Age Composition and Stress: Daily Mobility Exposures to Age-peers Among Older Adults in Chicago

Thelonious Goerz
Cornell University
Department of Sociology
Brooks School of Public Policy[1]
MASS 2024

March 6th, 2024

[1]Affiliate: Cornell Population Center, Center for the Study of Inequality

Background

- The social environment, social interactions, and exposures to age peers have been shown to have positive benefits on older adult health [stress responses]
- Structural neighborhood features, such as the share of older adults in a tract, are associated with positive health benefits (Zhong et al. 2022)
- At an individual level, real-time social interactions reduce momentary pain, fatigue, and stress (Goldman and York Cornwell 2023)

- Prior work linking age composition to health looks at **static, ecological data**, but we do not know if individuals are actually interacting with one another
- This paper overcomes these issues, by using **geo-located ecological momentary assessments (EMA)** to **differentiate between structural; neighborhood characteristics and real-time experiences**

- In this paper, I explore how both neighborhood shares of age peers and real-time observations of older adults are related to real-time stress responses.

Research Questions:

- How is the share of older adults in respondents' activity spaces associated with the probability of stress?
- Does this association depend on observing age peers in real time?

Data and Methods

CHART Data Overview

- Data are from the Chicago Health Activity Space in Real Time (CHART) Study: A representative survey of (N=455) 65+ older adults in Chicago, IL
- Sampled from 10 neighborhoods and followed over three waves (2018-2019)[2]
- EMA data collected at 5 windows each day for 7 days asking about health/wellbeing, affect, social activities, public observations
- Goal is to understand how social context and spatial environment broadly shape health

[2]GPS tracking is derived and survey responses collected using mobile phone pings on a Galaxy S7 phone

Table 1: A Stylized EMA Stress Sequence (All Locations)

ID	1	2	3	4	5
1008341	Not Stressed	NA	Not Stressed	NA	Not Stressed
1014511	Not Stressed	Not Stressed	Not Stressed	NA	Not Stressed
1016922	Stressed	NA	Stressed	Stressed	Not Stressed
7022192	Not Stressed	Stressed	Not Stressed	Not Stressed	Not Stressed

This table displays EMA stress-trajectories for the first 5 EMAs respondents complete in Wave 1. Each respondent is prompted with 5 EMAs per day. Data are not representative of the entire sample.

Table 2: A Stylized EMA Stress Sequence (Excluding Home EMAs)

ID	1	2	3	4	5
1008341	NA	NA	Not Stressed	NA	NA
1014511	NA	Not Stressed	Not Stressed	NA	NA
1016922	NA	NA	Stressed	Stressed	NA
7022192	NA	NA	Not Stressed	Not Stressed	NA

For this analysis, EMAs are filtered so that only non-Home locations are kept.

- I use Logistic regression models to estimate the association between neighborhood composition and real-time observations of age peers and real-time stress responses, with wave and tract fixed effects[3]

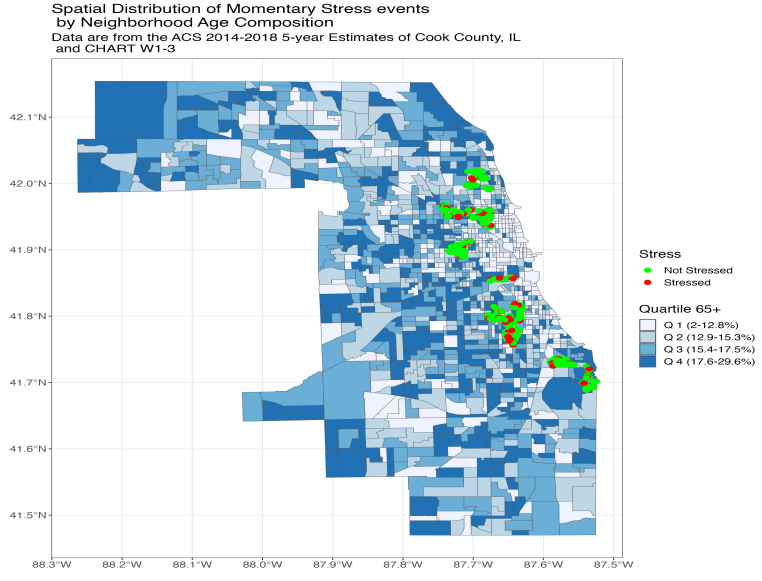
$$\hat{Y} = X\beta_{iwt} + \gamma_{iwt}$$

- Controls for tract and individual demographics, health status, wave, economic characteristics
- Weighted by the number of EMAs that individuals complete
- Standard errors are robust and multi-way clustered by wave, individual, and tract

[3] γ_{iwt} refers to fixed effects for individual, tract, and wave.

