NEIGHBORHOOD CONTEXTS ACROSS THE LIFESPAN AND MIDLIFE COGNITION

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DISCLOSURE

I have no actual or potential conflict of interest in relation to this presentation.

MIDLIFE A KEY DEVELOPMENTAL PERIOD

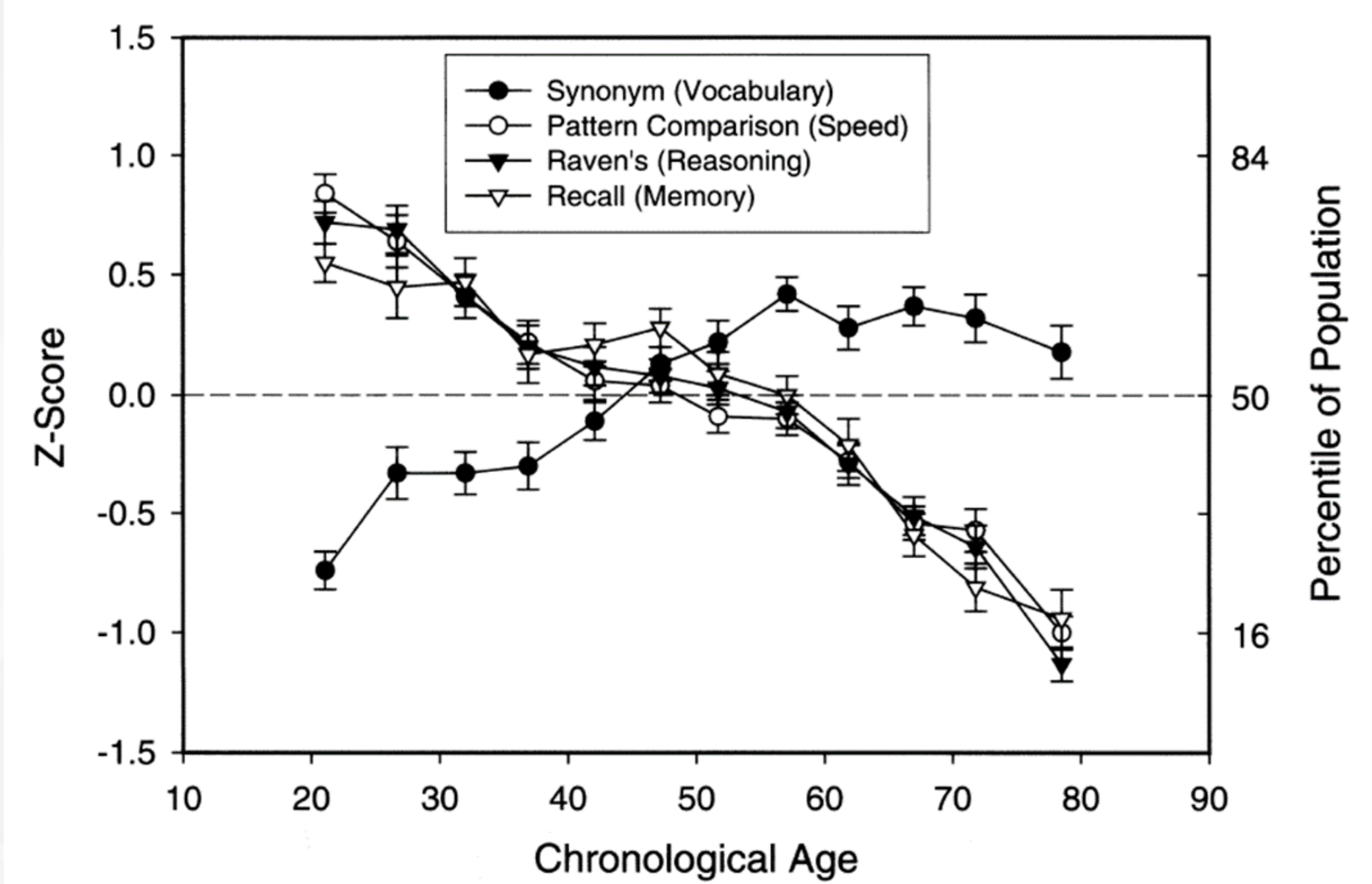

Fig. 1. Means (and standard errors) of performance in four cognitive tests as a function of age. Each data point is based on between 52 and 156 adults.

