Keyword 2: computerized neuropsychological testing
Keyword 3: psychometrics
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5 min. break

4:55 - 5:00pm Friday, 3rd February, 2023

Plenary F: Timing of Influences on Brain and Cognition: a Lifespan Perspective

Presenter: Kristine Beate Walhovd

5:00 - 6:00pm
Friday, 3rd February, 2023
Pacific Ballroom A

Abstract & Learning Objectives:
Brain and cognition vary and change markedly across the lifespan. I use magnetic resonance imaging and cognitive data to show that while general age trends can be identified in brain and cognition, there are great individual differences through life, and these are influenced by several factors, including at early life stages. Hence, in some respects, aging starts in the womb. Recognizing and understanding the impact of early relative to later stage factors on neurocognitive lifespan differences, changes and aging is a major challenge. Adequately meeting this challenge is crucial both to understand the mechanisms at work early in life, and to identify what and how residual variance may be affected by later life factors. Thus, knowledge of the timing of influences on brain and cognition along the lifespan is needed to develop realistic plans for prevention and intervention to optimize brain and cognition at different ages. I discuss how example factors such as prenatal drug exposure, birth weight, genetics, education, income, and “baseline” general cognitive ability, as well as cognitive training interventions relate to differences and/or changes in the human brain along the lifespan. Example findings are drawn from the studies of the Center for Lifespan Changes in Brain and Cognition (LCBC), where we follow individuals ranging in age from 0 to 100 years. Our studies are in part linked to Norwegian registry data, including the Mother, Father and Child Cohort study (Moba), the Norwegian Twin Registry and the Medical Birth Registry. Linkage to registry data on normal variation of pre-and perinatal characteristics, as well as studies of groups with known early biomedical risk, such a prenatal drug exposure, enable investigation of the possible impact of neurodevelopmental factors on brain and cognitive function through the entire life course. I also discuss how genetically informed studies of brain and cognition sampling broader age spans may contribute to our understanding of the timing of influences. Selectivity of samples constitute a challenge to generalizability in all human research. I discuss how research across international databases can, beyond boosting power and detect consistency of effects, help us appreciate there are diverse associations of possible factors of influence on different groups. This is crucial, as we need to understand to what extent various factors´ association with brain and cognition are universal or cohort-specific, prior to mechanistic understanding. Thus, in this presentation, I will discuss how transdisciplinary, longitudinal, multi-method, and multi-cohort research can illuminate factors that may influence brain and cognition, and their potential timing, in a lifespan perspective.
Upon conclusion of this course, learners will be able to:
1. Recognize that differences in brain and cognition even at advanced age may reflect early life factors, rather than, or in addition to, differences in brain and cognitive change with age
2. Describe consistency as well as diversity of factors´ (such as SES) associations with brain and cognition across cohorts of different age and origin.
3. Evaluate differences in factors present early in life, including at birth (“different offset”) before attributing variance in brain and cognitive function to changes with age (“different slope”)

CE Workshop 11: The Cognitive Contraindications, Complications and Costs of Epilepsy Surgery

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