



# The Rockland Sample II

How your contributions have helped to move science forward.

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**Nathan Kline Institute for Psychiatric Research**



# Today's Talk

What your participation has helped us discover:

**1**

## **A New Model to Understand Brain and Behavior**

How your body's "autopilot" (the autonomic nervous system) shapes cognition, development, and aging.

**2**

## **The Future of the Rockland Sample**

Where we're headed next, and how your continued involvement helps turn discoveries into real-world tools.

Invitation to participate further.



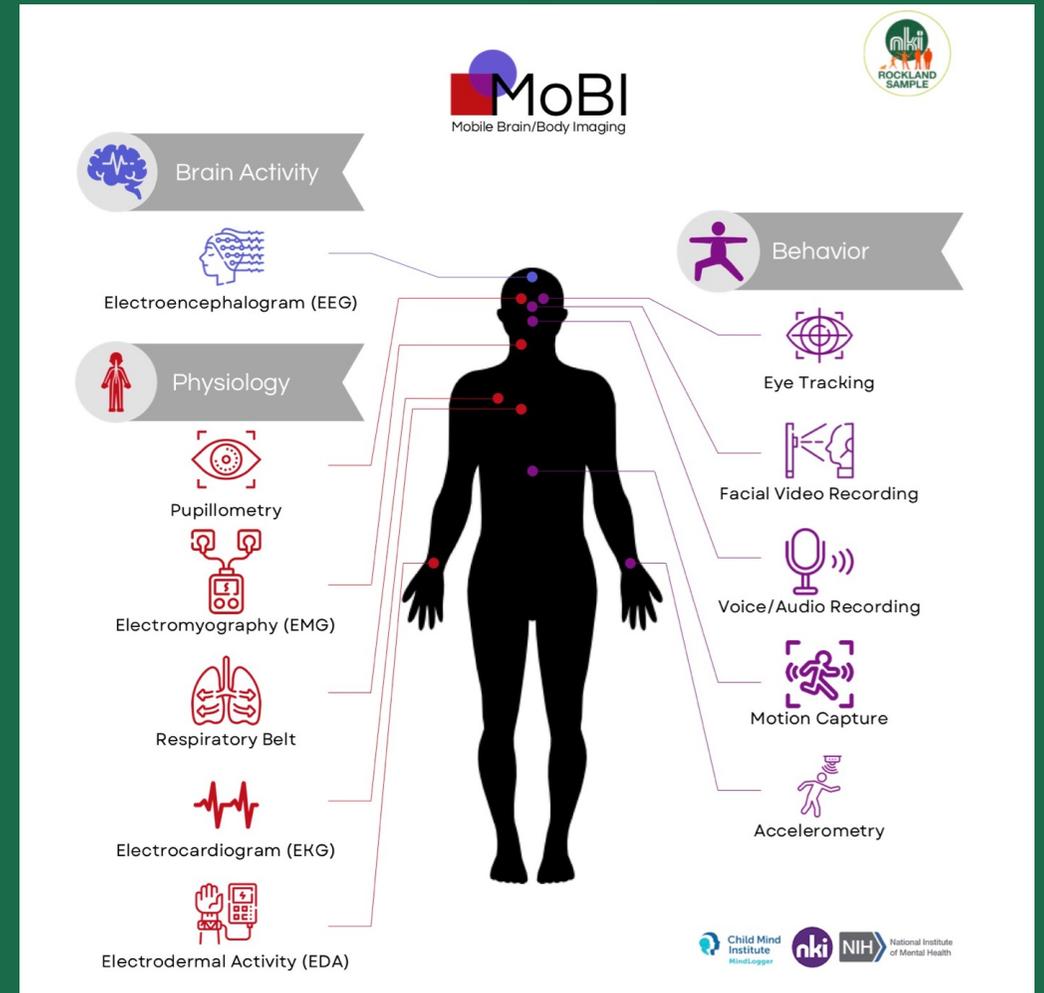
# MoBI Lab: The Central Innovation of RS2

**Key Concept:** We measure a range of physiological, brain, and behavioral signals simultaneously to identify 'Brain - Body' relationships.

