

AN ADAPTIVE EQUILIBRIUM REGULATION MODEL OF RESILIENCE

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Adaptive equilibrium regulation (AER) models distinguish between the effects of acute versus chronic stressors as a system responds to changes in the environment. Acute stressors have a short time interval during which the stressor is present. Chronic stressors have an onset and may also have an offset, but the stress persists over a period of weeks, months or years. Resilience to an acute stressors may involve rapid self-regulation back to equilibrium without affecting the regulation process itself. Resilience to a chronic stressor may require the system to readapt itself so that regulation of the chronic stressor becomes more effective over time. We present a differential equation model that allows for adaptation of regulation in response to chronic stress and illustrate its use in intensive longitudinal burst data from the Notre Dame Study of Health and Wellbeing.

QUANTIFYING SENSITIVE DEPENDENCE OF INITIAL CONDITION USING STRUCTURAL EQUATION MODELING

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Human systems display sensitive dependence of initial condition. That is, even though two individuals may be similar in most regards, small differences between these individuals may have far reaching consequences later in life. In dynamical systems analysis, this sort of behavior is quantified with maximum Lyapunov exponents. These exponents quantify the degree to which small differences in initial condition between two systems affect trajectories of these systems later in time. Current methods for estimating maximum Lyapunov exponents are sensitive to noise and this sensitivity leads to estimation errors when researchers attempt to estimate these exponents on data obtained from human participants. Additionally, most current methods only allow for maximum Lyapunov exponent estimation using univariate time series. In this presentation, we present a method for using structural equation modeling for estimating latent maximum Lyapunov exponents from noisy multivariate time series and discuss applications of this method for analyzing human generated data.

SEQUENCE MINING FOR COMPLEX PATTERN FINDING

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The processes of aging play out across multiple variables and multiple timescales, with patterns of daily, and weekly behavior that may be influenced by each other and by changes across the aging process. Further, many of these patterns do not fit neatly into the linear modeling approaches common in the field. Sequence mining, an approach from the data mining literature, provides a means of identifying commonalities and differences in these sequences in ways that can begin to handle the multivariate and multi-timescale nature of behaviors in aging. In this talk, I present an example of

sequence mining to illustrate its ability to find arbitrarily complex patterns of behavior that characterize and distinguish groups and individuals.

SESSION 2010 (PAPER)

COGNITIVE FUNCTIONING AND IMPAIRMENT

ASSOCIATION BETWEEN FAMILY TYPOLOGY AND COGNITIVE FUNCTION AMONG OLDER ADULTS IN THE US? FINDINGS FROM THE PINE STUDY

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A broad literature has explored racial and ethnic disadvantages in cognitive aging. Migration and acculturation created additional challenges on cognitive aging of minority older immigrants. Asian Americans are the fastest growing minority group in the United States. Chinese Americans constitute the largest segment of Asian Americans. Family is a core social value in Chinese culture. Less is known regarding the impact of family relationship on cognitive function for US Chinese older immigrants. Data were derived from the Population Study of Chinese Elderly (PINE), a community-engaged, population-based epidemiological study of 3,157 US Chinese older adults aged 60 and above in the greater Chicago area from 2011-2013. A typology approach is a useful tool to operationalize multifaceted family relationships. Our prior study used Latent Class Analysis to cluster family typologies, evaluating structural, associational, affectual, functional and normative aspects of family relationship. Cognitive function was evaluated by global cognition, episodic memory, executive function, working memory, and Chinese Mini-Mental State Examination (C-MMSE). Linear regression and quantile regression were used. The findings showed detached and commanding conflicted typologies were associated with lower global cognitive function compared with unobligated ambivalent typology. Wish respect to cognitive domains, detached, commanding conflicted, and tight-knit typologies were associated with lower episodic memory, working memory, and C-MMSE than unobligated ambivalent typology, respectively. Commanding conflicted typology, featured by high intergenerational conflicts, was associated with lowest cognitive function among all typologies. Health care professionals and social service providers should focus on older adults with commanding conflicted typology and prevent them from cognitive impairment.

CAN HEARING AIDS DELAY THE ONSET OF ALZHEIMER'S AND OTHER AGE-RELATED CONDITIONS AMONG ADULTS WITH HEARING LOSS?

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