(Salthouse, 2009; Also see Singh-Manoux et al., 2012)

NEIGHBORHOODS AND COGNITION

Social determinants of health: "conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks."

(Healthy People, 2020)

Neighborhoods are multi-dimensional and multi-temporal

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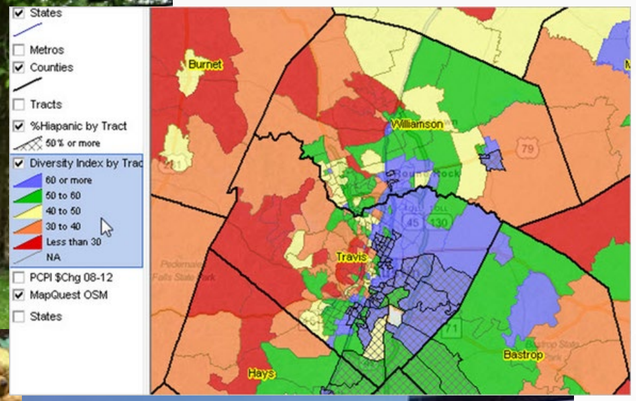
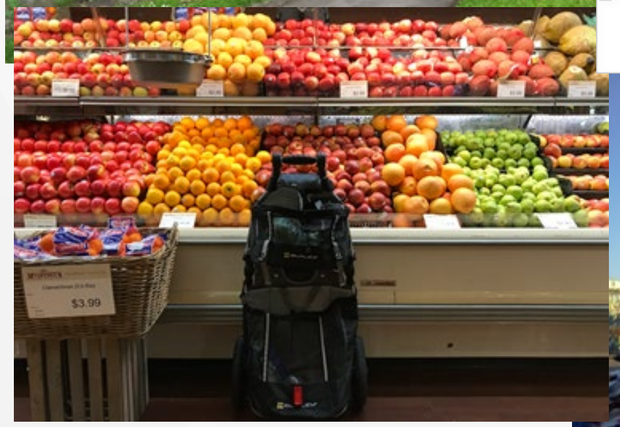
NEIGHBORHOOD DIMENSIONS

STRUCTURAL

Includes socioeconomic, spatial, and physical aspects





SOCIAL

Includes sense of safety, connection with neighbors, etc.

NEIGHBORHOOD DIMENSIONS & COGNITION

Contents lists available at ScienceDirect

Health and Place

journal homepage: http://www.elsevier.com/locate/healthplace

The role of neighborhood stressors on cognitive function: A coordinated analysis

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- Less neighborhood safety → lower executive & spatial functioning
- Poorer aesthetic quality → lower spatial function
- More neighborhood crime → lower spatial function
- Lower social cohesion → lower working memory function

Covariates: age, sex, race/ethnicity, education, marital status, employment status, financial strain, depressive symptoms, self-reported health

Timing of Neighborhood Exposures

A critical period of rapid brain development

Exposures can have a sustained effect on levels of cognitive function.

Neighborhood contexts in young adulthood and midlife

May change and be more or less salient after moving from parental home, complete education, obtain employment, etc.

May spend more time in neighborhoods after retirement

More salient with increasing health limitations

May be more relevant for rate of cognitive change?

NEIGHBORHOOD COHESION & TIMING

Neighborhood Cohesion Across the Life Course and Effects on Cognitive Aging

Jean Choi, MA,[1,*] Sae Hwang Han, PhD,[1] Yee To Ng, PhD,[2] and Elizabeth Muñoz, PhD[1]

[1]Department of Human Development and Family Sciences and Population Research Center, The University of Texas at Austin, Austin, Texas, USA.
[2]Department of Physical Medicine and Rehabilitation, University of Michigan, Ann Arbor, Michigan, USA.

