

Pickleball Fever:

Unlocking the Brain's Joy and Health Boosts  
in Every Swing

Dr. Glynis Worthington  
Pickleball Scientist



# My Big Idea - 2017



## Holiday Lake resident sets record and wins five golds in Senior Olympics

Poweshiek County CR, Wednesday, June 27, 2012

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It was the first Senior Olympics for Brooklyn's Glynis Worthington, and it was well worth it.

The Holiday Lake resident brought home five gold medals and set a state record in the standing long jump at the meet on Saturday, June 16 at Valley High School in Des Moines.

"It was a great experience," she said.

Beside the standing long jump, she captured gold in the 50-meter run, 100-meter run, the 200-meter run and

the long jump.

I work out at the Wellness Center at BGM school and run very steep hills at Holiday lake," she said. "Workout is only about five hours a week -no kidding."

Worthington's results were

- Standing Long Jump - First place with a jump of 7-feet, 2-inches (broke old state record of 6-feet, 1.5-inches).

- 50-meter run - First place in 9.12.

- 100-meter run - First place in 14.62 (just missed the

state record of 14.52).

- 200-meter run - First place time of 32.6 seconds.

- Long Jump - First place jump of 10-feet, 6-inches.

"My coach is Travis Hansen at The Gym in Cedar Falls," she said. "Miracle worker. He knows many people in the Brooklyn area."

She plans in competing in the Iowa Games next month.

"My goal is to learn how the meets work," she said, adding that the last time she competed in track was as a sophomore at Grinnell High

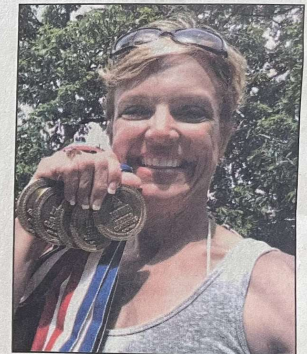
School.

"No NCAA championship or college experience here," Worthington said. "I had to put myself through school -it's all new."

"It's a hobby I've taken on as two of my four kids are in college and I had time on my hands," she added.

Also participating in the meet was Neva Weisskopf, Lehigh Acres, Florida.

"She and her husband are natives of Brooklyn," Worthington said. "What a small world!"



