



CHILDHOOD CONDITIONS, EDUCATION, AND LIFE EXPECTANCY WITH AND WITHOUT DEMENTIA

MATEO P FARINA

YUAN S ZHANG

JUNG KI KIM

EILEEN M CRIMMINS

MARK D HAYWARD

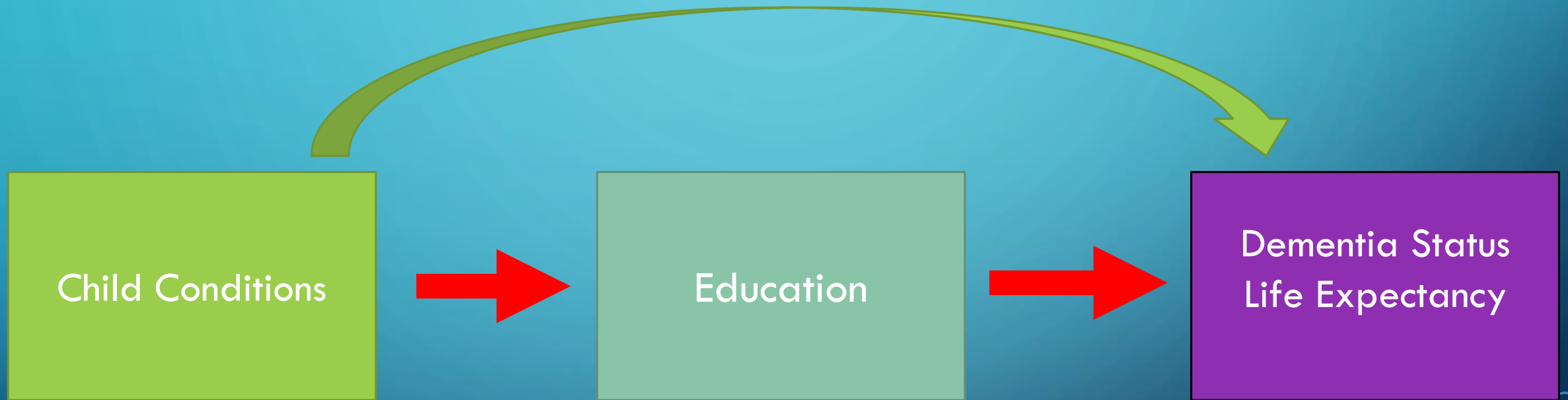
DISCLOSURES

- No Conflicts of Interest to Report

RESEARCH OBJECTIVE

- **Because early-life conditions set in motion adult achievement processes and exposures to AD risk factors, largely through education, we seek to assess how early-life conditions and education combine to influence the expected years of life with and without dementia.**

A CONCEPTUAL MODEL OF THE LIFE COURSE AND DEMENTIA STATUS LIFE EXPECTANCY





COGNITIVE RESERVE: MODERATING THE EFFECTS OF PATHOLOGY

- Two Main Components
 - more efficient brain networks
 - building of alternate networks
- These components allow brain to compensate for disruptions from cognitive aging or pathology
- Primarily established in early life, cognitive reserve is maintained or diminished throughout the life course.



RESEARCH QUESTION

HOW DOES EDUCATION COMBINE WITH CHILD
ADVERSITY TO SHAPE EXPECTED YEARS OF LIFE
WITH AND WITHOUT DEMENTIA AT 65?



DATA

- Health and Retirement Study (2000-2014), 7 waves of data
- Limited sample to 65+, non-Hispanic blacks and non-Hispanic Whites
- Cognitive status scores dichotomized: with or without dementia (obtained from proxy and self-respondents)

DEMENTIA CLASSIFICATION

Self Respondents

- Memory
 - Immediate recall of 10 words
 - delayed recall of 10 words
- Working memory:
 - 5 trials of serial 7s,
- Processing speed
 - backward counting
- Range from 0 to 27
- Dementia indicated by score of 6 or lower

Proxy respondents

- 5 IADLS to assess limitations (Physical Functioning Component), interviewer assessment, direct assessment of memory
- Range from 0 to 11
- Dementia indicated by score of 6 or greater

CHILD CONDITIONS

- Child Adversity

- 0-5 Scale:

- Father's Occupation at age 16

- Blue Collar [1]

- Mother's Education

- Less than 8 Years [1]

- Father's Education

- Less than 8 Years [1]

- Childhood perception of SES

- Poor SES [1]

- Never lived with their father

- Yes [1]