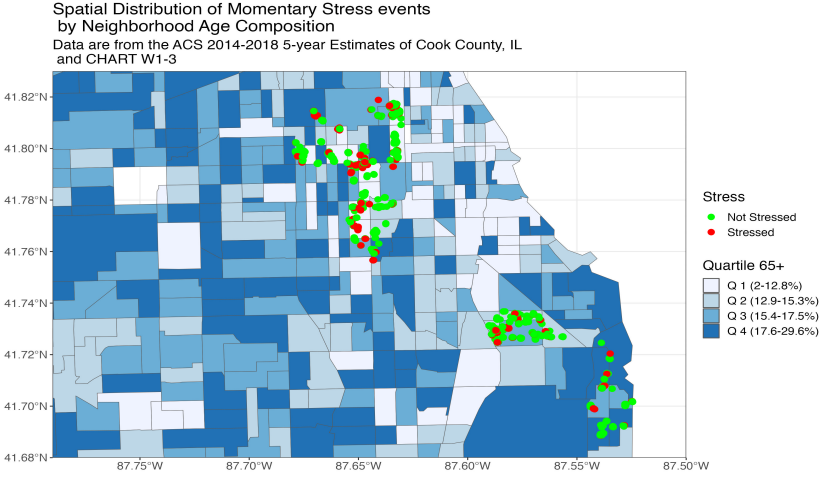
Results

Spatial Context of EMAs



Shapes represent whether older adults report stress in an Ecological Momentary Assesment (EMA).

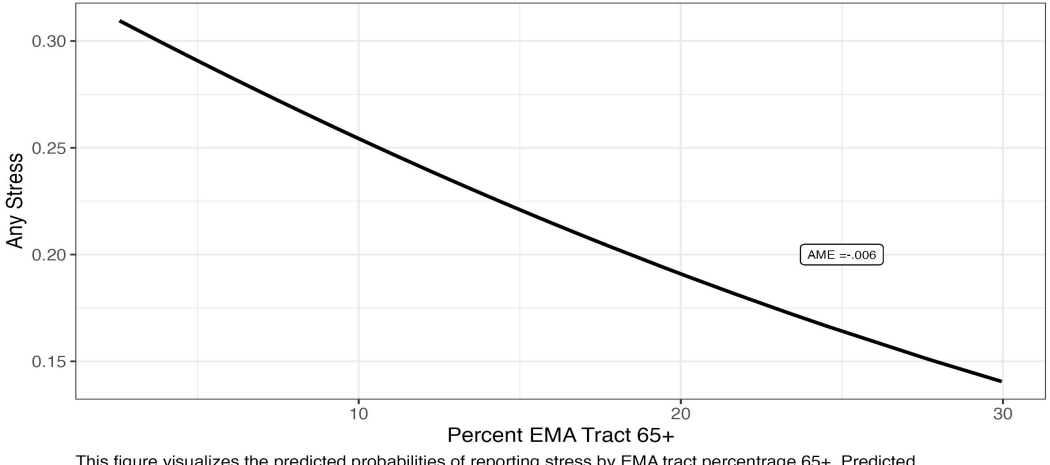
Spatial Context of EMAs



Shapes represent whether older adults report stress in an Ecological Momentary Assesment (EMA). This inset represents one of three main clusters of EMAs

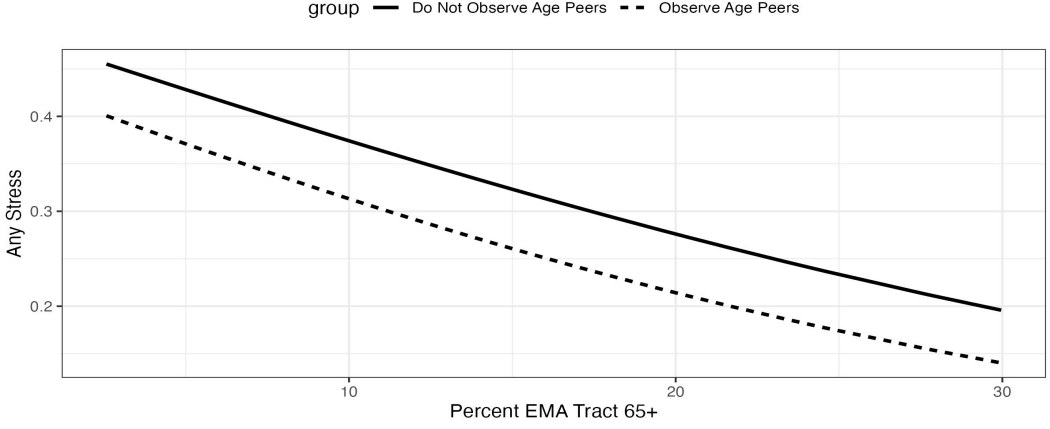
Figure 1: Predicted Probability of Stress (Preferred Spec.)