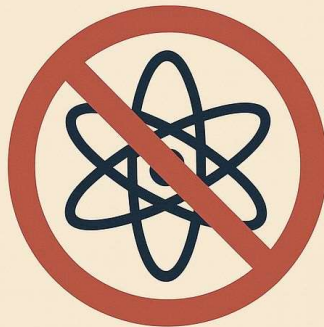
## The Big Objections

**NO SCIENCE**

**=**

**NO**

**MONEY**



**NO MONEY**

**=**

**NO**

**PROGRAM**





# My Solution



Dr. Glynis  
Sr. Sports Scientist

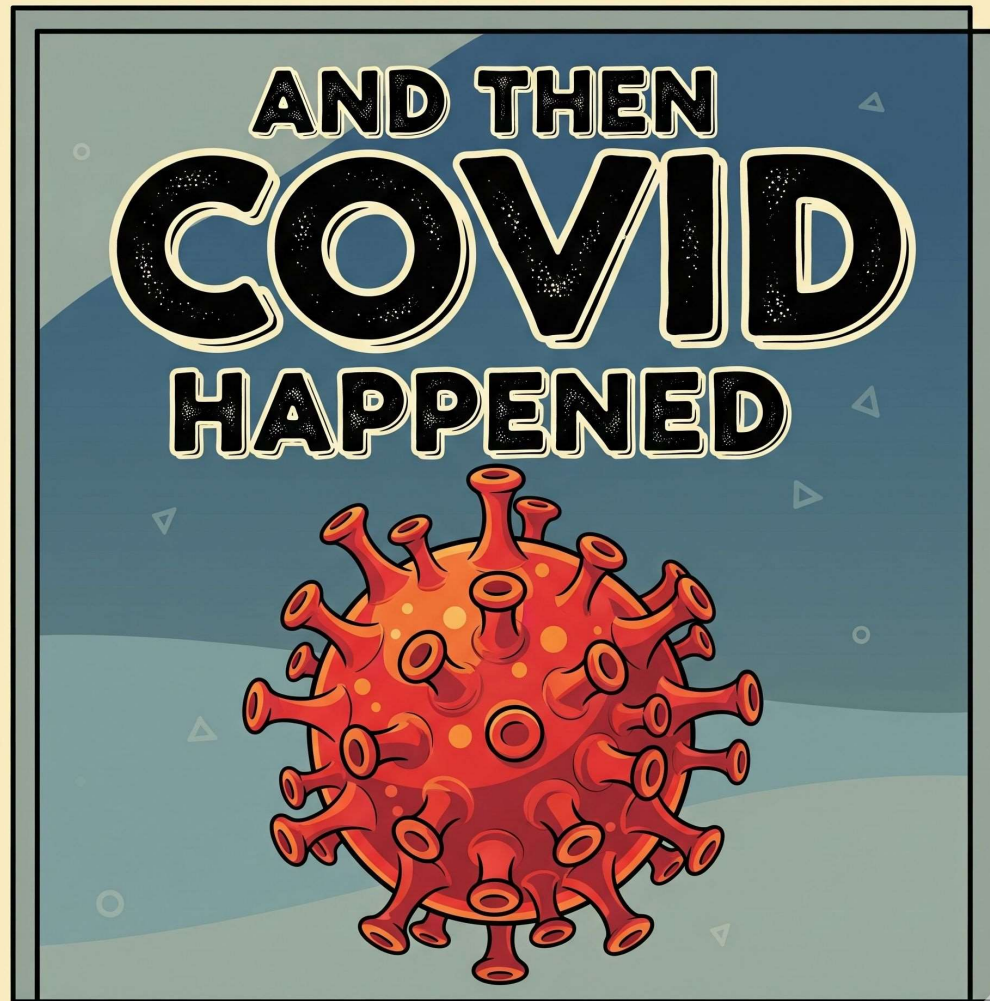


Dr. Chris Edgington

College of Education  
University of Northern Iowa



March 2020







USMA & USAFA campuses close - two youngest return home.

And then...

# FORTNITE

happened...





Jack Worthington, home from West Point, playing team fortnite during COVID.