The body and brain are in constant communication, each impacting the other.

**Central Insight:** It turns out that the same system that governs our physiological processes also regulates our brains and behavior.

# Mobile Brain and Body Imaging





# Introducing

# The ADAPT Framework

(Autonomic Dynamics And Performance Tuning)

**A new way of understanding how your nervous system shapes your thinking, feeling, and overall brain health.**



# The ANS: Your Body's Control Center

Your autonomic nervous system (ANS) is like your body's autopilot. It controls things you don't think about: your heartbeat, breathing, and digestion.

It has two main modes: an 'active', or '*sympathetic*' mode, and a 'resting', or '*parasympathetic*' mode.

**It's whole job is to optimially balance activity with available energy throughout the body.**

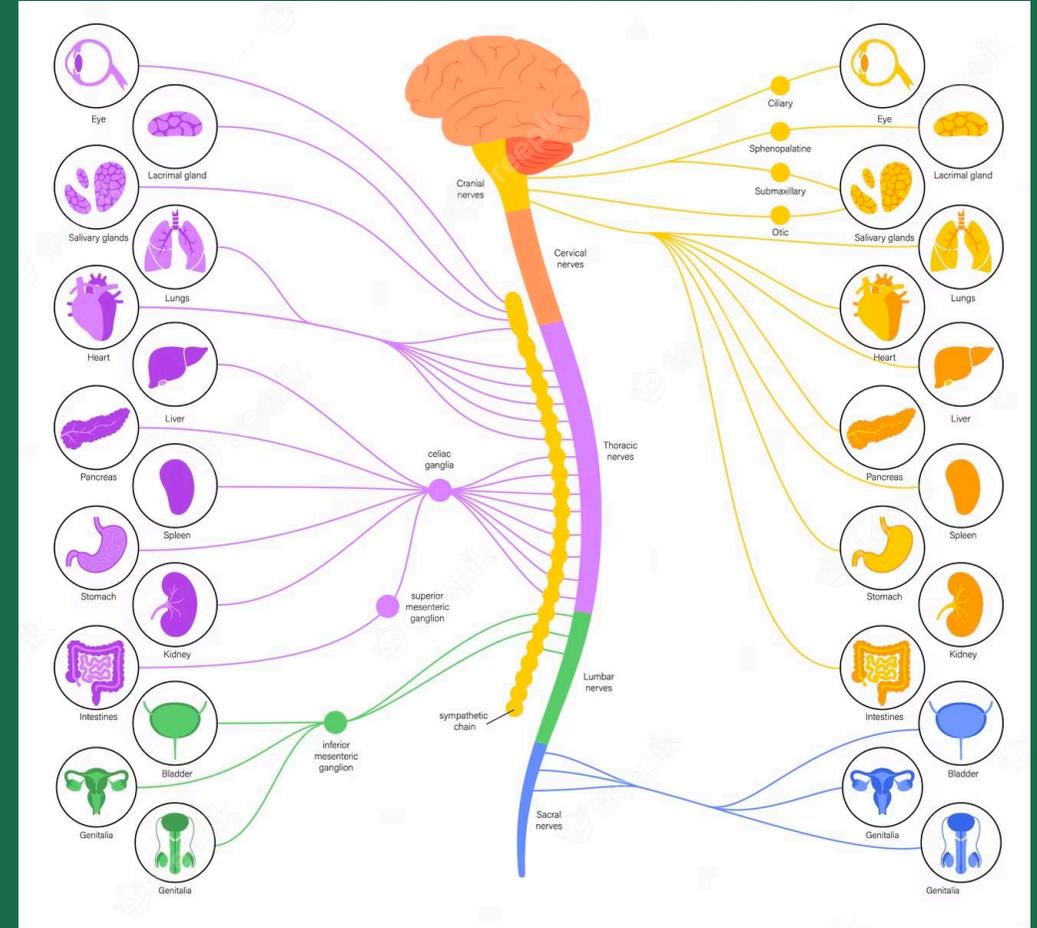
## The ANS Has Two Modes



**Fight or Flight  
'Active'**



**Rest & Digest  
'Rest'**





# Your Brain Has Two Gears

Just like your body switches modes, your brain alternates between two states,

Neither mode is necessarily better than the other. Both are important. And switching allows a way to promote balance.