LIFE HISTORY SURVEY

- How much participants felt part of their local areas (i.e., the area within 20-minute walk or about a mile of one's home)
- Age 10, start of first full-time job, age 40
- 1 = I felt I didn't belong in this area to 7 = I really felt part of this area

LEAVE-BEHIND QUESTIONNAIRE

- I really feel part of the area/I feel that I don't belong in this area;
- Most people in the area can be trusted/most people in this area cannot be trusted;
- Most people in the area are friendly/most people in this area are unfriendly; and
- If you were in trouble, there is nobody in this area that would help you.

CHILDHOOD & MIDLIFE NEIGHBORHOOD COHESION

Neighborhood cohesion in childhood and late midlife associated with baseline level of cognitive function, but not rate of change in cognitive function

	Age 10	**1st Job**	**Age 40**	**Concurrent**	**Full**
	Estimate (SE)	Estimate (SE)	Estimate (SE)	Estimate (SE)	Estimate (SE)
Intercept	16.93 (0.08)***	16.92 (0.08)***	16.91 (0.08)***	16.92 (0.08)***	16.91 (0.08)***
Linear Time	-0.07 (0.01)***	-0.07 (0.01)***	-0.07 (0.01)***	-0.07 (0.01)***	-0.07 (0.01)***
Neighborhood cohesion at age 10	**0.09 (0.04)***	–	–	–	**0.09 (0.04)****
Neighborhood cohesion at 1st job	–	<0.00 (0.04)	–	–	–
Neighborhood cohesion at age 40	–	–	0.08 (0.04)	–	–
Concurrent neighborhood cohesion	–	–	–	**0.11 (0.04)***	**0.11 (0.04)****
Covariates					

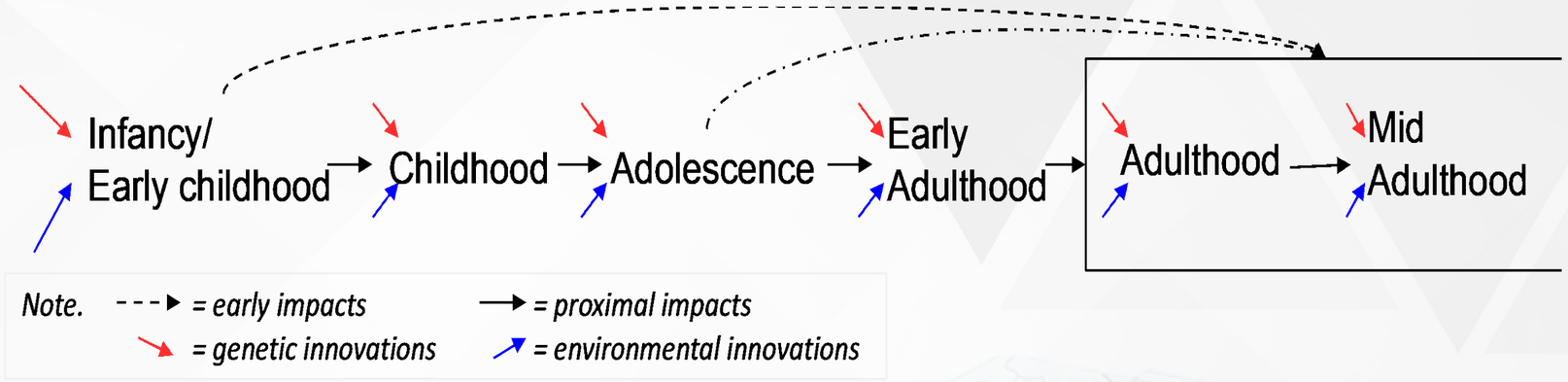
Note. n = 3,59; *p < .05. **p < .01. ***p < .001.