- Categorized into:

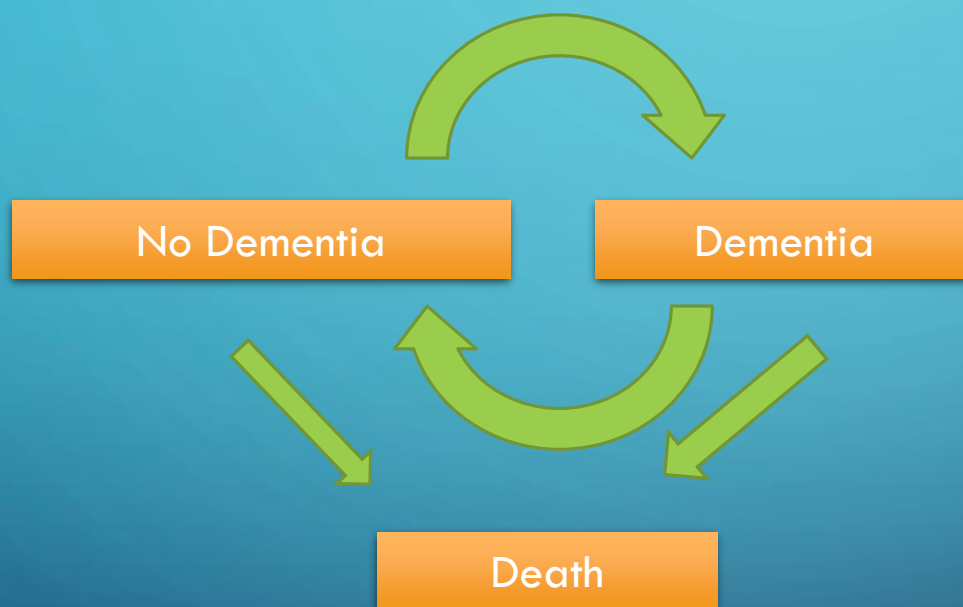
- No Adversity [0]

- Low Adversity [1-2]

- High Adversity [3-5]

METHODS

- We create incidence-based multi-state life table using a specialty software called IMaCh (interpolated Markov Estimation Chain)
 - Estimate transition probabilities between state space



- Generates Life Tables based on estimated transition probabilities

The background is a blue gradient with decorative white circuit-like lines in the corners. These lines consist of straight segments and small circles, resembling a stylized electronic circuit or neural network.

How are Childhood Conditions and Education associated with Dementia Risk?

Transition Parameters from Cognitively Normal To Having Dementia

Education (reference group: less than HS or GED)

HS

-.64

Some College or More

-.93

Childhood Adversity (reference : no adversity)