And while it is switching back and forth, it is **maintaining** and **optimizing** your brain networks moment-by-moment.

Rest

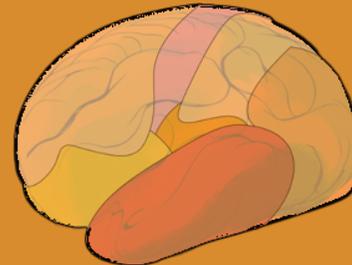


## Focused Mode

Brain regions form tight networks.  
Deep concentration, problem-solving

**Strengthens useful connections.**

Active



## Flexible Mode

Looser 'interrupted' brain networks  
Creativity, big-picture thinking

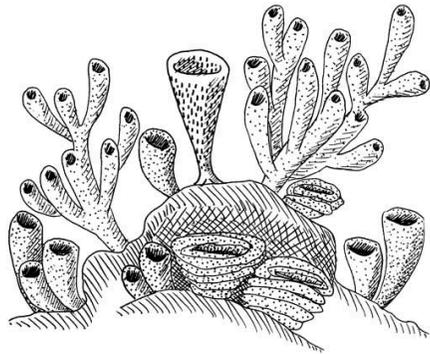
**Weakens unhelpful connections**



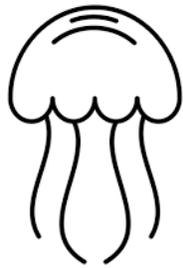
# From Primordial Foraging to Complex Cognition

Sponges to swimmers.

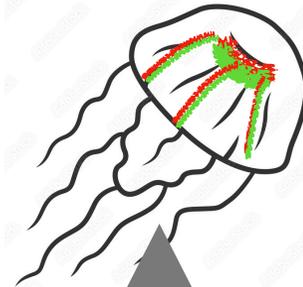
Immobile  
Filter Feeders



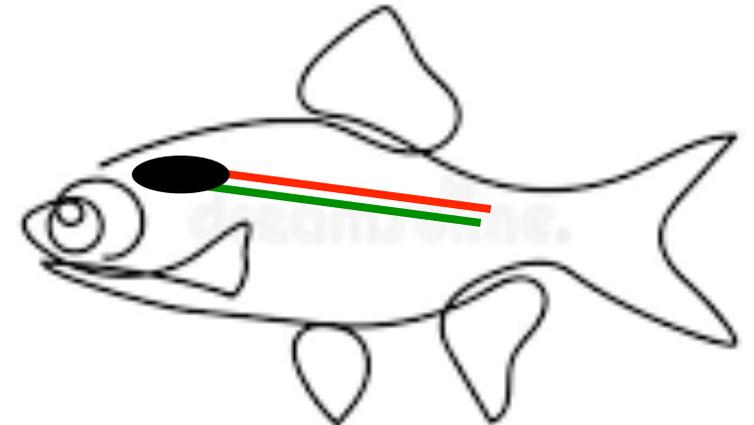
Floating  
Filter Feeders



Swimming  
Filter Feeders



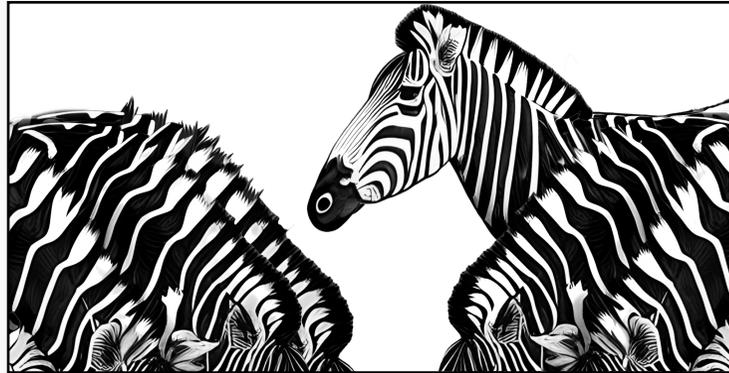
Swimming, Seeing,  
Feeling,  
Capable of Hunting Prey





# The Rhythm of Life

Your brain doesn't stay in one mode. It naturally oscillates between flexible and focused states, about 6-10 times per minute.



