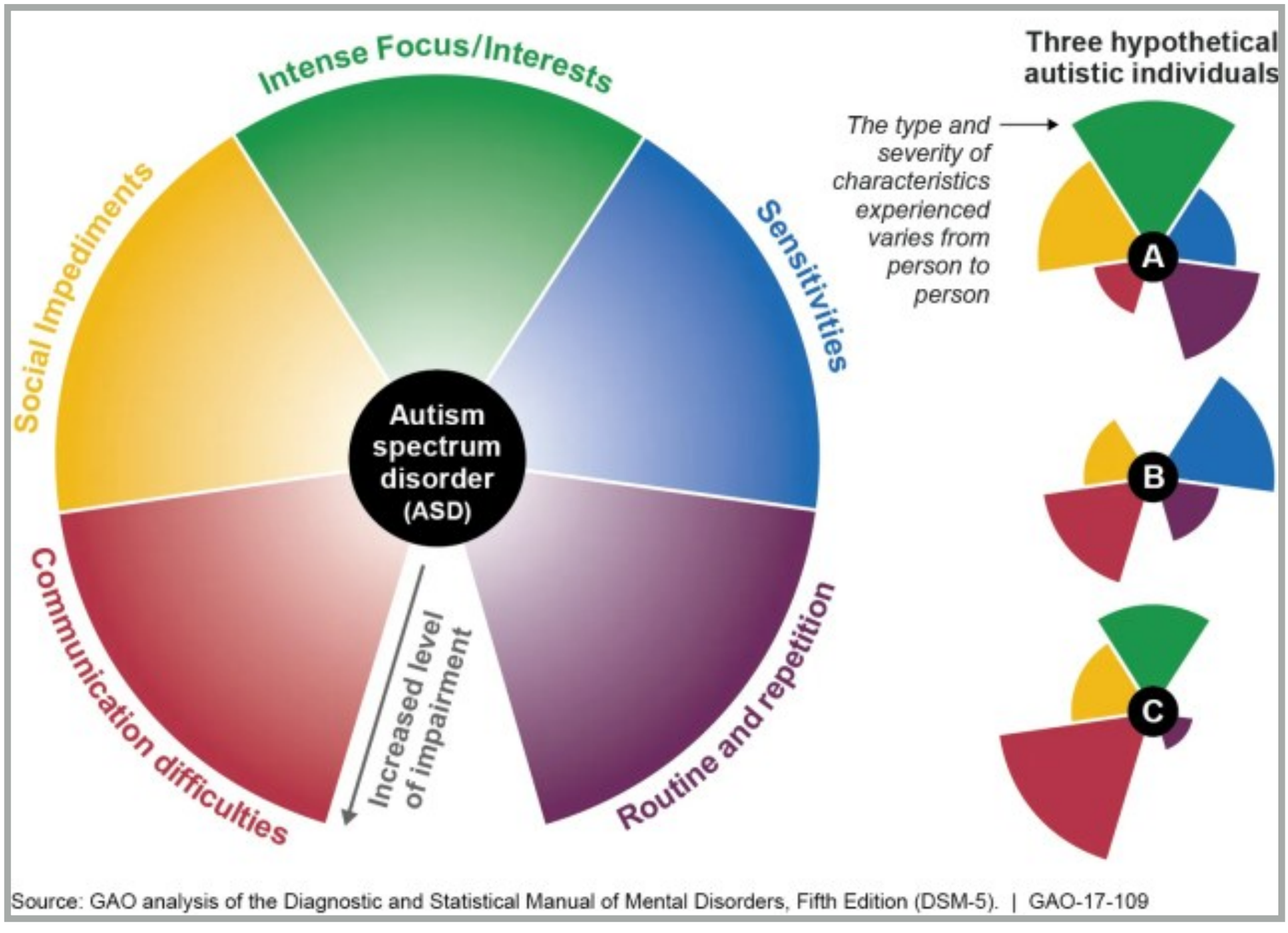


Figure 1A: Overlapping characteristics in neurodiversity

• DARK GRAY = strengths • LIGHT GRAY = challenges

"When you meet one person with autism...
you have met one person with autism..."
-A private student (;

Individuals with Autistic Spectrum Conditions demonstrate a *wide spectrum* of ability.



Source: GAO analysis of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). | GAO-17-109

Neurodiversity in Music

©HeidiMossErickson2026

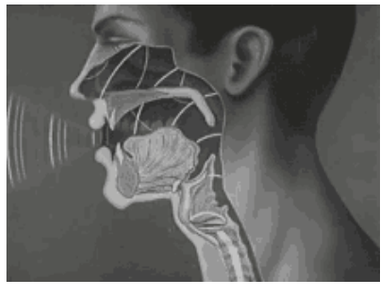
What is *making* music?

INTEGRATION











Focus

Thought *

Action/Consequence

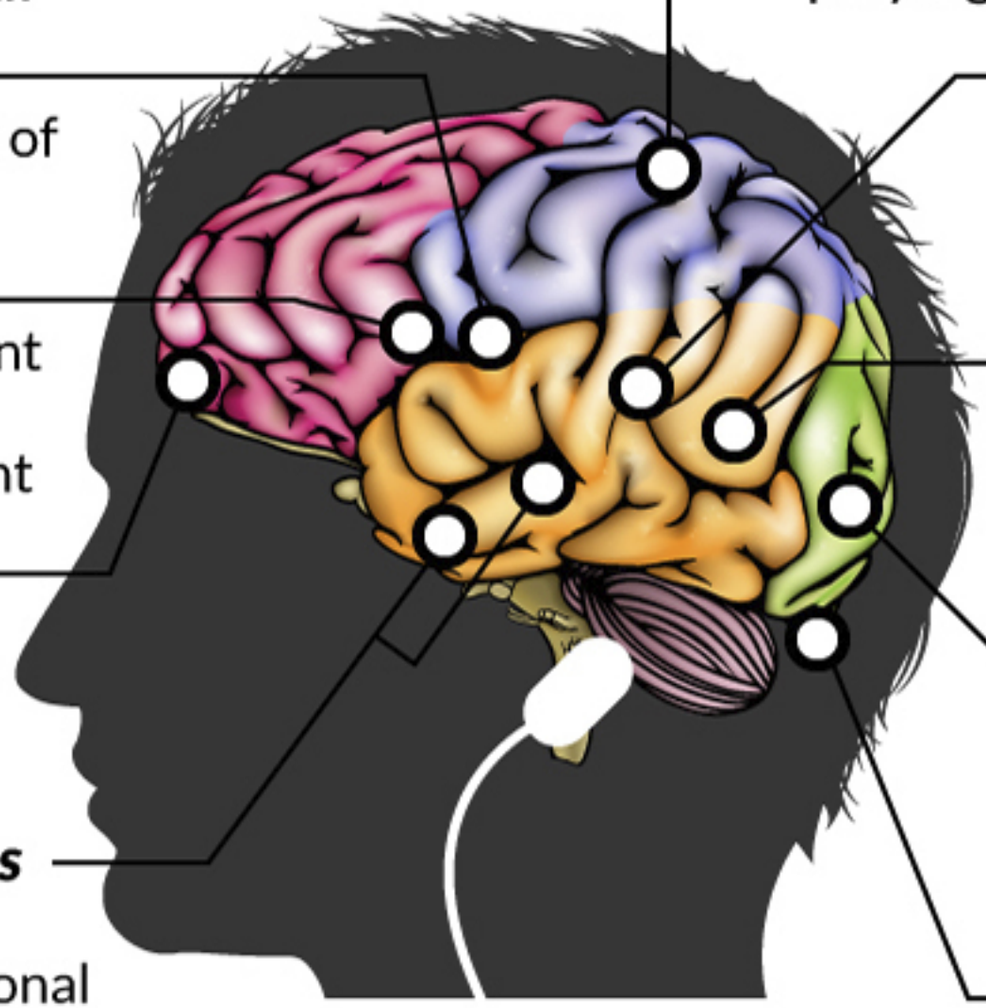
Feedback *

*neurodiversity

Music is a WHOLE BRAIN experience.
Musicians use many parts of their brain!

