

TIC8: Presenters, Titles, and abstracts by session

Session 1

Susan Kemper – University of Kansas, USA

Title:

Aging and the Role of Working Memory in Language Processing

Abstract:

Age-associated declines in working memory affect syntactic processing, limiting older adults' ability to produce complex grammatical sentences and their ability to understand such constructions. Evidence from studies of spontaneous speech production, controlled production studies, and dual-task production studies will be reviewed to support this hypothesis. Further evidence will be provided by examining eye fixation patterns while readers are processing different types of complex sentences. The role of individual differences in working memory will be considered along with implications for processing languages other than English.

Paul Verhaeghen – Georgia Institute of Technology, USA

Title:

A Walk Down Working Memory Lane: Age Differences in Focus Switching and Retrieval
Dynamics in Working Memory

Abstract:

Working memory is a hierarchical system, with some items available for immediate processing inside a so-called focus of attention, while others are stored away in an outer store. This leads to two types of retrieval processes: focus switching and search through the outer store. Here, an interesting age-related dissociation emerges: The dynamics of these processes are well-preserved with age; however, when a focus switch is required, older adults retrieve items from working memory with decreased accuracy. Additionally, the focus of attention is expandable through practice in younger, but not older adults. This then points at specific age-related problems with working memory capacity, even in the absence of age-related speed differences. Repercussions for other aspects of cognition, including language, are discussed.

Etsuko Harada - Hosei University, Japan

Title:

Error Repetitions and cognitive control: Why does it happen outside the psychology lab?

Abstract:

Error repetition is the phenomenon that older adults continually repeat the same erroneous operations when they are using IT-based equipments in their daily lives and also in usability testing labs. In order to clarify its cognitive mechanisms, the phenomenon has been replicated in the cognitive psychology laboratory with the kanji selection task (Harada & Suto, 2004). The phenomenon was consistently observed, both with younger and older adults, with some restricted conditions, especially when participants were asked to keep multiple goals: i.e., in the dual task condition and/or with a task-switching condition under some constraints (Harada & Suto, 2006). In the talk, we will report that the task-switching condition is effective and necessary to repeat errors, not because of their local switching costs, but because of keeping multiple goals, which were given to the participants by the condition that requires the keeping the current task during unswitched trials. In addition, to showing the specificity of task-switching with memory loads, some correlational analysis within error occurrences (single / repetition under different experimental conditions) and also between error occurrences and some other attention test scores by older adults were conducted. This specificity of the task-switching with memory loads will be discussed as the key to understand why error repetitions were observed easily when using IT-based equipments, but were rare with the usual cognitive psychological tasks.

Session 2

Denise Park - University of Texas at Dallas, USA

Title:

Age differences in neural structure and function in East Asians and Westerners.

Abstract:

There is clear evidence that sustained experiences may affect both brain structure and function. Thus it is quite reasonable to posit that sustained exposure to a set of cultural experiences and behavioral practices will affect neural structure and function. The burgeoning field of cultural psychology has provided innumerable demonstrations that there are subtle differences in the way individuals process information that appears to be a product of cultural experiences. An important question is whether cultural effects on neurocognitive function magnify with age, due to sustained exposure to the culture, or whether neurobiological aging is dominant, resulting in more similarities in neural structure and function with age. In the present talk, I will address these issues, drawing from the largest cross-cultural study of neurocognitive aging to date--a study that examine differences in brain structure, ventral visual function, memory function, and cognitive behaviors in 200 young and old Singaporeans and Americans.

Thomas Hess – North Carolina State University, USA

Title:

Aging and memory in context

Abstract:

A general contextual framework will be presented for understanding the relationship between aging and memory. Within this framework, age-related variation in everyday memory functioning is accounted for by a variety of influences in addition to the normative changes in cortical structures and functions assumed to underlie such variation in many accounts of cognitive aging. This presentation will focus on socioemotional influences on memory performance, with a particular emphasis on how both the broader social context (e.g., stereotypes of aging) and more immediate individual-based factors (e.g., motivations and goals in response to changing life circumstance and personal resources) affect memory functioning in later life.