**Pickleball Complex  
Cedar Falls, Iowa**

Video Games = Flow

# Video Game Science

Image Source: Chat/GPT





## Definition of Flow

**FLOW** is...

...an optimal state of complete immersion

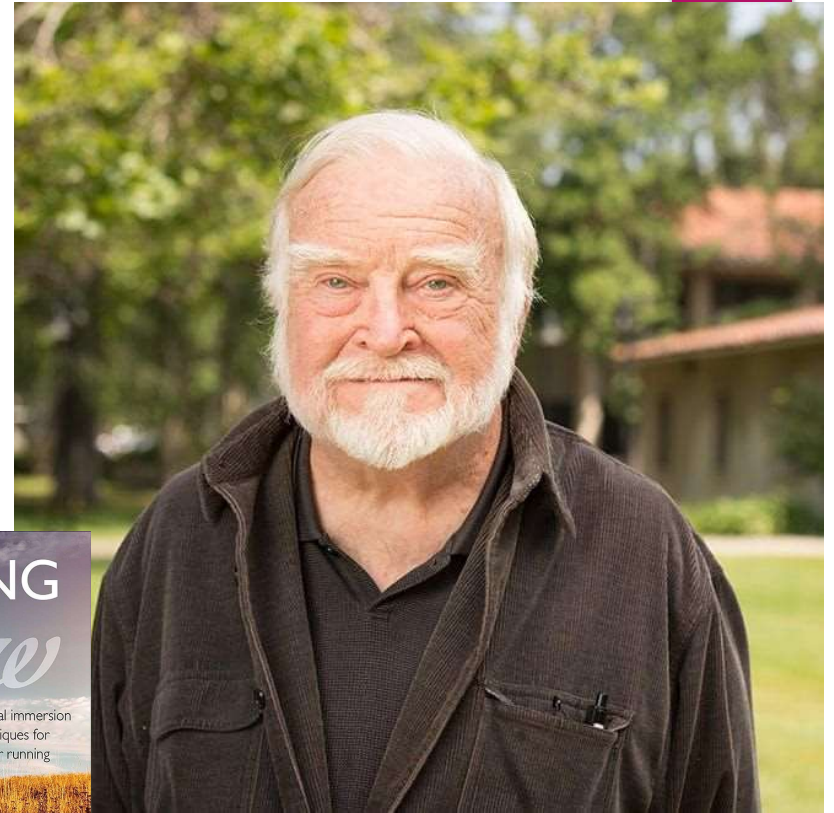
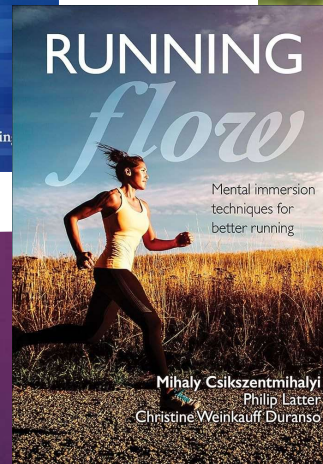
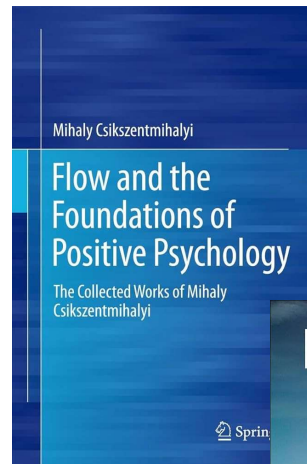
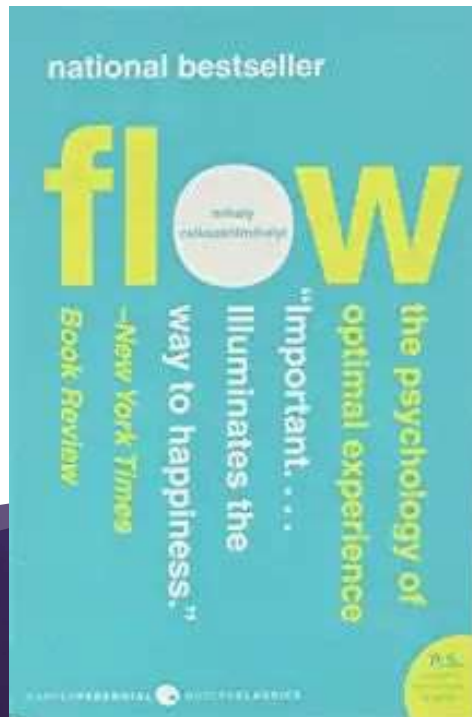
...and focused engagement

...often referred to “being in the zone”.