Music and the brain

Playing and listening to music works several areas of the brain



Sensory Cortex:
Controls tactile feedback while playing instruments or dancing

Corpus callosum:
Connects both sides of the brain

Auditory cortex:
Listens to sounds; perceives and analyzes tones

Motor cortex:
Involved in movement while dancing or playing an instrument

Hippocampus:
Involved in music memories, experiences and context

Prefrontal cortex:
Controls behavior, expression and decision-making

Visual Cortex:
Involved in reading music or looking at your own dance moves

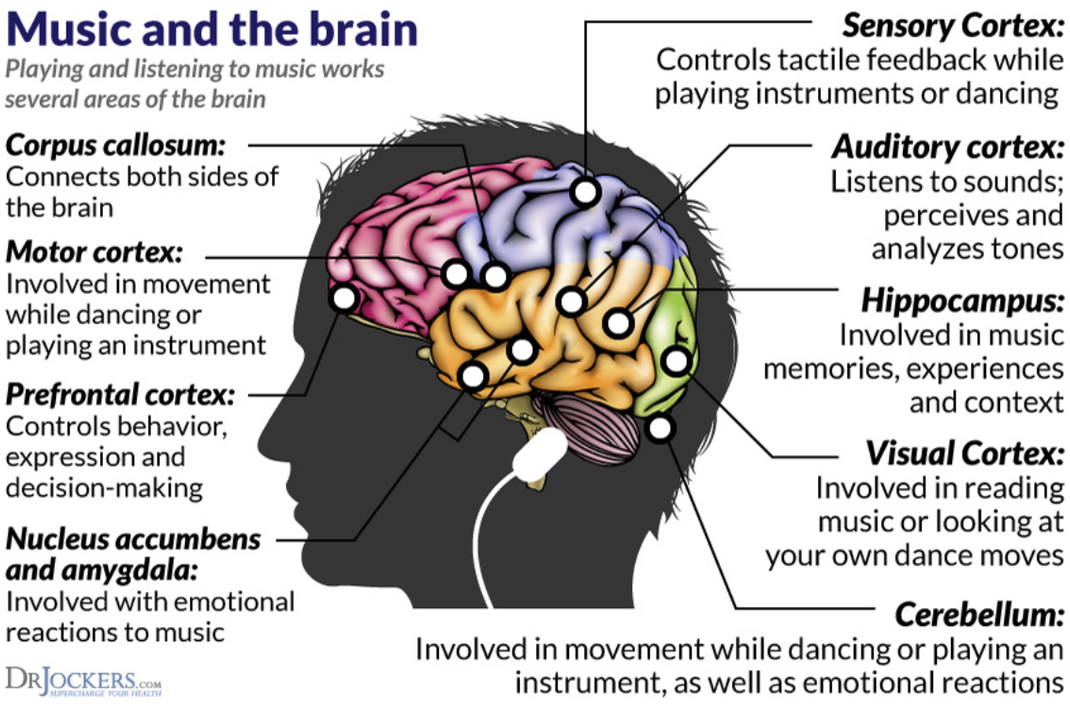
Nucleus accumbens and amygdala:
Involved with emotional reactions to music

Cerebellum:
Involved in movement while dancing or playing an instrument, as well as emotional reactions

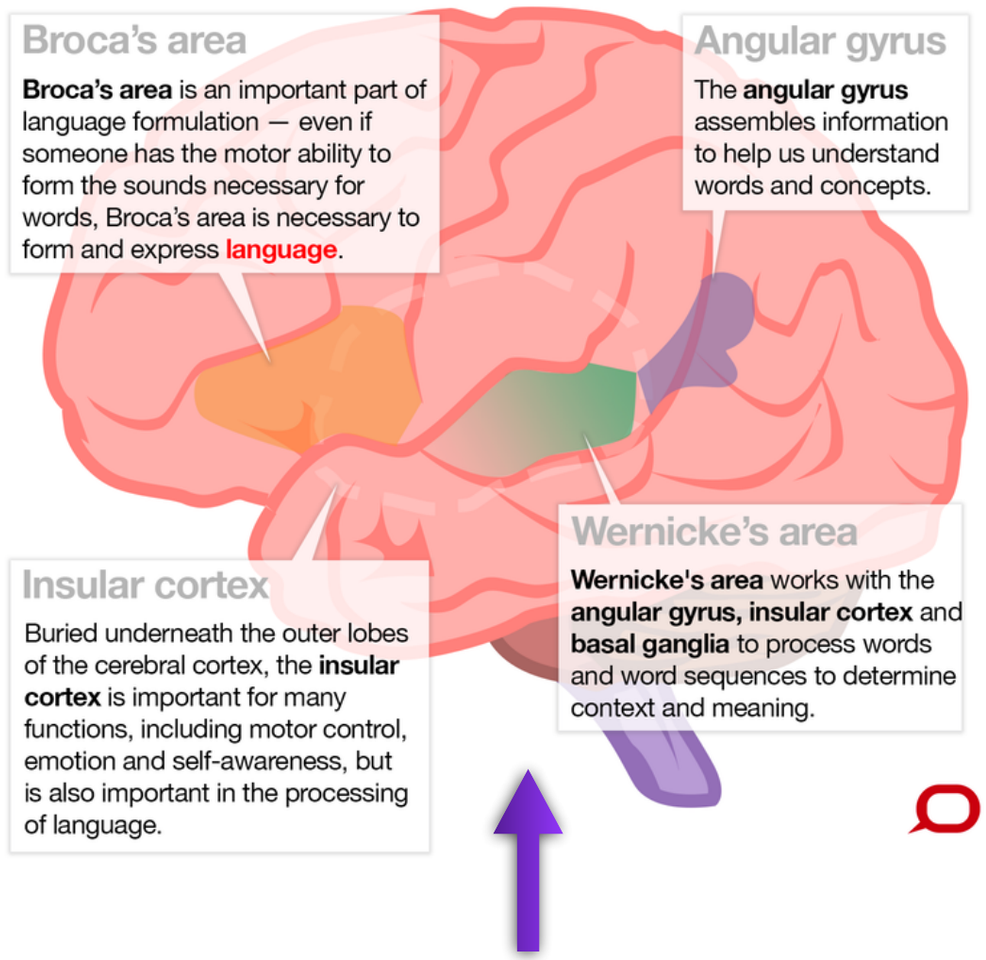
DrJockers.com
SUPERCHARGE YOUR HEALTH

SINGING requires even MORE parts of the brain!

Musical

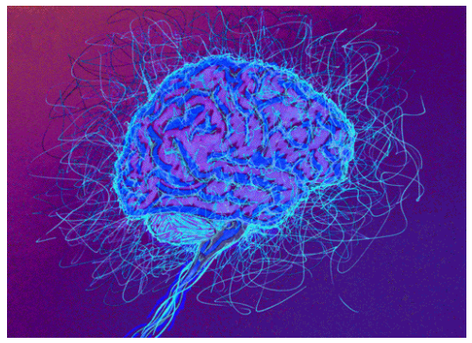


Linguistic

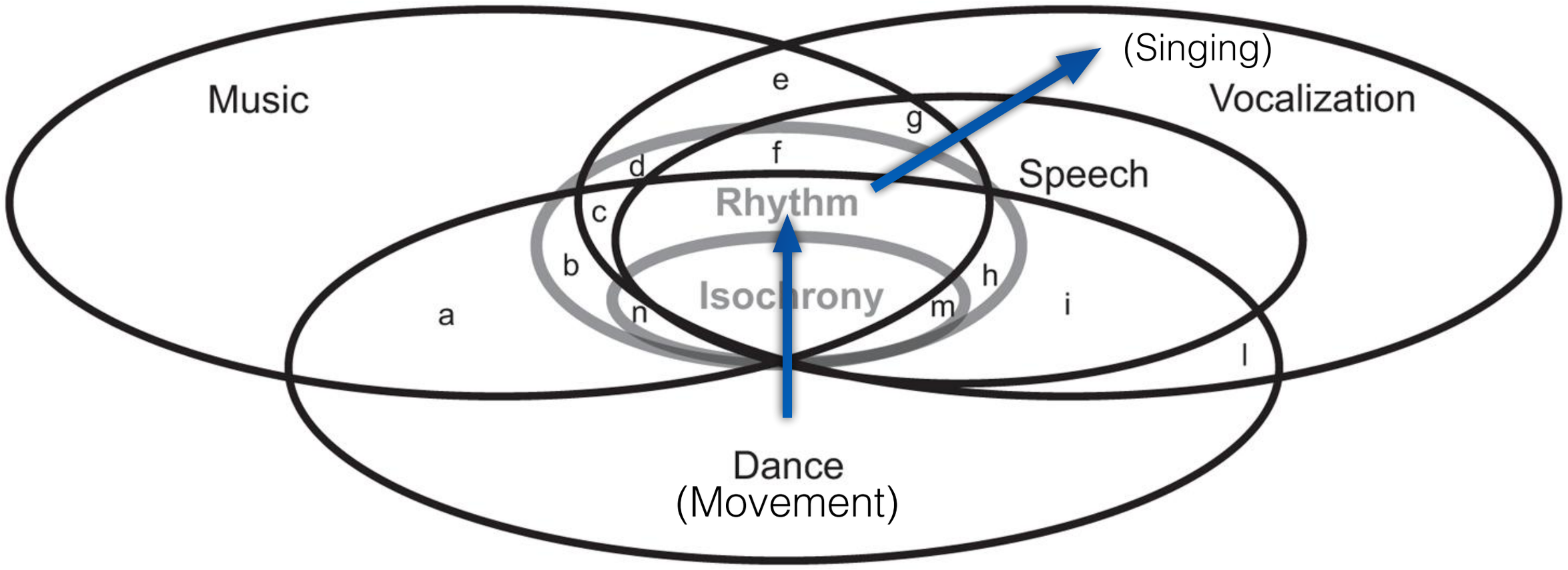


Neurodiversity can impact processing.