Low Adversity

.23

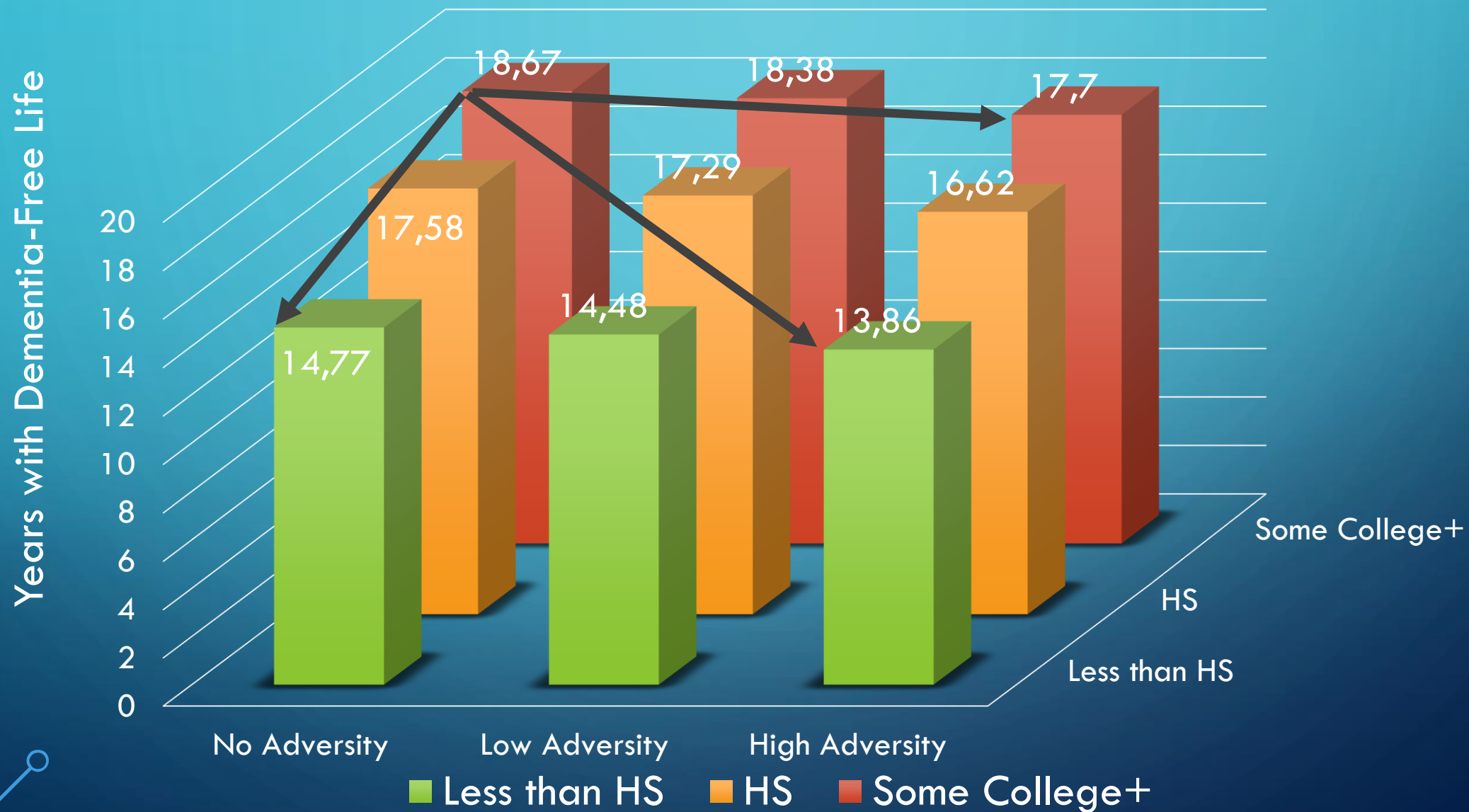
High Adversity

.46

The background is a blue gradient. In the corners, there are white line art elements resembling circuit boards or neural networks, with lines and small circles connecting them.

How do education and childhood conditions
combine to shape dementia-free life
expectancy?

Dementia Free Life Expectancy at 65 Years By Childhood Adversity and Education (HRS, 2000-2014)



The background is a solid blue gradient. In the corners, there are white, stylized circuit-like lines. These lines consist of straight segments connected by small circles, resembling a network or a simplified circuit board layout. They are positioned in the top-left, top-right, bottom-left, and bottom-right corners, framing the central text.