**This rhythm is the heartbeat of healthy body and brain function.**



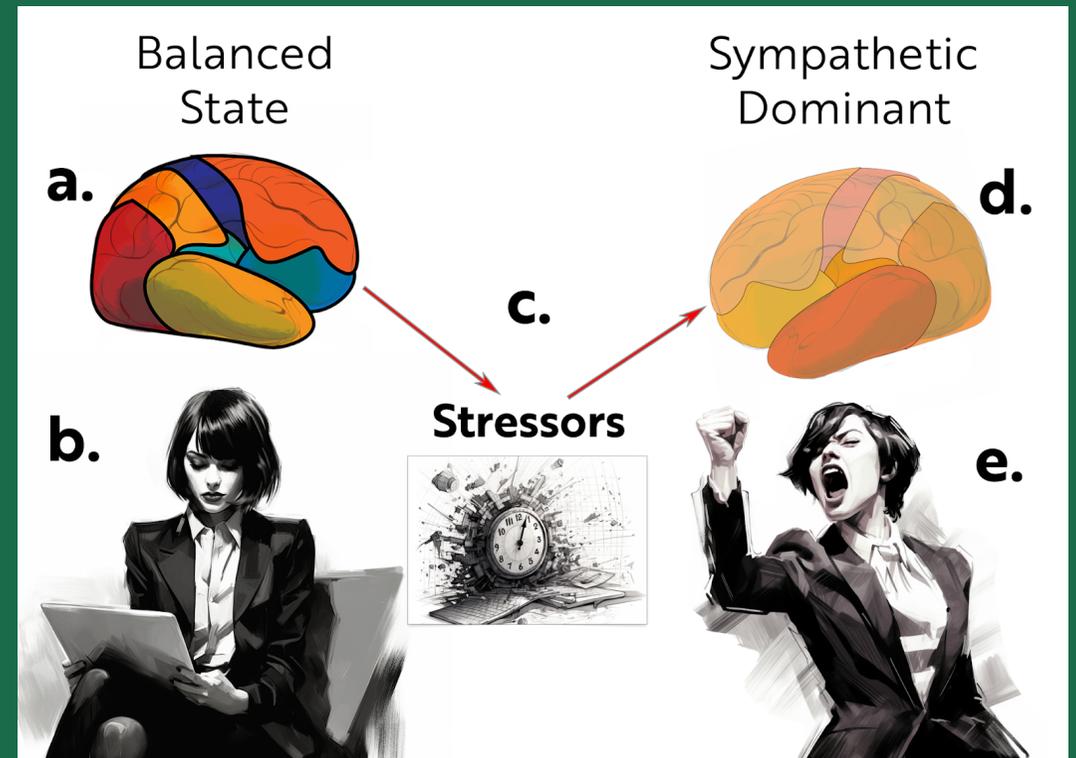
# The ANS: Your Brain's Control Center

Your ANS maintains energy balance in the body - including the brain, which uses about 10x the energy of your muscles, measured pound-for-pound.

But here's what's exciting: it can also deeply influence how you think, feel, and respond to the world.

**It might also explain why our lab tasks don't always predict 'real world' behavior.**

## The ANS' State Can Impact How Your Brain Reacts





# The Key Insight

The ability to smoothly shift between these modes, guided by your autonomic nervous system, is what keeps your brain healthy and adaptable.

