SESSION 3190 (SYMPOSIUM)

INTEGRATION OF OBJECTIVE AND SUBJECTIVE EXPERIENCES OF HEALTH IN OLD AGE
Chair: Shannon T. Mejia, University of Illinois, Urbana-Champaign, Champaign, Illinois, United States
Co-Chair: Johanna Drewelies, Humboldt University Berlin, Berlin, Germany, Germany
Discussant: Cynthia Berg, University of Utah, Salt Lake City, Utah, United States

Life-span perspectives on adult development and aging highlight the processes of understanding and acting to support one’s own health and well-being. Within this framework, subjective measures offer insight into the experience of objective measures of health. This symposium brings together four papers that highlight the overlap and discrepancy between subjective and objective measures of health and how these are shaped by individual development in different contexts and phases of adult development over various time-scales. Mejia and colleagues consider the intra-individual dynamics of older adults’ perceived and actual fall risk. Using 30 days of subjective and objective balance assessment, they illustrate individual differences in how awareness of fall-risk relates to physical activity on that day. Koffler and Kamarck use data from the Pittsburgh Healthy Heart Project to examine how reactivity of cardiovascular response and affective experience to daily experiences of stress changes with age. Drewelies and colleagues consider how objective aging feels. Using data from the Berlin Aging Study II, they examine how chronological and subjective age are linked to biological age in older adults. Gonzalez and colleagues use self-reported and behavioral data from an in-context biosocial research lab to comment on the theoretical and methodological implications of integrating objective and subjective measures of experience. The discussion by Berg integrates the four papers, highlights their theoretical and methodological contributions, and considers challenges and opportunities for subjective and objective inquiries of older adults’ experiences of health.

THE DAILY BALANCE PROJECT: AN INQUIRY INTO THE INTRAINDIVIDUAL DYNAMICS OF PERCEIVED AND ACTUAL FALL RISK
Shannon T. Mejia,1 Katherine Hsieh,2 Jason Fanning,3 and Jacob Sosnoff,4 1. University of Illinois, Urbana-Champaign, Champaign, Illinois, United States, 2. University of Illinois, Urbana-Champaign, Urbana, Illinois, United States, 3. Wake Forest University, Winston-Salem, Illinois, United States, 4. University of Illinois, Urbana-Champaign, Urbana, Illinois, United States

An accurate understanding of one’s abilities and limitations allows adaptive response to the challenges that are faced in daily life. However, older adults may over or underestimate their actual abilities. The Daily Balance Project examined the intra-individual dynamics of older adults’ perceived balance with objective measures of balance and physical activity. For 30 consecutive days, following a comprehensive fall risk assessment, 20 older adults rated their balance confidence (Activities Balance Confidence scale) at that moment and then performed five standardized balance assessments measured via smartphone accelerometer held to their chest. Physical activity was measured with an activity monitor. Baseline measurements of fall risk differentiated the extent of intra-individual variation and co-variation of balance and physical activity. For some participants, actual and perceived balance became more closely aligned as the study progressed. The implications of the findings for life-span perspectives on aging and fall prevention are discussed.

LONGITUDINAL EVIDENCE FOR DISCREPANT CHANGES IN NEGATIVE AFFECT REACTIVITY AND BLOOD PRESSURE REACTIVITY WITH AGE
Rachel E. Koffler,1 and Thomas W. Kamarck1, 1. University of Pittsburgh, Pittsburgh, Pennsylvania, United States

Both affective and blood pressure (BP) reactivity are associated with long-term risk of chronic disease and mortality. Thus, understanding age-related changes in negative affect and BP responses to everyday demands is vital for promoting healthy aging. However, few studies have examined both psychological and BP reactivity simultaneously, which would provide more comprehensive understanding of regulatory processes at play. For the present study, 232 adults aged 50–70 years were assessed at baseline and 6 years later with ambulatory BP monitoring and momentary electronic diaries. Reactivity coefficients were output from multilevel models and used to test changes in negative affective and ambulatory BP reactivity to task demand, longitudinally. Results indicate that both systolic and diastolic BP reactivity increase with age, while negative affect reactivity does not change with age. Results are discussed in the context of life course theories of role strain and role changes and socioemotional theories of aging.

FEELING YOUNGER, BEING YOUNGER: ASSOCIATIONS BETWEEN BIOLOGICAL AGE AND SUBJECTIVE AGE IN OLDER ADULTS
Johanna Drewelies,1 Ilja Demuth,2 Sandra Duezel,3 Gizem Hueler,4 Lars Bertram,5 Elisabeth Steinhagen-Thiessen,2 and Denis Gerstorf6, 1. Humboldt University Berlin, Berlin, Germany, Germany, 2. Charité – Universitätsmedizin, Berlin, Berlin, Germany, 3. Max Planck Institute for Human Development, Berlin, Berlin, Germany, 4. University of Zurich, Zurich, Zurich, Switzerland, 5. University of Lübeck, Lübeck, Schleswig-Holstein, Germany, 6. Humboldt University, Berlin, Berlin, Germany

Subjective age has been shown to be a strong predictor of both subjective and objective health outcomes. However, little is known about the extent to which individuals’ subjective age is related to one’s biological age or not. In our study, we examine how subjective age relates to biological age—a comprehensive multi-indicator biomarker algorithm aggregating information of metabolic, cardiovascular, inflammatory, lung, and kidney functioning. We used data from 996 older adults from the Berlin Aging Study II (mean age = 68.40 years, range 60 to 85, 52% women) who provided information about chronological age, biological age, and subjective age. Multiple regression analyses revealed that subjective age was associated with biological age among older women with and without controls for age, education, and physician-observed comorbidity, but not older men. Our findings suggest that subjective age might provide unique
insights into how biological age differs across adulthood and contributes to overall health.