# Mihaly Csikszentmihalyi

*Father of Flow*



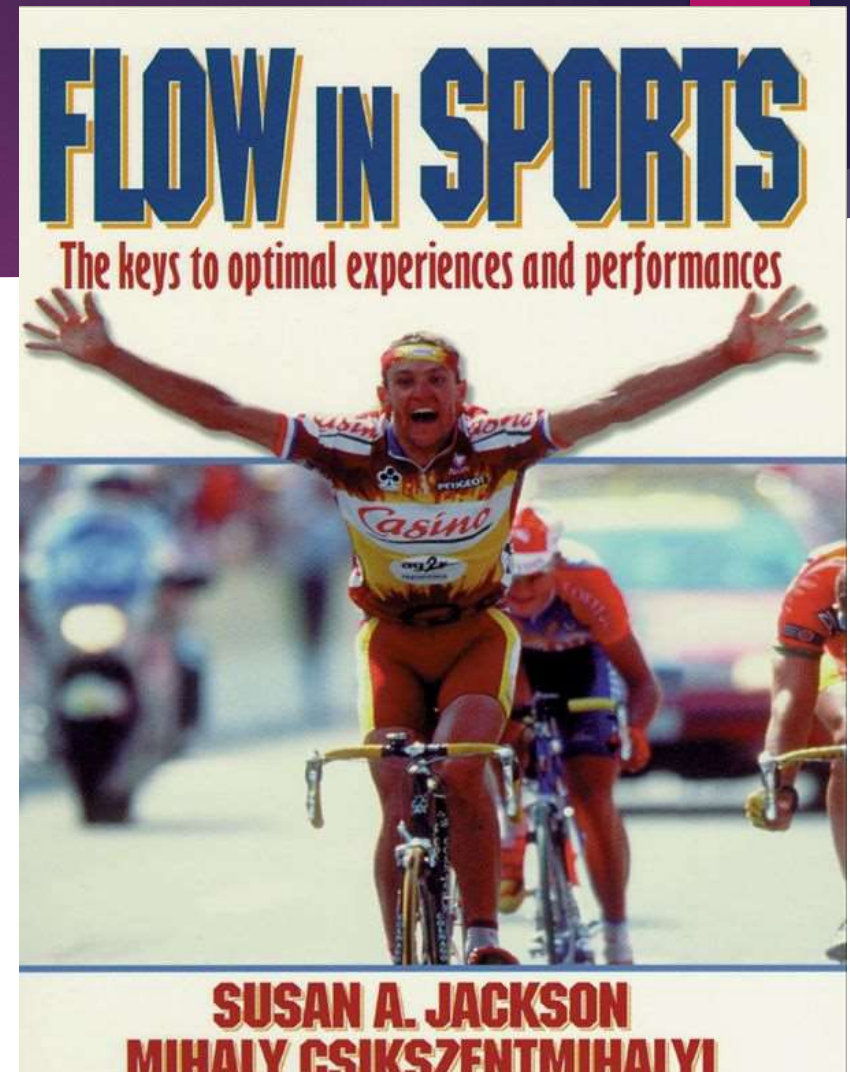
## Research Method



**Dr. Susan Jackson**

*The Flow Manual & DFS-2*

(Jackson, Eklund, & Martin, 2010)



# Literature Review

## Casper & Jeon (2018)

n = 690      Tournaments  
Psychological Continuum Model (PCM)

**Player Motives = Fitness and Socialization.**

**Competition & Skill Mastery important with increased play.**

## Casper (2022)

**Pickleball during COVID.**

## Ryu, Yang, Kim, Kim, Heo, & Rhee

(2018, 2018, 2020)

n = 153      Tournaments  
MDI, SLIM and LOT surveys

**Negative link to depression.**

**Positive link to positive psychological functions.**

**Good activity for seniors.**

## Buzelli & Draper (2018)

n = 3,102      USAPA Email  
Sport Motivation Scale (SMS), Task & Ego in Sports, and Quality of Rec Services surveys

**Intrinsic motivation, but competition (extrinsic) top benefit.**

## Cerezuela et al. (2023)

**Systematic Review.**



# DFS-2 Survey



I was not concerned with what others may have been thinking of me

Strongly Disagree

Disagree

Neither Agree nor  
Disagree

Agree

Strongly Agree

Things just seemed to be happening automatically

Strongly Disagree

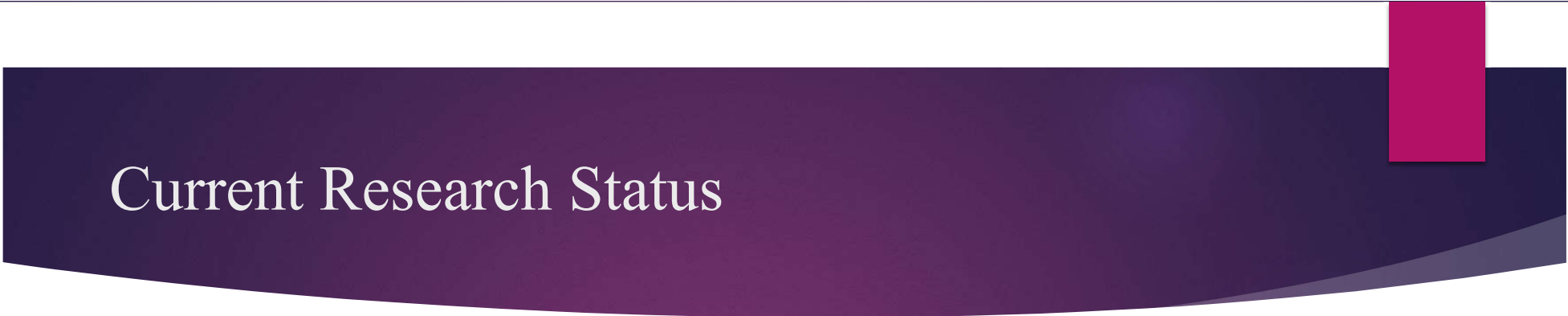
Disagree

Neither Agree nor  
Disagree

Agree

Strongly Agree

)



Current Research Status

Under Editorial Review

....but what if...