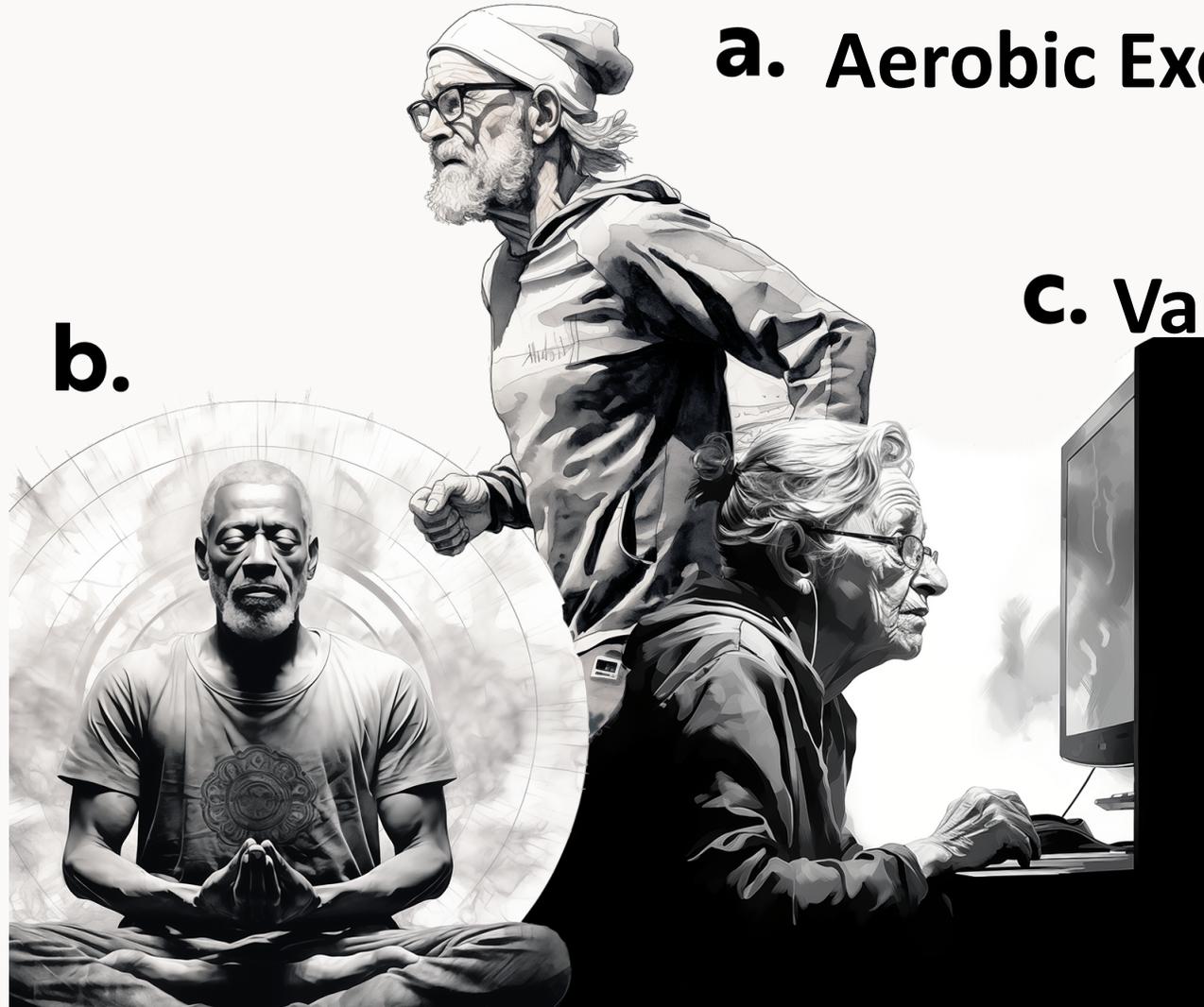
**When this shifting becomes less flexible, we see problems in attention, memory, mood, and more.**



# The Good News

Your autonomic flexibility can be improved!

**Mindfulness  
Meditation**



**b.**

**a. Aerobic Exercise**

**c. Variable-priority  
Cognitive  
Training**



# Why Does This Matter?



## Development

Understanding attention differences in children



## Mental Health

New insights into anxiety, depression, ADHD



## Healthy Aging

Early detection of cognitive changes



## Prevention

Identifying who might benefit from intervention



# Informs all of these areas.



## Development

Understanding attention differences in children

Provides mechanism for how the brain is shaped.