DISTINGUISHING SUBJECTIVE EXPERIENCE FROM OBJECTIVE FACTORS IN DECISION MAKING AND PERCEIVED EFFORT
Richard Gonzalez,1 Patricia Abbott,1 James Ashton-Miller,1 and Jacqui Smith1, 1. University of Michigan, Ann Arbor, Michigan, United States

We use self-reported and behavioral data from the HomeLab to comment on the theoretical and methodological implications of integrating objective and subjective measures of experience. To illustrate, we will focus on two domains that vary in the nature of objective and subjective measurements examined. One domain will be decision making where subjective measures include subjective probability and utility and the respective objective measures include probability and actual outcomes. The second domain will be activities of daily living, where the subjective measure is perceived effort and the objective measures include various data from sensor such as EDA (arousal) and EMG (muscle contraction). The presentation will discuss the benefits of conducting such research in a realistic standardized context such as the HomeLab, which is a fully connected, fully functioning apartment set up as a standardized lab in order to study activities of daily living.

SESSION 3195 (SYMPOSIUM)

INTERVENING IN THE LONGEVITY NETWORK
Chair: Alexander Mendenhall, University of Washington, Seattle, Washington, United States
Co-Chair: George L. Sutphin, University of Arizona, Tucson, Arizona, United States

This session will focus on interventions to delay biological aging with the goal of increasing lifespan and healthspan.

TARGETING TRYPTOPHAN-KYNURENINE METABOLISM TO EXTEND LIFESPAN AND TREAT AGE-ASSOCIATED DISEASE
George L. Sutphin1 and George L. Sutphin1, 1. University of Arizona, Tucson, Arizona, United States

The kynurenine pathway, the major route for tryptophan catabolism, becomes dysregulated with age and in many age-associated pathologies in humans. Interventions targeting kynurenine metabolism are being pursued for neurodegeneration, cardiovascular disease, and chronic kidney disease. By manipulating kynurenine pathway enzymes and metabolites, we have extended lifespan up to 40% in Caenorhabditis elegans. Our most promising single target is the metabolite 3-hydroxyanthranilic acid dioxygenase (3HAA). Elevating physiological 3HAA by directly supplementing 3HAA or inhibiting the enzyme 3HAA dioxygenase (HAAO) extends worm lifespan by ~30% while reducing oxidative stress by directly degrading hydrogen peroxide. In rodents, anti-inflammatory activity of 3HAA improves outcomes in models of cardiovascular disease, asthma, and autoimmune encephalomyelitis. We are now beginning to validate our C. elegans work in mice and investigating a mechanistic model in which 3HAA acts to extend healthy lifespan by slowing age-associated accumulation of oxidative damage and repressing chronic inflammation.

INCREASED LIFESPAN THROUGH ALTERED GCN4 / ATF-5 IN S. CEREVISIAE AND C. ELEGANS
Mark McCormick, Christine Robbins, Olivia Heath, and Marissa Westenskow, 1. University of New Mexico Health Sciences Center, Albuquerque, New Mexico, United States

In a whole-genome screen for deletions that increase lifespan in S. cerevisiae, we identified increased Gcn4 signaling as a mediator of increased lifespan. Gcn4 is a nutrient-responsive transcription factor whose entire pathway is functionally conserved from yeast through humans. Accumulation of uncharged tRNAs has been shown to upregulate Gcn4, and its mammalian ortholog, ATF4. Here we demonstrate that chemical inhibitors of tRNA synthetases significantly extend lifespan in both yeast and the nematode C. elegans, in a dose- and Gcn4-dependent manner.

LEVERAGING DRUG-DRUG INTERACTIONS FOR PHARMACOLOGICAL EXTENSION OF HEALTHY LIFESPAN
Jan Gruber1, 1. Yale-NUS, Singapore, Singapore

Traditional approaches aimed at delaying or preventing age-dependent diseases view each disease as a distinct entity, resulting from separate pathophysiological chains of events. However, it is becoming increasingly clear that even in adult animals there remains significant plasticity in terms of ageing trajectories and lifespan, suggesting that targeting ageing processes directly may be a promising alternative strategy. However, to date effects of even the most efficacious pharmacological interventions are smaller than those of ageing mutations, even when targeting the same ageing pathways. Interestingly, it has been shown that simultaneously targeting multiple ageing pathways can result in lifespan benefits that are synergistic (more than additive). We have recently shown that dramatic lifespan and healthspan extension can also be achieved by leveraging interactions between drugs targeting distinct subsets of the gene-regulatory network controlling ageing of C. elegans. These interventions were highly efficacious, even when animals were treated only as adults.

UNDERSTANDING AGING IN TERMS OF PHYSIOLOGICAL STATES
Alexander Mendenhall, Nikolay Burnaevskiy, Soo Yun, and Bryan Sands, 1. University of Washington, Seattle, Washington, United States

The “network” of homeostatic systems fails in distinct ways in individual isogenic animals during the aging process. We believe that understanding these distinct physiological states, the transitions between them, and how they relate to homeostatic system functions will allow us to better affect change in the aging process. Work in yeast showed that fixing an initial system failure, loss of vacuole acidification capacity, could increase cellular lifespan. Here we showed how the long-lived physiological state conferred by high expression of the hsp-16.2 promoter based lifespan/penetrance biomarker correlates with differences in the expression of other genes, and the structure and function of lysosomes. We found that vacuole acidification failure is not a major initial proximal cause of aging in C. elegans – at least not in their intestine cells.