SESSION 2220 (SYMPOSIUM)

GENE-ENVIRONMENT INTERPLAY IN A SOCIAL CONTEXT: THE IGEMS CONSORTIUM

Chair: N.L. Pedersen, *Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden*
Discussant: J.W. King, *National Institute on Aging, Bethesda, Maryland*

The Interplay of Genes and Environment across Multiple Studies (iGEMS) consortium of nine longitudinal twin studies was initiated to determine how genes and environments interact to influence late-life functioning. This symposium provides examples of how the influence of genetic effects on individual differences in aging related outcomes can be moderated by age, gender, and social context. The first presentation evaluates the role of marital status on measures of self-rated health. Marital status has widely differing influences on determinants of self-rated health depending on the measure, gender and age. The second presentation addresses the interplay of socioeconomic status (SEI) with genetic influences on cognitive aging. As SEI level increases, genetic contributions decrease in importance for some cognitive abilities, particularly for age cohorts 60 - 69 and 70-79. There are a variety of ways in which one can assess whether there may be an interaction of genes and environments for aging related outcomes. The third presentation uses identical twin comparisons to demonstrate gene-environment interplay. GE interplay may be more important for late life decline than for more stable mid-life periods. Whereas the first two presentations focused on interplay given specific environments (marital status and socioeconomic status), the last presentation evaluates both interplay and the role of APOE genotype in the interplay, using grip strength as an example. As a whole, this symposium is meant to provide further insights into the complex interplay of genes and social context on susceptibilities and resilience in the aging process.

MARITAL STATUS MODERATES GENDER DIFFERENCES IN GENETIC AND ENVIRONMENTAL INFLUENCES ON SUBJECTIVE HEALTH

D. Finkel[1], C.E. Franz[2], B. Horwitz[3], *1. School of Social Sciences, Indiana University Southeast, New Albany, Indiana, 2. University of California, San Diego, San Diego, California, 3. California State University, Fullerton, Fullerton, Colorado*

Subjective health (SH) taps personality and cognitive status, as well as physical health. Behavior genetics allow us to examine genetic and environmental contributions to SH. Three measures of SH are collected by 9 twin studies participating in IGEMS. Over 16,000 individuals aged 24 to 95 contributed data on 3 SH items: self-rated health (SRH), health compared to others (COMP), and impact of health on activities (ACT). Marital status, coded as either married/cohabitating or living alone, was used as a marker of environmental resources that impact subjective health perceptions. The strongest impact of marital status was found for ACT in men. Heritability of ACT was higher in single men (40%) than married men (30%) up to age 70, then the pattern reversed and heritability was higher in married men (26%) than single men (10%). Results suggest gender differences in the role of marriage as a source of environmental resources for health.

SOCIOECONOMIC STATUS AND AGE AS MODERATORS OF COGNITIVE PERFORMANCE

C. Zavala[1], W. Johnson[2], C.A. Reynolds[1], *1. Psychology, University of California, Riverside, Riverside, California, 2. The University of Edinburgh, Edinburgh, United Kingdom*

Socioeconomic status (SES) shows a robust influence on cognitive performance across the lifespan. Furthermore, evidence suggests heritability of cognitive abilities may differ across levels of SES. The current study examined the presence of GxE interaction, with harmonized household occupational status (SEI) as a moderator of cognitive

performance in the IGEMS consortium of nine studies. Cognitive tasks assessed verbal, spatial, working memory, and perceptual speed abilities. Results suggested SEI moderation of genetic and environment contributions for verbal ability, memory, and perceptual speed. For example, shared environmental contributions were greater with higher SEI for verbal ability and perceptual speed, while additive genetic and unique environmental influences were smaller. For verbal ability, age group differences suggested that SEI moderation of shared environmental variance was most striking in older cohorts (60 years and later). Overall, results suggested that the relative contributions of genetic and environmental to cognitive performance vary with both SEI and age.

GENE-ENVIRONMENT INTERPLAY CONTRIBUTES TO HEALTH, WELL-BEING AND COGNITIVE PERFORMANCE IN MID TO LATE ADULTHOOD

C.A. Reynolds, *UC Riverside, Riverside, California*

Gene – environment interplay may be important across aging domains. GxE interactions were evaluated for depressive symptoms, BMI, and cognitive performance in eight IGEMS studies from Denmark, Sweden, and the US. Analyses considered mixture distributions of within pair differences among identical twins. Results for the full sample, within country, and within sex, suggested GxE for depressive symptoms (p<1.62E-05) and for BMI (p<2.26E-06). GxE was suggested across cognitive domains in the full sample (p<5.29E-03), and generally across country and sex. Trends over age bands (<50, 50-59, 60-69, 70-79, 80+) suggested GxE for depressive symptoms until age 80, peaking at 60-69 years. For BMI, GxE trends were nonlinear with peaks before 50 and after 70 years. For cognition, peak GxE was observed in midlife for speed but later adulthood for verbal ability and working memory. Peak periods of GE interplay in health, wellbeing and cognitive traits may coincide with salient periods of age-related change.

GENE-BY-ENVIRONMENT INTERACTION PARTLY EXPLAINS THE HAND GRIP STRENGTH LEVELS AS WELL AS DECLINE

I. Petersen[1], K. Christensen[1], M. McGue[2,1], C.A. Reynolds[3], *1. Institute of Public Health, University of Southern Denmark, Odense, Denmark, 2. Department of Psychology, University of Minnesota, Minneapolis, Minnesota, 3. Department of Psychology, University of California, Riverside, California*

Previous studies of hand grip strength have demonstrated a strong association with age and sex; males having a higher initial as well as decline of grip strength than females. Heritability studies of grip strength have estimated that genes and environmental factors each account for half of the observed variation of grip strength. However, apart from sex and age, little is known about the genetically and environmental determinants of level and decline of grip strength. Based on a pooled sample of longitudinal survey studies of Danish, Swedish and US twins (N=10,000; age-range: 34-99) we set out to examine the possible presence of gene-by-environment interaction as part of the mechanism behind initial level and age-dependent decline of grip strength. Using an analytical approach proposed by Fisher (1925) revealed evidence of heterogeneity of the distribution of the within-pair difference of growth curve parameters in monozygotic twins indicating that gene-by-environment interaction may be present.

SESSION 2225 (SYMPOSIUM)

AGING IN THE CONTEXT OF NEIGHBORHOOD CHANGE

Chair: J.A. Ailshire, *Andrus Gerontolgoy Center, Univ Southern California, Los Angeles, California*
Discussant: P. Clarke, *University of Michigan, Ann Arbor, California*

The U.S. population is aging rapidly and many factors, from the predicates of policy, to the assumptions of individuals, are heightening