Neural Circuitry



Many elements of singing, language, and rhythm overlap in our brains!

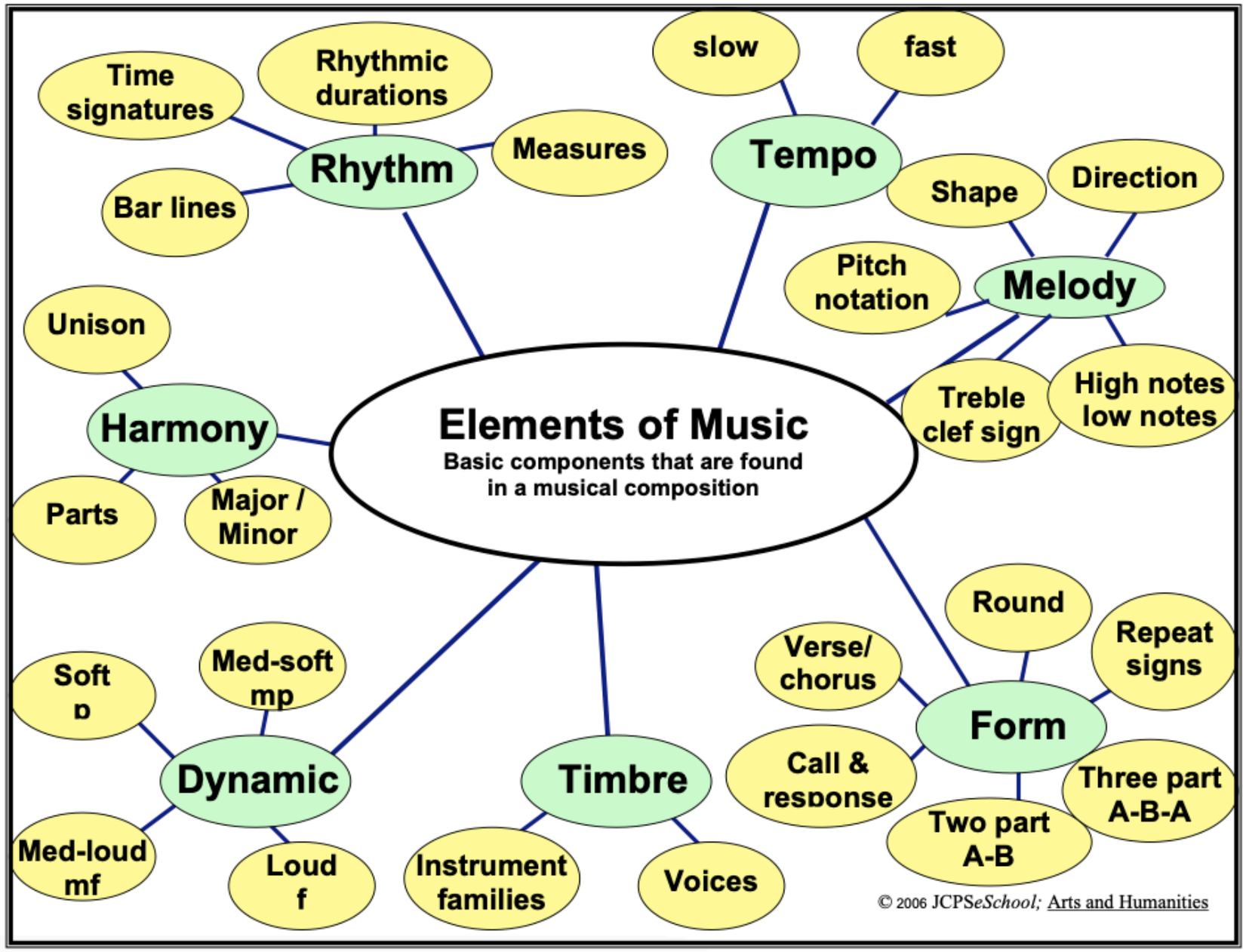


(Ravignani and Madison, Frontiers in Psychology 2017)

Elements of overlap will also be **varied** in **neurodiverse populations**:

they can be used as a **tool** to **enhance different circuits**!

Music gives our brains SO many things to observe!



When you view this diagram,
are you drawn to certain elements more than others?
Do you feel skilled in certain elements more than others?
How about your students?

How alike are YOUR musical brains?



Let's PLAY!

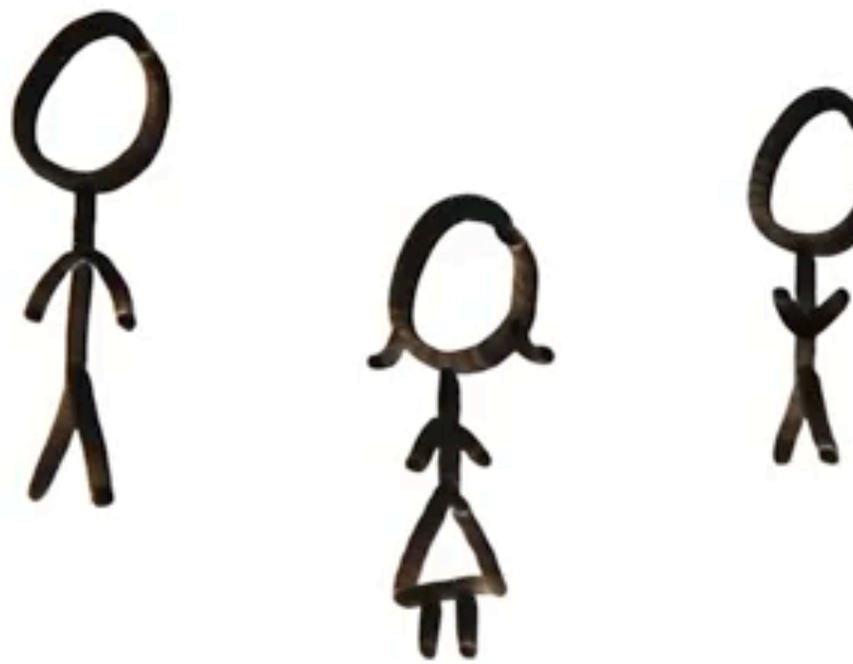








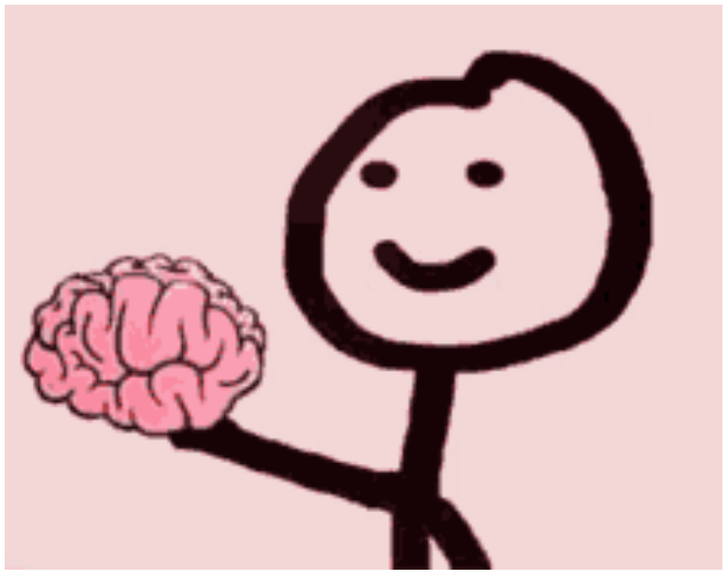




#1

If a room full of music educators differ in how we hear, imagine those differences in our students?



