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Supplement: Social Environment and Cognitive Health in Urban and Rural Areas | Editorial

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Social Environment and Cognitive Health in Urban and Rural Areas: an introduction

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This issue is designed to bring the gerontological community's awareness to the Social Environment and Cognitive Health in Urban and Rural Areas (SECHURA) study and to encourage future use beyond the original team of investigators. SECHURA is a state representative panel study of 510 adults aged 55 years and above living across 41 geographically diverse counties in Indiana. This issue outlines the research design and several key results from Wave 1 (W1). Collected between November 2023 and March 2024, this wave gathered a range of data on the cognitive function of participants as well as in-depth accounts of their social interactions, relationships, and networks, the activities in which they engage throughout daily life, and the places these activities transpire. The social environment aspect of SECHURA is designed to be inherently multilevel in that it views participants as simultaneously occupying macro-level environments (communities), meso-level environments (personal networks), and micro-level environments (momentary social interactions), all of which cumulatively contribute to the cognitive aging process (Finlay et al., 2022; Hicken et al., 2026; Perry et al., 2022a; Zhaoyang et al., 2021).

Development of SECHURA

The development of SECHURA took inspiration from a rich history of investigations into aging. From the most basic level, multiple long-running panel studies dating back to the 20th century such as the Wisconsin Longitudinal Study (WLS), the Health and Retirement Study (HRS), and the Midlife in the United States (MIDUS), established the feasibility and value of tracing cohorts of individuals over time to explore the dynamics of aging. These seminal studies pointed to many of the social processes that play a crucial role in health trajectories in later life. For instance, the results from these panel studies demonstrated that older adults do not uniformly slip into social isolation as once believed (Cumming & Henry, 1961) but that there is considerable heterogeneity in the degree to which people stay connected to family, friends, and the healthcare system as they navigate the later stages of life (Brooks et al., 2014; Coyle & Dugan, 2012; Kahn et al., 2011).

This latter insight went on to inspire a wave of 21st century studies whose methodological innovations expanded the idea of social interconnectivity into new empirical territories. For instance, the National Social Life, Health, and Aging Project (NSHAP) introduced multiple measures of social connectedness, including a core discussion network module that cast each participant in a web of social relationships with confidants (Cornwell et al., 2009; York Cornwell & Waite, 2009). NSHAP was particularly impressive because it made this empirical push toward a network framework while maintaining a large-scale nationally representative panel sample (Suzman, 2009). The Social Networks and Alzheimer's Disease (SNAD) study extended this network framework by incorporating multiple name-generating prompts to give researchers a broader view of the people who were central to the social lives of the study participants. These expanded network data were paired with MRI neuroimaging to study the social processes associated with the etiology of Alzheimer's disease and related dementia (Perry et al., 2022b).

The Daily Experiences and Well-Being Study (DEWS) and the Chicago Health and Activity Space in Real-Time (CHART) study maintained a social network framework but went one step further by introducing an ecological momentary assessment (EMA) module in their respective designs. This latter methodology allows participants to track their daily activities using smartphone technology (Browning et al., 2024). Participants who agree to such a study will start receiving multiple notifications per day to complete short burst surveys (i.e., EMAs) asking questions pertaining to their location, activity, social interactions, and behaviors/attitudes at any given moment. Despite the relatively large burden it places on participants, adopting an EMA framework has allowed these studies to further reconceptualize social life by conducting within-respondent analysis of social behaviors and corresponding measures of momentary well-being (Fingerman et al., 2020; Goldman & York Cornwell, 2023).

SECHURA borrowed elements from all the aforementioned studies to provide a dynamic portrait of cognitive aging as it is experienced across different geographic contexts. Although smaller in size and geographic scope than the seminal 20th century studies, SECHURA mirrored these studies in sampling a population-based cohort to be tracked over time. It followed the lead of NSHAP and SNAD by dedicating a substantial portion of the survey to gather network data as well as drawing on the innovations from DEWS and CHART to implement an EMA module. Collectively, this resulted in data on a state representative

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sample that simultaneously captures elements of the social environment at the macro, meso, and micro levels.