## Mental Health

New insights into anxiety, depression, ADHD

Describes how developmental challenges might lead to disorders.



## Healthy Aging

Early detection of cognitive changes

Changes in ANS integrity may precede changes in behavior.



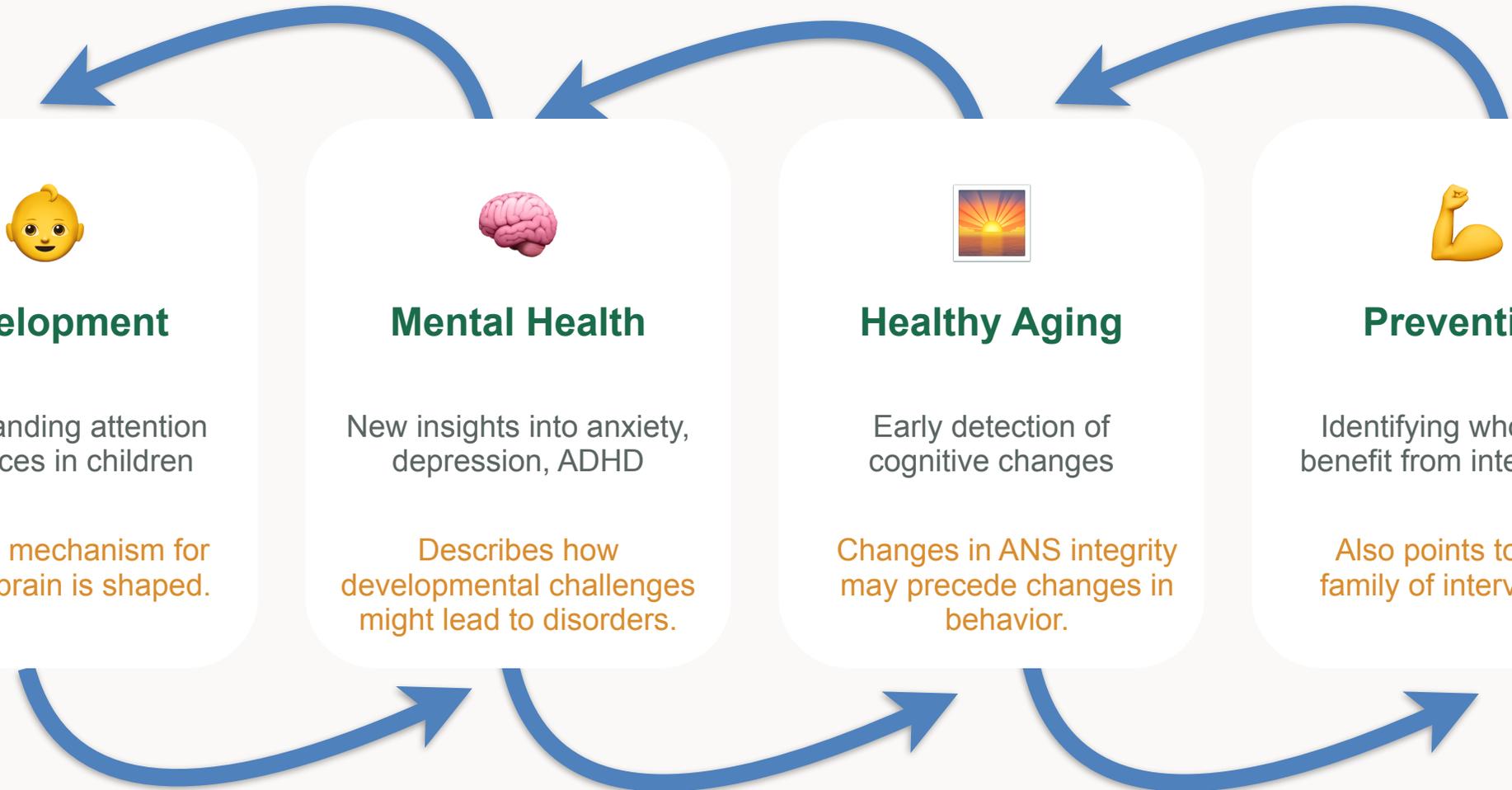
## Prevention

Identifying who might benefit from intervention

Also points to a new family of interventions.