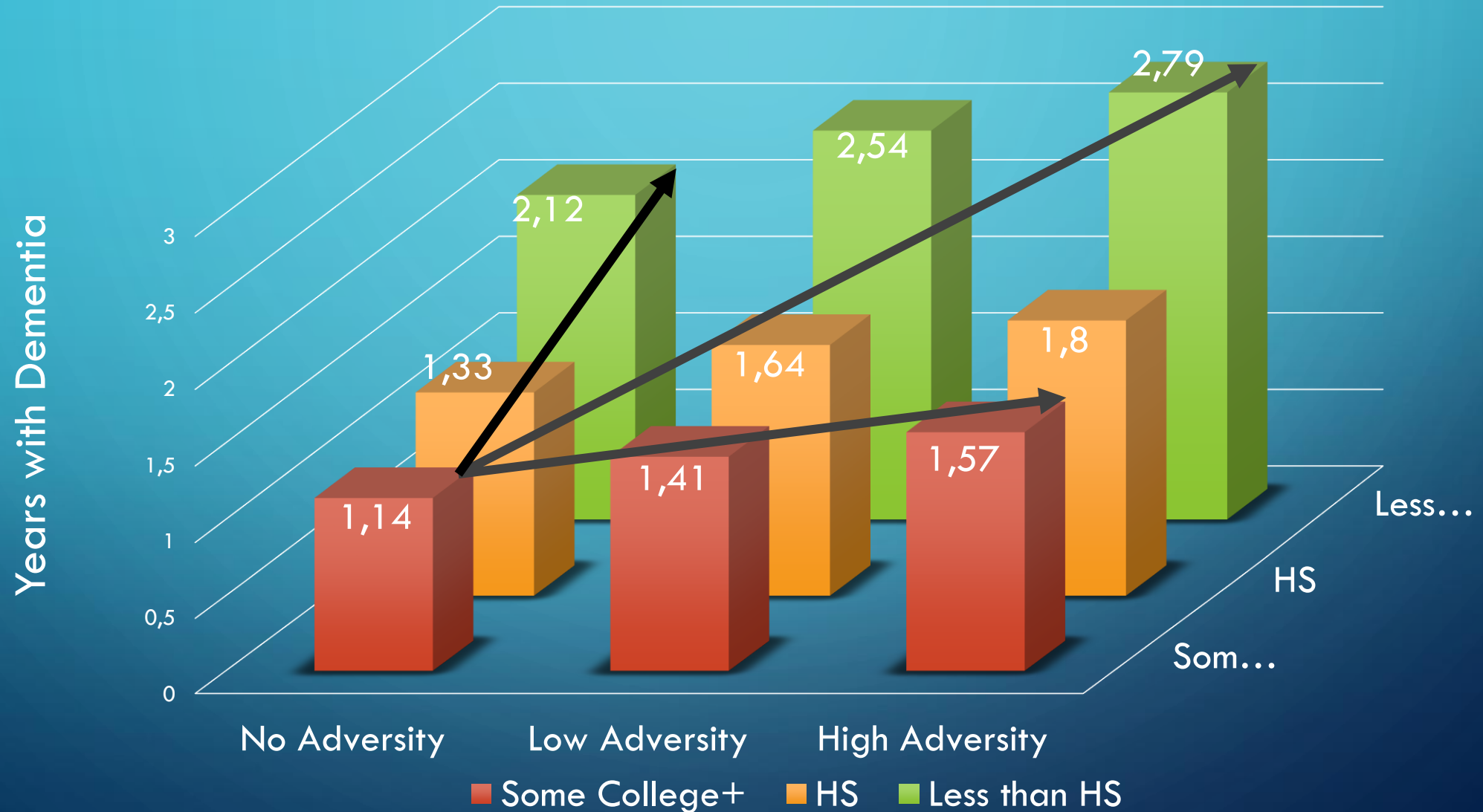
How does education and childhood conditions
combine to affect dementia life expectancy?

The background is a blue gradient with decorative white circuit-like lines in the corners. These lines consist of straight segments and small circles, resembling a stylized electronic circuit or data network.

Note:

Orientation for education groups is flipped. Colors remain the same.

Dementia Life Expectancy at 65 Years of Age by Childhood Health, Childhood Adversity, and Education (HRS, 2000-2014)



DISCUSSION

- Education has the greatest effects on dementia-free and dementia life expectancy
- Child conditions matter too, but not as much
- Education can mitigate the deleterious effects of a poor childhood, but cannot eliminate it (also found in other studies)
- Higher levels of education:
 - Increase DemFLE and decrease DemLE
 - Reduce dementia prevalence
 - Reduce disparities in dementia
 - Improve quality of life

CONCLUSION

- Dementia burden can be reduced by focusing on improvements in early childhood and higher education
- While dementia manifests at later ages, life course perspectives should be utilized to understand its development
- Importance of education points to the importance of cognitive reserve and capacity to circumvent with cognitive aging and pathology

THANK YOU

Funding and Acknowledgements:

This research was supported by the National Institutes of Health [P30 AG17265; R24 AG045061; U01 AG009740] and the National Institutes of Child Health and Development [R24 HD042849; RO1 HD053696; T32 HD007081]

WHY STUDY DEMENTIA-FREE LIFE EXPECTANCY AND DEMENTIA LIFE EXPECTANCY?

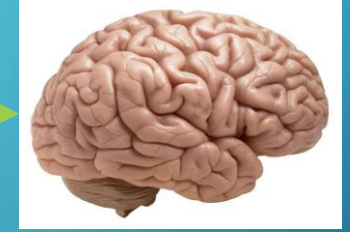
- Implications for trends in dementia prevalence
- Broader understanding of disparities in terms of the span of years lived with and without dementia
- Quality of life indicator:
 - “compression of morbidity”
 - “failure of success”

