

## HOW POVERTY SHAPES THE BRAIN ACROSS THE LIFESPAN — AND WHAT IT MEANS FOR DEMENTIA RISK

2026 Forum on Aging  
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## FRAMING THE PROBLEM

Section One

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### Opening Context: Poverty is a Lifelong Brain Issue, Not a Childhood One

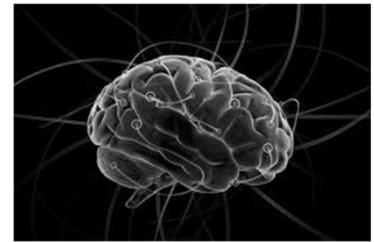


- **Key Points:**
- Poverty is a chronic neurodevelopmental stressor
- Brain Development is experience-dependent
- Effects begin before birth and compound across decades

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### Why This Matters Now: Why Brain Development and Dementia Are Connected

- **Key Points:**
- Dementia risk is shaped **decades before symptoms**
- Early-life development determines:
  - Cognitive reserve
  - Stress resilience
  - Vulnerability to aging pathology
- Poverty accelerates risk by reducing cognitive reserve early



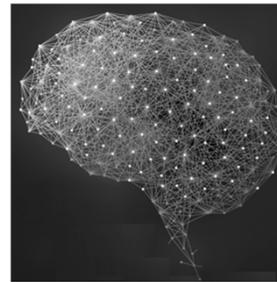
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## CHILDHOOD BRAIN DEVELOPMENT UNDER POVERTY

Section Two

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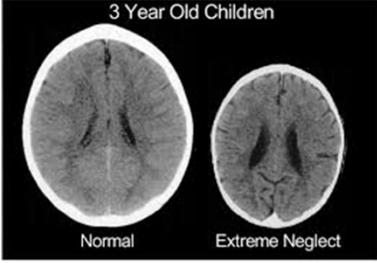
### The Developing Brain: Gray Matter vs. White Matter



- **Gray Matter:**
- Neurons and Synapses
- Learning, memory, executive function
- **White Matter:**
- Myelinated connections
- Speed, efficiency, network integration
- **Key Point:**
- Healthy development requires both volume and connectivity

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### 3 Year Old Children



**Infancy & Early Childhood: Poverty's Earliest Brain Effects**

- **Gray Matter Effects:**
  - Smaller overall brain volume
  - Reduced frontal, temporal, hippocampal growth
- **White Matter Effects:**
  - Less mature wiring
  - Slower myelination trajectories
- **Mechanisms:**
  - Prenatal stress
  - Nutrition
  - Caregiving stress
  - Environmental stability

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### Middle Childhood & Adolescence: When Differences Become Entrenched



- **Gray Matter:**
  - Reduced cortical surface area
  - Slower maturation of executive networks
- **White Matter:**
  - Altered integrity of long-range tracts
  - Reduced processing efficiency
- **Key Insight:**
  - These are **developmental trajectories**, not temporary delays

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## ADULT BRAIN FUNCTION IN THE CONTEXT OF POVERTY

Section Three

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### From Childhood Brain to Adult Brain: Early Brain Architecture Shapes Adult Function



- Persistent effects include:
  - Lower baseline cognitive reserve
  - Higher cognitive effort for daily tasks
  - Reduced stress recovery capacity

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### Summary: What Childhood Poverty Looks Like in the Adult Brain

Brain Change	Adult Expression
Reduced frontal gray matter	Difficulty planning, impulse control
Smaller hippocampus	Heightened stress sensitivity, memory challenges
Altered white matter	Slower processing, cognitive fatigue
Chronic stress calibration	Survival-focused thinking, reduced mental bandwidth

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### Executive Function & Decision-Making: Why Poverty Increases Cognitive Load



- **Brain regions involved:**
  - Prefrontal cortex
  - Frontal-parietal networks
- **Adult expressions:**
  - Difficulty planning long-term
  - Reduced flexibility under stress
  - Faster cognitive fatigue
- **Key clarification:**
  - This is **neural efficiency**, not motivation.

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### Stress, Memory & Emotional Regulation: The Hippocampus Under Chronic Stress

- **Early changes:**
  - Smaller hippocampal volume
  - Altered stress hormone regulation
- **Adult Impact:**
  - Heightened stress sensitivity
  - Memory inefficiencies
  - Emotional reactivity under pressure



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### White Matter & Processing Speed: When the Brain's Wiring Is Less Efficient

- **Adult effects:**
  - Slower processing
  - Reduced multitasking capacity
  - Difficulty integrating emotion, logic, and memory
- **Real-world consequence:**
  - Everyday life requires **more mental energy**.



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# CONNECTING POVERTY TO DEMENTIA RISK

Section Four

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### Dementia Is a Lifelong Process: Dementia Does Not Begin in Old Age

- **Key Concept:**
  - Clinical symptoms emerge when pathology **exceeds cognitive reserve**.