(N=7486) Non-Home EMA Tracts



This figure visualizes the predicted probabilities of reporting stress by EMA tract percentrage 65+. Predicted probabilities are from my preferred model specification incorporating neighborhood, demographic, and health controls. AME refers to the Average Marginal Effect of the EMA tract percentage 65+ on the probability of any stress. Data are from CHART Waves 1-3 excluding home EMAs.

Figure 2: Predicted Probability of Any Stress by (Percent 65+ X Observing Age Peers)
(N=7587) Non-Home EMA Tracts



This figure visualizes the predicted probabilities of reporting stress by the interaction between EMA tract percentrage 65+ and real-time observation of age peers. Predicted probabilities are from my preferred model specification incorporating neighborhood, demographic, and health controls and reflect coefficients estimated on the subgroup that did and did not observe age peers. Observed Age Peers refers to the R reporting that there were people of the same age present. Data are from CHART Waves 1-3 excluding home EMAs.

Discussion and Next Steps

Summary:

- Older adults are significantly less likely to report stress in neighborhoods with larger shares of age peers.
- Real time observations of older adults significantly reduce stress above and beyond age peer shares.

Discussion:

- What other social, environmental, or contextual information may affect these patterns?
- How should weights be used to account for time in tract, cumulative exposure to a certain tract, and differential levels of EMA completion?

Acknowledgements

Data collection for the CHART study was funded by the National Institute on Aging of under award R01AG050605. The content of this research paper is solely the responsibility of the author(s) and does not necessarily represent the official views of the National Institutes of Health.

References[4]

Cagney, Kathleen A., Christopher R. Browning, Aubrey L. Jackson, and Brian Soller. 2013. "Networks, Neighborhoods, and Institutions: An Integrated 'Activity Space' Approach for Research on Aging." in New Directions in the Sociology of Aging. National Academies Press (US).

Cuba, Lee, and David M. Hummon. 1993. "A Place to Call Home: Identification with Dwelling, Community, and Region." The Sociological Quarterly 34(1):111–31.

Goldman, Alyssa W., and Erin York Cornwell. 2023. "Stand by Me: Social Ties and Health in Real Time." Socius 9:23780231231171112. doi: 10.1177/23780231231171112.

Hand, Carri L., and Bret T. Howrey. 2019. "Associations Among Neighborhood Characteristics, Mobility Limitation, and Social Participation in Late Life." The Journals of Gerontology: Series B 74(3):546–55. doi: 10.1093/geronb/gbw215.

Hutchinson, Rebbeca N., Mary A. Putt, Lorraine T. Dean, Judith A. Long, Chantal A. Montagnet, and Katrina Armstrong. 2009. "Neighborhood Racial Composition, Social Capital and Black All-Cause Mortality in Philadelphia." Social Science & Medicine 68(10):1859–65. doi: 10.1016/j.socscimed.2009.02.005.

Krause, Neil. 1986. "Social Support, Stress, and Weil-Being Among Older Adults." Journal of Gerontology 41(14):512–19.

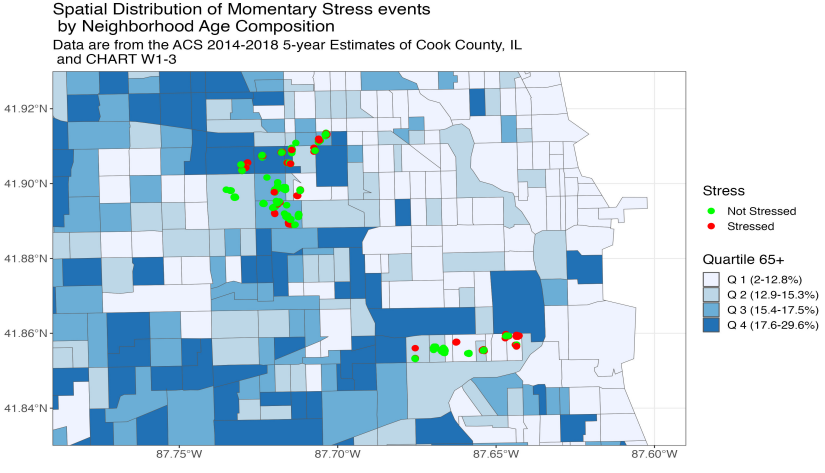
York Cornwell, Erin, and Rachel L. Behler. 2015. "Urbanism, Neighborhood Context, and Social Networks." City & Society (Washington, D.C.) 14(3):311–35. doi: 10.1111/cico.12124.