A CONCEPTUAL MODEL OF THE LIFE COURSE AND DEMENTIA STATUS

Childhood

Prime adulthood

Late adulthood



Education

- **Occupation and Health Behaviors**

- **Health Conditions (especially cardiometabolic)**

Dementia

- **Childhood Conditions**

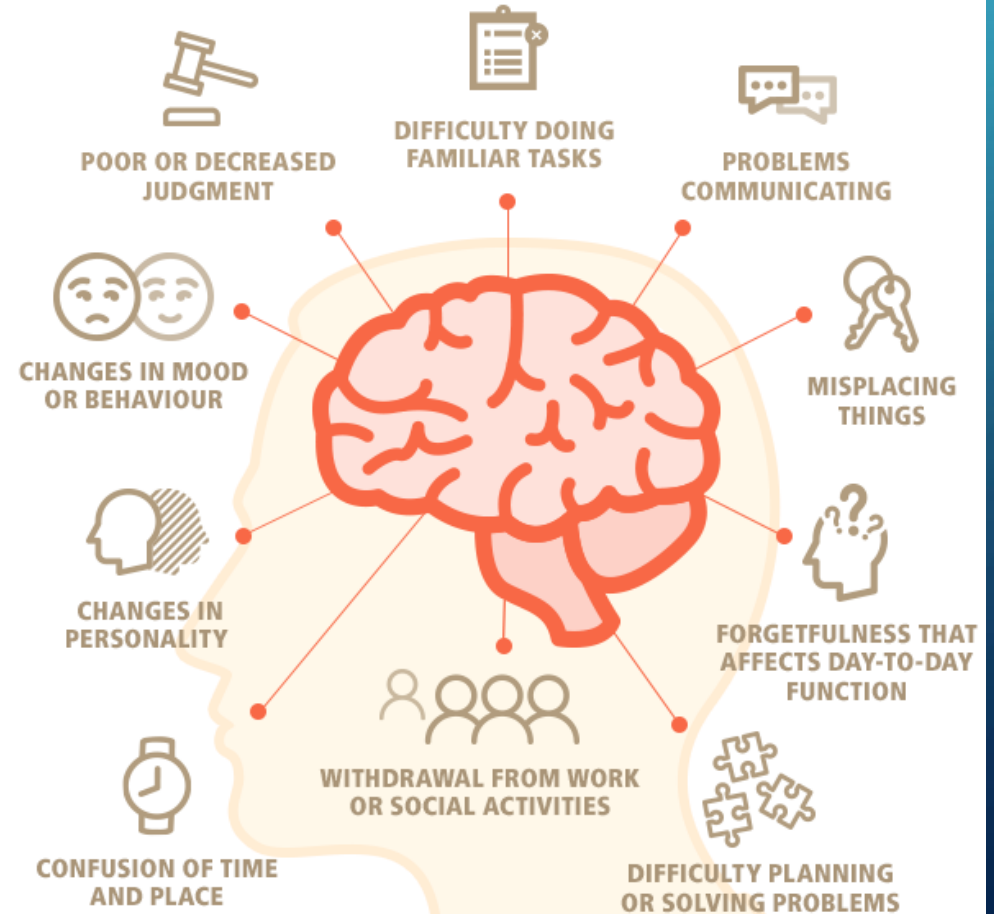


DEMENTIA DEFINITION (NIA-AA CRITERIA, 2011)

1. IMPAIRMENT IN AT LEAST TWO OF: MEMORY; REASONING; VISUOSPATIAL ABILITIES; LANGUAGE; OR CHANGES IN PERSONALITY/BEHAVIOR; &
2. THE IMPAIRMENTS “INTERFERE WITH THE ABILITY TO FUNCTION AT WORK OR AT USUAL ACTIVITIES”; ARE A DECLINE FROM PREVIOUS LEVELS OF FUNCTIONING; & NOT EXPLAINED BY DELIRIUM OR PSYCHIATRIC DISORDER