Contents of this issue

This issue is composed of five empirical articles that draw on W1 data. The first article presents a study overview by discussing the sampling process, participant onboarding, contents of the computer-assisted personal interview survey and EMAs, and the strengths and limitations of the research design (Roth et al., 2026c). This article will be particularly useful for any prospective researcher wishing to use SECHURA data to answer their specific research question. The second article tackles the issue of rurality head-on by analyzing the EMA data to show how rural and urban participants visited the same types of places at remarkably similar rates, but that those residing in rural communities had to travel further to reach commercial places such as restaurants, stores, and healthcare centers (Roth et al., 2026b). The third article addresses the multilevel themes of SECHURA to investigate how participants are situated at varying levels of social environments (via their communities and networks) and how certain combinations of these environments are associated with cognitive health (Peng et al., 2026b). The authors of this article find that rural participants who are embedded in networks consisting of only a few, homogenous, and overlapping set of ties score lower on the Montreal Cognitive Assessment (MoCA) compared to participants situated at any other combination of environmental exposures, including rural participants with large, structurally diverse networks. These findings challenge the notion that rurality is universally associated with poor cognitive health and instead demonstrate how it is the joint occurrence of geographic and relational constraints that should be considered particularly worrisome.

The fourth article departs from the geographic focus to explore the dynamic sequences that participants present in their daily lives (Qu et al., 2026). Specifically, the authors apply sequence analysis to construct two weekly routine indices that measure repetitions in activities and social interactions, respectively. They documented a negative association between the activity index and cognitive function such that participants who engaged in repetitive activities across the week scored lower on the MoCA than participants who engaged in a varied set of activities. Overall, the findings from this study complicate assumptions about the beneficial nature of routines in later life. The fifth and final article explicitly makes the link between the meso-level networks and micro-level interactions by documenting how participants who are embedded in structurally and compositionally expansive personal networks are more likely to engage in explicitly social activities with a wider range of people (including non-kin) throughout their daily lives compared to participants with smaller, more homogenous networks (Perry et al., 2026). The findings from this latter article have implications not only for micro-level social processes linked to health and well-being in later life but also for assumptions that are often made in the social network literature.

Methodological implications of EMAs

Previously published studies using the W1 data shaped the articles published in this issue. For example, there was considerable variation in the EMA module in terms of enrollment and compliance. Roth et al. (2026a) leveraged this variation and implemented a two-stage analysis to model the extent to which participants enrolled in the module and the degree to which they responded to the EMA notifications upon enrollment. They found that age and cognitive function were negatively associated with enrollment, whereas smartphone ownership and frequency of computer use, both taken as proxies for technological familiarity, were positively associated with enrollment and compliance rates, respectively. This study helped create inverse probability weights applied to all EMA analyses published in this issue.

There was also the question of whether EMA data provide valid representations of the features of daily life that they are designed to capture. Peng et al. (2026a) therefore compared the W1 EMA data with time diary data from the American Time Use Survey to identify where estimates of daily life overlapped or diverged across the two sources. They found that the two data sources produced similar estimates of moments recorded at home and workplace, but overestimated moments spent alone and underestimated moments spent in third places. These bounds led the articles in this issue to use EMAs for within-sample comparisons of social interactions and corresponding attitudes, behaviors, or locations rather than for estimating total daily time for socializing.

Conclusions and future directions

SECHURA was designed to provide methodologically innovative data that allows researchers to explore how older adults are simultaneously embedded in multiple levels of the social environment and how occupying unique environmental positions links to the cognitive aging process. Indeed, the initial results from the baseline wave of data exemplify the value of treating social life as a complex process that not only situates people within communities but also acknowledges that residents of the same community form their own social worlds via their networks and daily interactions. Although data are not currently available for use beyond the SECHURA research team, prospective researchers will be encouraged to learn that W1 data will be made publicly available within approximately the next year. Moreover, there will soon be a second wave of data that will enable researchers to track changes over time. This additional wave—and all subsequent waves—will help address changing exposures to social environments as well as trajectories in cognitive decline and similar health outcomes that take years to fully reveal themselves.

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Conflicts of interest

A. R. Roth is the organizer of the supplement in which this article is published but was not involved in the manuscript's review process or decision to accept it for publication.

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Ethics approval

The SECHURA study was approved by the Institutional Review Board at Indiana University (IRBIUB-16000) and exempted by the Institutional Review Board at Oklahoma State University (IRB22-351).

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