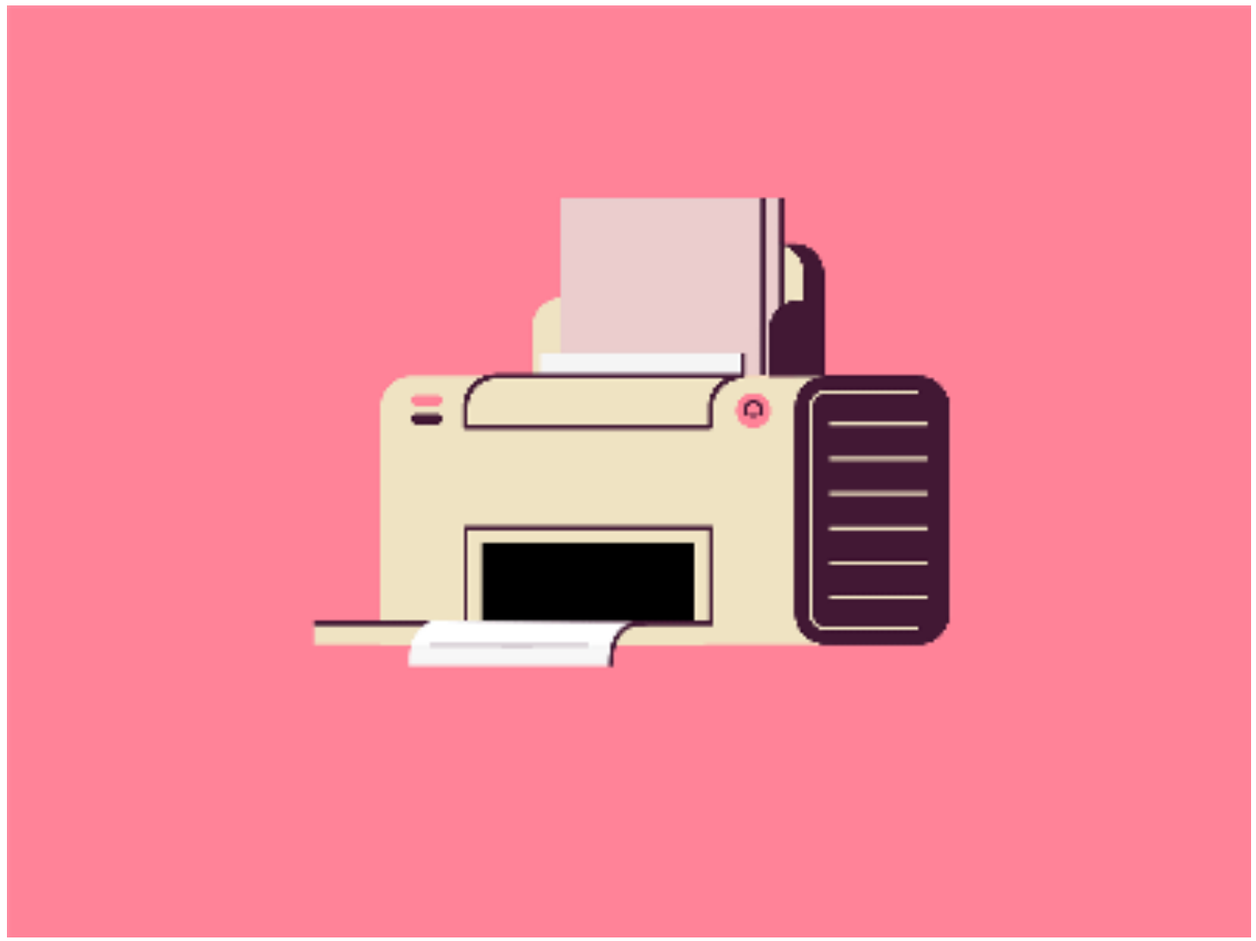


Universal Features of ALL Brains

- Attention
- Prediction
- Consolidation

©HeidiMossErickson2026

A metaphor



What happens *FIRST?*



Observation *vs* Action



SO much of what we do cannot be seen
AND happens BEFORE we even do it!

ATTENTION

©HeidiMossErickson2026

Teachers are directors of ATTENTION.

*What **can** you think about?*
*What **should** you think about?*
***When** do you think about them?*

Sense,
feel,
observe,
teach,
learn



Technique	Sound	Emotion	Sensations	Text	Visual
Posture	Vibrancy	Character	Vibration	Words	Imagery
Jaw	Timbre	Mood	Tension	Syntax	Surroundings
Tongue	Pitch	Musicality	External	Foreign	Music
Lips	Intensity	Personal subtext	Internal	Native	Biofeedback
Folds	Melody	Unrelated	Kinesthetic	Vowels	
Breath flow	Rhythm	Distraction	Body movements	etc.	
Body maps	Patterns	etc.	etc.		
etc.	Chiaroscuro				
	etc.				

*Each thought triggers a cascade of unique and interconnected neural networks.

NEURODIVERSITY will impact each element in different ways!*

*

What draws your attention?
How alike are our brains?
Let's watch this advertisement and compare. (:

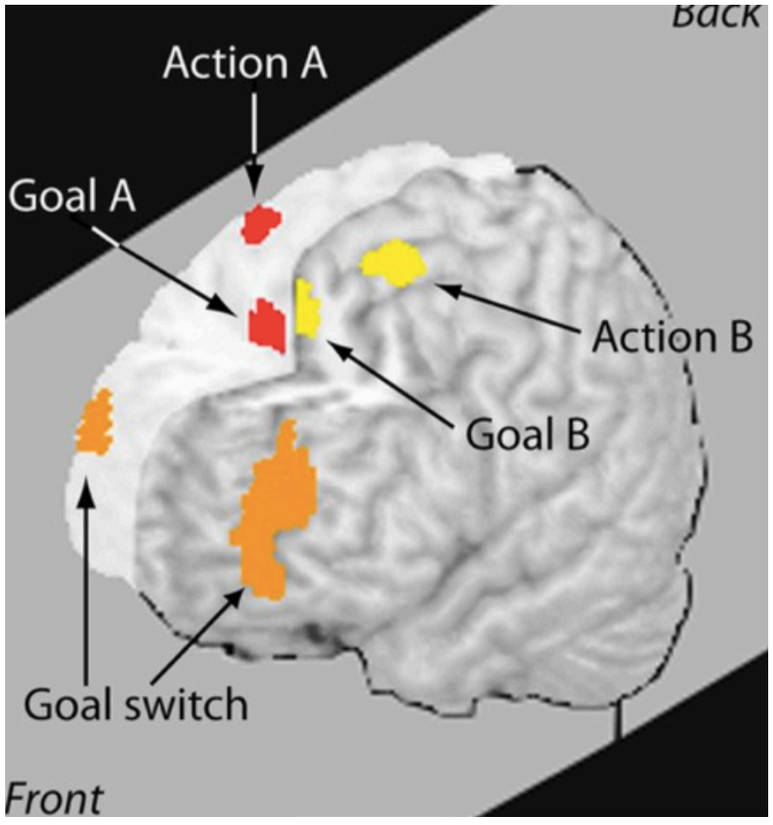


ATTENTION

- The brain doesn't truly multitask—it ***task-switches.***
- Competing tasks divide our limited attentional resources.
- Switching between tasks introduces ***processing delays.***
- The result? *Slower processing, greater cognitive load, and more errors.*

Goal-switching involves time and extra brain energy

Neurodiversity can impact processing.



Mayr, U. & Kliegl, R. (2000)