Covariates: age at baseline, sex, race, ethnicity, educational attainment, number of interstate relocations, parental education, depressive symptoms

Colorado Adoption/Twin Study of Lifespan behavioral development and cognitive aging (CATSLife)

~1400 participants

- Yearly assessments birth through age 16, regularly thereafter until 22
- 28 – 45 years (CATSLife1)
- 33 – 50 years (CATSLife2)



cognitive change across midlife

- Episodic memory
- Executive functioning
- Processing speed
- Spatial navigation
- Short-term variability and plasticity

Formats - online, in-person, smartphone

http://mezja.blogspot.com/2011/01/cognition-and-emotion.html

biomarkers of accelerated aging

- neurofilament light (NfL)
- methylation/epigenetic clocks
- blood transcriptome profiles

Other Biomarkers – lipids, cytokines, CRP

environmental factors

- Individual factors (education, SES)
- Neighborhood disadvantage, urbanicity, walkability
- Longitudinal neighborhood change

http://inyo-monowater.org/resources/glswhat/

https://www.colorado.edu/ibg/catslife/home

R01 AG046938, MPIS: Chandra A. Reynolds (contact) & Sally J. Wadsworth

ADDRESS HISTORIES IN CATSLIFE

- First addresses between 1976 and 1986 matched to 1980 & 1990 Census
- Longitudinal Tract Database (Logan et al., 2014) to retain consistency in tract boundaries
  - Neighborhood disadvantage composite scores,
  - access to parks and green space
  - Index of Relative Rurality, etc.

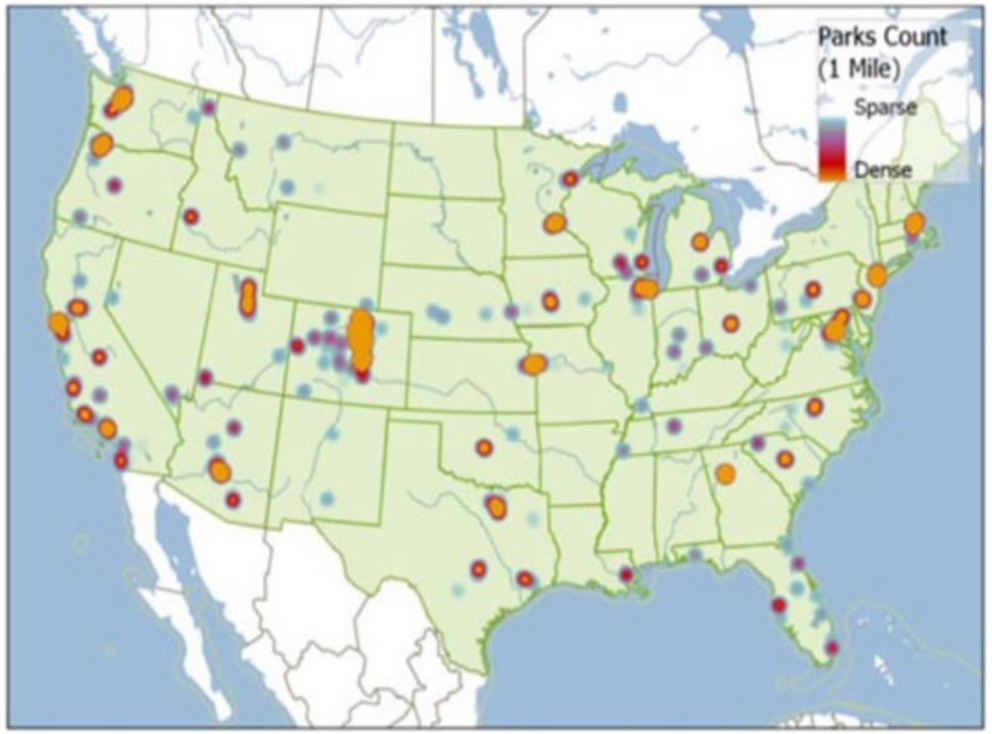


Fig. 8. Geospatial mapping in the CATSLife sample from the first 3 years of data collection ($N = 940$): density of parks within a 1-mile radius.