Zhong, Sinan, Chanam Lee, and Hanwool Lee. 2022. "The Role of Community Environments in Older Adults' Intergenerational and Peer Social Interactions." Cities 129:103785. doi: 10.1016/j.cities.2022.103785.

[4]Additional references included correspond to material in the handout.

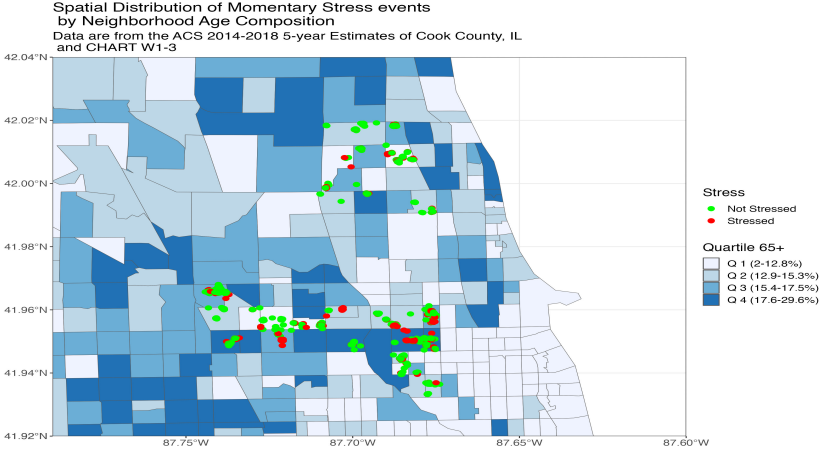
Appendix

Spatial Context of EMAs (cont.)



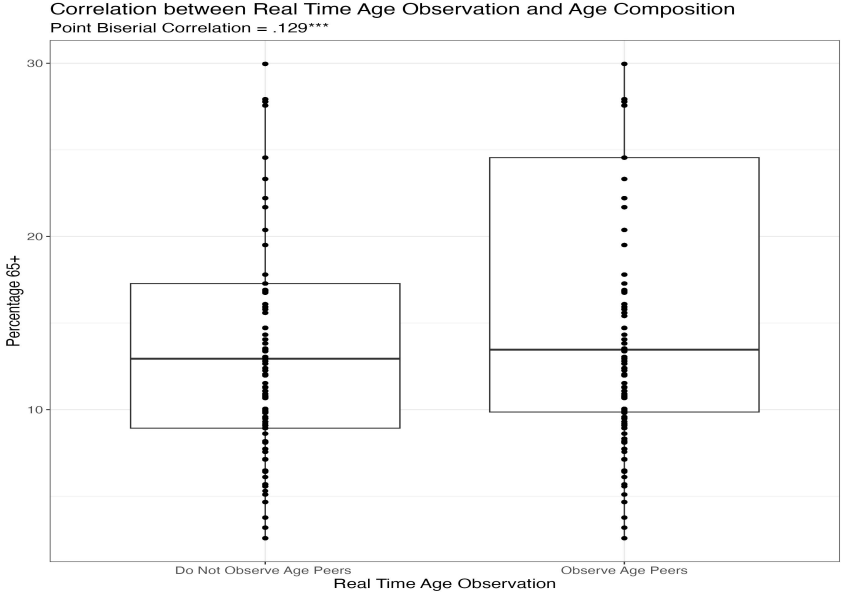
Shapes represent whether older adults report stress in an Ecological Momentary Assesment (EMA). This inset represents one of three main clusters of EMAs

Spatial Context of EMAs (cont.)



Shapes represent whether older adults report stress in an Ecological Momentary Assesment (EMA). This inset represents one of three main clusters of EMAs

Correlation Between Observing Age Peers and Tract Older Adult Share



Correlation Between Stress and Age Composition