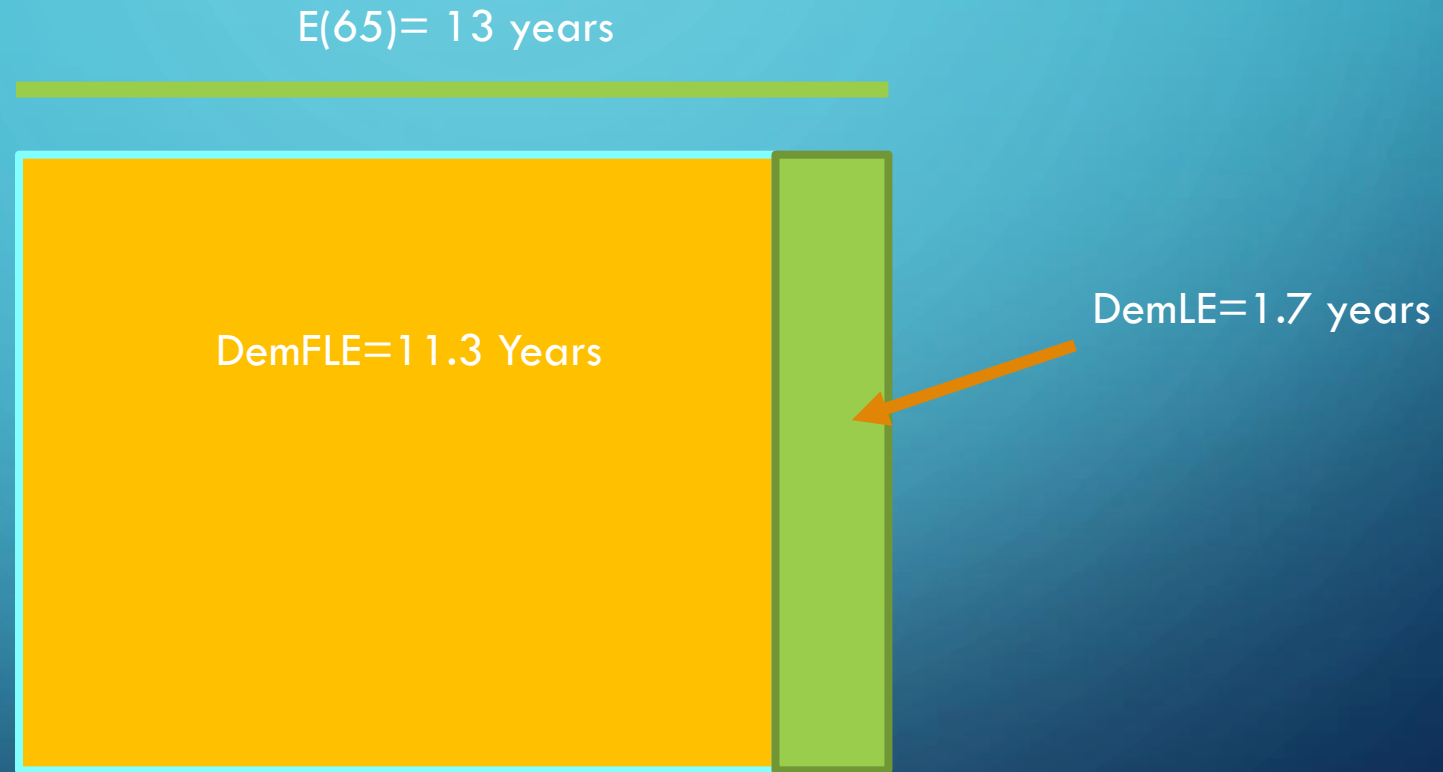
10 WARNING SIGNS OF DEMENTIA

Knowing the symptoms of dementia and identifying them early can make a positive difference for both the patient and their family members.



Learn more about these [warning signs](#).

Hypothetical: Total Life Expectancy, Dementia-Free Life Expectancy, and Life Expectancy with Dementia for Whites with a High School Degree aged 65 Years



EDUCATION

- Direct:
 - Building of Cognitive Reserve (discussed in next slide)
- Indirect BY CONTRIBUTION TO BUILDING COGNITIVE RESERVE THROUGH:
 - Occupational attainment
 - Lifestyle Choices
 - HEALTH BEHAVIORS
 - SOCIAL RELATIONSHIPS

LIFE COURSE

- Dementia risk tied to accumulation of risks across the life course
 - early life conditions important in developing cognitive reserve that protects against dementia--“long arm of childhood”
 - Brain development (critical and sensitive stage) in childhood
 - Early life conditions set foundation for trajectories of social exposures also linked to cognitive reserve (or chains of risk): indirect
 - Education one of the strongest predictors of dementia (also achieved earlier in life)
 - Adult conditions THAT ARE PARTLY DOWNSTREAM CONSEQUENCES OF EDUCATION such as health behaviors, OCCUPATION, income, wealth, and cardiometabolic conditions are also linked to cognitive reserve
 - Here, educational attainment is a surrogate for the total influence of education encompassing both direct and indirect pathways

When someone has dementia,
it's as if their brain can't
drive their body well any more.



I am the source
of consciousness!



COMMAND CENTER
of the BODY!



Capable of storing a
MILLION GIGABYTES
of information!



And yet you still have to sing
the alphabet song to remember
the order of the letters.



©The Author and Yeti