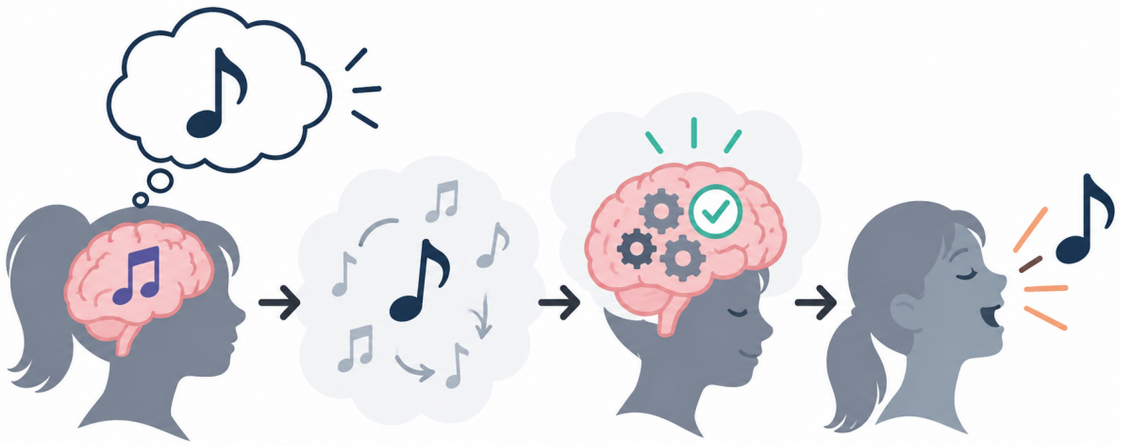
PREDICTION

©HeidiMossErickson2026

Prediction

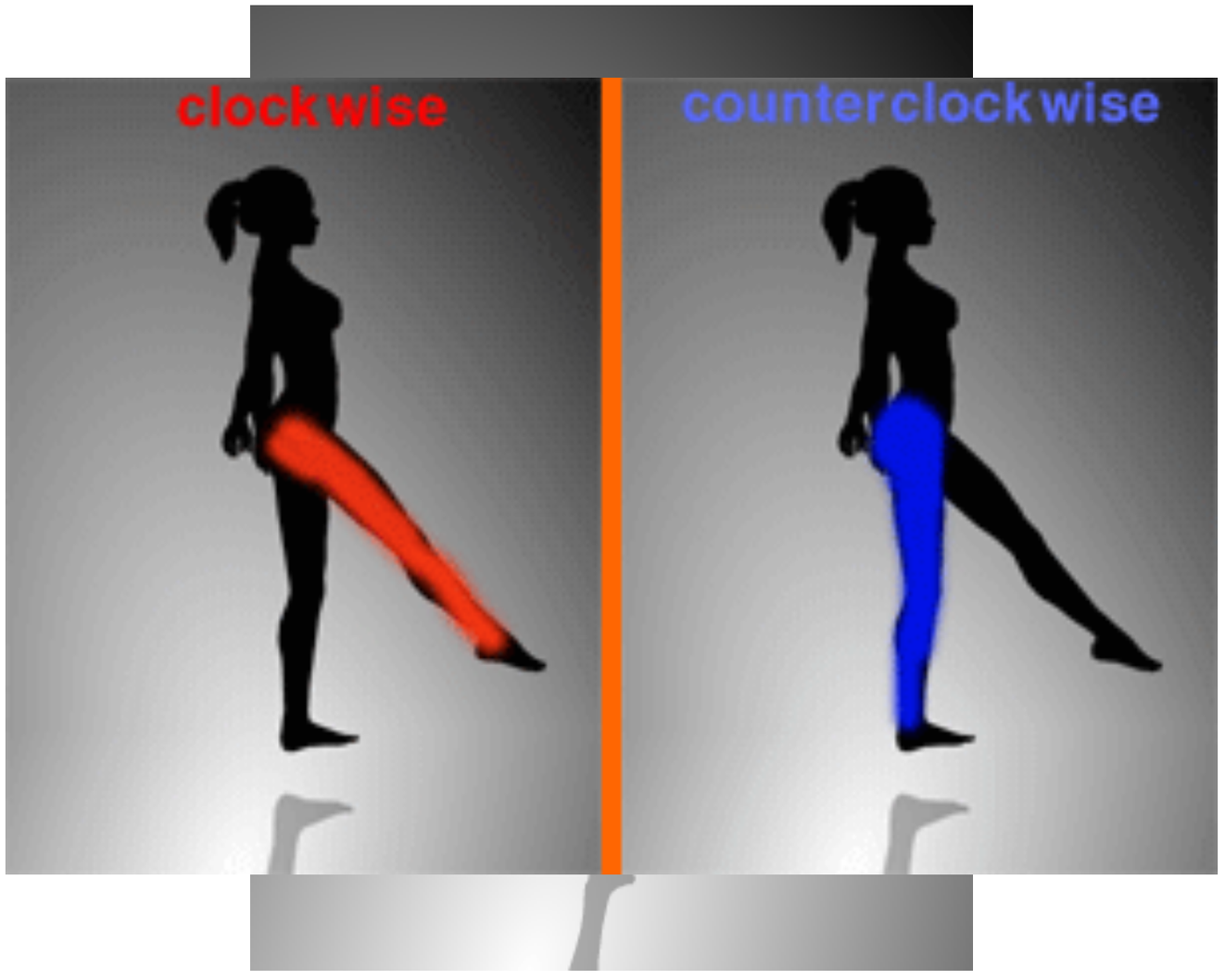
🧠 **Your brain is always predicting.**

- **Before you DO something, your brain makes a guess.**
- It uses **past experience** to predict what will happen.
- Then it checks: **Did that work?**
- Every success—*and every <u>mistake</u>*—gives it **new information.**
- This process makes it better and more accurate the next time!
- 🎤 **Playing music and singing works the same way!**



We are generating algorithms for our students to predict more accurately and efficiently!

Optical Illusions are a form of prediction errors.



Is the dancer turning CLOCKWISE or COUNTERCLOCKWISE?

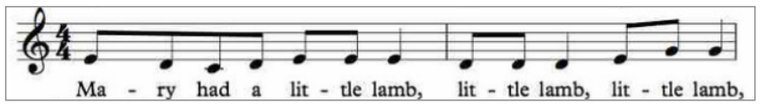
PLAY

Allows the brain to **EXPLORE, DISCOVER, and REFINE** useful solutions.



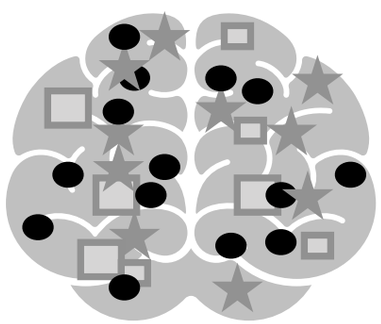
More exploration → richer data → better predictions → musical proficiency.

Many kinds of PLAY for a musical brain!



R L

A. Expressive Play



Emotion

- Enthusiastic joy
- Morose
- Indifferent

Character

- Momma singing a lullaby
- Like an angry CEO
- A boy skipping through a field

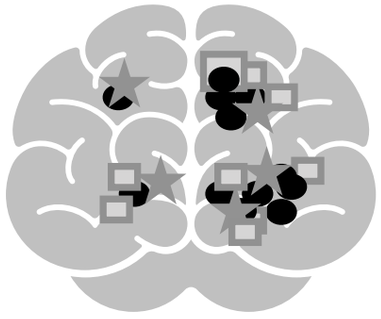
Somatosensory

- Drawing circle on white board
- Squatting every other beat
- Squeezing a ball

Imagery

- Forward blue waves
- Spirals
- Standing ovation

B. Targeted Play



Toggle



1. [u]; [i]; [a]
2. little; little; little

Inversions



1. [i]
2. had a li-

Notes from above/below

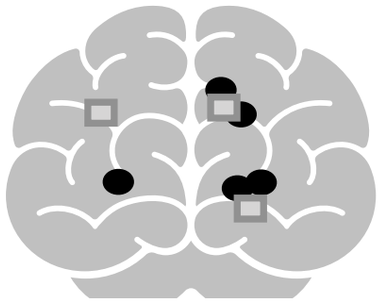


1. [a]
2. little lamb

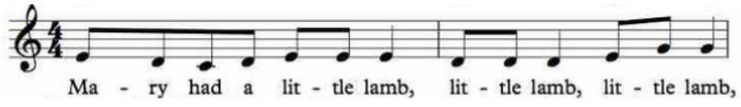
Improvisation

e.g. scat;
jump octaves;
change patterns
(quiets DLPC)