# It also links them





## Where we are headed next.

We have several new projects:

- Wrap up the current RS2

## RSII Wrap-Up

Still Recruiting

Ages 9-95

Now through April

Phone: 845-835-3008

Email: [rocklandsample@nki.rfmh.org](mailto:rocklandsample@nki.rfmh.org)



## Where we are headed next.

We have several new projects:

- Wrap up the current RS2
- New Longitudinal Study (45-95)

## New Adult Study

Adults aged 40-95

Abbreviated version of RS2

Focus on mid-later life  
Measures.

RS2 Participants Welcomed

Pending Funding via NIA

Builds on the current RS2



## Where we are headed next.

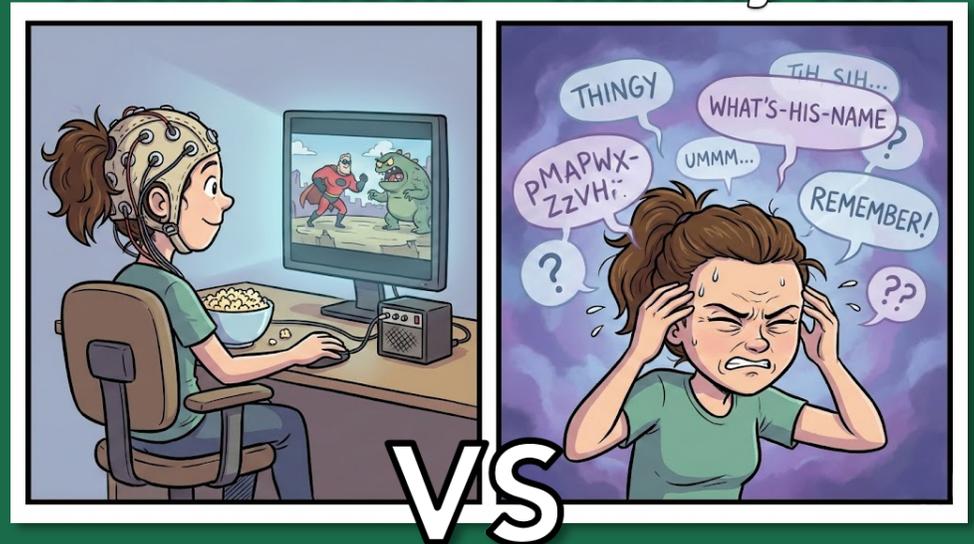
We have several new projects:

- Wrap up the current RS2
- New Longitudinal Study (45-95)
- New Method to Predict Memory Performance

# Movie to Memory

Watch a Movie

Memory Test



Grant submitted to the NIA, based on RS2 data.



# Your Contribution Changes Lives

By participating in the Rockland Sample, you help scientists around the world:

**1,500+**

Participants

**17+**

Years of Data

**1,000+**

Research Papers

**Open science:** We share our findings freely with researchers worldwide.



# Key Take Home Points

**1**

## **Your body and brain are deeply connected**

The autonomic nervous system isn't just about heartbeats. It orchestrates how your brain thinks, adapts, and stays healthy.

**2**

## **Flexibility is the key**

The ability to smoothly shift between "focused" and "flexible" brain states may be central to healthy development, mental health, and aging.

**3**

## **This can be measured and improved**

Exercise, mindfulness, and cognitive challenges can enhance autonomic flexibility. And thanks to your data, we're developing easier ways to assess brain health.



# Thank You for Being Part of our Discoveries

Together, we're building a new understanding of how the brain develops and stays healthy across the lifespan.

Learn More  
[rocklandsample.org](http://rocklandsample.org)

Contact  
[rocklandsample@nki.rfmh.org](mailto:rocklandsample@nki.rfmh.org)  
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**We can't do it without you.**