# NeuroPhysiology of Pickleball?

- ▶ Pickleball is
- ▶ like video games???

With  
Oxytocin  
too?







## NeuroPhysiology of Flow

- ▶ **Dopamine**
- ▶ **Adrenaline**
- ▶ **Serotonin**
- ▶ **Endocannabinoids**
- ▶ **Endorphins**
- ▶ **beta-endorphins**
- ▶ **Anandamide**
- ▶ **Norepinephrine**

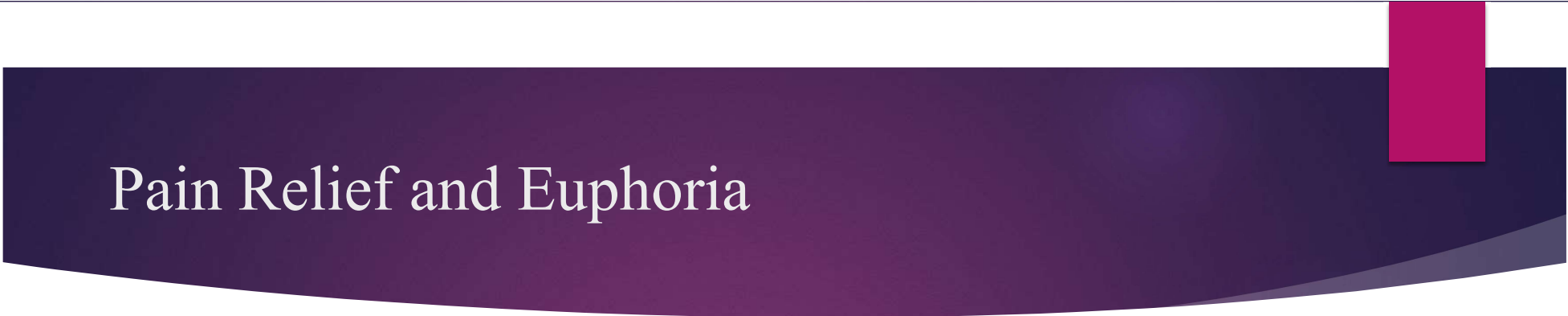


## Mood, Motivation & Reward

**Dopamine** - Motivation, pleasure, movement; reward system.

**Serotonin** - Mood, sleep, appetite; "feel-good" chemical.

**Norepinephrinem** - Alertness, concentration, attention; stress response.

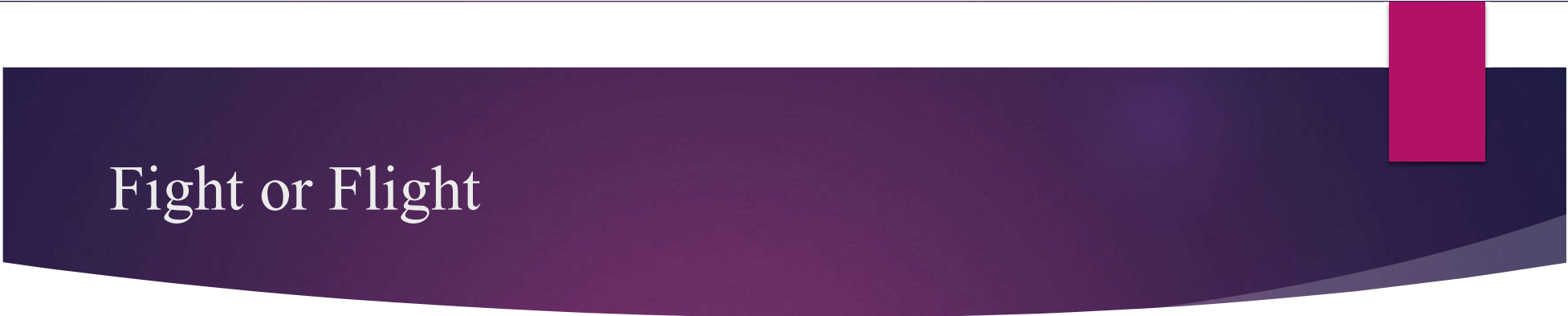


## Pain Relief and Euphoria

**Endorphins** - Natural pain relief, euphoria; "runner's high."

**Beta-endorphins** - Potent pain relief; stress response, reward.





## Fight or Flight

**Adrenaline** (Epinephrine) - increases heart rate, blood pressure; fight-or-flight.