C. Literal approaches

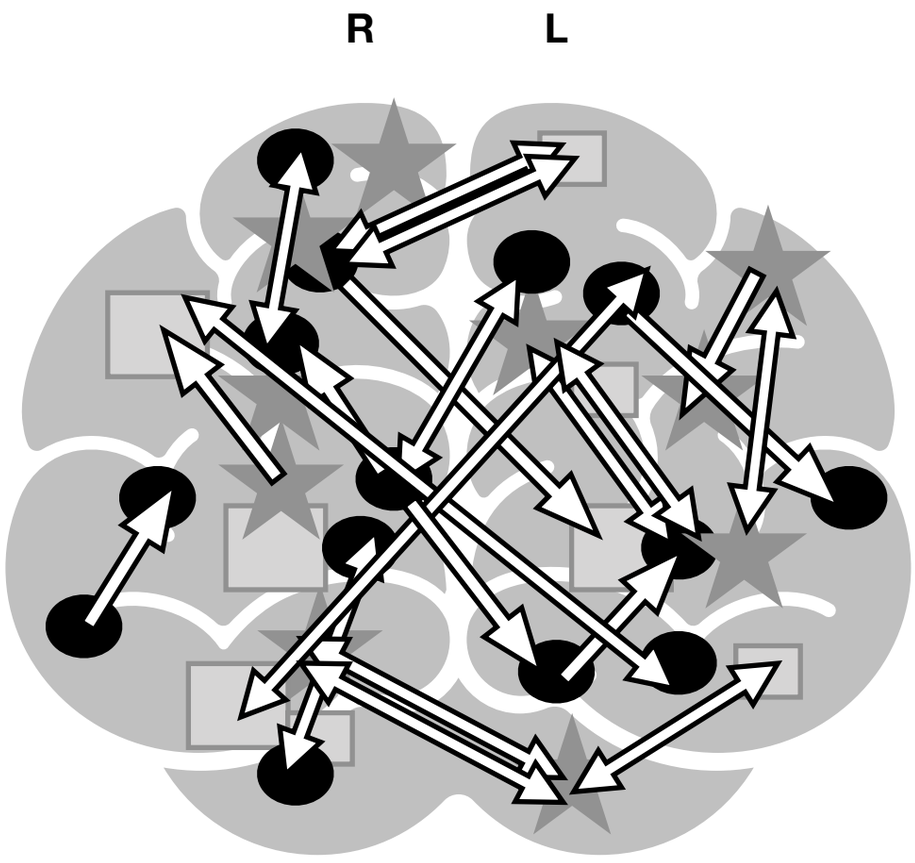


Sung as written only

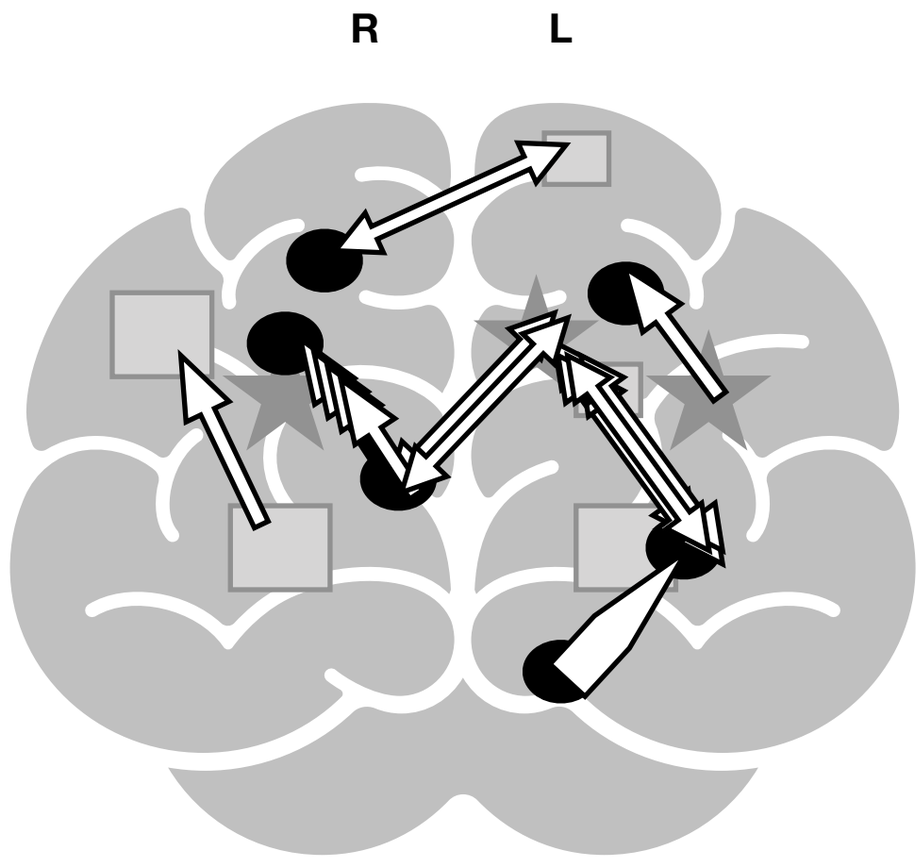


From H.MossErickson Journal of Singing, *in press*

Variety/Play + Rest



Literal Drilling



All brains benefit!

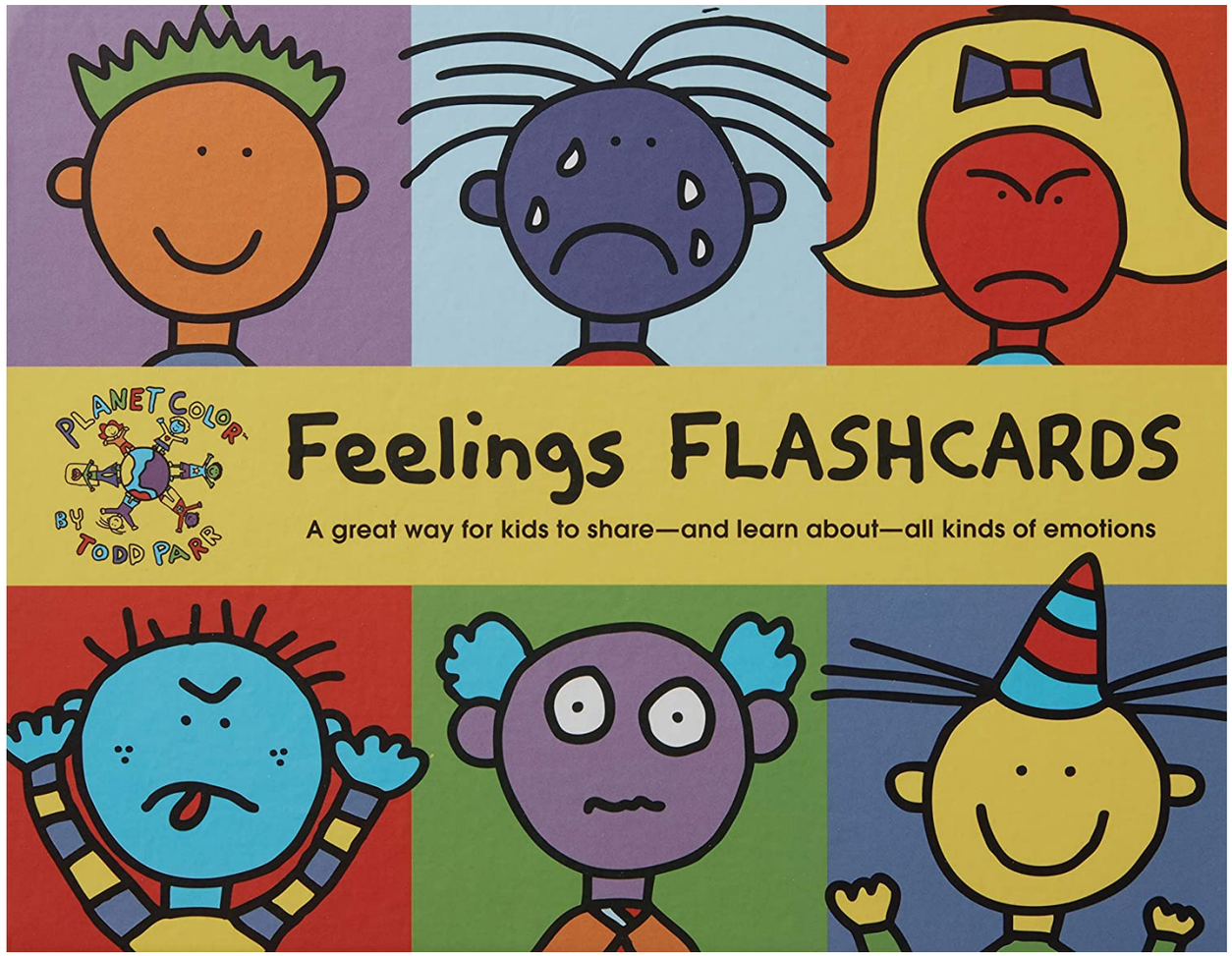
But <u>especially</u> in **neurodiversity** where standard approaches may not be as effective.

PLAY!

EMOTIONS

PARTNERING

CHARACTERS



OPPOSITES

STORIES

PROPS

VISUALS

MOVEMENT

REST

©HeidiMossErickson2026

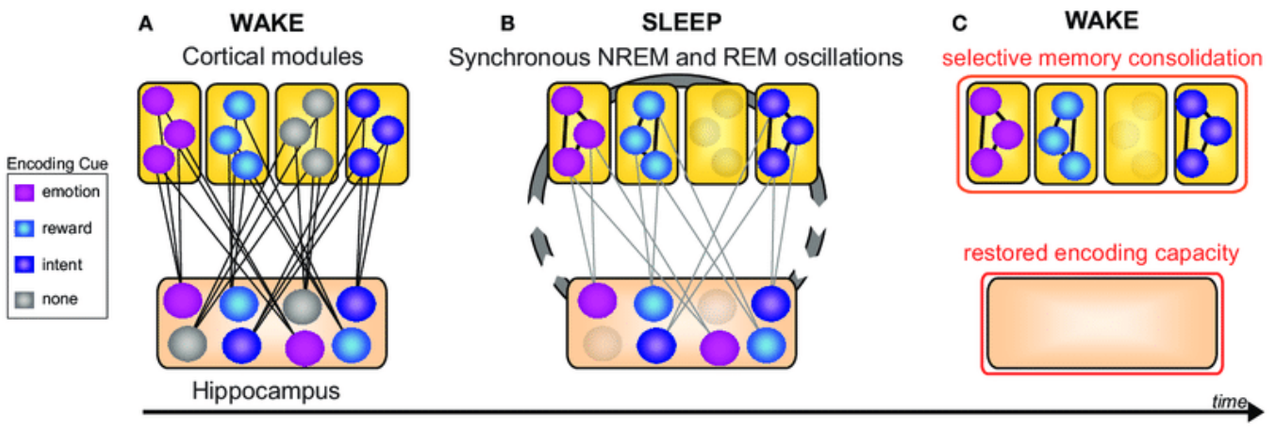
Why do we need REST?