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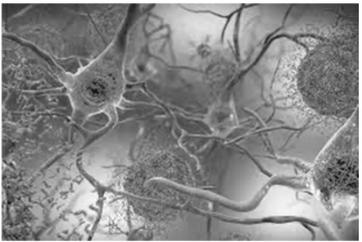
### How Poverty-Related Changes Increase Dementia Risk

Mechanism	Dementia Impact
Reduced gray matter	Lower cognitive reserve
Smaller Hippocampus	Earlier memory decline
Altered white matter	Reduced compensation capacity
Chronic stress	Accelerated brain aging
Vascular risk	Higher mixed dementia prevalence

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### Cognitive Reserve Explained: Why Some Brains Tolerate More Damage

- **Higher reserve =**
  - Later symptom onset
  - Slower functional decline
- **Lower reserve =**
  - Earlier symptoms
  - Faster progression
- **Poverty's role:**
  - Reduces reserve **before adulthood begins**.



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Hippocampus & Alzheimer's Disease:  
A Shared Vulnerability

- **Key Facts:**
  - Hippocampus is affected early in Alzheimer's
  - Stress-sensitized hippocampi show earlier decline
- **Result:**
  - Earlier memory impairment
  - Faster MCI → dementia transition

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## White Matter & Vascular Dementia: Connectivity Matters in Aging

- **Poverty increases:**
  - Vascular risk
  - White matter vulnerability
- **Outcome:**
  - Higher rates of mixed dementia
  - Reduced compensatory capacity



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### When Poverty Persists into Adulthood: Risk Is Amplified, Not Created

- Adult poverty adds:
  - Hypertension
  - Diabetes
  - Depression
  - Sleep disruption
  - Limited healthcare access
- **All are independent dementia risk factors layered onto a brain with reduced reserve.**



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## CRITICAL CLARIFICATIONS & HOPE

Section Five

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What This Does NOT Mean:  
Avoiding Misinterpretation

- Poverty does **not** cause Alzheimer's
- Brain differences are **not destiny**
- Many individuals demonstrate resilience

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### Neuroplasticity Still Exists: The Brain Can Still Adapt

- Protective factors include:
  - Education and learning
  - Cognitive engagement
  - Stress reduction
  - Stable relationships
  - Health management
- **Plasticity slows with age – but never disappears.**



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# IMPLICATIONS FOR PRACTICE

Section Six

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## Why This Matters for Professionals: Recognizing Hidden Vulnerability

- **Key takeaway:**
- Early poverty increases risk for:
  - *Cognitive overload*
  - *Financial vulnerability*
  - *Earlier cognitive decline*



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What Changes When We Understand the Brain: Shifting From Judgment to Support

- Reduced blame
- Better communication strategies
- Earlier intervention
- Improved outcomes



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Window of Opportunity: Dementia Prevention Begins Decades Earlier

- Brain health is cumulative
- Poverty exposure is a **modifiable risk factor**
- Prevention is not just medical — it is developmental



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# CLOSING

Section Seven

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## Final Takeaway: Poverty Leaves a Neural Footprint

- **Key Message:**
- Poverty shapes the brain across the lifespan. Its effects on gray matter, white matter, and stress biology can lower cognitive reserve and increase dementia vulnerability — especially when adversity persists. Understanding this allows us to **intervene earlier, design better systems, and support aging brains more effectively.**

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For Baby Boomers Concerned About Dementia and Alzheimer's

# THE BOOMER BRAIN



Your Brain is Ageless  
A Longevity Guide

Patricia McCarthy Faust MGS

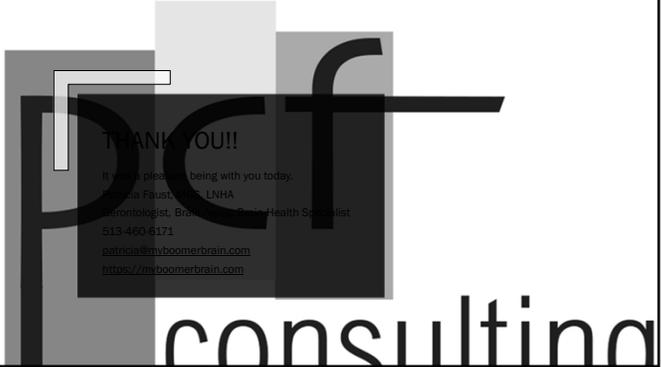
## THE BOOMER BRAIN

For Baby Boomers Concerned about Alzheimer's and Dementia

Patricia McCarthy Faust, MGS  
Fluxx 2025 Award Winner  
Gerontology Innovator in Preventive Cognitive Care  
Health and Wellness, USA

Available on Amazon:  
<https://Amazon.com/dp/1962133613>

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THANK YOU!!

It was a pleasure being with you today.

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