Session 3

Moshe Naveh-Benjamin - University of Missouri, USA

Title:

Age-Related Changes in Episodic Memory: Automatic and Strategic Contributions

Abstract:

Older adults show a decline in episodic memory. In particular, while aging seems to cause relatively minor impairment in memory for components of an episode, older adults' ability to remember associations between components is typically significantly compromised, relative to that of younger adults. The current studies were carried out in order to determine whether such an age-related associative deficit is mediated by strategic and automatic processes. Several experiments were conducted, in which younger and older adults studied and were tested on their memory for small episodes under either incidental or intentional learning instructions, under full or divided attention conditions, and under specific strategy instructions. In addition, high ability older adults' performance was compared to that of typical older adults. Results are discussed in terms of the role of automatic and strategic processes in older adults' associative deficit and the potential underlying brain structures, in particular the MTL/H and the frontal areas.

Darlene Howard - Georgetown University, USA

James Howard - The Catholic University of America, USA

Title:

Dissociable Forms of Implicit Learning & Memory in Aging

Abstract:

Implicit learning and memory occur without intention or awareness of what has been learned. They are important for acquiring skills, including language and reading, for social intuition, and for rehabilitation. Global claims are often made regarding whether implicit learning and memory are impaired or spared in aging or in disorders. But there are many forms that impose different cognitive demands, and call upon different brain systems. Here we focus on two forms, presenting evidence that they are differentially affected by healthy aging, and by conditions such as Mild Cognitive Impairment and dyslexia. We conclude that such comparisons contribute to characterizing the cognitive/brain differences underlying healthy aging, and might reveal early markers of pathology and avenues for rehabilitation and intervention.

Roger Dixon – University of Alberta, Canada

Title:

Longitudinal Perspectives on Memory Change and Aging

Abstract:

Longitudinal research on memory and aging permits attention to several unique and important issues: (a) intraindividual memory change, (b) interindividual differences in memory change, and (c) precursors and other factors affecting memory change. In Canada, the Victoria Longitudinal Study (VLS) has collected data from three samples recruited in successive decades and tested at 3-year intervals (VLS Sample 1 [1980s, now with 7 waves or 18 years], VLS Sample 2 [1990s, now with 5 waves or 12 years], and VLS Sample 3 [2000s, now with 2 waves or 6 years]). At each wave, each VLS participant contributes about 12-14 hours of memory, cognitive, neuropsychological, biological, health, demographic, and lifestyle data. In this paper we present new results pertaining to the three issues (noted above), and draw conclusions relevant to key theoretical, clinical, and methodological concerns.

Session 4

Lars Nyberg - Umea University, Sweden

Title:

Mapping within-person changes in functional brain activity patterns

Abstract:

Previous age-comparative functional neuroimaging studies have revealed evidence for under- as well as over-recruitment in regional brain activity as a function of increasing age. However, with only a few exceptions, past conclusions rest on cross-sectional designs. We have previously shown that conclusions of how aging affects cognition across the adult life span vary greatly depending on whether they are based on cross-sectional or longitudinal studies. Here we extend this work to analyses of functional brain activity patterns. Preliminary analyses indicate that longitudinal analyses are more sensitive than cross-sectional comparisons, and that they mainly show under-recruitment in older age.

Shu-Chen Li – Max Planck Institute, Germany

Title:

Neuromodulation and genetics of memory in old age: Empirical evidence and
neurocomputational modeling

Abstract:

The frontal-hippocampal memory circuitry is affected by aging at the neuroanatomical, neurofunctional, and neurochemical levels. Guided by computational theories relating dopaminergic modulation to neuronal noise and distinctiveness of memory representations, we combined neurocomputational, genomic behavioral, and genomic imaging approaches to investigate the effects of neuromodulation on memory aging. In a large sample of younger (20 to 30 years) and older (60 to 70 years) Berlin residents we assessed working memory and episodic memory functions along with genetic data relevant for individual differences in dopaminergic modulation (e.g., COMT, DAT) and other genetic factors related to memory functions (e.g., KIBRA and DBNF). Our results indicate that dopamine relevant genotypes interact with aging and other genes affecting hippocampal processes in affecting memory functions.

Kaarin Anstey – Australian National University, Australia

Title:

Functional biomarkers and memory ageing

Abstract:

Functional biomarkers include sensorimotor and physiological measures that index functional ageing. They typically include measures of vision, hearing, muscle strength, and lung function. I will give an overview of cross-sectional and longitudinal findings on the associations between functional biomarkers and memory ageing. I will then focus on longitudinal findings from a mid-life and late-life cohort drawn from the PATH Through Life study based in Canberra. Association of biomarkers with normative memory ageing, brain ageing, and conversion to mild cognitive disorders will be described. Recent experimental work on the impact of visual function and eye disease on laboratory tasks and neuropsychological assessment will also be presented. Finally, directions for further investigation in relation to biomarkers and memory ageing will be identified.