It is how information gets STORED.
It also makes connections to other experiences
To REFINE prediction.

Practice and play plant the seeds.

Rest helps them grow. 🌱🧠



Rest = Brain Processing Time

- Sorts new information
- Connects it to old memories
- Strengthens useful learning
- Helps you remember later

Learning is strongest when you are:

- Interested
- Motivated
- Emotionally engaged

Learning is harder when you are:

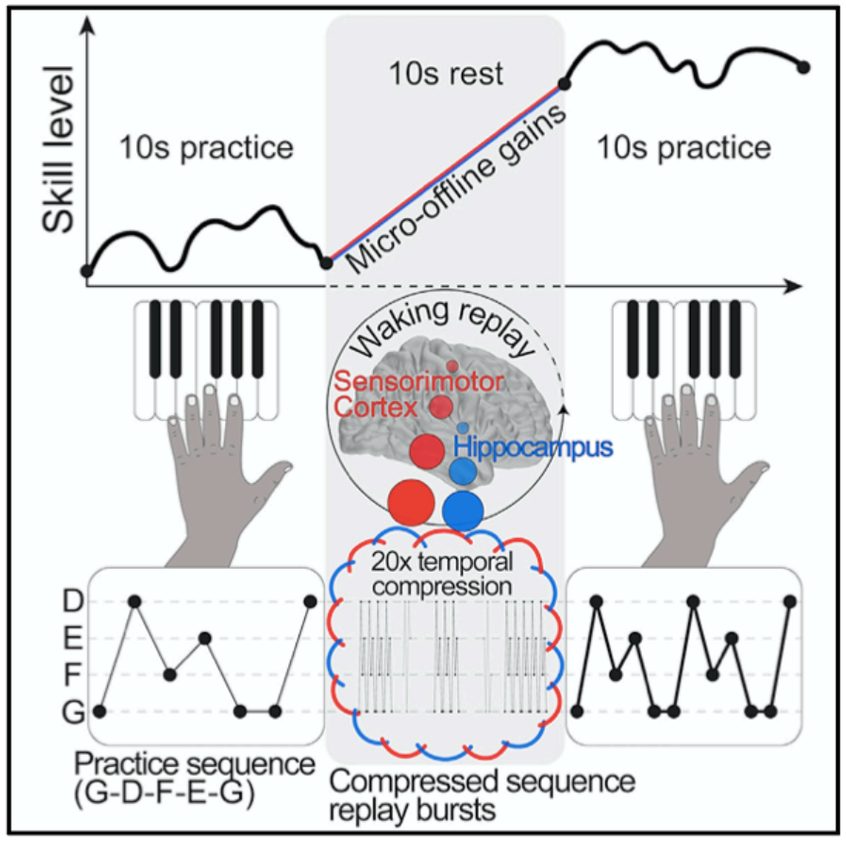
- Stressed
- Passive
- Disconnected from the goal

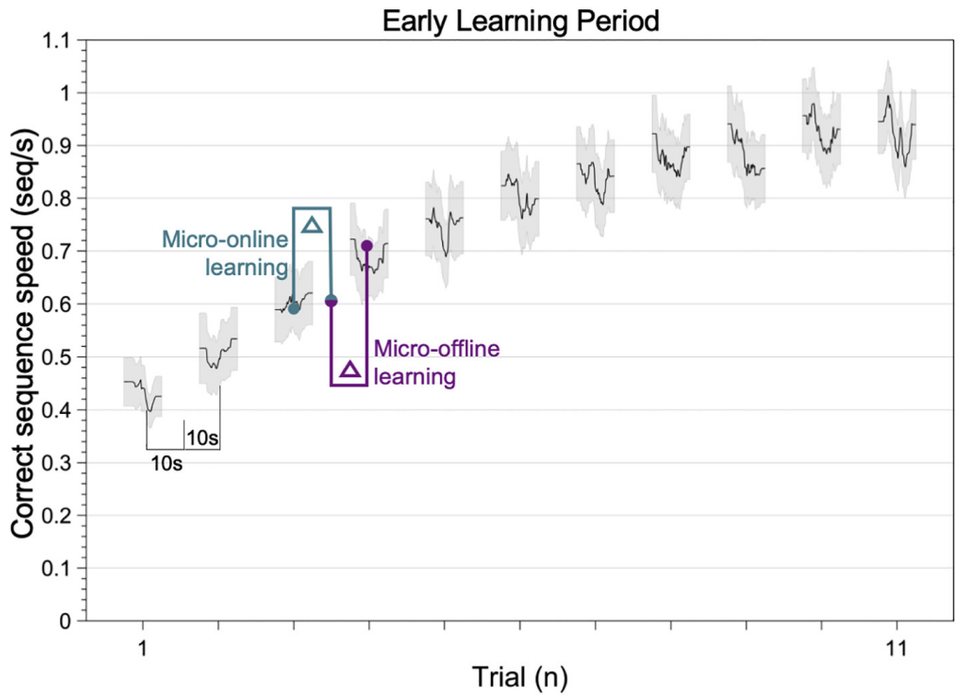
The VALUE of Short Rests in Music Pedagogy



AN ACTUAL PIANO BRAIN EXPERIMENT!!!

FASTER IMPROVEMENT with spaced 10-second RESTS than with continuous repetition alone!





- Practice **a chunk a few times**, then **stop!**
- Do nothing: *breathe, blink, vibe, stare at the wall*
- While you rest, your brain **secretly practices 20–30 times forwards and backwards!**
- You don't feel it happening — it's **autopilot learning**
- **Mini breaks = faster progress**

Ethan R. Buch, Leonardo Claudino, Romain Quentin, Marlene Bönstrup, Leonardo G. Cohen,
Consolidation of human skill linked to waking hippocampo-neocortical replay,
Cell Reports,Volume 35, Issue 10 ,2021,

Neurodiversity in Music Pedagogy

©HeidiMossErickson2026



There are *a lot* of variables
(with many permutations*)
in music…
in singing…
in life...
between individuals
(and their brains).
It makes our job challenging…
But also interesting and fun!
Enjoy the process, not product!
(Be a seeker).

COLLECTIVE INDIVIDUALITY

THREE key areas we can vary and optimize
for our wonderfully diverse collection of brains.

Environment

Communication

Strategies

ALWAYS work to strengths
we can learn just as much from what is going **RIGHT**
as from what is going *WRONG.*

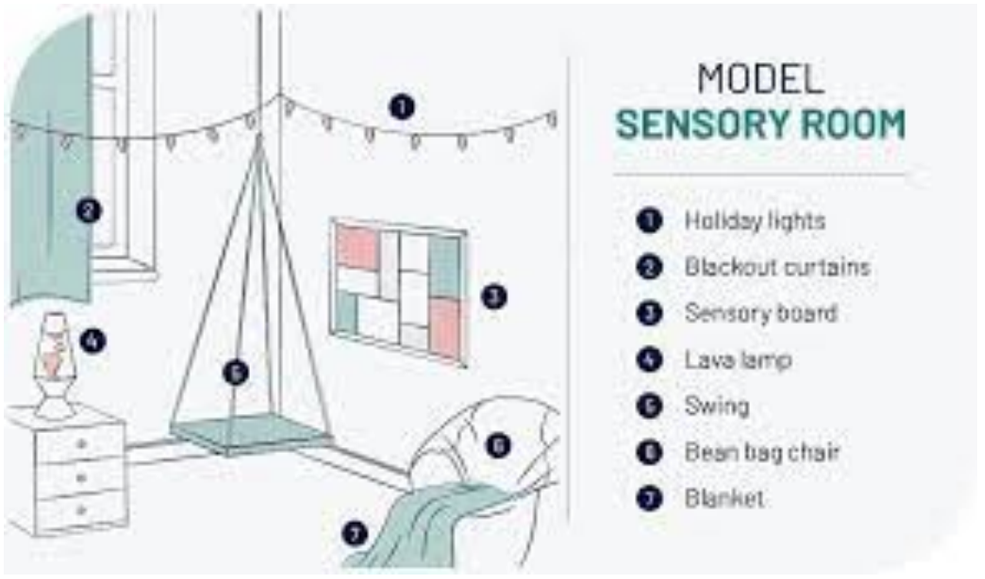
©HeidiMossErickson2026

Environment

- Know sensory triggers



- Include safe spaces



- Calming strategies



- Calming objects



- Provide a buddy or mentor



Environment

- Limit distractions



- Options for sitting/ standing



- Time as a visual



- Access to fidgeting objects



- Change position frequently



Communication

- Create communication board



- Be specific and precise with instructions



- Give agenda ahead of time for every lesson, identify and acknowledge when deviating from it