(Wadsworth et al., 2019; *Twin Research and Human Genetics*)

RESEARCH ARTICLE

An examination of early socioeconomic status and neighborhood disadvantage as independent predictors of antisocial behavior: A longitudinal adoption study

Shelley A. Gresko[1,2]*, Laura K. Hink[1,2], Robin P. Corley[2], Chandra A. Reynolds[1,2,3], Elizabeth Muñoz[4], Soo Hyun Rhee[1,2]

Modality of Cognitive Assessments Matters

N = 256, urban-dwelling adults
Age 25 – 65; 63.18% NH Black, 23.43% Hispanic; 9.21% NH White

- Exposure to neighborhood violence associated with poorer performance in latent working memory construct
- Effect mediated by performance in ambulatory (smartphone-based) working memory task

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Social Science & Medicine

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Exposure to neighborhood violence, and laboratory-based and ambulatory cognitive task performance in adulthood☆,☆☆,☆☆☆

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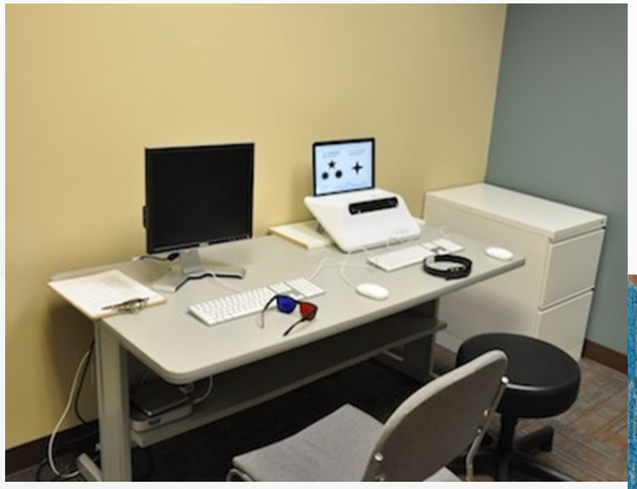