**Endocannabinoids** - modulates pain, appetite, memory; body balance.

**Anandamide** - modulates mood, pain, appetite; "bliss" molecule.

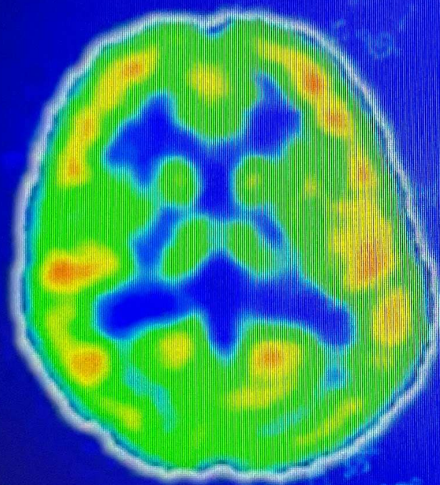


## Social & Emotional Bonding

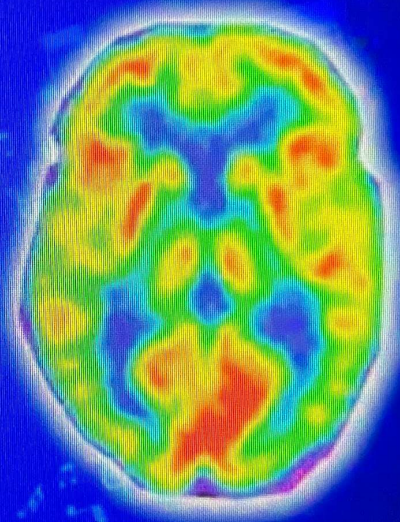
**Oxytocin** - Promotes social bonding, trust, and empathy.

# THE BRAIN'S REACTION TO MUSIC

The Brain  
at Rest



The Brain's  
Reaction to Music





## What Makes Pickleball so Popular?

- ▶ **Social**
- ▶ **Easy to Play, but Lifetime to Master**
- ▶ **Flow**
- ▶ **Eustress**
- ▶ **Highly Auditory**
- ▶ **Exercise - Tempo Pace**
- ▶ **Flow-Associated Brain Functions**



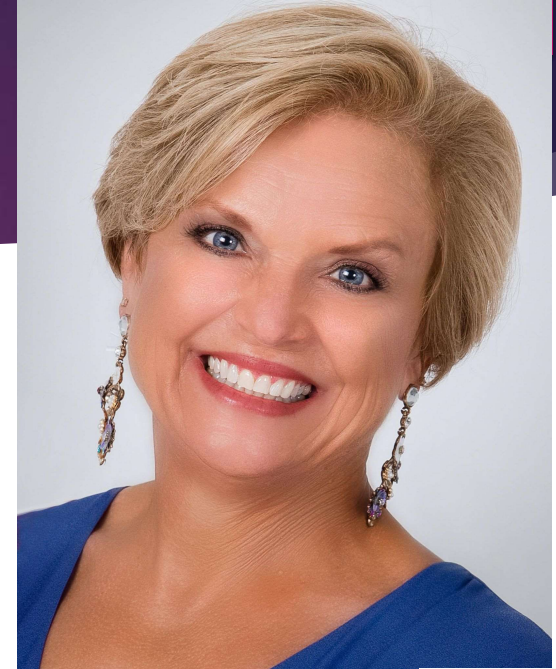
# The Big Question

What if we could  
*map brain activity*  
during pickleball?

Image Source: Chat/GPT



# Dr. Glynis Worthington



**dr\_glynis\_pickleball\_scientist**