Communication

- Give extra time before and after to review ideas



- Include REST to process

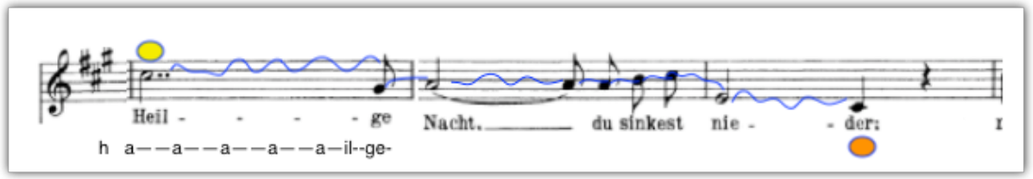


- Use visuals



Strategies

- Memory skills: teach shorter segments and patterns



- Organizational skills:
  e.g. color-coding



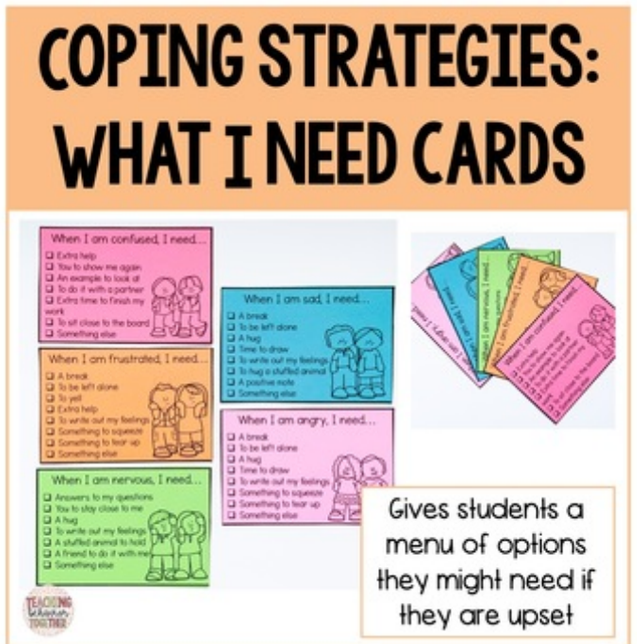
- Create a routine



- Timekeeping: e.g. pomodoro or timer

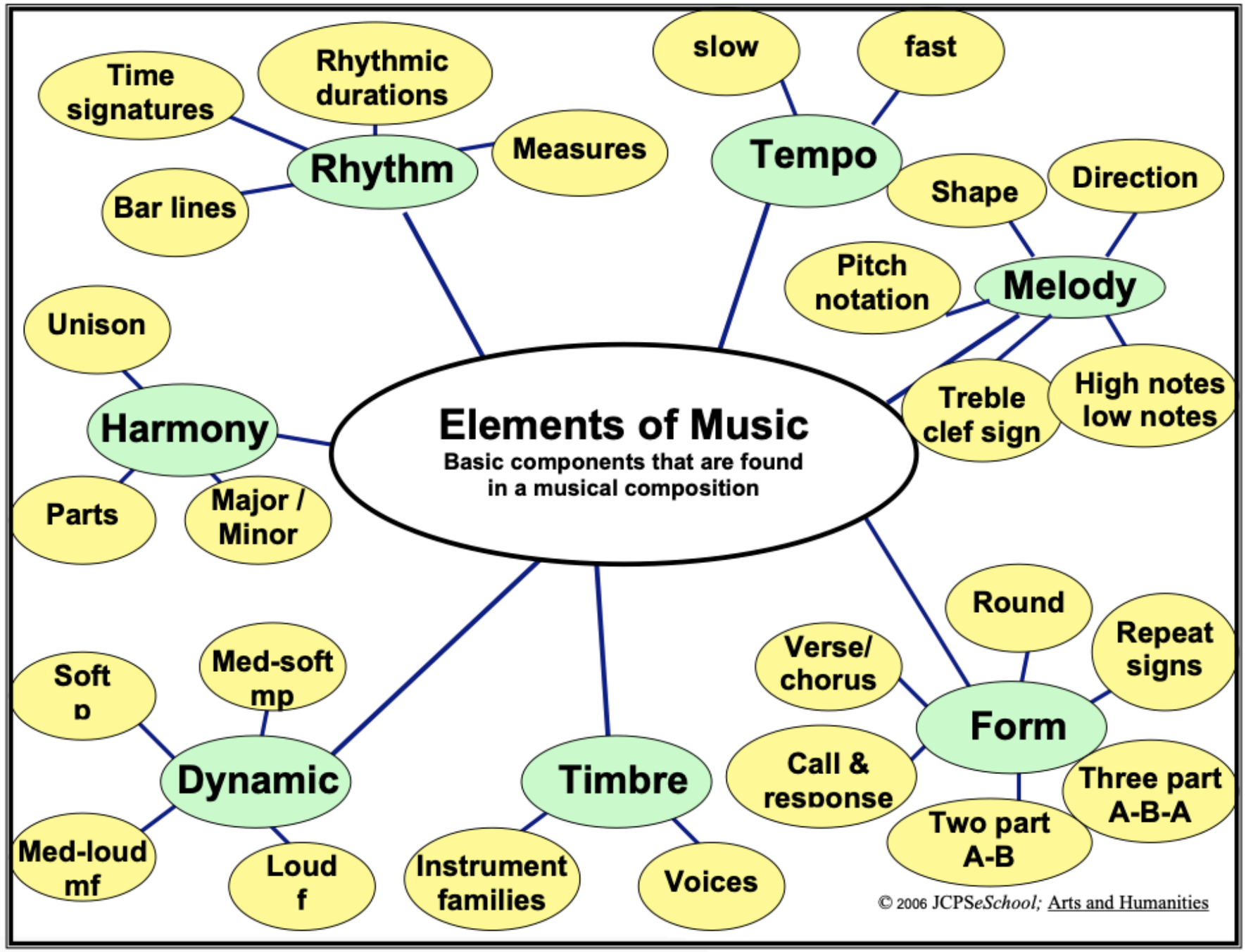


- Create *"what I need"* cards



Strategies

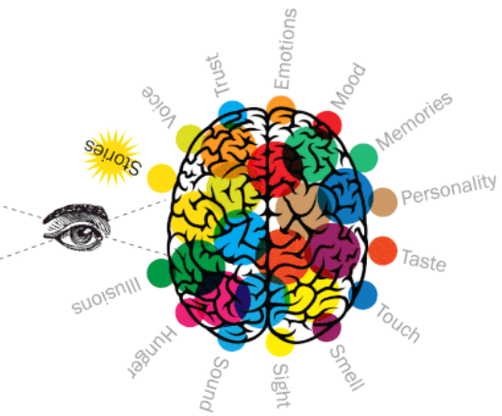
- Separate components, then add elements



The bigger the toolbox,
the more ways to reach every learner.

VIP: Varied Inclusive Pedagogy

Two Pathways to Music Learning



Multisensory Learning — *Multiple Ways In*

- **Hear it:** Echo/mimcry, rhythmic patterns, vocal modeling.
- **See it:** Color-coded notation, visual cues, gesture demonstrations.
- **Feel it:** Body percussion, movement, tactile props.
- **Imagine it:** Metaphors, storytelling, character voices.
- **Choose it:** Offer multiple pathways to the same musical goal.

Social-Emotional Learning — *Connection Before Correction*

- **Recognize it:** Emotion cards to identify feelings and musical expression.
- **Express it:** One phrase with different emotions or characters.
- **Regulate it**: Humming, gentle breathing, movement, sensory breaks.
- **Connect through it:** Musical turn-taking, mirroring, collaborative creation.
- **Reflect on it:** “What helped you feel ready to make music?”



MUSIC HEALS

Music is ALSO a therapeutic tool for neurodiverse brains.



Any Questions?