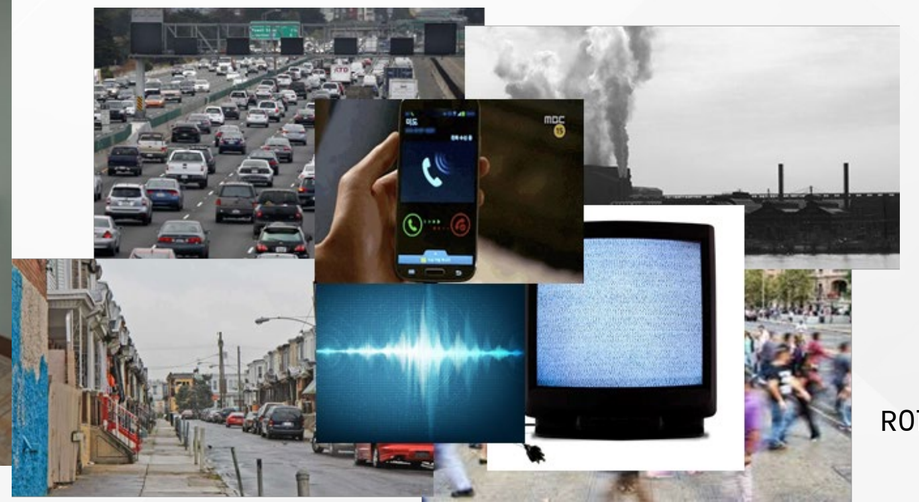

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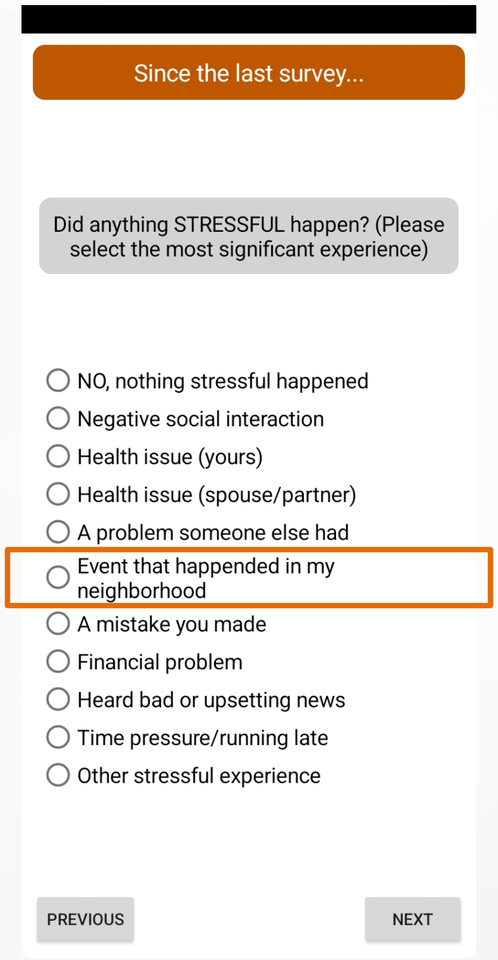
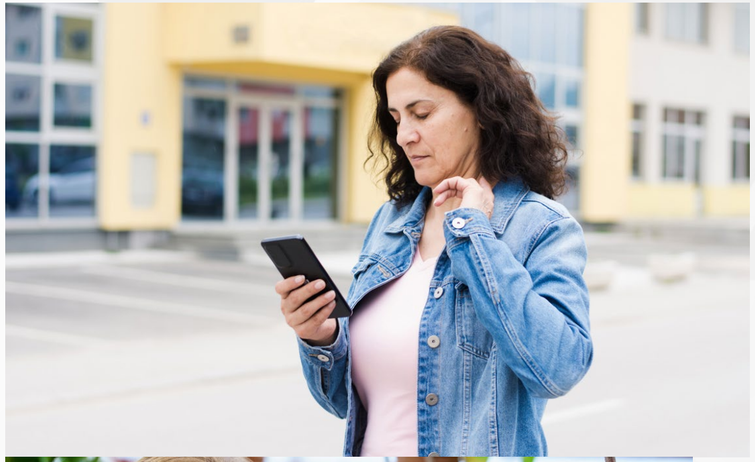
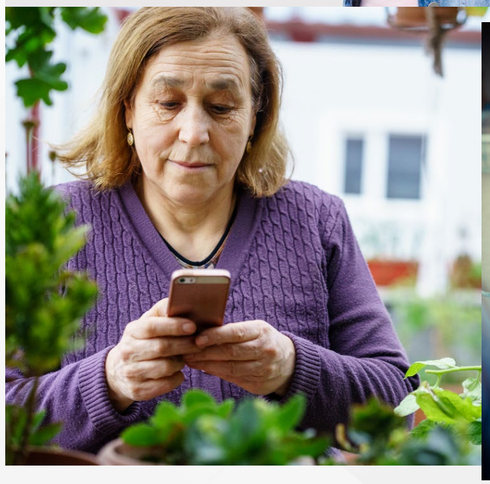
DaLE

Daily Life Experiences & cognition

- 100 Latinx adults between 45 and 65 years in the greater Austin, TX area
- Spanish and English assessments
- Community-engaged recruitment
- Flexible training / onboarding locations
- Surveys and brief cognitive assessments 4 times/day for 2 weeks







R21 AG078846, PI: Elizabeth Muñoz

DISCUSSION AND FUTURE DIRECTIONS

Importance of evaluating neighborhood domains

- Structural (physical, spatial), and social
- Objective and self -report

Timing of neighborhood exposures and experiences

- Independent effects of early life and midlife neighborhood cohesion
- Need to examine potentially distinct mechanisms
  - Across (and in conjunction with) other neighborhood domains
  - Domains by Timing interaction

Modality of assessment of cognitive outcomes may influence findings on neighborhood effects

- In-lab cognitive assessments vs. in everyday life

CHART

COGNITION, HEALTH, & AGING RESEARCH TEAM

(PICTURED FROM LEFT TO RIGHT: ANDRIA, BRIANNA, LOURDES, ZOE, DR. MUÑOZ, BELLA, ASMA, ISABELLE, GEORGIA. NOT PICTURED: JEAN CHOI)

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*THE CONTENT IS SOLELY MY RESPONSIBILITY AND DOES NOT NECESSARILY REPRESENT THE OFFICIAL VIEWS OF THE NATIONAL INSTITUTES OF HEALTH.

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THANK YOU

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